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METROPOLITAN WATER SUPPLY, SEWERAGE, AND DRAINAGE ACT, 1909-1969.

Metropolitan Water Supply, Sewerage,
and Drainage Board,
Perth, 21st January, 1970.

THE Metropolitan Water Supply, Sewerage, and Drainage Board, a body corporate established under the Metropitan Water Supply, Sewerage, and Drainage Act, 1909-1969, acting pursuant to section 146 of that Act, hereby—

(a) revokes the by-laws made under the provisions of the Metropolitan Water Supply, Sewerage, and Drainage Act, 1909 (as amended), as reprinted pursuant to the Reprinting of Regulations Act, 1954, and published in the *Government Gazette* on the 8th March, 1960 and amended from time to time thereafter by notices published in the *Government Gazette*;

(b) makes the by-laws set forth in the Schedule hereunder.

G. SAMUEL,
General Manager.

SCHEDULE.

METROPOLITAN WATER SUPPLY, SEWERAGE AND DRAINAGE BOARD BY-LAWS.

PART I.—PRELIMINARY

1. These by-laws may be cited as the Metropolitan Water Supply, Sewerage, and Drainage Board By-laws.

2. In these By-laws, unless the context otherwise requires—

"**air gap**" means the unobstructed vertical distance between the lowest opening of a water service pipe or fitting supplying water to a fixture or receptacle and the highest possible water level of the fixture or receptacle;

"**anti-syphonage vent**" (or "**back vent**") means any vent pipe from an individual trap to the open air or to a main or branch vent pipe having for its purpose the prevention of loss of water seal in the trap;

"**approved**" means approved by the Board or by a duly designated officer of the Board;

"**bore**", "**diameter**", or "**size**", in reference to—

(a) any pipe of copper or brass, means the external diameter of the pipe; and

(b) any pipe of any other material, means the internal diameter of the pipe;

"**branch vent**" means a vent connecting one or more individual vents with a vent stack or stack vent;

"**building**" means any building used as a work place, residence, place of business, place of amusement or a place of human habitation, or used for the storage of food intended for human consumption, but does not include an out-building unless that out-building is used for any of those purposes or is provided with plumbing fixtures;

"**Chairman**" means the Chairman or Acting Chairman of the Board;

"**combined waste pipe**" means any pipe which receives the discharges from both soil and waste fixtures and conveys those discharges to the drain; combined waste pipes are connected directly to the drain and are used only in connection with the combined pipe system;

"**Chief Engineer**" means—

(a) the person who is for the time being the Chief Engineer or Acting Chief Engineer for the Board; and

(b) any other officer or person appointed by the Board for the purpose of discharging the duties and exercising the powers of the Chief Engineer;

"**developed length**", in reference to a pipe, means the length along the centre line of the pipe and fittings;

"**disconnector trap**" means a trap used in the separate pipe system for isolating or disconnecting waste pipes from the drain and soil pipes and for providing inlet ventilation to the waste pipe or pipes discharging into it;

"**domestic purposes**", in relation to the supply of water, means the supply of water to rated land classified as residential under section 90 of the Act or non-rated land used for residential purposes; the term also includes the use of water for watering lawns and gardens appurtenant to the land and for watering lawns and gardens growing in a street or road adjoining the land;

"**domestic sewage**" means all faecal matter, urine, household slops and household liquid refuse;

"**dwelling house**" means a building used solely for human habitation, but does not include boarding houses, tenement buildings, flat buildings, hostels, hotels, convents, schools, clubs, colleges, churches, halls, dwelling and farm, dwelling and nursery, dwelling and dairy, dwelling and stables, warehouses, shops, combined shops and dwellings, or any other premises of a similar nature;

"**educt vent**" means an opening or pipe for the exit of air from a soil pipe, waste pipe, combined waste pipe or drain;

"**external water closet**" means any closet which is entered solely from an area of not less than 9 square feet open to the sky;

"**feeder**" means any water course, creek, stream or other channel with either perennial or intermittent flow whereby water can be conveyed to any reservoir;

"**fittings**" means all pipes, meters, or other apparatus used for or in connection with the supply of water; and all pipes, cisterns, traps, syphons, manholes, ventilators, and all other apparatus connected with and requisite to secure the safe and proper working of any sewer or drain;

"**fixtures**" means all apparatus, together with their necessary appurtenances, which may be attached to the plumbing or drainage system of any property, and which are intended for the collection or retention of any wastes or waste waters for ultimate discharge into the sewerage system, such as closet pans, urinals, baths, sinks, basins, troughs and the like;

"**flat**" means a suite of rooms used or intended or adapted for use as a separate habitation and comprised in a building containing one or more similar suites;

"**high-water mark**" means the level of full supply of any reservoir or feeder thereto;

"**horizontal branch**" means that part of a soil and/or waste pipe extending laterally from a soil and/or waste stack with or without vertical section or branches which receives the discharge from one or more waste and/or soil pipes and conducts it to the soil and/or waste stack;

"**induct vent**" means an opening or pipe for the admission of air to a soil pipe, waste pipe, combined waste pipe or drain;

"**industrial waste**" means the liquid refuse from any business, industry or manufacturing premises other than domestic sewage, stormwater or unpolluted water;

"**Inspector**" means any person appointed by the Board for purposes connected with the administration of these By-laws, and also any person acting in the capacity of ranger of any proclaimed catchment area;

"**interceptor trap**" or "boundary trap" means a trap situated on the drain at some point between the sewer and the lowest inlet to the drain, for the purpose of preventing the passage of air or gases from the sewer to the drain;

"**internal water closet**" means any closet other than an external closet as herein defined.

"**main vent**" means the principal artery of the venting system, to which vent branches may be connected;

"**private service**" includes all the pipes and fittings, and all connections and apparatus of any nature or kind, whether used temporarily or otherwise, on any part of any land or building, supplied with water, whether by meter or otherwise, and includes any pipes or fittings the property of the consumer, which are used for conveying water from the mains of the Board whether situated on the premises of the consumer or otherwise;

"**property**" includes any house, building, tenement, land or premises.

"**relief vent**" means any vent which is connected below the level of the lowest fixture for the purpose of relieving the main vent.

"**residential building**" means a building in which sleeping accommodation is provided for persons other than caretakers and their families and includes dwellings, tenements, flats, hotels, lodging houses, dormitories, hospitals and motels;

"**separate pipe system**" means that type of plumbing installation in which separate pipes are provided for soil and waste discharges and for the ventilation of soil and waste fixtures, and in which all waste pipes are connected to the drain through a disconnector trap;

"**single pipe system**" or "**combined pipe system**" means that type of plumbing installation in which disconnector traps are omitted in connecting waste pipes to the house drain and both soil and waste pipes are connected direct to the house drain, or are combined as a single pipe taking both soil and waste discharges and in which a common system of venting is used for all classes of pipe;

"**soil pipe**" means any pipe other than a combined waste pipe which conveys the discharge from water closets, slop sinks or urinals to the drain;

"**stack**" means the vertical main of a system of soil waste or vent piping;

"**stack vent**" means the extension of a soil or waste stack above the highest horizontal drain connected to the stack;

"**the Act**" means the Metropolitan Water Supply, Sewerage, and Drainage Act, 1909, as amended from time to time;

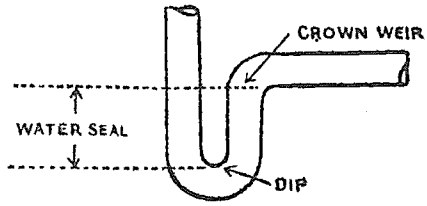
"**Trap**" means a fitting which retains water to form an effective water seal and used for the purpose of preventing the passage of air or gases or for intercepting air or gases or silt or grease or acid or oil or for any other such like approved purpose, includes interceptor, boundary, disconnector, gully, grease, acid, oil, or any other like traps;

"**vent pipe**" means any pipe used or intended to be used for ventilating soil pipes, waste pipes, drains, traps, connections or sewers;

"**vent stack**" means a vertical vent pipe installed primarily for the purpose of providing circulation of air to and from any part of the drainage system;

"**waste pipe**" means any pipe which conveys the discharge from any fixture except water closets, slop sinks or urinals to a disconnector trap in the case of the double pipe system or to a soil pipe or combined waste pipe in the case of the single pipe system;

"**water seal or "trap seal**" means the vertical distance between the dip and the crown weir of a trap as shown in sketch:—



"**yard gully**" means a disconnector trap which is used externally and fitted with a basin top and grating.

PART II.—PREVENTION OF POLLUTION OF THE CATCHMENT AREAS.

SCOPE OF BY-LAWS.

3. This Part applies to all Water Reserves and catchment areas constituted under or for the purposes of the Act.

PREVENTION OF POLLUTION.

4. No person shall bring, convey, throw, deposit, discharge or leave or cause, permit or suffer to be brought, conveyed, thrown, deposited, discharged or left into or upon a catchment area any litter, rubbish, refuse, dirt, garbage, offal, filth, dung, dead animal or any noisome, noxious or polluting liquid substance, matter, or thing which is likely to cause pollution of the catchment area, or any reservoir or watercourse in the catchment area, or which is likely to affect the purity of the water supply.

5. No person shall permit the water of any sink, sewer or drain or any filthy or polluted water discharging from premises occupied by him or under his control, to run, flow, or be brought into any reservoir or watercourse in any catchment area.

DESTRUCTION OF PROPERTY AND TRESPASSING.

6. No person shall camp, light a fire, shoot, hunt any game or catch, or attempt to catch, any fish or marron within a catchment area.

7. No person shall in or upon any water course, lake, reservoir, aqueduct or other water works in a catchment area set afloat, sail, propel or cause to be propelled any craft or vessel, or catch or attempt to catch any fish or marron.

8. No person shall swim, bathe or wash any clothes or other articles in any stream, reservoir, aqueduct or other water works within a catchment area.

9. No person shall within a catchment area—

(a) wifully injure, damage, disfigure, displace or remove—

(i) any hedge, fence, stake, post, pillar, pipe or survey mark or peg of the Board; or

(ii) any board, plate or tablet or any support, fastening or fitting of any board, plate or tablet used or constructed or adapted to be used for the exhibition of any by-law, rule, regulation or notice;

(b) wilfully injure, deface or disfigure any notice or copy of a by-law, rule or regulation displayed upon such a board, plate, tablet or structure;

(c) wilfully injure or damage any work or property belonging to or under the control of the Board upon or used in connection with a catchment area;

(d) open any gates, slip rails or other entrance into any enclosure of the property of the Board without the written permission of the Board;

(e) wilfully or carelessly break, injure, open or shut or wilfully permit to be open or shut any lock, sluice cock, valve, pipe or other authorised fitting or any work belonging to the Board; or

(f) do or continue or suffer to be done or continued any act or thing which will cause or be likely to cause damage or injury to any property of the Board.

ERECTION OF BUILDINGS AND DEVELOPMENT OF CATCHMENT AREAS.

10. No person shall commence or carry out any agricultural or industrial development in a catchment area without the approval in writing of the Board.

11. No person shall commence or proceed with the erection of a building, or any alterations or additions to a building, in a catchment area without the approval in writing of the Board.

LIVESTOCK ON CATCHMENT AREAS.

12. A person shall not raise or graze horses, goats, sheep, cattle, pigs, or carry on the operations of poultry farming or dairy farming on a catchment area, without written permission of the Board.

13. A person shall not cause or permit any horse, goat, cattle, sheep, pig, duck, geese or fowls or other species of livestock to stray or depasture over any portion of a catchment area.

14. The owner or person in charge of any animals or birds shall prevent such from straying on to any lands of the Board within a catchment area.

15. Any animal or bird found straying on any lands of the Board within the catchment area may be—

(a) driven away or otherwise removed from off such lands;

(b) sold;

(c) destroyed; or

(d) otherwise disposed of,

by any officer or person authorised by the Board.

16. The owner or person in charge of any animal or bird which is driven away, sold, destroyed or otherwise disposed of as provided in by-law 15 of these by-laws, shall be liable to pay to the Board all costs and expenses incurred or reasonably charged by the Board, and such costs and expenses may be recovered by the Board from such person in any court of competent jurisdiction.

USE OF MANURE AND PESTICIDES.

17. The owner or occupier of any house, land or premises situated within a catchment area shall not use any animal manure or artificial manure for cultivation purposes unless written permission therefor has been given by the Board.

18. No person shall lay, place or use upon any part of a catchment area any poison, pesticide, insecticide, or other dangerous substances without written permission of the Board.

ABATTOIRS AND SLAUGHTERING OF BEASTS.

19. Abattoirs or slaughter houses shall not be established or conducted in any part of a catchment area.

20. The owner of any animal which dies upon any part of a catchment area or the person under whose charge the animal was at or immediately before the time of its death, shall forthwith upon knowing or being informed of death of the animal remove its body or carcass and so effectively dispose of the same as to prevent pollution of the catchment area.

21. No person shall slaughter a beast in a catchment area in any place or in any manner or under any circumstances or conditions which may be likely to pollute water supply of the catchment area.

22. (1) Any person who slaughters a beast within the catchment areas shall forthwith cause all blood, offal and other refuse products, to be collected and deposited in some suitable and proper receptacle constructed of iron or other non-absorbent material and to be disposed of either by removal from the catchment area or by burning or burial in such place and manner or in such other way as shall not be likely to cause pollution of any part of the catchment area or the water supply.

(2) Such person shall cause every such receptacle to be thoroughly cleansed immediately after it shall have been used for the collection and removal of the products aforesaid.

23. Any person who slaughters a beast within the catchment area shall cause every part of the floor of any shed or slaughter house in which such beast has been slaughtered and the walls thereof to a height of 6 feet from the floor and all the fittings thereof upon which any blood or refuse from such slaughtering has been spilled, splashed or deposited, to be thoroughly washed and cleared immediately after completion of the slaughtering.

24. Any person destroying or killing any rabbits or other vermin upon any part of the catchment area shall dispose of the bodies or any part thereof by removal from the catchment area or destruction by fire within all reasonable despatch or shall bury the same at a distance of not less than one hundred yards from the top water level of any reservoir or centre line of any water course or the covering of earth of not less than 10 inches in thickness.

CUTTING OF TIMBER, DESTRUCTION OR REMOVAL OF TREES OR SHRUBS.

25. No person shall without the written permission of the Board, carry out any clearing operations or destroy, cut, damage or remove any tree or shrub on lands in the catchment area.

DISPOSAL OF DOMESTIC SEWAGE.

26. A person shall not construct a cesspit upon any land within the catchment area without written approval of the Board.

27. The occupier of any land shall, upon being required by notice in writing from the Board to do so, discontinue the use of any cesspit or receptacle for the deposit of human excreta or urine, and shall comply with the requirements of any such notice directing the method to be adopted for the emptying, disinfecting and filling up of the cesspit or receptacle.

28. (1) No person shall within the catchment area dispose of human excreta or urine except in one of the following ways:—

(a) by its being deposited in water-tight metal pans, which shall be emptied and cleansed at least once in every seven consecutive days, or oftener, if necessary to prevent overflow, and the contents removed and disposed of elsewhere than on the catchment area;

(b) by means of a septic tank or other treatment plant approved by the Board and the Health Department.

(2) Any application for permission to install a septic tank or treatment plant shall be accompanied by complete plans and specifications thereof, a statement of the way in which it is proposed to dispose of the effluent water and a statement of the number of persons to be served by the tank or plant.

(3) No alteration to any septic tank or sewage treatment plant shall be carried out without the permission of the Board.

29. A person shall not cause or permit nightsoil, faecal matter, or refuse to be buried, deposited or spread within a catchment area.

CONSTRUCTION AND SITING OF SANITARY CONVENIENCES.

30. (1) Sanitary conveniences on catchment areas shall be constructed to comply with the Uniform Building By-laws or Local Authority By-laws and shall be in conformity with any By-laws made under the Health Act, 1911.

(2) Sanitary conveniences shall not be constructed within fifty yards of high water mark or such greater distance as the Board may specify and any conveniences situated within this distance shall be taken down by the owner or occupier of premises on which it is situated within one calendar month after notice in writing to this effect has been given by the Board or by an Inspector to such owner or occupier.

(3) Existing sanitary conveniences on catchment areas shall whenever considered necessary by the Board be removed to any position directed by the Board and such removal or re-erection shall be at the cost of the owner who shall have the work completed within one calender month after service of a notice in writing by the Board requiring this to be done provided that the owner may at any time within two weeks after service of such notice appeal to the Board whose decision shall be final.

DISPOSAL OF RUBBISH.

31. (1) The occupier of every house or premises shall provide and keep, in a position approved by the Board, such and so many receptacles or boxes of such material and dimensions as may be required by the Board for the temporary deposit of solid house refuse.

(2) The owner or occupier of every house or premises shall regularly collect all refuse or rubbish from such premises and place the same in approved receptacles, and shall not permit or suffer such receptacles to overflow or become offensive, and shall, when necessary or directed by the Board, thoroughly disinfect the receptacles forthwith.

(3) The owner or occupier of every house or premises to which a receptacle is attached or used shall cause it to be emptied at least once a week, or as often as the Board may direct, and shall keep the receptacle in good repair, and upon notice from the Board, shall immediately replace by a new and approved receptacle any receptacle that the Board determines to be worn out or unfit for use.

(4) All receptacles shall be kept in such convenient place to allow of ready removal as may be directed by the Board, so as not to be a nuisance to any person, and shall be kept in a thoroughly sanitary condition, and removed at least once every week.

CAMPS.

32. (1) No person shall establish upon a catchment area any camp of workmen engaged in construction of public or other works—

(a) in such a position that any part of the camp shall be within 250 yards or such a greater distance as shown or be specified by the Board from the top water level of the reservoir or the centre line of the water course;

(b) unless permission to establish the camp has been granted to him by the Board and in that event subject to such conditions as may be imposed by the Board.

(2) The person to whom permission is granted shall comply with all conditions subject to which such permission was granted, and shall not maintain the camp on the catchment area after the expiration or cancellation by the Board of the permission so granted.

(3) A person to whom any permission has been granted under this by-law shall—

(a) cause the camp to be maintained at all times in good order and in a clean and sanitary condition;

(b) provide and at all times maintain proper and convenient closet accommodation and urinals for the use of persons resorting to or occupying such camp with suitable pans constructed of iron or other non-absorbent material;

(c) make provision that all such pans shall be so covered as to prevent the access of flies thereto;

(d) cause such pans to be regularly emptied, cleansed and disinfected as often as shall be necessary for the preservation of the sanitation of the camp area and cause the contents of such pans to be disposed of in such place and in such manner as may be approved or directed by the Board or any officer or person authorised by the Board in that behalf;

(e) cause all closets and urinals to be regularly limewashed or disinfected;

(f) provide a garbage removal service and cause such garbage to be regularly removed from the camp area and disposed of so as to prevent possibility of pollution of the catchment area; and

(g) not knowingly allow any animal to be kept or to remain in any such camp.

(4) For the purpose of paragraph (f) of sub-bylaw (3) of this by-law, garbage includes all kinds of refuse, rubbish, manure, ashes, offal, dead animals and noisome things.

ENTRY PRIVATE PREMISES BY OFFICERS OF THE BOARD.

33. (1) It shall be lawful for an Inspector, or any assistants acting under the directions of an Inspector, or other authorised officer, at his discretion, at any reasonable hour, with or without notice, to enter any land, house, or premises for the purpose of ascertaining whether any act or thing is being done or permitted within such land, house or premises in breach of these by-laws, and to remove, or cause to be removed, anything therein or thereon in breach of these by-laws, or to take such steps as he may deem necessary for carrying out these provisions.

(2) The cost of such removal or such other necessary act shall be borne by the owner or occupier of the premises upon which such breach shall occur.

PERIOD FOR COMPLIANCE WITH NOTICES.

34. Unless otherwise provided, the time which may elapse between the giving of a notice and the doing of a thing required to be done by any Inspector or other authorised officer shall be determined by the Board according to the nature of each case.

PART III.—PROTECTION OF WATER, GROUNDS, WORKS, etc. FROM TRESPASS AND INJURY.

DESTRUCTION OF PROPERTY OR TRESPASSING.

35. No person shall trespass within the fenced ground adjacent to or reserved for Water Supply, Sewerage or Stormwater Drainage Works or enter, without lawful authority, any Water, Sewerage or Stormwater Drainage Work not open to the public.

36. No person shall—

(a) picnic, camp, light fires, shoot, hunt any game, bathe or swim, or angle for, or catch, any fish or marron within any ground or reserve referred to in by-law 35 of these by-laws unless, in the case of picnicking, it is on specified areas set aside for that purpose by the Board;

(b) in or upon any water course, lake, reservoir, compensating basin, aqueduct or drain, set afloat, sail, propel or cause to be propelled any craft or vessel or catch or attempt to catch or take fish or marron;

(c) wilfully injure, damage, disfigure, displace or remove—

(i) any hedge, fence, stake, post, pillar, pipe or survey mark or peg of the Board; or

(ii) any board, plate or tablet or any support, fastening or fitting of any Board plate or tablet used or constructed or adapted to be used for the exhibition of any by-law, rule, regulation or notice.

(d) wilfully injure, deface or disfigure any notice or copy of a by-law, rule or regulation displayed upon any board, plate, tablet or structure referred to in paragraph (c) of this by-law;

(e) wilfully injure or damage any work or property belonging to or under the control of the Board upon or used in connection with such works;

(f) open any gates, slip rails or other entrance into any enclosure of the property of the Board without the written permission of the Board;

(g) wilfully or carelessly break, injure, open or shut or wilfully permit to be open or shut any lock, sluice cock, valve, pipe or other authorized fitting or any work belonging to the Board; or

(h) do or continue or suffer to be done or continued any act or thing which will cause or be likely to cause damage or injury to any property of the Board.

PROTECTION OF FLORA, SHRUBS, etc.

37. No person shall remove, pluck, or damage any wildflower, shrub, bush, tree, or other plant, growing on any land or reserve vested in the Board.

DOGS PROHIBITED.

38. No person shall permit any dog of which he is the owner to trespass on any portion of the ground in the vicinity of any water, sewerage, or stormwater drainage works.

DISPOSAL OF REFUSE, etc.

39. No person shall leave loose paper or other refuse on any portion of the grounds of any reservoir or water, sewerage or stormwater drainage works, except in the receptacles provided therefor.

POSTING OR DISTRIBUTION OF BILLS, etc.

40. No person shall post or distribute bills, advertisements, or other notices on any portion of any reservoir or water, sewerage or stormwater drainage works, or on any portion of the ground in the vicinity thereof.

NUISANCES.

41. No person shall commit a nuisance on any portion of the grounds in the vicinity of any reservoir or water, sewerage or stormwater drainage works.

PROTECTION OF PIPES.

42. No person shall drive, take or ride any vehicle, conveyance, or animal in such manner as to endanger any pipe or conduit or any branch thereof, or permit such vehicle, conveyance or animal to cross the same except where crossing places have been provided as indicated by signboards.

PROTECTION OF WORKS FROM INJURY.

43. No person shall in the vicinity of any works carry on or cause to be carried on any mining or quarrying operation, or make any excavation of any sort, or cause any explosion so as to injure any waterworks, sewerage works, sewers, drains, pipes, or fittings whatsoever.

PART IV.—LICENSES AND PERMITS.

WATER SUPPLY PLUMBING WORKS SHALL BE DONE ONLY BY LICENSED PLUMBERS.

44. No person shall carry out any work in connection with the water supply or apparatus connected therewith, unless he is duly licensed by the Board as a **"Licensed Water Supply and Sanitary Plumber"** or as a **"Licensed Water Supply Plumber."**

SEWERAGE OR DRAINAGE WORK SHALL BE DONE ONLY BY LICENSED WATER SUPPLY AND SANITARY PLUMBERS.

45. No person shall carry out any work in connection with sewerage or drainage on any premises or in connection with any fittings or apparatus connected therewith unless he is duly licensed by the Board as a **"Licensed Water Supply and Sanitary Plumber."**

PENALTIES FOR DOING WORK WITHOUT A WATER SUPPLY OR SANITARY PLUMBER'S LICENSE.

46. Any person who contravenes either of the two preceding by-laws, shall be guilty of an offence and liable on conviction to a penalty not exceeding fifty dollars.

DESCRIPTION AND SCOPE OF LICENSES.

47. The conditions upon which licenses will be issued by the Board are:—

(a) The Board may grant licenses to Water Supply and Sanitary Plumbers and to Water Supply Plumbers on condition that the certificate of a Board of Examiners appointed by the Board has been obtained, the prescribed payment made and provided that he is satisfied that the applicant is a fit and proper person to hold a license and is more than 21 years of age.

(b) Such licenses shall be issued subject to the by-laws and any special conditions that the Board may consider desirable.

(c) The holder of a Water Supply and Sanitary Plumber's License may carry out any water supply or sewerage plumbing or drainage work within the Metropolitan Water, Sewerage, and Drainage Area, and only plumbers holding such licenses shall do or cause to be done plumbing or drainage work within areas open for sewerage house connections.

(d) The holder of a Water Supply Plumber's License may carry out water supply work only outside any area open for sewerage house connections.

CONDITIONS OF LICENSE.

48. (1) Every holder of a license from the Board:—

(a) shall execute such works in accordance with the provisions of the Act and of these by-laws, and of any special directions or orders given or issued by the Board;

(b) shall execute such works in a thorough and tradesman-like manner to the satisfaction of the Board as expeditiously as practicable;

(c) shall on actual sewerage plumbing work, but not including drains employ only such certificated operatives as provided for in by-law 58;

(d) shall obtain permission from the person or authorities concerned when necessary for the execution of such works on, over, or through any private property, or any streets, roads, parks, reserves, or other public places or properties;

(e) shall pay any fees demanded by any Municipality or other local authority for opening any street, road, or thoroughfare, or otherwise in connection with such work;

(f) shall restore any part of any street, road, or thoroughfare interfered with by such work to the satisfaction of the local authority having control thereof, upon the completion of such work;

(g) shall restore any other property interfered with by such work to the satisfaction of the Board's Inspector; and

(h) shall, in the execution of such work, take such proper and necessary precautions that no accident or damages or unnecessary inconvenience may be directly or indirectly occasioned thereby.

(2) Every license granted by the Board shall be subject to suspension or cancellation, as the Board may determine when, in the opinion of the Board, the holder thereof has failed to comply with the conditions of such license, and such suspension or cancellation shall not prejudice the Board's right to take any other proceedings against the holder of such license which the Board is by law authorised to take.

EXAMINATION—WATER SUPPLY AND SANITARY PLUMBERS.

49. Subject to the provisions of these by-laws every applicant for a License as a Water Supply and Sanitary Plumber shall pass an examination set by a Board of Examiners appointed by the Board in the following subjects, namely:—

(a) All branches of the plumber's trade, including a knowledge of all materials used by the plumber or drainer.

(b) Water supply, sewerage and drainage work, including the proper disposal of pipes, fittings, etc., for hot water installations.

(c) A knowledge of these by-laws, and the construction of all water supply and sewerage apparatus and appliances required thereby; and a knowledge of the by-laws of Local Authorities in the Metropolitan Water Supply, Sewerage, and Drainage Area.

(d) The general principles of sanitary and water supply plumbing work.

(e) Every candidate shall satisfy the Board of Examiners as to his practical ability as a sanitary plumber and drainer and that he has served not less than five years at the trade and may be required to submit samples of work done by himself, and also to do any plumbing or drainage work which may be required by the Examiners.

CANDIDATES HOLDING LICENSES FROM OTHER AUTHORITIES.

50. Candidates holding licenses issued by other authorities may be exempted from such portions of the examination as the Board may think fit.

EXAMINATION—WATER SUPPLY PLUMBERS.

51. Subject to the provisions of these by-laws every applicant for a Water Supply Plumber's License shall pass an examination by a Board of Examiners appointed by the Board in the following subjects, that is to say:—

(a) A knowledge of that branch of the plumber's trade relating to water supply.

(b) Water supply work, including the proper disposal of pipes, fittings, etc., for hot water installations.

(c) A knowledge of these by-laws as applied to water supply plumbing.

(d) The general principles of water supply plumbing work.

(e) Every candidate shall satisfy the Board of Examiners as to his practical ability as a water supply plumber and may be required to submit samples of work done by himself, and also to do any water supply plumbing work which may be required by the Examiners.

CANDIDATES HOLDING LICENSES FROM OTHER AUTHORITIES.

52. Candidates holding licenses issued by other authorities may be exempted from such portions of the examination as the Board may think fit.

ANNUAL FEE FOR LICENSE.

53. A fee of five dollars shall be payable for every Water Supply and Sanitary Plumber's License and Water Supply Plumber's License issued by the Board under these by-laws, and for every renewal of any such license.

RENEWAL OF LICENSES.

54. Every license issued by the Board under these by-laws shall be current only to the 30th June next following the date of issue and may be renewed each year for a period of twelve months expiring on the 30th June in the next succeeding year, and the holder of a Water Supply and Sanitary Plumber's License or a Water Supply Plumber's License shall apply for a renewal thereof and pay the necessary fee prior to the expiration of the period for which his existing license is current.

LIST OF LICENSED PLUMBERS SHALL BE PUBLISHED.

55. A list of licensed water supply and sanitary plumbers and water supply plumbers shall from time to time be published at the office of the Board.

PENALTIES FOR BREACHES OF BY-LAWS BY PLUMBERS.

56. (1) Any licensed water supply and sanitary plumber or water supply plumber who shall refuse either by himself or by those employed by him to give any needful or proper information required by an officer of the Board shall be guilty of an offence and liable on conviction to a fine not exceeding eighty dollars.

(2) Any licensed water supply and sanitary plumber or water supply plumber who commits a breach of any of these by-laws may be required by the Board to show cause why his license should not be suspended or cancelled.

(3) Any water supply and sanitary plumber or water supply plumber whose license has been suspended shall not be relicensed as a licensed water supply and sanitary plumber or water supply plumber until the term of his suspension has expired, or the Board has directed the reinstatement of his license.

NOTICES, APPLICATIONS, PERMITS, AND INSPECTION OF WORKS.

57. (1) Applications for permission to undertake work in connection with water supply, sewerage, or drainage or the extension or alteration or replacement thereof shall be made in writing on the prescribed form by the owner or occupier of any tenement, and if approved by the Board a permit will be issued to the owner or occupier, and in the case of minor alterations and additions which in the opinion of the Engineer do not require a Board plan, to a licensed plumber nominated by the owner or occupier.

(2) Any person licensed as a water supply and sanitary plumber may perform any specified work in connection with water supply, sewerage or drainage work, for which a permit has been issued by the Board, in any area whether sewered or unsewered.

(3) Any person licensed as a water supply plumber may perform any specified work in connection with water supply work for which a permit has been issued in any unsewered area.

(4) (a) No person shall perform any work as aforesaid unless a permit has been issued by the Board covering such work. Where the permit has been issued to the owner or occupier it must be sighted by the licensed plumber who shall give not less than 48 hours' notice to the Board of his intention to commence the work.

(b) In no case shall any water pipes, drains, or apparatus in connection with water supply, sewerage or drainage be used until the said work shall have been inspected, and tested by the said officer, and certified by him on the prescribed form.

(c) No underground or enclosed work shall be covered up or concealed from view until the same shall have been duly inspected and passed by the Inspector, and for this purpose the licensed plumber shall immediately report any work which is ready for inspection or test, and every facility shall be accorded to such officer for making such inspection or test.

(5) Such permit shall be issued by the Board, subject to the following conditions:—

(a) That a duly licensed water supply and sanitary plumber or water supply plumber, as the case may be, shall be employed to carry out the work for which the permit is issued.

(b) That the application has been made at least seven days prior to the date such work is to commence.

(c) That the information as required on the Board's application form has been supplied.

(d) That the application has been signed by the owner or occupier and in the case of minor alterations or additions by the licensed plumber who is actually engaged to carry out the work referred to in the notice.

Any licensed plumber signing an application for work which is not actually done either by himself or by a person employed under his direct supervision shall be guilty of an offence and shall be liable to have his license suspended or cancelled.

(e) That the fees as prescribed in these by-laws have been paid to the Board.

(f) That only work described on the permit shall be executed.

(g) That if any further work shall be required in addition to that covered by the original permit an additional permit shall be obtained.

(h) Provided that in extreme cases where water is wasting, pipes are choked, or property is being damaged the work may be put in hand at once, but a permit shall be applied for by the licensed plumber who carried out the work as soon thereafter as possible.

(6) If any person shall execute work unless the proper notice has been given to and the permit obtained from the Board, the Board may in addition to exercising any other remedy, charge to and recover from such person an inspection fee in connection with such work.

PERSONS AUTHORISED TO CARRY OUT PLUMBING WORK UNDER THE DIRECTION OF A DULY LICENSED SANITARY PLUMBER.

58. No person shall be employed upon actual plumbing work in connection with sewerage installations unless he complies with the following conditions where such are applicable:—

(a) That he has passed the practical examination for Water Supply and Sanitary Plumbers (as defined in by-law 49) and possesses a certificate from the Board that he is authorised to execute work of a plumbing nature only.

(b) That he has prior to 1st October, 1938, been employed under a licensed plumber and has satisfied the Board of Examiners as to his tradesmanship and knowledge of practical plumbing, and possesses a certificate to that effect.

(c) That he is a plumbing apprentice duly registered with The Western Australian Industrial Commission or a trainee apprenticed under the Commonwealth Reconstruction Training Scheme, and is employed under the direction and supervision of a licensed sanitary plumber on work of a plumbing nature only.

(d) That he is in possession of a provisional certificate from the Board allowing him to work at the trade of sanitary plumbing and draining under the immediate supervision of a licensed sanitary plumber, but such provisional certificate shall not continue in force for longer than a period of 12 months.

(e) That he has satisfactorily completed an apprenticeship in the plumbing trade.

REGISTRATION OF CERTIFICATES OF PERSONS PROVIDED FOR IN BY-LAW 58.

59. A record shall be kept at the Board's Head Office of all persons registered under by-law 58.

DELAY IN WORK.

60. Licensed plumbers shall execute any work they undertake with reasonable despatch; and any inconvenience to the public or the Board caused by licensed water supply and sanitary plumbers or water supply plumbers by unnecessary delay in carrying out work shall be rigorously dealt with.

DAMAGE TO PIPES SHALL BE REPORTED.

61. Damage caused by licensed water supply and sanitary plumbers or water supply plumbers or their employees to water, sewer, gas, or other pipes shall be reported forthwith to the authority concerned, and immediate steps shall be taken to have repairs effected, and the cost of same shall be defrayed by such plumber.

STATEMENT TO BE SIGNED.

62. Prior to issue of any license, the person to whom the same is to be issued shall sign a statement that he accepts the license subject to and in conformity with the conditions thereof and with these by-laws, and that he will conform and comply therewith.

CHANGE OF ADDRESS SHALL BE NOTIFIED.

63. Every licensed water supply and sanitary plumber shall, within forty-eight hours of any change in his address, give notice in writing thereof to the Board.

64. Every licensed water supply plumber shall, within forty-eight hours of any change in his address, give notice in writing thereof to the Board.

PART V.—WATER SUPPLY PLUMBING.

SPECIFICATION OF PIPES, FITTINGS, AND APPARATUS FOR PRIVATE SERVICES.

65. In connection with the laying down, maintenance, alteration, or repair of every private service, the following conditions shall be observed by the owner or occupier of the premises:—

(a) Except with the written consent of the Board only piping, fittings, fixtures and apparatus of approved quality or conforming to the Australian Standard Specification or such other specification as the Board determines, and tested and stamped by the Board, shall be used for services whether outside or inside the building line.

(b) All pipes and fittings shall be of steel, or malleable iron, copper, brass, cast iron, cement asbestos, stainless steel, or other approved material.

(c) A charge shall be made by the Board for testing and branding all pipes, fittings, fixtures and apparatus to be used in connection with water supply and sanitary plumbing work.

(d) Galvanised steel tubing shall comply with AS B105.

(e) Galvanised steel pipe fittings shall comply with BS 1740.

(f) Cast iron pipes shall conform to the Board's standard specification for cast iron pipe for water supply.

(g) Asbestos cement pipes shall conform to the Board's standard specification for asbestos cement pipe.

(h) Copper or brass pipes shall comply with Australian Standard B158-1969 (including Tables 1, 2, 3, 4 and 5 thereof) and be used in accordance with Schedule C to these by-laws.

(i) Approved types of plastic pipe may be used for water supply in accordance with the requirements of Schedule D to these by-laws.

(j) Reinforced concrete pressure pipe shall conform to the Board's standard specification.

(k) Tees, thimbles, bends, reducing couplings, plugs, etc., shall be of the best material and manufacture, true in section, regular and of equal thickness, properly and truly cut with the British Standard thread perfectly sound and new, free from all defects; the tees, bends, tubes, etc., shall be capable of withstanding a hydrostatic pressure of 300 lb. p.s.i., shall be tested to this pressure by the duly authorised officer and shall conform otherwise to the British Standard Specification existing at the time.

(l) All joints between pipes, tees, bends, thimbles, couplings, elbows and cocks, etc., shall be made with flax or other approved jointing material.

(m) No pipe or other apparatus shall be laid through any sewer, drain, ash pit, cistern or manure bin, or through, in, or into, any place where in the event of the pipe becoming unsound the water conveyed through the pipe or apparatus would be liable to be polluted or to escape without observation, unless the pipe or apparatus is laid through an exterior approved iron pipe or box of sufficient length and strength to afford due protection to the pipe or apparatus, and to bring any leakage or waste within easy detection.

(n) All taps, stop-cocks, ball-cocks, valves, fittings or other apparatus used in connection with the supply of water shall be of approved types and capable of withstanding a pressure of 300 lb. p.s.i. and shall be tested and stamped by the duly authorised officer of the Board before being fixed.

(o) A valve, or cock or apparatus of any description shall not be used if a rise in pressure of more than 10 lb. p.s.i. occurs when the valve, cock or apparatus is closing.

(p) Every cistern and tank shall be provided with an equilibrium ball valve and stop-cock and the overflow pipe shall be laid and fixed in a suitable manner, so as to discharge in some conspicuous place open to inspection.

(q) No service pipe on private property below the ground surface shall be laid at a less depth than 18 inches, unless otherwise approved by the Board.

(r) No part of any service shall communicate directly with any vessel, other than approved apparatus for heating water for domestic purposes, except with the written permission of the Board.

(s) No part of any service shall communicate directly with any steam boiler or other vessel used for generating steam, or with any other vessel, in such manner that noxious liquids or gases can return into the main or service pipes.

(t) Every water closet, urinal, slop hopper, or other fixtures as directed by the Board shall be supplied from the service pertaining to the building through an approved waste-preventing apparatus, and no service pipe shall communicate directly with the fixture, or otherwise than with the cistern.

(u) Unless otherwise approved by the Board, the outlet of every fixture, such as baths, lavatory basins, kitchen sinks, etc., shall be distinct from and unconnected with the inlet, and the inlet shall be placed at least one inch above the highest water level of the fixtures; the outlet of every fixture shall be provided with a perfectly watertight plug, and shall be constructed so as to prevent a waste of water.

(v) Projection pieces between a bib tap and fitting on the end of a horizontal water service pipe shall not be permitted unless so supported as to prevent the pipe and tap swinging downwards.

(w) All taps over fixtures shall be so arranged that any drips from the taps will fall within the fixture.

(x) Stand pipes not secured to buildings shall be securely fixed to an approved support fixed in the ground.

(y) Pipes shall be secured to woodwork by means of approved galvanised clips and screws and to concrete, stone or brickwork with approved galvanised hooks or bolted clips, or other approved method.

(z) Pipes shall be laid in a straight line and where change of direction occurs underground, bends shall be used.

(aa) In all cases where a water service pipe is attached to a cistern, lavatory basin, or any other plumbing fixture when directed by the responsible officer, the connection shall be made by means of an annealed copper connection or other approved method.

(ab) No person shall fix any water ejector, automatic syphon, booster pump, or other water power pumping appliance to the Board's supply without the permission in writing of the Board being first obtained and in that event only in compliance with such conditions as the Board specifies in writing.

MAINTENANCE OF PRIVATE SERVICES AND INTERFERENCE WITH METERS, ETC.

66. (1) The owner of any property supplied with water shall at his own risk and expense lay down his private service and keep it in good order and repair, in such a manner as to conform with the provisions of these by-laws.

(2) The service pipe or apparatus within the boundary of the property being the property of the owner of the property supplied by such service pipes or apparatus, the owner shall, upon receiving notice that his service pipe or apparatus requires repairing, or is blocked up or broken, immediately proceed to repair the same by employing a licensed plumber, subject to the provisions of these by-laws, and he shall be responsible for any loss of water or other damage which shall be caused by reason of such service pipe or apparatus being leaky or otherwise out of repair or broken, and in default, be liable on conviction to a penalty not exceeding forty dollars, and in the event of continuing the offence, to a further penalty of five dollars for each day after receipt of such notice, and the Board may stop the water from flowing into such premises either by cutting off the service pipe, or otherwise, as the Board may see fit, until the necessary repairs shall have been effected.

(3) Without prejudice to the right of the Board to proceed for any penalty for the breach or non-observance of any of the provisions of this by-law, the Board may cut off the supply of water to any premises whereon the private service or any part thereof is not at all times laid, fixed, used or maintained in all respects in accordance with the provisions of the said by-law, and may keep the same cut off until such provisions have been fully observed.

(4) No branch shall be taken off the service pipe within a distance of three feet on the consumer's side of the Board's stop-cock or meter.

ORNAMENTAL FOUNTAINS AND SWIMMING POOLS.

67. (1) No person shall connect a supply pipe to any ornamental fountain or swimming or bathing pool, wading pool, fish pond, or ornamental lake or any receptacle of a similar nature, without first obtaining the written permission of the Board.

(2) Where the Board grants permission under sub-bylaw (1) of this by-law, it may specify—

(a) the size and location of the supply pipe or pipes required;

(b) whether the supply pipe shall be separate from the ordinary supply pipe;

(c) the rate at which the water will be supplied;

(d) the hours during which the supply of water will be permitted; and

(e) whether anemometer controls are to be fitted to the fountain,

and may require such supplies to be metered and recirculated.

PART VI.—SEWERAGE—PLUMBING AND HOUSE CONNECTIONS.

PROCEDURE FOR CONNECTIONS TO SEWER.

68. When a sewer is completed and ready for use, action may be taken under sections 59 and 60 of the Act.

PROOF OF CONNECTIONS HAVING BEEN MADE.

69. The certificate of such officer as the Board may appoint, in writing, shall be *prima facie* evidence that water-closet or water-closets, or drains, appliances, apparatus and connections have been provided or the works, matters and things have been performed, as the case may be, and *prima facie* evidence as to the amount of costs, expenses, and interest recoverable in respect thereof.

PLANS REQUIRED FOR DRAINAGE AND FEES FOR EXAMINATION AND PREPARATION OF PLANS.

70. (1) **Single Occupancy Dwellings—**

(a) **Proposed New Dwellings, Alterations and Additions:** A person who proposes to erect a new single occupancy dwelling, or to make alterations or additions to such a dwelling shall—

(i) furnish to the Board two copies of the building plan, of which one shall bear the stamped approval of the local authority; and

(ii) apply for examination of the plan by submitting a completed Form MWB 34.

(b) **Existing Dwellings:** Where it is required to connect fittings in an existing dwelling to the Board's sewer, two copies of a plan showing the location of the house in relation to the boundaries of the block and showing the location and level of the fittings concerned shall be furnished to the Board for examination and approval for use as the sewerage plan for the property concerned. Application for examination to be made on Form MWB 34. Copies of the building plan are not required.

(2) **All Other Buildings—**

(a) **Proposed New Buildings, Alterations and Additions:** Sewerage plans are required by the Board in all cases, however, plumbing plans prepared by Consultants and submitted to the Board for examination may be approved for use as the sewerage plan for the property concerned where the plans meet the standards required by the Board. Two copies of the plumbing plan will be required together with two copies of the building plan, one of which must have been stamped as approved by the local authority. Application for examination to be made on Form MWB 34.

Where Consultants have not been engaged to prepare a plumbing plan, application must be made on Form MWB 37—"Application for Sewerage Plan" and lodged with two copies of the building plan, one of which must have been stamped as approved by the local authority.

(b) **Existing Buildings:** Where Consultants have been engaged to prepare a plumbing plan, two copies of the plumbing plan are required to be left with the Board for examination and approval for use as the sewerage plan for the property concerned. Copies of the building plan are not required. Application for examination to be made on Form MWB 34.

(3) **Fees Payable—**

(a) **Examination of Plans:** The fee to be paid in respect of the building plan or drainage plan submitted shall be based on the number of major fittings connected which shall include—

a water closet,
urinal outlet,
slop hopper,
pan washer or trade waste outlet,

or any alteration to a sewerage house connection drain if 20 ft. or more of drain is involved in the alteration.

When one major fitting or alteration of any sewerage house connection drain if 20 ft. or more of drain is involved the minimum fee is $2.00. For each additional major fitting $1.00. Where more than one major fitting is to be connected no fee is payable in respect of a proposed alteration, if any, to any sewerage house connection drain.

(b) **Preparation of Sewerage Plan:** The preparation of a sewerage plan will be undertaken by the Board at a cost of $2.00 for each major fitting, the minimum charge being $5.00. The cost of additional copies of sewerage plan shall be $2.00 each.

(4) **Payment of Fees:** Fees will be assessed and paid for at the time of lodgment of the application.

(5) **Scale of Plans:** All plans submitted shall be drawn to a scale of not less than one inch to every sixteen feet.

DIAGRAM OF EXISTING DRAINS.

71. A person may make application to the Board for a diagram of existing drains in any area the plans or records of which are in the custody of the Board, and on payment of such sum as the Board requires, be supplied by the Board with a diagram of the existing drains in that area in accordance with those plans and records.

PLAN TO BE AVAILABLE TO THE BOARD'S REPRESENTATIVE.

72. The plan supplied or approved of by the Board shall be produced, whenever required during the progress of the work, to an Inspector or other officer of the Board. Any special instruction which may be written on the plan shall be strictly adhered to.

NOTICE AND PLAN OF INTENDED NEW BUILDING OR ADDITIONS ETC., TO EXISTING BUILDING.

73. Every person intending to erect a building, or rebuild, or to make any addition or alteration to any building adjacent to the Board's sewers shall give to the Board at least fourteen days' notice of such intention, and with such notice shall submit for approval two copies of the building plan, of which one shall bear the stamped approval of the local authority, and sections of such intended building, or additional alterations, drawn to a scale of not less than one inch to every sixteen feet, showing the position of proposed fixtures and approaches thereto. And provided that, when required by the Board, enlarged details to such scale as instructed shall be supplied.

WORK INCIDENTAL TO SEWERAGE INSTALLATIONS.

74. Any work of a structural nature in connection with a new building and additions or alterations to existing building which is not part of the actual plumbing or drainage installation but which is necessary in order to conform with these by-laws shall be carried out by the owner and the provisions of this by-law extends to approaches and floors to water closets, slop hoppers, urinals, baths and similar conveniences.

USE OF DRAINS.

75. The owner and the occupier of any sewered property shall discharge into the sewerage system all faecal matter, urine, household slops, and household liquid refuse from such property and such other polluted water from stables, washing areas, manure bins, basements, cellars and roofed yards and, subject to these by-laws in regard thereto, such industrial wastes as the Board has consented in writing to being so discharged.

INFECTIOUS DISEASE.

76. Solid or liquid discharge from patients suffering from typhoid fever or any other infectious or contagious disease shall not be emptied into any sewer or drain from any hospital, institution, or other private or public building, unless the discharge has been thoroughly disinfected.

PROHIBITED DISCHARGES.

77. The depositing or discharge of any of the following substances into any drain or into any sewer without prior approval of the Board, shall be an offence against these by-laws, namely:—

(a) Any animal matter, other than as mentioned in by-law 75, fleshing, wool, hair, dead animal, grease, dust, ashes, rubbish, garbage, offal, vegetable and fruit or their parings, rags, oil, fat, mud, sand gravel, or like substance, or any other substance which is, in the opinion of the Board, liable to be injurious to any part of the sewerage system or to employees of the Board engaged in the operation of maintenance of the sewerage system.

(b) Any petrol or other inflammable or explosive substance, whether solid, liquid or gaseous.

(c) Any rain, roof, surface, river or flood waters, except by special permission in writing under the hand of the Board.

(d) The contents of any nightsoil cart, cesspool, or privy.

(e) Any industrial waste or any substance which has a pH outside the range of 6.2 to 8.6.

(f) Any industrial waste which is above the temperature of 100 degrees Fahrenheit, or such lower temperature as may be prescribed by the Board, having regard to the special circumstances of any particular case.

(g) Any liquid which contains such percentage of common salt, or of any other mineral, salt, acid, solvent or gas, as in the opinion of the Board, injurious to, or liable to form compounds injurious to any part of the sewerage system or to employees of the Board engaged in the operation or maintenance of the sewerage system.

(h) Water from any steam exhaust, blow off drip pipe or condenser.

(i) Radio-active substances beyond the safe limits prescribed by the Radiological Council of Western Australia.

INDUSTRIAL WASTES—CONDITIONS, ETC., OF DISCHARGE.

78. The discharge of industrial wastes into any sewer shall be subject to the following terms, provisions and conditions:—

(a) Every application for permission to discharge any industrial wastes from any property into any sewer shall be made in writing to the Board and shall set out—

(i) the processes of manufacture from which industrial wastes are discharged into the Board's sewer;

(ii) the nature of the industrial waste from every such process;

(iii) the estimated maximum rate of discharge of industrial waste from every such process;

(iv) the hours of the day during which discharge of industrial wastes from every such process will normally take place;

(v) the estimated maximum daily discharge of such industrial wastes into the Board's sewer,

and the application shall be accompanied by detailed plans of the apparatus to be used for the treatment of the industrial waste and by such other information regarding the nature, quantity, rates, and times of discharge as may be required by the Board.

(b) No industrial waste shall be discharged into the Board's sewer unless a written permit has been first granted by the Board, and an agreement executed by the applicant containing a covenant to comply with the conditions of the permit, which shall include the following conditions, namely:—

That if at any time in the opinion of the Board—

(i) the quantity, quality, or rate of the discharge of the said industrial waste is not in compliance with the terms, provisions, or conditions of the permit; or

(ii) the occupier is not fully and faithfully performing and observing the terms, provisions, and conditions of the said permit and of this or any other by-law; or

(iii) the treatment apparatus is not in efficient working order; or

(iv) any other breach of the agreement has been made,

the Board may serve a notice in writing upon the occupier of the property, by leaving it thereon or posting it addressed to him at the property, specifying the matter or matters in respect of which a breach has taken place, or as to which the occupier is in default, or concerning which there is any complaint by the Board, and the notice shall require the occupier to make good the same in all things to the satisfaction of the Board, within a period to be stated therein, from the date of service thereof, in the manner so specified, and the notice shall also state that the Board is at liberty to terminate and put an end to the permit; And, further, that if the requirements of the notice have not been complied with on the expiration of the period mentioned therein, the permit shall automatically terminate and be and be deemed to be at an end, save and except as to the power of entry by the Board's officers as mentioned in the permit without any further or other notice from the Board, and the Board by its officers may enter upon the property, and at the cost and expense in all things of the occupier disconnect the apparatus used to discharge the industrial waste into the Board's sewers, and prevent and put an end to the further entry of industrial waste to the sewers, and the occupier shall be entitled to no compensation whatever in connection therewith.

(c) The Board shall be the sole judge as to the quality, quantity and rate of discharge of such industrial waste and as to whether the same complies with the conditions of the said permit and of Part VI of these by-laws and its decision in regard thereto shall be final and conclusive.

(d) Except by special permission of the Board, in writing, the volume per hour of industrial waste discharged from any property into a sewer of the Board shall not in any case exceed—

(i) a volume of 600 gallons per hour, if the trade waste is discharged into a 4-inch sewer of the Board;

(ii) a volume of 1,500 gallons per hour, if the trade waste is discharged into a 6-inch sewer of the Board; or

(iii) a volume of 2,500 gallons per hour, if the trade waste is discharged into a 9-inch sewer of the Board.

(e) The maximum aggregate daily quantity of industrial waste which may pass from any property into a sewer, the size and capacity of the drain for conveying such industrial waste from the property to the sewer, and the hours during which such flow will be permitted, shall be determined by the Board. The volume of industrial waste discharged shall, if ordered by the Board, be determined by meter or by some approved means of measurement provided by the occupier.

(f) The Board may levy industrial waste charges where it is considered necessary by the Board.

(g) All such trade wastes shall be passed through such settling, screening or neutralising chambers or such other apparatus as ordered or approved by the Board or any one or more of those chambers or apparatus to ensure that the resulting effluent shall comply with the requirements of the said permit and of this by-law. All such apparatus or machinery shall be approved in type and general arrangement by the Board, but the applicant shall determine the size, capacity and details of the treatment apparatus necessary to provide an effluent in compliance with the requirements of the said permit and this by-law.

(h) The occupier shall notify the Board in writing of his desire to make any alteration which shall in any way affect—

(i) the nature of the waste from any process of manufacture;

(ii) the estimated maximum rate of discharge from any such process of manufacture; or

(iii) the hours of discharge of industrial waste from any such process; and all alterations or additions to the treatment apparatus shall in all things comply with the requirements of the said permit and of this by-law, but in no case shall any such alteration be made without the approval in writing of the Board.

(i) The person to whom the permit is granted shall notify the Board in writing of any change of ownership or occupancy of any trade property connected with the Board's sewers, at least fourteen days prior to such change.

(j) The permit shall not be assigned or transferred, unless the consent thereto in writing of the Board has been first obtained.

(k) The owner or occupier of any property connected with the Board's sewers shall, if and where directed, install to the Board's design an approved chamber for inspection, sampling, and measurement, and every such chamber shall at all times be readily accessible to the Board's officers.

(l) The Board or any authorised officer, servant, agent, or workman, of the Board shall be at liberty at any time and from time to time to enter upon the property and every part thereof and take samples of industrial waste for analysis and otherwise and also to inspect the treatment apparatus.

(m) Every settling, screening, or neutralising chamber, or other apparatus for the treatment of industrial wastes in accordance with this by-law shall be cleansed and maintained by the occupier at his own expense and at such intervals as may be considered necessary by the Board to ensure the efficient operation of such chamber or apparatus.

(n) Notwithstanding the permission or approval of the Board, the occupier of any property shall be solely liable for and in respect of—

(i) any accident or damage, loss, or injury directly or indirectly arising out of or resulting from the discharge of the said trade waste from the said property into the Board's sewer, and the occupier shall agree to hold harmless and keep indemnified the Board against all claims and demands for such damage, loss, or injury of any description made and/or suffered by the workmen of the Board or any other persons whomsoever; and

(ii) all damage, loss, or injury occasioned or done to the Board's sewer or any property belonging to the Board or any Company, person, or persons whomsoever by reason of such discharge failing to comply with the terms, conditions, and provisions of the said permit or of the by-laws of the Board, and the occupier shall agree to pay the cost of making good any such damage, loss or injury.

(o) The Board may from time to time without payment of any compensation thereof exclude from its sewers all industrial waste from any property during the repairing, examination, or maintenance of the said sewers or the carrying out by the Board of any works in connection therewith.

(p) Such other conditions as may be required by the Board having regard to the special circumstances of the case.

CONNECTIONS PRIOR TO BY-LAW.

79. (1) In any case in which the Board has, before the date of the coming into operation of this by-law, granted to any person permission to discharge industrial waste into any drain or into any sewer of the Board, or in any case in which any person has, before the date of the coming into operation of this by-law, been discharging industrial waste into any drain or into any sewer of the Board without the express permission of the Board, if after the said date, such person continues so to discharge such industrial waste, the Board may, if it thinks fit and notwithstanding anything contained in these by-laws, by notice in writing, direct such person wholly to cease from discharging such industrial waste as aforesaid.

(2) Every notice given under sub-bylaw (1) of this by-law shall specify a day, not less than eight weeks from the date thereof, as the day on and after which such person is directed to cease from discharging such industrial waste.

(3) Any person, to whom a notice is given by the Board under this by-law, who fails to comply with any direction contained in the notice commits an offence.

(4) The provisions of this by-law shall not operate so as to prevent the Board from granting further permission to a person pursuant to the provisions of by-law 78 of these by-laws.

SUB-SOIL WATER.

80. Upon written application the Board may grant permission in writing to any person to discharge sub-soil water into any drain or into any sewer of the Board subject to such terms and conditions as may be imposed in such permit.

FITTINGS, ETC., TO BE ABOVE FLOOD LEVEL.

81. (1) No inlets or openings shall be placed, or, if already placed, shall be permitted to remain placed in such positions that any extraneous water, due to rise of subsoil water level, or from any river, bay, gully or creek, or any other source, whether in flood or otherwise, may gain access to the Board's sewers.

(2) Without in any way limiting the generality of sub-bylaw (1) of this by-law in areas liable to be flooded or affected by rise of subsoil water level, no person shall place in position for use any fitting, fixture, or apparatus having an inlet or opening into any drain or into any sewer of the Board unless the inlet or opening is above a level fixed by the Board for the particular district or locality as being a level providing a safe margin above the highest known subsoil water level or flood level.

INSPECTION—TESTS—MAINTENTANCE.

82. **Inspection:** All materials, pipes, bends, junctions, fittings, fixtures, and apparatus shall be inspected by the responsible officer of the Board to ensure compliance with the by-law and approved plans.

83. **Tests:** The responsible officer of the Board shall require the application of the water or smoke test or such other tests as he may order or approve.

84. **Water Test:**

(1) The water test shall be applied to the drainage and plumbing systems and their fittings in their entirety or in sections, and shall be applied by hermetically sealing all openings below the top of the section to be tested. The system shall then be filled with water to the highest point of the section, or, if considered necessary, to such additional height as the responsible officer may order, and every joint, fitting and pipe carefully examined for leaks.

(2) In testing stoneware or concrete drains a loss allowance at the rate of two and one-half per centum per hour of the capacity of the drain under test and at five feet head shall be permitted.

85. **Smoke Test:** The smoke test shall be applied by forcing into the system thick smoke to a pressure of one inch of water by means of a smoke test apparatus, closing all openings at which smoke appears and maintaining the pressure for five minutes after last opening is closed. Every joint or pipe shall then be carefully examined for leaks.

86. **Equipment:** The equipment, material, power and labour necessary for the inspection and tests shall be furnished by the licensed plumber.

87. **Defective Work:** Any materials, pipes, bends, junctions, fittings, fixtures, and apparatus found to be defective shall be removed and replaced by sound ones, and all defective joints made tight and every part of the work shall be made to comply to these by-laws and shall be subject to the approval of the Board or its responsible officer.

88. **Maintenance by Licensed Plumber:** Every person who holds a license from the Board, and executes any work in connection with sewerage, drainage or sanitary plumbing shall, when so directed by the Board, make good at his own expense, any defect that is found within twelve months of date of completion of the work and is due, in the opinion of the Board, to faulty workmanship.

89. **Maintenance by Occupier:** Every silt trap, grease trap, oil trap or neutraliser, and such other appliance as the Board may direct, shall be maintained by the owner or occupier at his own expense and shall be cleaned at such intervals as may be necessary to ensure that such trap or appliance operates in an efficient and hygienic manner.

MATERIALS AND WORKMANSHIP.

90. **Materials:** All materials, pipes, bends, junctions, fittings, fixtures and apparatus shall be of the best of their respective kinds, sound and free from defects, and shall be approved by the Board.

91. **Testing:**

(1) All materials, pipes, bends, junctions, fittings, fixtures, and apparatus shall be submitted for examination and test or either of them, and shall not be placed in position until passed and stamped or passed or stamped by the Board, and the examination and testing of materials shall be paid for by the person submitting the materials, whether passed or rejected, and shall be done at such time and place and at such rates as are from time to time, determined by the Board.

(2) Every application for the approval of any fitting, fixture, or apparatus for use in connection with the Board's Sewerage System shall be made in writing and shall be accompanied by a sample and, if ordered or approved, by approved drawings showing full details of the fitting, fixture or apparatus.

(3) Every fitting, fixture, or apparatus so approved shall, if it is a condition of the approval, be tested, stamped, marked, or authorised by the Board, in accordance with the conditions of the approval.

(4) A charge, which may be varied from time to time shall be made by the Board for testing or branding all pipes, fittings, or fixtures used in connection with water supply and sewerage installations.

92. **Workmanship:** All work shall be executed in a thorough and workmanlike manner to the satisfaction of the Board.

93. **Protection of Workmen, etc.**: Adequate precautions shall be adopted, by the person carrying out the work, to prevent injury to workmen, property, or the public, and the Board shall not be responsible for any injury arising from the inadequacy of those precautions.

94. **Concrete**: Concrete, unless otherwise ordered, shall consist of one part Portland cement, two parts clean sharp sand and four parts ¾ in. gauge approved coarse aggregate, thoroughly mixed with clean water to form a workable mix; ready-mixed concrete shall be of a grade to develop a compressive strength at 28 days of 2,500 p.s.i. by standard cylinder test.

95. **Cement Mortar**: Cement mortar, unless otherwise ordered, shall consist of one part Portland cement, and two parts clean sharp sand properly mixed with an approved proportion of clean water.

96. **Use of Concete**: Concrete shall be used in any of the following cases:—

(1) Gully basins as specified in by-laws 126 and 127.

(2) Around the top of educt vent and induct vent pipe sockets.

(3) Around interceptor trap covers and tops of disconnector or other shafts.

(4) Under and around bends rising vertically off oblique branches and under bases of all drainage traps.

(5) Around drains which are liable to be affected by tree roots.

(6) Drains under buildings as provided in by-law 120.

(7) Around drains having insufficient cover as provided for in by-law 118.

(8) Floors under plumbing fixtures, where specified.

97. **Cement Rendering**: Wherever any concrete work is exposed, the surface shall be neatly rendered in cement mortar in a tradesmanlike manner.

DRAINAGE—GENERAL.

98. **Separate or Combined Drains**:

(1) Every house shall be separately drained unless a combined drain is ordered or approved by the Board.

(2) Where a combined drain is ordered or approved by the Board, the provisions of section 70 of the Act shall apply, as well as any other conditions required by the Board.

99. **Size of Drains**: Every drain shall be of adequate size for the drainage of the property to be served in accordance with the requirements of by-law 165, with a minimum diameter of four (4) inches.

100. (1) **Materials**: All drain pipes, bends, junctions and fittings used shall be of stoneware, concrete, cast iron, copper, asbestos cement, pitch fibre, or other approved material to standards set by the Board, provided that the responsible officer of the Board may prohibit the use of any of those materials where he considers that, in the circumstances or conditions the use of that material would be unsuitable.

(2) **Copper Pipe**: In buildings with more than three floors where copper pipe is used expansion joints shall be inserted at least at every third floor.

101. **Cast-iron Pipes**: Cast-iron drainage pipes (where laid underground) and their fittings shall comply with the Australian Standard A88 1959 (Heavy Grade).

102. **Interceptor Traps**:

(1) Where shown on plan supplied by the Board, an interceptor trap shall be fixed in the drain laid from any property to the sewer.

(2) Such trap shall be fixed as near as practicable to the boundary, and wherever practicable shall be within the boundaries of the property.

(3) If ordered, an approved inspection chamber shall be provided for the trap.

103. **Inspection Chambers and Manholes:**

(1) All drains shall wherever shown on plan, join in an inspection chamber or manhole at least three feet long by two feet wide, fitted with a closed cover.

(2) The portions of the drains crossing the floor of the inspection chamber or manholes shall be connected in a straight line or by curved junctions in the floor of the chamber.

104. **Inspection Openings:**

(1) Every line of drain shall be provided with an approved inspection opening at each junction not provided with an inspection chamber, at each change of direction, at each fitting, and in no case at greater than 60 feet intervals, and in paved areas a loose slab shall be provided vertically over the inspection opening.

(2) The area of an inspection opening shall be not less than the cross sectional area of the drain.

105. **Gratings:**

(1) Every inlet to a drain other than from a water closet shall be effectively protected by approved gratings of ample area.

(2) The aggregate area of the apertures in any grating covering a ventilation opening shall not be less than the sectional area of the pipe or drain ventilated by such grating.

(3) Every opening for ventilation shall at all times be kept by the occupier perfectly free from obstruction.

106. **Drain openings not in use:**

(1) The ends of all drains not immediately connected with the plumbing fixtures shall be securely closed with watertight imperishable materials.

(2) If such drains be of stoneware or concrete, a stoneware, cast iron or other approved disc may be cemented in: if of wrought iron a plug may be screwed on the end; if of cast iron, a cast iron plug may be caulked in with lead.

(3) Where stoneware pipes are used with neoprene ring joints, plugs fitted with a neoprene ring shall be used in the socket and held in place by an approved metal clip.

107: **Inserting Junctions:**

(1) Where it becomes necessary to insert a junction in an existing line of drain, a suitable length of drain shall be removed, and the junction, with an inspection opening on either side dropped back into position, and the line tested in the usual manner.

(2) Junctions in existing metal pipes shall not be made unless an approved closure pipe is used in each case.

BASEMENT AND CELLAR DRAINAGE.

108. **Risk of Back Flow:**

(1) Where any cellar, basement, or floor below ground level is at such a level as may, in the opinion of the Board, involve risk of back flow in the event of the sewer becoming overcharged, the sewage from all fixtures therein shall be raised by ejector, pump, or other approved mechanical appliance to such height as ordered, and discharged into the sewer as and where directed.

(2) Reflux Valves shall not be used as an alternative to pumping.

109. **Fixtures:**

(1) If approval is given for the connection of a basement or cellar or floor below ground level, no sink, trap, water-closet, urinal, or other fixture or apparatus shall be laid or fitted in the cellar or basement or on any floor below ground level unless the following conditions are complied with:—

(a) The consent, in writing, of the Board shall be first obtained, and may be revoked at any time in accordance with this by-law.

(b) The owner shall submit such information as may be required by the Board and shall undertake, in writing, on an approved form, to accept all liability for damage that may occur, and shall also give to the Board any indemnity in reference thereto that the Board may require.

(c) Such other conditions as may be required by the Board, having regard to the special circumstances of the case.

(2) If on any subsequent inspection—

(a) the fixtures and their surroundings are not being kept, in the opinion of the Board, in a sanitary condition; or

(b) the purpose for which the cellar, basement or floor below ground level is used is found to have been changed,

then the Board may revoke its consent, and upon the expiration of 14 days from the date of revocation, if the defect has not been remedied, the closet, urinal, or other fixture shall be disconnected from the Board's sewers.

110. **Seepage Drains:** In no case shall seepage drains from cellars, basement, or any floor below ground level, be discharged into a sewer without the consent of the Board, and where any such discharge is permitted, the seepage shall be raised by ejector, pump or other approved mechanical appliance to such height as ordered and discharged into the sewer as and where directed.

POLLUTED AREAS.

111. **Connection:** The Board may by notice in writing require any owner or occupier of any land to which section 53 of the Act applies to connect with the sewer of the Board in accordance with these by-laws any dairies, market-places, abattoirs, areas for washing vehicles, or other polluted areas upon such land.

112. **Conditions Governing Connection:** A connection of the kind referred to in by-law 111 of these by-laws shall not be made unless the following conditions have been complied with:—

(a) The place to be connected, if of an area greater than 20 square yards, shall be so roofed as to prevent the entry of rainwater from it to the sewers, and in no case shall rainwater be permitted to discharge on to such place from adjoining surfaces.

(b) The property to be connected shall be paved with concrete or other approved materials, and graded to the satisfaction of the Inspector.

(c) The drain from any such place shall be provided with an approved silt trap with a removable grating.

LAYING DRAINS, ETC.

113. **Pipe Trenches:**

(1) The trench for the drain from any property shall be so dug as to meet the Board's sewer at the position provided, or to be provided, for the connection, in accordance with the drainage plan where approved.

(2) The material from the trench shall be so placed as to cause the least possible obstruction and inconvenience to the public, and proper barriers and lights shall be maintained by the licensed plumber where necessary, to guard against accident during the progress of the work, and unless otherwise approved, all trenches exceeding 5 feet in depth shall be supported against collapse by timber work to the approval of the Inspector.

(3) In refilling the trench, selected filling shall first be deposited around and over the pipe to a depth of 12 inches and carefully consolidated, after which the remainder of the trench shall be filled in, in layers and rammed or flooded as ordered or approved by the Inspector.

(4) No stone shall be used in refilling until earth or gravel has been placed over the pipe to a depth of 12 inches, or more if directed.

(5) On no account shall any water, sand, earth, or other prohibited discharge be allowed to enter the sewer during the progress of the work.

(6) On completion of refilling the surface shall be restored as nearly as possible to the same condition as it was before operations were commenced, unless the owner, in writing, otherwise requires.

Position and Line.

114. (1) Every drain shall be laid and every fitting or apparatus connected therewith shall be fitted in the position shown on drainage plan or as directed by the Inspector.

(2) As far as possible, all drains shall be laid in straight lines and where changes of direction are necessary, they shall be made—

(a) by oblique junction;

(b) by suitably curved pipes, with inspection opening;

(c) by a suitably curved pipe with an inspection opening on each straight pipe next adjoining the curve; or

(d) in inspection chambers or manholes.

115. **Oblique Junctions**: Where any drain joins another drain or sewer the junction shall be made obliquely at any angle not greater than 45 degrees with the direction of flow of such drain or sewer.

116. **Connection to Sewer**: The disc stopper at the point of connection to the sewer shall be carefully removed so as not to injure the socket or allow debris or other matter to get into the sewer.

117. **Gradients**:

(1) All drains shall be laid on an even grade and, except by permission of the Board, or where shown on drainage plans, the gradient shall, in no case, be less than the following:—

Size of Drain.	Gradient.
4 inch diameter drain	1 in 40
6 inch diameter drain	1 in 60
9 inch diameter drain	1 in 90

(2) Where the grades of drains are steeper than 1 in 15, concrete anchor blocks shall be placed at intervals of twice the grade (for example, anchor blocks will be placed at 14 feet intervals on a drain laid on a grade of 1 in 7) and every anchor block shall have a minimum width of 12 inches along the pipe, and be of such a thickness that there is three inches of concrete above and below the pipe and shall extend at least 9 inches into the virgin ground at each side of the trench.

(3) Where the drains are laid at an approved grade less than provided for in sub-bylaw (1) of this by-law, approved provision shall be made for regular and efficient flushing where ordered by the Board.

Depth of Drains.

118. (1) Drains of stoneware or concrete pipes, unless bedded on and encased in concrete of not less than four inches thickness over any part of the drain, shall be laid at a depth to the top of the socket of the pipe, of not less than the following:—

(a) In public thoroughfare, rights-of-way, or other places subject to vehicular traffic, three feet.

(b) In private property not subject to vehicular traffic, one foot.

(2) No person, being the owner or occupier of any land through which any drain runs shall alter the surface over or in the vicinity of any drain so as to deprive it of the minimum depth of cover specified by sub-bylaw (1) of this by-law, or to affect the stability of its foundation, unless he encases the drain in a manner approved of by the Board and notice in writing shall be given to the Board before the work is proceeded with.

(3) Drains shall not be brought up except in private property unless approved of by the Board.

Laying Drains.

119. (1) All pipes shall be laid to such lines and grades as may be shown on the approved plans or as may be directed by the Inspector, holes shall be cut in the bottom of the pipe trench to receive the sockets of the pipes and all pipes shall be carefully bedded with the barrel on solid ground.

(2) Only flexible jointed pipes of stoneware, concrete, cast iron, asbestos cement, pitch fibre or other approved material shall be laid unless other methods of jointing have been approved of by the Board in any particular case.

(3) **Flexible Jointed Pipes:**

(a) **Dry Sand:** Pipes shall be securely bedded on firm ground and packed into position with compacted sand or granular material to top invert.

(b) **Wet Sand:** If trench bottom is dried out pipes can be laid as for dry sand.

(c) **Clay or Rockbottomed trenches (wet or dry), or wet sand:** Pipes shall be laid on a crushed stone base with 100 per cent. by weight passing a $\frac{3}{4}$ BS sieve and not more than 5 per cent. passing a 100 BS sieve. The base shall be at least 4 in. thick below the bottom of the pipe, and pipes shall be packed into position with similar material or clean sand.

(d) **Unstable Ground:** Where ordered by the Inspector pipes shall be laid on a pile and keel foundation (jarrah), or concrete where directed, as follows:—

Pile and Keel—

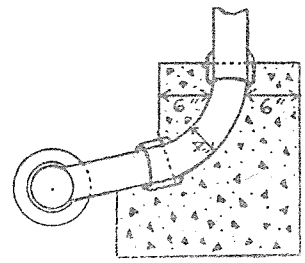
(i) 4 in. diameter pipes—Keel 6 in. x 2 in., Piles 4 in. x 4 in.
(ii) 6 in. diameter pipes—Keel 8 in. x 2 in., Piles 5 in. x 4 in.
(iii) 9 in. diameter pipes—Keel 9 in. x 2 in., Piles 5 in. x 4 in.
Piles to be set at 3 ft. maximum centres and driven to a depth ordered by the Inspector.

Concrete Keel—

(i) 4 in. diameter pipes—Keel 6 in. x 3 in. with three $\frac{3}{8}$ in. diameter rods placed longitudinally.
(ii) 6 in. diameter pipes—Keel 8 in. x 3 in. with three $\frac{3}{8}$ in. diameter rods placed longitudinally.
(iii) 9 in. diameter pipes—Keel 12 in. x 4 in. with four $\frac{3}{8}$ in. diameter rods placed longitudinally.

(4) In cases where it is considered that the drains are likely to be damaged by fibrous roots the pipes shall be bedded on and encased in 4 inches of concrete over any part of the drain but in vertical shafts concrete or stoneware pipes shall not be used if the height from the under side of the bend exceeds 4 feet. In such cases cast iron pipes shall be used.

(5) Bends rising vertically shall be protected as shown in sketch:—



(6) Pipes rising vertically in water charged ground or within two feet of highest known water level shall be adequately supported by concrete encasement or other approved methods.

120. **Drains under Buildings:**

(1) Every drain shall be so constructed as not to pass under any building, except in any case where any other mode of construction is impracticable; and if in any case a drain shall be so constructed as to pass under any building, such drain shall be laid in direct line for the whole distance beneath such building, and of such depth that there shall be a distance equal at least to a full diameter thereof between the top of such drain at its highest point and the surface of the ground under such building.

(2) The drain pipe in any such case shall be of cast iron and joined with lead as is usual with water pipes as required for water supply purposes, or of stoneware or concrete bedded in and surrounded with concrete at least six inches thick. All drains carried through walls shall have a space of three inches left over the pipe.

(3) Stoneware or concrete pipes brought up inside a building for the purpose of connecting a water closet, slop hopper, etc., shall be surrounded with four inches of concrete, but the height of such pipes to be brought up from the drain shall not exceed four feet, and if the height exceeds four feet cast iron pipes shall be used.

(4) Inspection openings shall be inserted in the drain immediately outside of the building.

JOINTS—DRAINAGE.

121. **Stoneware and Concrete Pipes:** Joints of stoneware and concrete pipes shall be an approved flexible type using neoprene rings and mortar joints shall not be used without prior approval of the Board.

122. **Cast-iron Pipes:** Joints in cast-iron pipes shall be—

(a) stemmed with approved gaskets and so filled and caulked with lead or other approved materials so as to make them gas and watertight; or

(b) made by other approved methods,

and joints between cast-iron and stoneware or concrete pipes shall be made with cement mortar joints.

123. **Trapping of Inlets:**

(1) Every inlet to any drain other than inlets provided for ventilation in accordance with these by-laws, shall be provided with an approved trap.

(2) No inlets to any drain connecting directly with a sewer shall be constructed within a building, other than such inlets necessary for the apparatus of any water closet, urinal, slop hopper, or other approved fixtures, unless in the case of the Combined Pipe System where direct connection may be permitted.

124. **Water Seal:** Every drainage trap shall have a water seal of 2 inches in depth.

125. **Provision of Yard Gullies and Disconnector Traps:**

(1) A yard gully may be provided in the yard of any property, as near as practicable to the kitchen or back door, with a tap placed over it at a height of not less than two feet. Where yard gullies are omitted a disconnector trap or other external relief shall be provided to relieve house drain blockages.

(2) No yard gully or disconnector trap shall be situated within a building or outbuilding, but will be permitted under a verandah not wider than 8 ft. provided the verandah is not enclosed.

(3) In cases where it is impracticable to install a yard gully, a slop hopper or cleaner's sink may be provided on each floor of a building.

126. **Details of Yard Gullies and Silt Trap Basins:**

(1) Yard gullies may be fitted with stoneware basin tops, spigot and faucet and grating, the basin top being in one piece with the trap jointed thereto and surrounded with concrete.

(2) The basin top may be constructed in concrete, which shall surround the gully and extend from six inches below the surface to three inches above surface level.

(3) The inside diameter of the basin top shall be 16 inches, the outside 21½ inches diameter, and the depth from top of basin to grating shall be six inches.

(4) The wastes shall discharge in all cases below the grating.

127. **Prevention of Storm Water entering Yard Gullies:**

(1) Stoneware yard gully basins and the top of silt traps provided with stoneware basins shall be so surrounded with an approved impervious kerbing of concrete or other approved material as to prevent the access of surface water to the drains, and if directed, the wall at the rear of a gully or silt trap, if of brick or stone, shall be cement rendered to the height of the tap over same, and if of wood, the wall shall be provided with an approved galvanised sheet iron apron.

(2) Rainwater pipes shall not be connected to or discharged into any gully or fixture connected with the Board's sewers.

(3) Gullies or pits for the disposal of road drainage, or for the disposal of storm water from any roof, yard or vacant land shall not be connected with any sewer or drain under the control of the Board.

128. **Sealed Disconnector Traps:**

(1) Sealed disconnector traps may be affixed inside or outside a building, or outbuilding, and in such cases breather pipes or fresh air inlet equal in area to the waste pipe or pipes discharging into the trap shall be taken to such height as directed.

(2) Where the trap is inside the building or outbuilding such pipes shall be led to the outside of the building or outbuilding.

(3) The material for such breather pipes shall be the same as for vent pipes.

(4) Inspection openings to such traps shall be sealed with screwed plugs, or as otherwise approved by the Senior Inspector.

129. **Provision of Grease, Petrol and Oil Traps:** Wastes from the following fixtures and areas shall first discharge into an approved apparatus for retaining objectionable matter, that is to say:—

(a) Every fixture or area from which petrol, benzine or other inflammable or explosive substance, or grease, oil or greasy or oily matter, is likely to be discharged, or conveyed into waste, combined waste, or soil pipes or into drains;

(b) Every sink in all food-packing houses, butchers' shops, lard rendering establishments, hotels, motels, restaurants, boarding houses, and such other places as the Board may direct; and

(c) Such other fixtures, areas or apparatus as the Board may direct.

130. **Construction of Grease Traps:**

(1) Grease traps shall be fixed outside buildings or outbuildings wherever practicable.

(2) External grease traps shall be constructed of approved materials.

(3) Internal grease traps shall be constructed of copper or other approved material, and, if directed fixed upon a tray.

(4) The outlet from any grease trap shall be connected to a disconnector trap.

131. **Grease Trap Ventilation:** Every internal and external grease trap shall have approved independent provision made for inlet and outlet ventilation as provided for waste pipes in by-law 153 of these by-laws.

132. **Size of Grease Trap:**

(1) The dimensions of any grease trap to be provided shall be such as to ensure the retention of all grease entering such trap.

(2) The height from the top of the outlet of grease trap to the vent take off shall not be less than four inches.

(3) The difference in level between invert of inlet and invert of outlet shall be not less than one inch.

(4) The capacity of a sink shall be measured to the overflow level, or, in the event of there being no overflow, to the top of the sink.

(5) Where hot water is being fed intermittently or continuously to a dishwasher the capacity of the dishwasher shall be taken as the amount of maximum hourly discharge.

133. **Outlet Pipes from Grease Traps:** The outlet pipe from any grease trap shall be at least one size larger than the size of the pipe which has a cross sectional area equivalent to the total area of incoming waste pipes and except by special permission no outlet pipe shall be less than 2½ inches in diameter.

134. **Construction of Petrol and Oil Traps:**

(1) Petrol and oil traps shall be constructed in accordance with the Board's type drawings.

(2) Every such trap shall be connected to a disconnector trap and shall be provided with independent ventilation.

135. **Construction of Silt Traps, Bucket Traps and Potato Peeling Machine Traps:** Construction of these traps shall be in accordance with the Board's Standard Drawings and be sized to the requirements of the Industrial Waste Inspector.

VENTILATION.

136. **Vents on Main House Drain:**

(1) The main house drain shall be ventilated at its upper end by a pipe ventilator erected vertically and such ventilator may be—

(a) A soil or combined waste vent pipe connected to the main drain.

(b) A main vent or stack vent erected in conjunction with a main stack and connected to it below the level of the lowest fixture branch (as required in the partially vented, modified vented, and fully vented plumbing systems).

(c) A combined soil and waste stack coming under the requirements of the unvented plumbing system.

(2) If the drain is provided with an interceptor trap there shall be in addition a ventilator pipe connected to the interceptor trap shaft and in such cases there shall wherever practicable be a difference in height of not less than six feet between the tops of vents at the upper end and lower end of the drain respectively.

(3) A ventilating pipe shall also be provided on the sewer side, of the interceptor trap.

137. **Vents on Branch Drains:** Branch drains need not be vented if the drainage traps are within twenty feet from the main house drain measured along the line of pipes including the drop, if any, from the centre line of the main drain to the centre line of the outlet side of the water seal; drainage traps within 30 feet of the main drain require a 2" diameter vent, over 30 feet require a 3" diameter vent.

138. **Size of Drainage Vents:**

(1) Drainage vent pipes shall be of not less than four inches diameter in the case of educt vents and not less than three inch diameter in the case of induct vents, with the provision that, where more than one educt vent is provided, the vent on the longest line of drain shall be of not less than four inch diameter and all others in accordance with by-law 137 of these by-laws.

(2) Every such vent pipe shall be provided with approved educt or induct cowl.

139. **Materials, etc., for Drainage Vents:**

(1) Drainage vent pipes, situated wholly outside buildings or outbuildings, shall be of cast iron, galvanised wrought iron, galvanised sheet iron, sheet copper, or other approved material above ground, and of stoneware or other approved material beneath the surface of the ground.

(2) Galvanised sheet iron vent pipes shall not be of less gauge than 20 for three inch and four inch diameter pipes, 18 for six inch diameter pipes and 16 for nine inch diameter pipes, but where, in the opinion of the Inspector, they are liable to injury, the first six feet above the ground shall be of cast iron or other approved material.

(3) Drainage vent pipes, inside a building or outbuilding shall, unless otherwise approved, be of cast iron of soil pipe strength, or of galvanised wrought iron, copper, brass, or approved plastic material.

(4) All galvanised sheet iron vent pipes shall be double galvanised, with longitudinal joints grooved, welded or riveted, and circumferential joints riveted and soldered.

(5) Copper vent pipes shall comply with AS B158, 1969, Tables 1, 2, 3, 4 and 5 thereof, and be used in accordance with Schedule C to these by-laws.

(6) Approved plastic vent pipes shall comply with the appropriate Australian Standards and Board Specifications and be used in accordance with Schedule D to these by-laws.

140. **Vent Supports:**

(1) Unattached posts shall be of not less than four inches by four inches (4 in. x 4 in.), rough dressed jarrah, properly strutted with four inch by two inch (4 in. x 2 in.) struts and sole pieces. The struts and sole pieces shall be bolted to post, and post shall be let into the ground to a depth of one-quarter ($\frac{1}{4}$) its length; the struts shall extend from sole pieces to one-third ($\frac{1}{3}$) of the length of the post above ground at an angle to post of 25 degrees.

(2) Vent post attached to buildings shall be of not less than four inch by four inch (4 in. x 4 in.) dressed jarrah, properly secured to top and bottom plates of buildings, with half inch ($\frac{1}{2}$ in.) bolts of required length.

141. **Materials for Soil, Waste and Combined Waste Vents:**

(1) Vent pipes for soil, waste or combined waste pipes shall be cast iron, galvanised wrought iron, lead, solid drawn copper or brass, or other approved material, except that, where the vent pipe is entirely outside a building, grooved sheet copper or grooved welded, or riveted double galvanised sheet iron vent pipes may be used, but sheet copper or sheet galvanised iron vent pipes shall not be used at a level lower than 2 feet above the level of the highest fixture served thereby.

(2) Copper vent pipes shall comply with AS B158, 1969, Tables 1, 2, 3, 4 and 5 thereof, and be used in accordance with Schedule C to these by-laws.

(3) Solid drawn brass vent pipes shall comply with the requirements of by-law 180 of these by-laws for waste, combined waste or soil pipes.

(4) External vent pipes of galvanised sheet iron shall be of a gauge not less than the following:—

$1\frac{1}{4}$-inch, $1\frac{1}{2}$-inch, 2-inch, and $2\frac{1}{2}$-inch diameter—22 gauge.
3-inch and 4-inch diameter—20 gauge.
6-inch diameter—18 gauge.
9-inch diameter—16 gauge.

(5) Galvanised sheet iron vents shall be coated in the inside with approved bituminous coating and painted on the outside to colour required by owner.

(6) Approved plastic vent pipes shall comply with appropriate Australian Standards and to Board Specifications and be used in accordance with Schedule D to these by-laws.

142. **Vents in Outbuildings:** Galvanised sheet iron vent pipes may be used inside external water closets, stables or open outbuildings but where liable to damage shall be protected as directed by the Inspector.

143. **Soil Vent Pipes:** In all cases the upward extension from the soil or combined waste pipe for ventilation shall pass in as direct a manner as possible above, and, if necessary, through the roof.

144. **Venting Closet Pans (also applicable to Slop Hoppers and Urinals):** Except as hereinafter provided every water closet pan shall be provided with an anti-syphonage vent, provided that the installation of an anti-syphonage vent shall be optional if the following conditions apply:—

(1) The closet pan comes under the special provisions required for Unvented, Partially Vented and Modified Vented plumbing systems; or

(2) (a) direct connection to the house drains is effected and the apartment floor is not more than 6 feet above the finished ground level.

(b) the maximum length of unvented branch drain to which an unvented closet pan may be connected shall be 20 feet, a disconnector trap branch may be included in this length. (The maximum length of unvented drain to which a syphonic pan is connected shall be 25 feet.)

(c) not more than five floors of plumbing are connected to the house drain.

(d) that where 4 in. diameter house drains are used the total fixture unit loading or the house drain does not exceed 100 fixture units.

(e) that where 6 in. diameter house drains are used the total fixture unit loading does not exceed 420 units.

(f) that where vertical stacks are installed no unvented water closet is connected to the house drain closer than 8 feet from the vertical stack.

(g) that vertical changes of direction are achieved by the use of bend fittings or a combination of bends and other fittings, and square junctions are not used.

145. Unless otherwise directed or permitted, every water closet which is not connected directly to a drain shall discharge into a soil ventilator pipe or combined waste ventilation pipe except in the case where there are no other fixtures connected to the soil pipe or combined waste pipe in which case discharge will be permitted into a soil pipe or combined waste pipe without extension as a ventilator pipe or combined waste pipe, if the fixture is ventilated by an anti-syphonage vent in accordance with the requirement of by-laws 151 and 166 of these by-laws.

146. **Grouped external or internal closets:** Where groups of water closets are situated in apartments not more than 6 feet above ground level whether located within a building used for other purposes than water closets or detached therefrom; and whether the pans are connected vertically or otherwise to the house drains, it is necessary to install only one back vent for every 3 closet pans installed.

147. **Venting of Lavatory Basins:** All lavatory basins wastes shall be provided with anti-syphonage vents provided that the installation of the vent is optional if the following conditions apply:—

(a) The installation meets the requirements of the Unvented, Partially Vented, and Modified Vented Plumbing systems.

(b) Comes within the provisions of by-law 205 of these by-laws.

(c) An anti-syphonage trap is used which meets the requirements of by-law 149 of these by-laws.

148. **Venting of Kitchen or Scullery Sinks discharging into Grease Traps:** All kitchen or scullery sinks discharging into grease traps shall be vented irrespective of the length of the waste.

149. **Length of Unvented Waste Pipes:** Except as provided in by-laws 147 and 148 of these by-laws waste pipes need not be ventilated provided the following conditions apply:—

(a) The waste pipes come under the special provisions required for Unvented, Partially vented, and Modified vented plumbing systems.

or

(b) (i) There is only one fixture attached to the waste pipe and the waste pipe is connected to a yard gully or disconnector trap.

(ii) No vertical length of waste pipe exceeds 8 ft.

(iii) That waste pipes do not exceed the lengths set out in the following table for the fixtures and types of trap indicated.

Fixture	Standard Trap	Anti Syphonic Trap
Kitchen Sink	12 ft.	15 ft.
Wash Trough Set	15 ft.	18 ft.
Bath	15 ft.	18 ft. if trap accessible
Shower Compartment	18 ft.	Not applicable
Lavatory Basin....	Vent required	15 ft.

150. Notwithstanding the provisions of by-laws 144, 145, 147, 148 and 149 of these by-laws where any trap loses its seal by syphonage, venting shall be nevertheless provided.

151. **Anti-Syphonage Vents:**

(1) Loss of water seal in trap shall be prevented by proper ventilation in accordance with the requirements of these by-laws.

(2) Anti-syphonage vents from fixtures shall be carried up in accordance with by-law 153, or joined to the branch or main vent above the level of the fixture, unless special permission to the contrary is granted.

(3) These vent pipes shall connect to the waste, combined waste or soil pipe on the opposite side of the water seal to the fixture at a point not more than 4 feet from the crown of the trap, provided that the seal of the trap is not affected.

(4) If the vent is connected in close proximity to the crown of the trap, it must be so arranged that no fouling shall occur by the discharge from the fixture.

(5) No other fixture shall be connected to the soil, combined waste or waste pipe at any point between the anti-syphonage pipe and the trap which it serves.

152. **Main Vents:** All main vents erected in conjunction with a main stack shall be—

(a) of constant diameter throughout their entire length, their diameter being determined by the application of by-law 166 of these by-laws; and

(b) connected to the main stack at its base.

153. **Height of Vents:**

(1) Every vent pipe extending upwards from a soil, drain or combined waste pipe shall be carried not less than 6 feet higher than any door, window, or other opening into a building, within a distance of 30 feet thereof, and except as otherwise provided in by-law 155 of these by-laws, every educt vent shall be carried at least 18 feet above ground level and 6 feet above the level of the eaves or coping.

(2) Every vent pipe extending upwards from a waste pipe shall be carried 4 feet above any door, window or other opening into a building, within 20 feet thereof, and in any case at least two feet above the level of the eaves or coping.

(3) Subject to the foregoing provisions of this by-law, any vent pipe which extends into a gable of a building shall be carried at least two feet above the point of intersection with the roof.

(4) Where necessary, in the opinion of the Board, vents shall be carried to such additional heights as may be required to effectually prevent the escape of foul air into any building within the vicinity.

(5) Vent pipes shall, where necessary, be provided with sufficient clips or stays to support them effectively.

154. **Chimneys and Cavity Walls:** No chimney or cavity walls shall be used as a ventilator to any drain, soil, combined waste or waste pipe.

155. **Vents near Chimneys:**

(1) Vents shall, as far as possible, be kept away from chimneys and ventilating air shafts.

(2) Where a ventilator pipe terminates 10 feet or more from a chimney opening or ventilating air shaft, the provisions of by-law 153 of these by-laws shall apply, but where the distance is less than 10 feet the vent pipe shall, provided it is at least 18 feet long, terminate not less than 2 feet below or 6 feet above the top of such chimney or air shaft.

156. **Vent Pipes Grades:**

(1) Where vent pipes connect to a soil or waste pipe the vent shall be taken off above the centre line of the soil or waste pipe and the vent pipe shall rise vertically or at an angle of not more than 45 degrees from

the vertical to a point at least 6 inches above the flood level rim of the fixture it is venting and from that point it shall either extend in undiminished size above the roof, or offset horizontally at a grade of not less than 1 in 40, or connect to a horizontal branch vent laid at a grade of not less than 1 in 40. All vent and branch vent pipes shall be so graded and connected as to drain back to the soil or waste pipe by gravity.

Vent stacks shall be erected vertically with offsets not less than 45 degrees from the vertical.

(2) Vent pipes shall not be used as waste or soil pipes.

157. **Combining of Vents**: Vent pipes may be branched into a soil or waste pipe, above the level of the highest fixture; provided that in the case of the Separate Pipe System, soil vents are branched into soil pipes and waste vents into waste pipes only.

158. **Vent Branch Junctions**: Where a junction is made to a soil or waste vent pipe the method of joining shall be by means of an approved welded joint or other approved methods and in accordance with the Board's standard drawings.

159. **Pipe Clips, etc.**:

(1) There shall be at least one pipe hook or clip to each six feet length of vent pipe.

(2) For cast iron or wrought iron pipe, approved coated wrought iron clips, and for copper, brass or galvanised sheet iron pipe, 1½ inch by 14 gauge band clips of the same material as the pipe, shall be provided or approved pipe hooks shall be provided.

(3) Where it is necessary to fix pipes clear of the wall, approved extension clips shall be used.

(4) Clips, in the case of cast iron pipes, shall be placed tight up against the bead or underside of the collar.

160. **Attachment to Walls**:

(1) Where a galvanised sheet iron pipe, with or without offset, is carried up above the brick wall of a building or outbuilding, it shall be secured by a galvanised wrought iron clip, leaded into the wall near the top, or by other approved means.

(2) All band iron clips of vent pipes to brick walls shall be fastened with nuts and bolts, leaded in, or for cavity walls by means of T-headed bolts passed through the brick joints and turned at right angles to the joints, or by other approved means.

161. **Supporting of Vents**: Wherever a vent pipe, with offset, exceeds nine feet in length above the offset, it shall be stayed, as directed, with ½ inch galvanised wrought iron piping, provided that an unsupported length of 15 feet, above the highest clip of straight vent pipe, without offset, shall be permitted.

162. **Vents Adjoining High Buildings**:

(1) In any case in which a building is erected next to an existing building of less elevation and any doors, windows or other openings of the new building are located within 30 feet of any existing vent stack on the lower building, the owner of such new building shall defray the cost of such alterations to the vents of the previously existing building as necessary to conform with by-law 153 of these by-laws.

(2) The owner of the lower or existing building shall make such alterations upon the receipt of money, or security therefor sufficient for the purpose, from the owner of the new or higher building, or shall permit at the request of the owner of the new or higher building the making of such alteration by the owner of such new or higher building.

163. **Down and Relief Venting:**

(1) **Down Venting:** In special cases, which must be approved by the Senior Inspector, vent pipes may be installed on the "down venting" principle. That is, the vent pipe from the fixture trap may be taken below level of the fixture and graded under the floor to an external wall or into the pipe duct and then carried up in accordance with the requirement of by-law 166 of these by-laws. An approved accessible fitting shall be provided at the lowest point of such vent for the purpose of draining off any water of condensation collected therein.

(2) **Relief Venting:** Relief vents on soil and combined waste pipes shall be provided where shown on plan and comply with by-law 166 of these by-laws.

CAPACITIES OF SOIL, WASTE AND VENT PIPES.

Fixture Units.

164. For the purpose of determining the size of any waste, soil or vent pipe, the following equivalent fixture units shall be adopted, unless otherwise directed:—

Table 1

—	1 Nominal Outlet Diameter	2 Fixture Units
	inches	
One lavatory basin	1½	1
For each lavatory basin over 20 served by such pipe	....	½ for each basin
One kitchen sink (up to 6 in. depth to overflow)	2	3
(over 6 in. overflow)	2	5
One bath (with or without overhead shower)	1½	4
	2	6
One wash trough set with common trap	2	5
One washing machine directly connected	2	5
One urinal or group of urinals draining to a common trap	2	3
One slop hopper	4	4
One shower compartment	2	3
One water closet	4	5
Groups of fixtures contained in one apartment—		
Bath, lavatory basin and shower	....	6
Bath and lavatory basin	....	6
Bath, lavatory basin, shower and water closet	....	6
Bidet	1½	1
Bedpan and bottle slop sink	3	4
Glass and teapot washers	1½	1
Foot baths	2	2
Dishwashers	2	6
Cleaner's and caretaker's sinks	2	3

For fixtures, other than those shown, the equivalent fixture units to be adopted shall be determined by the Board.

165. **Sizes of Soil, Waste, Combined Waste and Drain Pipes:** The sizes of soil, waste, combined waste and drain pipes computed in accordance with the method set out in Schedule B shall be not less than the sizes, determined on the basis of the total number of fixture units drained or likely to be drained in accordance with the following tables.

1.—Sizes of vertical soil and/or waste pipes and horizontal branches (see definition).

Table 2

1	2	3	4
Pipe Diameter	Maximum Number of Fixture Units Allowed into		
	Horizontal Branch	Modified Vented System	Fully Vented System
		Vertical Pipe	Vertical Pipe
inches			
1½	4	8	9
2	6	16	20
2½	12	28	36
3	20	40	50
4	160	350	425
5	350	750	925
6	650	1,250	1,550
7	1,000	1,800	2,250
8	1,400	2,400	3,000
9	1,900	3,100	3,750

Notes Applying to Table 2—

A. Waste, combined waste, soil and drain pipes shall not be diminished in the direction of flow.

B. The diameter of trap, waste, combined waste or soil pipe receiving the discharge from any fixture shall be in NO case less than the nominal outlet diameter of such a fixture.

C. For the purpose of this section, offsets in vertical stacks may be treated as though vertical, provided the offset is not more than 45 degrees from the vertical.

D. Soil, combined waste and waste pipes shall be as direct and free from bends as practicable; where bends are unavoidable approved provision if necessary shall be made to safeguard fixtures connected immediately above or below such bends.

Modified Vented System (Column 3).

E. Not more than 25 per cent. of the number of units shown in column 3 should be permitted into a stack per storey (known as a branch interval).

F. For vertical pipes serving 3 storeys or less the fixture unit totals in column 3 should be reduced by one-third.

Fully Vented Systems (Column 4).

G. Not more than 25 per cent. of the number of units shown in column 4 should be permitted into a stack per storey (branch interval).

H. For vertical pipes serving 3 storeys or less the fixture unit totals in column 4 should be reduced by one-third.

2. **Sizes of House Drains and Offsets in Plumbing Stacks (Table No. 3)**: This table shows the minimum sizes for house drains. It is also used to determine the size of plumbing stack offsets where these are laid at inclinations up to 45 degrees from the horizontal.

No house drain shall be less than 4 in. diameter.

Table 3

Size of House Drains and Offsets in Plumbing Stacks

Allowable Fixture Units

1	2	3	4	5	6
Pipe Diameter	Grade I In				
	20 and steeper up to 45°	40	60	90	More than 90
inches					
2	30	22			
2½	35	25			
3	40	30			
4*	250	220	170	170	170
5	600	500	450	400	400
6	1,050	900	800	700	700
7	1,650	1,300	1,200	1,050	1,050
8	2,350	2,000	1,800	1,600	1,450
9	3,300	2,800	2,450	2,200	2,000
10	4,300	3,700	3,250	2,900	2,500
12	6,900	5,900	5,200	4,600	4,000
15	12,500	10,500	9,350	8,400	7,000

*(i) Where more than 10 W.C's are to be connected, the house drain serving these shall be not less than 6 in. diameter. (This restriction does not apply to offsets in plumbing stacks.)

(ii) The minimum size pipe used for house drains or for conveying the discharge from W.C's shall be 4 in. diameter.

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166. **Sizes of Vents:**

1. This table shows the minimum sizes for main vents (i.e., the vertical vents adjoining the stacks) which are dependent on—

(i) the size of the stack served by a particular vent; and

(ii) the developed length of the vent;

(iii) the number of fixture units connected to the stack served by that vent.

Secondary or subsidiary vents which may be required in certain cases shall also be sized from the table.

Table 4

Sizes of Main Vents

Size of Soil and or Waste Pipe	Fixture Units Connected	Diameter of Required Vent (inches)									
		1¼	1½	2	2½	3	4	5	6	7	8
		Maximum Length of Vent (feet)									
inches											
2	12	30	75	200							
	16	26	50	150							
	20	26	50	150							
2½	28		30	100	300						
	36		30	100	300						
3	10		30	100	200	600					
	40			55	160	460					
	50			50	120	430					
4	100			35	100	260	1,000				
	200			30	90	250	900				
	350			25	80	215	800				
	425			20	75	200	750				
5	200				35	80	350	1,000			
	500				30	70	300	900			
	750				25	60	250	800			
	925				20	55	225	750			
6	350				25	50	200	400	1,300		
	650					30	125	300	1,100		
	1,250					20	90	230	900		
	1,550					20	80	215	800		
7	450						100	270	900		
	1,000						70	180	700		
	1,800						45	140	550		
	2,250						40	130	500		
8	600						50	150	500	900	1,300
	1,400						40	100	400	800	1,200
	2,400						30	75	350	700	1,050
	3,000						25	70	300	600	900
9	750							100	300	700	1,150
	1,900							75	240	570	900
	3,100							50	200	430	650
	3,750								150	360	590

Main vents and secondary vents shall be connected into the stack near its foot. Schedule B, Diagram 1.

In the case of offset stacks, the main or secondary vent serving these shall be offset with the stack or alternatively the upper and lower vertical section shall be separately vented. Schedule B, Diagram 5.

Cross relief vents shall be installed at each 10th storey measured from the highest connection. Schedule B Diagram 4.

2. This table shows the minimum sizes for branch vents. (See Schedule B Diagram 1).

Table 5

Sizes of Branch Vents

No. of Fixture Traps* Connected to The Branch Soil or Waste Pipes Entering the Stack at the One Point	Horizontal Branch Vent Diameter (inches)
2 to 20	2 in. } Except that where the
21 to 35	2½ in. } waste pipe is less than
36 to 50	3 in. } 2 in. dia., the vent may
More than 50	4 in. } be of the same diameter
* Not Fixture Units	

Note: The size of a particular branch vent pipe may be varied throughout its length in accordance with Table 5 provided that the pipe size does not decrease in the direction of the vertical vent to which it is connected, and provided also that at the point where the diameter alters, an individual vent connection is installed in accordance with Table 6 and the conditions applying thereto.

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3. This table shows the minimum sizes for vents which serve individual fixture traps and which connect to horizontal branch vent pipes or extend to open air.

Table 6

Size of Back (Anti-siphon) Vents for Fixtures each of which is Individually vented

Nominal Diameter of Fixture Outlet	Individual Vent Diameter
(inches)	(inches)
1½	1¼
2 }	
2½ }	1½
3 }	
4 }	

3.1 The back venting of individual fixtures in an installation normally intended to be fully vented may be omitted and a modified form of venting used if the following requirements are met:—

Conditions for Modified Venting for Multi-Storey Buildings—

(1) Traps shall have a 3 inch water seal.

(2) Sizes of Main stacks, vent stacks, horizontal waste and soil pipes, and horizontal vent pipes shall be determined from previous tables. However the number of fixtures vented and the sizes of the individual fixture vent shall be determined from the following table.

Table 7

Requirements for Modified Venting on Multi-Storey Buildings

For Fixtures up to and including 2½ in diameter Outlets		Fixtures with Outlets greater than 2½ in. diameter	
1. Groups of up to 10 fixtures to the one branch waste or soil pipe	One only 2 in. vent need be provided which shall be taken off the furthest trap or from a point on the waste pipe not more than 6 ft. from the furthest trap. For each additional group of 10 such fixtures or part thereof an additional 2 in. vent shall be similarly provided. Such vents shall be connected to a horizontal vent pipe or extend to open air. In addition the size of the horizontal waste pipe shall be increased one diameter above the size required by Table 2.	2. Groups of fixtures in excess of 6 connected to one branch or soil pipe	One 2 in. diameter vent connected at first and last fixture and every sixth fixture in between such vents shall be connected to a horizontal branch vent pipe or extend to open air.
		3. Groups of 3 to 6 fixtures connected to one waste or soil pipe	One 2 in. diameter vent shall be provided at the first fixture and either at the last fixture or between the last two fixtures. Such vents shall be connected to a horizontal branch vent pipe or extend to open air.
		4. With two fixtures connected to one branch waste or soil pipe	Only one 2 in. vent need be provided and shall be connected to a horizontal branch vent pipe or extend to open air.
		5. With any single WC pan on a branch soil pipe above which are no other fixtures connected to the same stack the individual vent may be omitted provided that the fixture trap is within 5 ft. of the stack.	

PLUMBING GENERAL.

167. **Waste Pipes:** Separate waste pipes shall be provided for each of the following classes of polluted water, namely:—

(a) Dirty water from baths, sinks, lavatory basins, and wash troughs and other waters containing a small proportion of soap or dirt.

(b) Greasy water from kitchens and scullery sinks or other fixtures, in such cases where grease traps are ordered or required.

168. **Soil Pipes:** Except as provided in by-law 169 of these by-laws, soil pipes shall be provided for soil water from closets and other waters containing faecal matter and for urinal waters from slop hoppers and urinals, and where directed, for discharges from operating theatres and mortuaries.

169. **Combined Pipe System:** The combined pipe system for plumbing installations may be used subject to the following conditions and such other conditions as may be required by the Board in any particular case:—

(a) An interceptor or boundary trap shall be provided in the house drain in accordance with by-law 102 of these by-laws.

(b) Fixture traps shall be vented as required by these by-laws.

(c) In order to prevent fouling of traps as much as possible by the discharge from water closets, slop hoppers and urinals, in the event of a blockage in the combined waste pipe—the waste pipe from baths and shower compartments or other fixtures, as determined, shall be branched into the combined waste stack.

170. **Connections to Drain:**

(1) All waste pipes shall discharge under the grating and above the water seal of a yard gully or disconnector trap.

(2) All soil pipes, including those for urinals and slop hoppers must be connected direct to the drain.

171. **Flashings, etc:**

(1) Unless otherwise directed all troughs sinks and other plumbing fixtures which are placed less than three inches from any wall except those provided with wall skirtings of not less than three inches in height, as part of the fixture shall be flashed with 4lb. lead, 24 gauge copper, bronze, brass, nickel silver or monel metal or other approved material.

(2) All such flashings shall be turned up the walls at least three inches, properly secured and made watertight or cover flashed and made watertight except where the walls are tiled, when the flashings shall be carried up at least one-quarter inch behind the tiles.

(3) Baths and other plumbing fixtures having turned up flanges for use against tiled walls in lieu of sheet metal flashing shall be rigidly and properly supported in approved manner to prevent settlement, and the flange shall lap at least one-quarter ($\frac{1}{4}$) inch behind the tiles or other approved wall surface, which shall be brought hard down on the surface of the fixture.

172. **Internal Cocks:** Cocks delivering water shall not be fixed internally unless a sink, lavatory basin or other approved fixture, or a properly drained impervious floor, is provided underneath.

173. **Sheet Metal Bends and Offsets:** All sheet metal bends and offsets for flush and vent pipes, shall be bent or pressed. Mitred elbows will not be permitted.

174. **Pipes through Roof:** In all cases where a vent, waste, combined waste or soil pipe passes through any roof a suitable collar worked out of four-pound sheet lead shall be soldered or otherwise fixed to the pipe and also the roof in such a manner as shall make the roof perfectly watertight.

SOIL, COMBINED WASTE AND WASTE PIPES.

175. **General:** All lines of soil, combined waste and waste pipes shall be as direct as possible.

176. **Materials:** soil, combined waste and waste pipes:— Except by permission of the Board no material shall be used for soil pipes, other than cast-iron, brass, copper, stoneware, concrete or ceramic ware, and for waste pipes, other than wrought iron galvanised steel tube, cast iron, malleable iron, brass, copper, stoneware, concrete or ceramic ware, or other approved materials.

177. **Galvanised Steel Tubing and Malleable Iron Fittings:** Galvanised Steel Tubing shall comply with AS B105. Malleable Iron Fittings in $1\frac{1}{4}$", $1\frac{1}{2}$" and 2" diameter sizes shall comply with AS-A74.

178. **Cast Iron Pipes and Fittings:**

(1) Cast iron pipes, where laid in the ground shall comply with Australian Standard A88 1959 (Heavy grade) and pipes above ground to the same standard but complying with light grade requirements and fittings shall comply with the same standard.

(2) Pipes and fittings shall be sound free from holes and cracks and coated with approved bituminous composition or lined with glass enamel or other approved material.

(3) All junctions shall be curved but right angled junctions shall not be made or permitted.

179. **Fittings for Waste, Combined Waste, and Vent Pipes:** Fittings approved of by the Board shall be in accordance with Australian Standard Specifications.

180. Copper or brass pipes for soil, combined waste and waste pipe shall comply with A.S.B. 158-1969 (including Tables 1, 2, 3, 4 and 5 thereof) and be used in accordance with Schedule C of these by-laws.

181. **Plastic Pipe**: Approved plastic waste pipes shall comply to the appropriate Australian Standards and to Board specifications and be used in accordance with Schedule D of these by-laws.

182. **Minimum Permissible Gradients**:

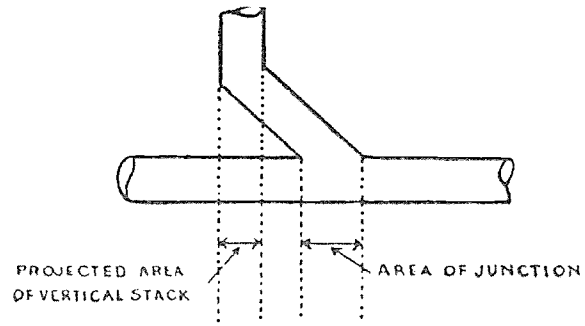
(1) Unless indicated otherwise by these by-laws the following are the minimum gradients to be adopted for soil or waste pipes:—

Diameter of Pipe	Minimum Gradient	Diameter of Pipe	Minimum Gradient
inches		inches	
....	....	3	1 in 30
1½	1 in 15	4	1 in 40
2	1 in 20	6	1 in 60
2½	1 in 25	....	....

(2) If copper piping is used gradients for 1½ inch diameter pipe may be one in 18, and for 2 inches diameter pipe one in 24. For 2½ inches diameter pipe one in 30, and for 3 inches diameter pipe one in 36, in cases where copper is used for waste pipes only.

183. **Junctions**:

(1) Where a soil or waste stack is branched into a graded waste or soil pipe above ground level, the branch fittings shall have an angle not less than 45 degrees to the graded pipe, and the length of the branch of the fitting shall be such that the vertical projection of the attached stack will be wholly outside the area of the junction with the graded pipe.



(2) Where a soil stack is branched into a graded soil pipe or drain, it shall enter same on the horizontal at an angle of 45 degrees, when below ground level.

184. **Sealing of Pipes**: Wherever a fixture is abolished, the soil, combined waste, waste, vent and water supply pipes to such fixture shall be removed, or, if allowed by the Board to remain, the end of the pipes shall be sealed with a screwed plug. Cast iron pipe may have the end securely closed with a wiped joint; stoneware pipe may have a stoneware disc cemented in.

185. **Pipe Clips, etc.**: There shall be at least one pipe hook or clip to each six feet length of soil, combined waste, or waste pipe, in accordance with the provisions of by-laws 159 and 160 of these by-laws for vent pipes.

186. **Concealment of Pipes**:

(1) All soil, combined waste, waste, and main vent pipes and traps shall, except where passing through walls, partitions or floors, be reasonably accessible at all times for inspection and convenience of repairing.

(2) In hospitals and similar institutions, all soil, waste, combined waste and main vent pipes, where practicable, shall be fixed on the outside of external walls or in pipe ducts having a minimum width of two feet, and minimum area of nine square feet (measured clear of all pipes or other obstructions), and shall be so arranged as to facilitate inspection and maintenance at all times. Such pipe ducts shall be provided with access doors so placed as to permit ready inspection of every straight line of waste, combined waste, soil, or main vent pipe.

(3) In buildings other than hospitals or similar institutions, if soil, waste, combined waste, or main vent pipes are concealed within pipe ducts or recesses in walls, such pipe duct or recesses shall—

(a) be provided with approved means of access and have a width of not less than 2 feet and a minimum area of nine square feet (measured clear of all pipes or other obstructions); or

(b) shall have at least one of its sides constructed of wood work, fibro cement, plaster or expanded metal lathing or other approved material, so constructed and fixed as to be capable of being removed independently of, and without damage to, any other part of the structure and provided with inspection opening so placed as to allow of ready inspection and cleaning of every straight line of soil, combined waste, waste or main vent pipe.

(4) Branch and anti-syphonage vent pipes may be concealed in hollow walls, or may be built in wall chases, provided the pipes and fittings are made of brass or copper in accordance with the requirements of by-law 180 of these by-laws for soil, waste, and combined waste pipes.

(5) All inspection or access openings to concealed pipes shall be finished throughout with smooth surfaces, and shall be of such size and shape as to permit the entrance of cleaning tools, as required, to the pipe.

(6) For the purpose of this by-law, a straight line of soil, combined waste, waste or main vent pipe shall be taken to include any offset or deviation from the straight line of not more than 45 degrees and not more than three feet in length.

(7) The base of each duct or recess provided for in sub-bylaws (2) and (3) of this by-law shall have an impervious floor provided with suitable drainage.

187. **Painting**: Except by permission of the Inspector, no painting shall be done on any part of the plumbing installation until after the work has been inspected and approved by the Inspector.

188. **Provision for Inspection and Cleaning**: Inspection and cleaning eyes shall be provided on all soil, combined waste and waste pipes in such positions as will provide access for proper inspection and cleaning of the entire length of pipe.

189. **Inspection Openings on Soil Pipes, etc.**: In all cases where the vertical stack of soil or combined waste pipe provided for closets six feet or more above ground level, measured from floor level of water closet to ground level at foot of stack, an inspection opening, eight inches in length and of sufficient width to take a four-inch testing plug and having a cover fixed to a flange with non-corrodible bolts or studs, shall be provided near the foot of the stack.

190. **Washers for Inspection Openings**: Inspection openings to soil, combined waste and waste pipes shall be provided with insertion material, or other approved washers.

191. **Joints—Plumbing**: Stoneware, Concrete or Cast Iron Pipes: Joints of stoneware, concrete or cast-iron pipes shall be made in accordance with the requirements of by-laws 121 and 122 of these by-laws or by other approved methods.

192. **Lead Pipes**: All joints in lead pipe shall be plumber's wiped joints.

193. **Galvanised Steel Tubing:**

(1) The screwed ends and sockets of galvanised steel tubing shall be so formed and the threads so cut, that the ends of the pipes shall butt against each other when screwed home in the sockets; bends, junctions and similar fittings shall be similarly formed and screwed, so that when the pipe ends are screwed home, the bore will be continuously uniform and without breaks or pockets.

(2) The burr shall be neatly filed off on the inner edge of all pipe ends.

(3) All screwed joints shall be made with approved jointing material.

194. **Galvanized Steel Tubing to Lead Pipe:** All joints between galvanized steel tubing and lead pipes shall be made by means of brass unions screwed to iron and wiped to lead.

195. **Brass or Copper Pipes:** Joints on brass or copper pipes shall be made by means of brazing to the satisfaction of the Board or in accordance with the Australian standard specification for "Compression joints and copper alloy screwed fittings for standard copper tubes", or by other approved means.

196. **Lead Pipe to Cast Iron Pipe:** The connection of lead pipes or traps to cast iron pipes shall be made by means of brass sleeves; brass sleeve shall be lined with and connected to the lead pipe or trap by means of a wiped joint and connected to the cast iron by inserting the sleeve in socket thereof and making the joint in the same way as in cast iron pipe.

197. **Sheet Iron Pipe to Cast Iron Pipe:** All connections of galvanised sheet iron to cast iron pipes shall be made with molten lead, lightly but tightly caulked into the cast iron socket.

198. **Sheet Iron Pipe to Wrought Iron Pipe:** Galvanised sheet iron pipes shall be connected to wrought iron pipes by means of brass unions or thimbles soldered to the sheet iron and screwed to the wrought iron.

199. **Welded Joints:** Welded joints may be permitted provided the method of welding and a sample of the work is submitted to the Board for its approval.

200. **Connection of Closet Pan or Slop Hopper Traps to Soil Pipe or Drain:**

(1) The connection of an external closet pan or slop hopper to a drain or soil pipe shall be made by means of a cement mortar joint neatly splayed off at an angle of 45 degrees, or by other approved method.

(2) In the case of internal closet pan or slop hopper traps the joint shall be of metallic-ceramic type, but in approved position the closet pan or slop hopper trap may connect direct to the cast iron and a cement mortar joint used.

(3) An approved mastic joint may be used in multi-storied construction or other connections as approved by the Board.

201. **Cistern Flush Pipe to Closet Pan:**

(1) The flush pipe from cistern shall be connected to the water closet pan by connections approved by the Board.

(2) The connection of the flush pipe to cistern shall be by means of a brass union, wiped to lead pipe or soldered by approved methods.

202. **Vent Pipe to Closet Pan:** The joint between the vent pipe and the vent horn of the water closet pan shall be of the metallic-ceramic type or approved equivalent.

203. **Outlet Fittings to Fixtures:**

(1) Connection between outlet fittings and such fixtures as baths, sinks, basins, troughs, etc., when the latter are constructed of cast iron, plate iron, ceramic ware, or concrete shall be made with locknuts.

(2) The outlet fitting shall in all cases be connected to the waste pipe by means of a union.

(3) When approved fixtures are made of sheet metal lighter than 20 gauge soldered connections may be used in lieu of locknuts.

204. **Waste Pipes to Troughs:** Connections of waste pipes to washtroughs shall be made as provided hereunder:—

(a) Sheet metal troughs shall be connected to the waste pipe in compliance with the requirements of by-law 203 of these by-laws.

(b) Where wrought iron or other screwed pipes are used the plug shall be connected to the trough by means of a locknut in lieu of flange.

FIXTURE TRAPS.

205. **Fixtures to be Trapped:**

(1) Every fixture shall be effectively trapped unless otherwise permitted, in writing, by the Board.

(2) Separate traps shall be provided for each fixture except lavatory basins or sinks which may be connected in pairs provided that they are situated in detached outbuildings, open verandahs, in well ventilated sanitary blocks, and provided that the length of the waste pipe between the two fixtures shall not exceed three feet.

(3) Anti syphon traps may be used where—

(a) the length of waste from the fixture does not exceed the distances including drops given in by-law 149 of these by-laws.

(b) the waste discharges into a vented vertical waste pipe the rating of any fixture units above the junction shall not exceed four (4) fixture units; and

(c) the trap is readily accessible.

206. **Position of Traps:** The traps in each case shall be placed, unless otherwise directed, as near the outlet of fittings as possible.

207. **Form of Trap:** The "P" form of trap shall be used in preference to the "S" form where, in the opinion of the inspector, it is equally suitable for the situation.

208. **Materials:** Traps for fixtures, other than closet pans, slop hoppers or urinals, shall be of copper, brass or other approved materials.

209. **Depth of Water Seal:** Every trap shall have a minimum water seal of two inches, but traps used for the Unvented, Partially Vented, and Modified Vented Plumbing Systems shall have a water seal of three inches.

210. **Gratings:** Non-corrodible outlet gratings, of approved design and material, shall be provided for all urinals and slop hoppers, and for all fixtures not discharging faecal matter.

WATER CLOSETS, SLOP HOPPERS, URINALS AND FLUSHING APPARATUS.

211. **Provision of Water Closets:**

(1) At least one water closet approved by the Board shall be provided for each house, flat, building or land required by notice from the Board to be connected with the Board's sewer.

(2) After the date fixed by notice from the Board to the owner of any house, building or land, requiring him to connect the same with the Board's sewer, or after such further time as shall be allowed by the Board, for the purpose of such connection, no privy closet other than a water closet approved by the Board, shall be used in such house or building or upon such land.

212. **Fixing Closet Pan:** On concrete floors or floors of tiles set in concrete, the closet pan shall be securely fixed with brass screws to approved lead dowels set in the floor, or by other approved means. Where pans are fixed on wooden floors such floors shall be covered with an approved material as required under by-law 242 of these by-laws.

213. **Closet Pans:**

(1) Closet pans shall be of approved non-absorbent material and constructed in accordance with the Board's standard drawings, specifications or as otherwise approved by the Board.

(2) Wash down or syphonic type pans may be used.

214. **Closet Pan Seats:**

(1) Where a seat is provided, it shall be of approved construction and material, fitted with non-corrosive hinges and screws and secured to pan in an approved manner.

(2) The opening in any water closet pan seat shall be in accordance with the Australian Standard Specification for water closet seats.

215. **Flushing Apparatus:**

(1) Approved apparatus shall be provided for the effective application of water to the closet pan and for the efficient flushing and cleansing of the pan and removal therefrom of any solid or liquid matter which may, from time to time, be deposited therein.

(2) Such apparatus shall have a flushing capacity of not more than 2½ gallons and shall be so constructed, fitted and placed as to supply water for use in the pan without any direct connection from the pan to any water service pipe upon the property.

216. **Flushing cisterns:** Flushing cisterns shall be of a type and pattern approved of by the Board.

217. **Flush Pipes:**—Flush pipes to closet pans shall be of brass, copper, drawn galvanised steel of not less than 22 gauge, or other approved material.

218. **Flushing Apparatus other than Cisterns:**

(1) Flush valves shall be of a type approved by the Board and each valve shall be provided with a fullway stop cock fixed in such position as to be easily accessible.

(2) Direct connection shall not be made between any water service pipe and any part of the water closet or slop hopper or other fixtures used for a like purpose.

219. **Storage Tanks:**

(1) Provision for the storage of water for flushing purposes shall be made in schools, hotels, hospitals, public institutions, multi-storey, and other buildings when directed and whenever flushing valves are installed.

(2) The storage tank shall have a capacity of not less than 10 gallons for each water closet, slop hopper or urinal stall and any other approved fixture required to be flushed, with a minimum of 50 gallons when directed by the Board.

(3) Where the capacity of a tank exceeds 50 gallons, it shall be fitted with a fullway valve on the main feed to valves.

(4) Flush valves installed in private residences and self-contained flats shall be provided with independent storage tanks.

(5) In no case shall plumbing fixtures be served with water from a storage tank supplying a hot water system, unless the supply is taken off at a point in the cistern where it will not lessen the storage capacity required for the plumbing fixtures.

(6) Unless otherwise approved by the Inspector, the storage tanks shall be placed on the roof over a flat or gutter, or in an accessible place between the ceiling and the roof, in which latter case a safe of galvanised iron, lead, or other approved impervious material, with at least a 1½ inch overflow shall be fixed under the storage tank.

(7) Every storage tank shall be provided with an approved cover.

(8) The head of water measured vertically from the top water level of storage tank to the level of the point of discharge into a cistern shall be not less than ten feet, but the head in the case of discharge into a flush valve shall be such that the flush valve will operate to the test required by the Board.

(9) The water supply pipes from storage tanks to cisterns shall be not less than the following diameters:—

For 1 or 2 cisterns—¾ inch diameter.

For 3 or 6 cisterns—1 inch diameter.

For 7 to 25 cisterns—1½ inch diameter.

For 26 to 50 cisterns—2 inch diameter.

(10) Where more than 50 cisterns are supplied, or where more than 10 cisterns are subject to a head of less than 20 feet, measured vertically from the top water level of the storage tank to the level of the point of discharge into the cistern, the case shall be submitted to the Board for decision.

(11) Where the head of water supply from the storage tank to the Flushing cistern is less than 20 feet, a low pressure ball valve shall be provided to the cistern.

(12) The water supply pipes from storage tanks to flush valves shall not be less than the sizes determined from—

(a) the available head measured vertically, in storeys, from the level of the first flush valve served by the portion of supply pipe under consideration to the normal water level of the storage tank; and

(b) the total number of flush valves served by that portion of the supply pipe under consideration; in accordance with the following table:—

Available Head in Storeys	Diameter of Portion of Supply Pipe under Consideration	Maximum Permissible Number of Flush Valves Served by Portion of Supply Pipe under Consideration	
		Galvanised Wrought-Iron Pipe	Copper or Brass Pipe
	inches		
1	1½	1	2
	2	10	15
	2½	30	50
	3	100	150
2	1½	2	3
	2	15	30
	2½	50	150
	3	100	150
3	1½	2	4
	2	25	50
	2½	100	150
4 or more	1½	2	6
	2	40	100
	2½	100	150

(13) Where the flush valves to be supplied exceed the maximum number above stated, or where more than 20 flush valves are subject to an available head of less than 20 feet, the case shall be submitted to the Board for special investigation. The overflow from a storage tank shall be not less than 1½ inches in diameter.

220. **Details of Urinal Construction, etc.**

(1) Each urinal fixture shall be of design approved by the Board and constructed of glazed fire clay, glazed earthenware, stainless steel, salt glazed stoneware or other approved material with a smooth surface of non-absorbent material.

(2) The soil pipe shall be of brass (of 11 gauge) earthenware or glass enamel or coated cast iron or other approved material and shall be kept as short and free from bends as practicable.

221. **Urinal Floors:**

(1) The floors of all urinals shall be constructed of either—

(a) cement concrete of not less than four inches in thickness; or

(b) other approved materials of an approved thickness.

(2) All floors shall be graded to a fall of not less than one inch in six feet and shall be finished to approval.

(3) The floors of urinals shall be drained to the urinal channel or trapped floor waste which shall be connected to house drain.

(4) Where the floor in front of the urinal channel is raised above the general floor level, the width of such raised portion shall be not less than 18 inches and shall be so graded that it shall fall towards the urinal channel on a grade of not less of one-half inch in 18 inches and shall be finished to approval.

222. **Hose Taps for Urinals:** Every public urinal shall be provided with a tap at least four feet above floor level located over the urinal channel and suitable for hosing of floors.

223. **External Urinals:**

(1) External urinals shall be constructed in an approved position and of materials approved for internal urinals and channels.

(2) The stalls shall be fixed against a brick or concrete wall in an approved manner and shall be at a height of at least four feet from the floor.

(3) An outlet shall be provided for each ten feet of channel or part thereof.

(4) The floor in front of every urinal shall consist of approved impervious material for a width of 18 inches and shall be graded towards the channel with a fall of one-half inch to 18 inches.

224. **Flushing Apparatus:**

(1) Low level or intermediate level cisterns shall not be fixed to urinals unless the operating control is on the front of the cistern and the bottom of the cistern shall be 20 inches above the top of the urinal stall.

(2) The discharge from the urinal flushing apparatus shall be not less than one gallon for each urinal stall or for every two feet width of urinal.

(3) The cistern shall be so fixed that the ball-cock is accessible.

(4) A separate stop tap shall be provided for each urinal cistern.

(5) Automatic flushing cisterns shall not be used unless so directed by the Board.

225. **Flush Pipes:**

(1) Flush pipes for urinals shall be constructed of copper or brass, of the following diameters:—

For 1 gallon cistern 1 inch external diameter.
For 2 gallon cistern 1¼ inch external diameter.
For 3 gallon cistern 1½ inch external diameter.

(2) (a) If the discharge pipe from the cistern used is 1 inch in diameter, one 1 inch spreader only shall be permitted.

(b) If the pipe used is 1¼ inch diameter, two 1 inch spreaders shall be permitted.

(c) If the pipe used is 1½ inches in diameter, three 1 inch spreaders shall be permitted.

(3) The distance between spreaders shall not exceed 24 inches.

(4) Saddle or bridge pieces shall be of approved diameter where same are necessary and flush pipes clips, bolts and screws, used in fixing flush pipes in cisterns, shall be of brass or copper.

226. **Flush Valves for Urinals:**

(1) Every urinal flush valve shall be supplied from a storage tank which shall comply with the requirements of by-law 219 of these by-laws.

(2) Urinal flush valves may be supplied from a storage tank serving water closets, or to the supply pipes therefrom, provided that the above storage capacity shall be provided in addition to that required for the water closets.

(3) A full-way stop cock shall be provided for each flush valve in such a position as to be easily accessible.

227. **Slop Hoppers:**

(1) Slop hoppers shall be made in one piece of approved impervious material and provided with approved flushing apparatus of 2½ gallons capacity similar to that set out for Water Closets in by-laws 215 to 219 inclusive of these by-laws.

(2) A bib-cock shall be fixed directly over a slop hopper and at least 18 inches above it.

228. **Wash Troughs:** Wash troughs shall be of approved pattern and material, securely fixed and graded to an outlet fitted with brass strainer, sunk to the level of the bottom of the trough.

229. **Troughs abutting against Brickwork:** Wherever the end of a wash trough abuts against the brickwork the space between the end of the trough and the brickwork shall be bridged with approved waterproof material and made water-tight.

SINKS, BATHS, LAVATORY BASINS AND SHOWER COMPARTMENTS.

230. **Kitchen and Scullery Sinks:**

(1) Kitchen and scullery sinks shall be of approved material and shall be cast, welded or moulded with the drainers in one piece and the whole to be effectively supported, the drainers shall be fluted with a fall to the bowl for drainage.

(2) The walls immediately above the sinks and drainers shall be made impervious with glazed tiles or other approved materials for at least six inches above the top surface of the sink and drainer.

(3) Twin bowl kitchen or scullery sinks may connect above the water seal of a two inch diameter trap providing the outlets are not more than ten inches apart and the trap is fixed to the bowl having the lowest outlet.

231. **Shower Compartments:**

(1) The floors of shower compartments shall be graded to an approved two inch diameter trapped outlet, and shall be constructed of not less than four inches of concrete, trowelled smooth or covered with tiles set in cement mortar, or of other approved impervious materials, or, if constructed of timber, shall be covered with enamelled cast iron, approved non-corrosive sheet metal, or other approved material, turned up at the edges and flashed in accordance with the requirements of by-law 171 of these by-laws.

(2) The level of the grating on the outlet shall be at least two inches below the level of the floor outside and adjoining the shower compartment, or where a kerb is provided, two inches below the level of the kerb.

(3) All walls adjacent to showers shall be made water proof with approved impervious materials.

(4) Not more than two shower compartments shall be graded to a common outlet unless each compartment first falls to a graded channel.

232. **Showers over Baths:** Showers shall not be fixed over baths unless bath or bathroom comply with the following conditions:—

(a) Walls within a radius of three feet from shower be of an impervious nature.

(b) Approved impervious floor graded to an outlet provided with approved flap valve.

(c) A clear space of not less than six inches shall be left around bath if not flashed in accordance with by-law 171 of these by-laws.

233. **Baths:**

(1) Each bath shall be cast iron enamelled inside and over flanges with acid resisting porcelain enamel, glazed fire clay or other approved material with a smooth, well glazed surface of non-absorbent material and shall be provided with an approved trap fixed immediately under the outlet of such fixture.

(2) In existing buildings with wooden floors, safes shall be used under the baths in accordance with by-law 242 of these by-laws.

234. **Lavatory Basins and Sinks:**

(1) All basins and sinks shall be of approved type and if provided with an overflow they shall be of the weir pattern.

(2) Tip-up lavatory basins shall not be permitted unless by special permission of the Board.

(3) Basin brackets shall be bolted to wall in approved manner.

(4) Unless otherwise requested in writing to the Board pillar taps shall be provided attached to basins.

(5) Traps, other than lead traps connected direct to a porcelain basin without an expansion joint shall be fixed at owner's risk.

(6) Lavatory basins shall include the type of basin known as a "vanity" bowl.

(7) All lavatory basins shall be provided with anti-syphonage vents except as provided in by-law 147 of these by-laws.

CONNECTION OF MISCELLANEOUS FIXTURES.

235. Bed pans, bottle slop sinks, bidets, dental units, glass washers, teapot washers, foot baths and other fixtures of similar type shall be submitted for approval before fixing.

236. **Bed Pan and Bottle Slop Sinks:**

(1) Shall be provided with approved flushing apparatus and shall be connected and vented to a soil pipe or drain in a similar manner as for connection of a water closet.

(2) The water supply to jets shall not be connected direct from the Board's supply, but from a storage tank fixed at approved height.

(3) The service pipe to the jets shall be provided with a spring valve. Where a stream jet is used in such fixtures for sterilising purposes an approved vent pipe shall be taken off the fixture.

237. **Bidets:**

(1) Bidets shall be provided with not less than 1½ inch waste pipe, trapped and vented in a similar manner to lavatory basin, and taken direct to the house drain.

(2) Every bidet shall be provided with an approved tank of capacity of at least 2 gallons and so constructed fitted and placed as to supply water for flushing and cleaning of the bidet without any direct connection with any other pipe supplying water for domestic purposes.

(3) Hot water systems supplying bidets shall not be connected directly to the water mains.

238. **Dental Units:**

(1) Dental units shall be provided with 1½ inch waste pipe, trapped and vented.

(2) The trap may be placed at floor level provided that the waste pipe between the trap and the fixture is one inch diameter copper or brass and free from bends.

(3) The water supply to the fixture shall be provided with a stop-cock and check valve which shall be fixed as near to the fixture as possible.

(4) The water supply pipe serving the dental unit shall have a vacuum breaker fitted and shall not pass through the waste recesses of the unit.

239. **Refrigerators, Bain Maries, Glass and Teapot Washers, Ice making machines and other similar fixtures:**

(1) Unless otherwise directed by the Board, wastes from refrigerators other than those used solely for domestic purposes, from bain maries and from glass and teapot washers, shall discharge into a copper or brass box of 16 gauge in thickness, not less than six inches in depth and of a content not less than 216 cubic inches.

(2) The outlet of the box shall be provided with an approved plug and washer and a trap of not less than 1½ inches in diameter and vented in a similar manner as for baths and troughs.

240. **Foot Baths**: Approved foot baths shall be provided with not less than 2 inch waste pipe trapped and vented similarly to wash troughs and baths and the dimension of such foot baths shall be approved by the Board.

241. **Potato Peeling Machines**: Potato peeling machines shall be fixed to a floor of impervious material of approved grade or slope and shall drain to and discharge into a silt trap through a screen or mesh of non-corrodible material of not less than four meshes to the inch.

SAFES AND OVERFLOWS.

242. **Safes—where required**: Unless the floor is constructed of concrete of not less than 4 inches thickness or of other approved impervious material, graded as directed, safes of approved impervious material shall be fitted under slop hoppers and water closets, and under baths, wash troughs, and other plumbing fixtures, where in the opinion of the Board there is a likelihood of damage being caused by the fixtures overflowing.

243. **Safes under Fixtures**:

(1) The safe shall discharge in some conspicuous place.

(2) This by-law shall not apply to any water closet situated on the ground floor of any house or building, and where in the opinion of the Inspector, there is no likelihood of damage being caused by leakage or blockage.

244. **Safe Overflows**: Unless otherwise permitted, every safe shall be drained by a separate two-inch diameter pipe provided at the inlet with a brass grating and at the outlet into the open air with a flap valve of brass or other approved metal and shall not connect with any waste pipe, soil pipe, drain or sewer.

245. **Cistern Overflows**:

(1) Every cistern supplied with water shall have an overflow pipe of adequate size discharging in such a position that it will not cause damage and will act as a warning pipe.

(2) On ground floors where cisterns are fixed over impervious floors graded to drain outside the room, the overflow may discharge on to such floors provided no damage is likely to arise therefrom.

246. **Discharges from Safe Overflows**:

(1) Overflows may discharge into the open air above ground level only when the discharge, in the opinion of the Inspector, will not cause any inconvenience or nuisance.

(2) In all other cases the pipes shall be brought nearly to the ground surface, or be arranged to discharge where they will not prove a source of annoyance or inconvenience.

247. **Existing Floors Under Fixtures**: Where necessary, in the opinion of the Board, every existing floor under a fixture shall, at the owners cost, be re-graded, and a proper discharge pipe with flap valve fixed.

248. **Existing Fixtures and Fittings, etc.**: All existing fixtures, fittings and apparatus not in accordance with these by-laws which in the opinion of the Board are unsatisfactory shall be removed or replaced by approved fittings at the cost of the owner.

249. **Supply of Water to Fixtures**:

(1) All water closets and other plumbing fixtures shall be provided by the owner with a sufficient supply of water from the Board's service, unless otherwise directed by the responsible officer, for flushing purposes to keep them at all times in a proper and clean condition.

(2) Every owner of property who desires, or who has been ordered, to provide sanitary appliances for his property and to connect his property with the Board's sewers, shall provide and have made the necessary connections for the conveyance of water, in accordance with these by-laws.

(3) The piping shall be of capacity sufficient to supply all sanitary fixtures on the property freely and continuously, and convey to the flushing cistern, flushing tank or other flushing apparatus of each water closet upon the property enough water to fill the same at an average rate of not less than one gallon per minute, with one other tap turned on.

(4) The owner shall keep the piping of sufficient capacity to fill the flushing cistern, storage tank or other flushing apparatus, at an average rate of not less than one gallon per minute, with one other tap turned on.

250. **Fixtures not Connected with Sewer:** No water service pipe shall be laid to supply any plumbing fixture in any property connected to the Board's sewer unless the fixture is connected with the said sewers; or unless special permission, in writing, has been previously given to lay such service pipe.

251. **Storage Tanks:**

(1) Water supply pipes to storage tanks for internal closets shall be of not less than three-quarter inch diameter, and shall be provided with high pressure ball valves, except where the available pressure from the water supply system is not sufficient to allow of high pressure ball valves being used, and in such case the permission of the Board to fix low pressure ball valves shall be obtained.

(2) A stop-cock shall be fixed on the supply pipe to the storage tank.

252. **Maintenance and Defective Work:**

(1) Any soil, waste, combined waste, vent or drain pipe, trap, water closet, urinal, sink or other fixture or fitting which is laid, used, or constructed otherwise than in accordance with these by-laws or which, in the opinion of the Board, is, or has become, bad or of defective quality, shall, upon notice in writing from the Board to the owner or occupier of the property or in the case of joint drainage to the owners or occupiers of the several properties be removed, altered or repaired by the owner or occupier, as required by the Board, and within the time fixed by him, and to the satisfaction and approval of the Inspector, and, in case such owner or occupier fails to comply with the requirements of such notice, he shall be liable to prosecution and a penalty for a breach of this by-law, or for an offence against the Act, as the case may be and/or the Board may, if it thinks fit, remove, alter, or repair the defective fitting, fixture or apparatus and charge the owner or occupier of the property with the cost so incurred, and proceed for recovery of the same in the manner provided by the Act.

(2) The occupier shall be responsible for cleansing and keeping clean the drain connected to the Board's sewer and wherever such drain is used as a common drain by more than one occupier, the cost of cleansing and keeping clean shall be equally borne by each of the occupiers of such several properties.

PART VII.—RATES AND CHARGES.

RATES—HOW PAYABLE.

253. (1) Rates shall be payable in each year in equal moietys in advance and the first moiety shall be payable within 14 days after due service of the account and the second moiety shall be payable on the 1st day of January.

(2) Notwithstanding sub-bylaw (1) of this by-law, where accounts are served on or after the 18th day of December in each year, rates shall be paid in full within 14 days after due service of the account.

ALLOWANCE FOR RATE.

254. (1) Subject to the provisions of these by-laws, every ratepayer is entitled to consume during each consumption year on each separately assessed piece of land of which he is the owner or occupier that quantity of water which, if calculated at the price specified in item (1) of the Schedule in by-law 267 of these by-laws, would amount to the equivalent of the water rate levied in respect of that separately assessed piece of land for the rating year ending the 30th day of June during which that consumption year terminates, provided that such water is taken during that consumption year.

(2) In this by-law "consumption year" means, subject to by-law 278 of these by-laws, the period of twelve months terminating on the day (being in any year a day between the 15th day of January and the 29th day of June next following) fixed by the Board for reading, for the purpose of ascertaining the water consumed, the meter attached to the water service supplying the separately assessed piece of land.

ALLOWANCE FOR RATES WHERE METER INSTALLED DURING YEAR.

255. When, during the currency of the year in respect of which a water rate has been levied, a meter is attached to a pipe on any land supplied with water, the consumer shall pay for the quantity of water taken, as registered by the meter, from the time when the meter was attached, at the prescribed price per 1,000 gallons, so far as the water supplied is in excess of the quantity to which the consumer is entitled in respect of the rate as provided in by-law 254 of these by-laws.

PAYMENT FOR EXCESS WATER.

256. Every consumer taking water in excess of the quantity to which he is entitled in respect of the rates shall pay for the excess in accordance with prices set forth in the Schedule in by-law 267.

FEES FOR ADDITIONAL SERVICES.

257. In any case where the owner or occupier of any separately rated piece of land requires more than one service to be installed for supplying water to such land such additional service or services shall, at the discretion of the Board, be installed on such occupier or owner paying in advance the cost of installation and a fee of six dollars per annum, in addition to meter rent, for each additional service. Such owner or occupier shall also bear cost of installing meter and maintaining service and of having it disconnected when it is no longer required. In return for such fee an equivalent quantity of water will be supplied in each year, in the same way as water is supplied in return for water rates. The provisions of this by-law shall not apply to any apparatus referred to in by-law 266.

METER RENTS.

258. Every person supplied with water by measure to other than rated premises, private residences, or non-rateable hospitals, shall pay meter rent in advance according to the following scale:—

Size of Meter	Annual Rent.
	$
Less than 2 inches	2.00
Not less than 2 inches and less than 4 inches	4.00
Not less than 4 inches	8.00

DISCONNECTION AND RECONNECTION FEES.

259. (1) In every case in which the supply of water shall have been cut-off by reason of non-payment of rates or other charges or by reason of a defective service, or by request of the occupier or owner, or when in the opinion of the Board necessary to prevent waste of water, or for other reasons, a fee as determined by the Board shall be charged, and shall be payable by the owner or occupier on demand.

(2) The service shall not be restored until the disconnection fee and a reconnection fee as determined by the Board have been paid.

PRIVATE FIRE SERVICES.

260. Private fire services will be allowed, but every such service shall be sealed, except in cases where the Board may decide that sealing is unnecessary. For each such service the owner or occupier shall pay in advance the actual cost of installation and a minimum annual fee and meter rent as determined by the Board in each case, and such owner or occupier shall also bear the cost of maintaining the boundary service and of having it disconnected when it is no longer required. The owner or occupier for the time being shall in addition at his own risk and expense, and subject to the provisions of these by-laws, keep the internal fire service in good order and repair, so that the same shall at all times be in accordance with the by-laws. No water shall be taken from any sealed portion except for extinction of fire. In the event of the seal having been broken in case of fire or by accident or otherwise, the owner or occupier shall give notice forthwith to the Board and pay the cost of re-sealing.

WHEN ACCOUNTS DUE AND PAYABLE.

261. Where water is supplied by measure to the owner or occupier of land, whether rated under the Act or otherwise, payment for same shall become due and payable within fourteen days after due service of the account, unless otherwise agreed upon.

FLUSHING ALLOWANCES.

262. Every consumer of water who received his supply of water through a meter and pays for such supply an amount exceeding the sum which he would be required to pay upon the water rating of his premises, shall, out of such excess, be allowed, so far as such excess will admit thereof, a deduction equal to the value of 5,000 gallons of water per annum on account of each water closet on the premises, for which the supply of water for the flushing shall pass through and be recorded by such meter.

ANNUAL FEES FOR NON-RATEABLE PROPERTIES.

263. Annual fees in accordance with the scale prescribed hereunder shall be payable by owner for water and sewerage services to non-rateable properties:—

Water Services.

	Annual Fee per Boundary Service.
Commonwealth Properties and Properties not exempt from rating under section 72 of the Act.	A fee for each separately assessable property based on the annual valuation of property and current water rate, subject to a minimum fee of $6.00.
All Other Properties	$6.00.

Sewerage Services.

	Annual Fee.
Commonwealth Properties	A fee for each separately assessable property based on the annual valuation of property and current sewerage rate.
All Other Properties	$5.00 per water closet.

WATER SUPPLIED UNDER AGREEMENT.

264. (1) Water may be supplied by the Board under agreement to any company carrying on business on land having a frontage to Cockburn Sound for the purposes of the company delivering the water to a vessel if the vessel is lying at a wharf within Cockburn Sound and it is engaged in loading or unloading cargo for or on behalf of the company.

(2) Where the water is delivered to the vessel by or through the company's equipment and the work of delivering the water is carried out by the company's employees, the rate for the water so supplied to the company and delivered to the vessel shall be thirty cents per thousand gallons.

(3) The company shall file with the Board on forms supplied by the Board for the purpose, a return each month showing the amount of all water so delivered by it to vessels.

(4) The company shall—

(a) arrange for the accurate measurement of the quantity of water so delivered by it to any vessels;

(b) permit an officer authorised by the Board at all reasonable times to inspect all accounts in connection with the water delivered by the company to a vessel: and inspect the method adopted by the company for measuring the quantity of water so delivered by it.

WATER FOR BUILDING PURPOSES.

265. (1) Where water is required for building purposes, an application shall be lodged, in writing, on the prescribed form, and the charges shall be in accordance with the fees set forth in the schedule of prices of water in by-law 267.

(2) All fees and charges, except charges for water consumed in excess of quantity allowed in return for fee, shall be paid in advance. Charges for excess water referred to shall be payable in accordance with by-laws and regulations relating to the sale of water by measure.

(3) When applying for a building service the applicant shall produce the plans of the building to be erected for endorsement thereon of fee paid, and shall also, if called upon, produce the specifications and contract.

(4) Charges shall be based on the cost of the building, and where there is no contract, the value of the proposed building shall be fixed by the Board.

(5) No person shall use any water from an existing service for building purposes, including alterations and additions to existing buildings, without first making application for same, producing building plans and paying the necessary building fee.

(6) If any person shall use water in connection with any work in addition to that mentioned at the time of applying to the Board for a building supply, without first paying the necessary additional fees, the whole supply may be cut off at the consumer's expense without prejudice to the Board's right to proceed for breach of the by-laws.

WATER FOR COOLING PURPOSES.

266. (1) Any apparatus in which water is used for cooling purposes, including refrigerating equipment or machinery, or any apparatus or system used for the cooling of roofs, or for any form of air conditioning or temperature control, or in connection with any form of hydraulic ejector or hydraulic apparatus for power purposes, shall be deemed to be an apparatus within the meaning of this by-law.

(2) The use of water for any such apparatus shall be subject to the conditions set out in this by-law.

(3) From and after the commencement of this by-law, no apparatus shall be installed or used, and no apparatus previously installed shall be used in, on, or in connection with any property, land, or tenement unless the Board shall have first consented thereto in writing.

(4) Applications for consent to instal or use such apparatus shall state the make and type, the minimum and maximum requirements, and any other information the Board may require.

(5) If water used for or in the operation of any apparatus under full output exceeds one half gallon per minute, it shall be re-used, unless consent to run it to waste shall have been obtained in writing from the Board. If installation is such that the unit cuts in and out, the supply of water for cooling purposes must be automatically shut off when the unit cuts out.

(6) The quantity of water run to waste shall be limited to the quantity specified in the Board's consent. The water which shall so run to waste shall be recorded by a meter specially affixed for the purpose.

Should water in excess of the quantity so specified in the Board's consent be run to waste, every owner or occupier of the property, land, or tenement or other persons supplied by the Board who so permit or allow such excess water to be run to waste, shall be guilty of an offence against this by-law.

(7) The owner or occupier or other person supplied by the Board with water as aforesaid shall, at his own expense, make any alteration to the existing water service necessary in order that the subservice can be separately metered, and shall also pay the cost of removing the meter and disconnecting the subservice, if not further required, and during the continuance of the service shall keep or cause to be kept such apparatus, and all pipes in connection therewith, in a proper state of repair.

(8) In any case where the occupier or owner desires to draw the supply direct from the Board's main through an additional service, such additional service shall, at the discretion of the Board, be installed upon such occupier or owner depositing in advance the amount of the estimated cost of installation, in addition to the amount of the estimated cost of affixing a meter, and paying on completion of the work the actual costs thereof, whether they amount to

more or less than the estimates. He shall also pay meter rent and bear the expense of maintaining the service and of having it disconnected when no longer required.

(9) Any owner, occupier, or other person who is supplied with water by the Board aforesaid, who shall fail to comply with this by-law, or who shall otherwise commit a breach of its terms shall be deemed to be guilty of an offence hereunder, and shall be liable for each offence to a penalty not exceeding forty dollars and to a further penalty not exceeding eight dollars for each day the offence continues after notice thereof from the Board.

SCHEDULE OF PRICES OF WATER.

267. The scale of charges for water supplied within the Metropolitan Water, Sewerage, and Drainage Area shall be as set out in the following schedule, namely:—

SCHEDULE.

	Per 1,000 gals. $
(1) Allowance for rates or annual fees—the charge for water supplied in return for water rates or for annual water fees	0.21½
(2) Water taken in excess of quantity allowed for rates or annual fees and used for:—	
(a) Domestic purposes	0.27½
Provided that if the full year's rates or annual fees, and any arrears of rates and annual fees and interest from previous years, are paid on or prior to 30th November of the current rating year	0.25
(b) All other purposes not specified in these by-laws	0.22½
(3) Water supplied to the Fremantle Port Authority and delivered by that Authority to vessels at wharves	0.30
(4) Building services (metered or non-metered)—	
(a) Building, etc., brick, stone, concrete:	
If cost of building, etc.—	
$1,000 and under $2,000, one-fourth per cent. on cost of building, etc., with minimum of $2.00	
$2,000 and over, one-fourth per cent. on cost of building, etc., up to $2,000 plus one-tenth per cent. on cost over $2,000.	
(b) Buildings, etc., wood and/or iron and asbestos with brick chimneys, or lath and plaster linings—	
if cost of building $1,000 and over—£2.00.	

Note: The charges set out in item (4) shall apply to new buildings and to alterations and additions to existing buildings, also to wood and iron buildings without brick or plaster work if service is available before completion of construction of building.

It shall be at the discretion of the Board as to whether or not in any case a supply of water shall be classed as a supply for building purposes, and as to whether or not the supply shall be measured by meter.

Should the Board specially meter a service, water shall be allowed in return for a building fee at 21.5 cents per 1,000 gallons, and the applicant shall pay for all water consumed in excess of such allowance at the charge prescribed in item (2).

In cases where supply is drawn through an existing metered service, water shall be allowed in return for building fee paid at 21.5 cents per 1,000 gallons.

The cost of installing and maintaining service to boundary of premises, affixing meter and disconnecting service, shall, in addition to fee, be borne in each case by applicant or owner, provided that, if property is rateable and service is to remain as a means of permanent supply, the cost shall be defrayed by Board.

Item (4) shall be read in conjunction with by-law 265 of these by-laws.

PART VIII.—GENERAL.

DIVISION (1).—WATER AND SEWERAGE SERVICES.

SUPPLY TO RATED PROPERTIES.

268. Applications for water services to rated properties shall be made on printed form procurable at the Head or Branch Offices, and shall be lodged not less than seven days before the service is required.

WATER SERVICES TO NON-RATEABLE PROPERTIES.

269. Applications for water services to non-rateable properties shall be made on printed form procurable at the Head or Branch Offices, and the Board may provide a supply on payment of the prescribed annual fees, the cost of extending the water main to the land if the main is not already extended thereto and installing service to boundary of land, and, except in cases of private residences and non-rateable hospitals, meter rent, if service is metered. Applicant shall also bear cost of installing meter and maintaining service and of having it disconnected when no longer required.

It shall be at the discretion of the Board as to whether or not a meter shall be fixed in each case.

The annual fee shall take the place of a water rate and the general provisions of these by-laws as applying to rate-paying consumers shall apply to consumers under this by-law.

SEWERAGE SERVICES TO NON-RATEABLE PROPERTIES.

270. Applications for sewerage services to non-rateable properties shall be made on prescribed form procurable at the Head or Branch Offices and the Board may provide a service on payment of the prescribed annual fee, the cost of extending the sewer to the land if the sewer is not extended thereto and installing drain to boundary of land. Applicant shall also bear the cost of maintaining drain and of having it sealed when service is no longer required.

The annual fee shall take the place of a sewerage rate and the general provisions of these by-laws shall apply to such services.

SEPARATE SERVICES REQUIRED.

271. Except with the written permission of the Board not more than one house or tenement shall be supplied from a single water service. The Board may, in special cases, consent to two or more tenements being supplied from one water service, but in such cases the sub-services shall be so arranged that the supply to each house shall be independent of the supply to the remaining houses and controlled by a stop-cock on such sub-service.

SIZES OF SERVICE PIPES.

272. Where water is supplied to any land the service pipe shall not exceed $\frac{3}{4}$ in. in diameter, unless the Board is of the opinion that a service pipe of the diameter of $\frac{3}{4}$ in. is not sufficient to maintain a reasonable supply of water when the Board, in its absolute discretion, may supply a service pipe of a diameter exceeding $\frac{3}{4}$ in.

BOARD MAY IMPOSE RESTRICTIONS.

273. (1) The Board may, from time to time as it considers necessary, by notices published at least once in a daily newspaper circulating in the Metropolitan Water, Sewerage and Drainage Area—

(a) prohibit, regulate, or impose restrictions on, the use or consumption of water by any person or class of person, within the whole or any portion of the area, for any purpose generally or for such purpose or purposes as are specified in the order, or for any period or periods;

(b) exempt either wholly or partially any portion of the area, any person or class of person. or any place or institution or class of place or class of institution from the operation of the whole or part of the order.

(2) An order so made and published may be cancelled or varied by a subsequent order made by the Board and published in a daily newspaper circulating in the area.

(3) A person using or consuming water in contravention of an order made and published under this by-law is deemed to commit a breach of this by-law.

(4) For the purposes of this by-law a person who allows water to flow or leak from any pipe or other fittings used for or in connection with the supply of water to or in any premises shall be regarded as a person using water.

DIVISION (2).—METERS.

FIXING OF METERS.

274. (1) The Board may fix a meter on any service, and shall determine the size and class of meter in each case.

(2) Meters will be supplied by the Board and placed above or below the normal surface of the ground at the discretion of the Board.

REPAIRS AND MAINTENANCE OF METERS

275. (1) Any person supplied with water through a meter belonging to the Board shall pay the cost of making good any damage to such meter whilst on his land.

(2) Repairs required shall be done by the Officers of the Board, and the expense incurred by the Board in so doing shall, on demand, be paid by the owner or occupier of the land, and if not paid on demand shall be recoverable in the same manner as water rates.

NOTICE OF DAMAGE OR NON-REGISTRATION SHALL BE GIVEN.

276. Any person supplied by the Board with water through a meter shall, on finding meter damaged, or not registering, immediately give notice of the damage or non-registration to the Local Water Supply Office.

INTERFERENCE WITH METERS.

277. No person shall break or in any way interfere with the seal fixed on the meter through which water is supplied by the Board, or turn or attempt to turn any screw, bolt, or nut on or attached to such meter, or use any tool or appliance on any such meter, or introduce or attempt to introduce any body or substance into such meter, or in any way interfere with any portion of such meter, or any pipes or fittings attached thereto.

PERIOD FOR READING.

278. The quantity registered by a meter at any time between ten days before and ten days after any stated date may be taken as the reading of the meter at such date.

AVERAGING CONSUMPTIONS.

279. During the time any meter is undergoing repair or should it cease to properly register the consumption of water, the Board or any officer appointed by the Board may, at its option, estimate the quantity of water consumed, by taking an average of the quantity used during any previous period, or by adopting any other basis of adjustment, as the Board may determine, and the quantity so ascertained shall be paid for by the consumer.

TESTING METERS.

280. If any consumer shall at any time be dissatisfied with any particular reading of a meter, and be desirous of having the meter tested, he shall give written notice thereof to the Board or its officer within twenty-one days from date of receipt of notice of such reading, and thereupon the said meter shall be tested by passing through it a predetermined quantity of water, and if upon such testing it shall appear to the satisfaction of the Board or its officer that the meter registered five per cent. or more in excess of, or below, the quantity that shall actually pass through it at such testing, then the Board shall bear the expense of and incidental to such testing and shall also adjust the charge to the said consumer; but if the meter upon such testing shall not register five per cent. or more in excess of, or below, the quantity that shall actually pass through it, then the consumer shall pay to the Board all the expenses of and incidental to such testing: Provided that the expense of every test shall be fixed by the Board; provided also, that the consumer shall not, unless the Board decides otherwise, be at liberty to avail himself of the right to test the registration of the meter for any period other than the period of registration next preceding the date of reading in respect of which he shall have given notice as aforesaid.

DIVISION (3)—OFFENCES AND PENALTIES.

MISUSE OF WATER.

281. Any person entitled to a supply of water for domestic purposes only or entitled only to a supply of water for any other specified purpose, shall not use such water for any other purpose except that specified.

WATER NOT TO BE USED ON OTHER PREMISES.

282. No person shall, without the written permission of the Board, use water supplied by the Board except on the premises in respect of which application was made for the service from which the water was drawn, or carry away any such water from such premises, or allow any other person to carry any such water away therefrom.

ILLEGAL TAKING OR SELLING OF WATER.

283. No person whether entitled to receive water from the Board or not shall, without the written permission of the Board, take, carry away, or allow to be taken or carried away, such water from his premises, or sell the same to any other person.

WASTE OF WATER.

284. No person supplied with water by the Board, whether by meter or otherwise, shall allow the same to run to waste.

WATER FOR STREET WATERING.

285. It shall not be lawful for any person or corporation to use any water whatsoever for street watering purposes, unless with the written approval of the Board first obtained.

GRATUITIES PROHIBITED.

286. Officers, workmen, or agents of the Board shall not solicit or receive any fee or gratuity whatever.

JUNCTION OR INTERFERENCE WITH PIPES, SEWERS, OR FITTINGS.

287. No person shall make any connection or interfere with any pipe, sewer, or fitting of the Board or with any water pipes, sewer, or drain communicating therewith, at any other place than shall be approved by the Board, and the main shall only be tapped by the workmen of the Board.

OBSTRUCTION OF PIPES, SEWERS, DRAINS, OR FITTINGS.

288. (1) Any person who, without the written consent of the Board, erects or maintains any building or structure or causes any building or structure to be erected or maintained, or places or keeps any material or thing or causes any material or thing to be placed or kept over any pipe, sewer, drain or fitting which is the property of the Board, and thereby—

(a) trespasses on or causes injuries to such pipe, sewer, drain, or fitting; or

(b) prevents or in any way impedes or obstructs the inspection, maintenance, cleansing, repair, management or use, of such pipe, sewer, drain, or fitting,

shall be guilty of an offence and be punishable on summary conviction by a penalty not exceeding eighty dollars, and in the case of a continuing breach of this by-law the offender shall be liable to a further penalty not exceeding ten dollars for each day the offence continues after notice thereof has been given by or on behalf of the Board to the offender.

(2) The Board may cause any building, structure, material, or thing erected, placed, maintained, or kept over any such pipe, sewer, drain, or fitting in contravention of this by-law to be altered, pulled down, removed, or otherwise dealt with as it thinks fit.

(3) Any person committing any breach of this by-law shall, in addition to any penalty imposed on him, pay any expense incurred by the Board in consequence of such breach.

(4) This by-law shall extend and apply to buildings, structures, materials, or things maintained or kept as aforesaid, whether they were erected or placed over the pipe, sewer, drain, or fitting before or after the passing of this by-law.

PENALTIES

289. Any person committing a breach of any of the provisions of these by-laws, to which no specific penalty is attached, shall be liable on summary conviction to a penalty not exceeding eighty dollars and in addition may be ordered to pay any expense incurred by the Board in consequence of such breach.

In the case of a continuing breach the offender shall be liable in addition to the fine and payment of expenses to a daily penalty not exceeding ten dollars for each day the breach continues after notice thereof has been given by or on behalf of the Board to the offender.

DIVISION (4)—MISCELLANEOUS.

NOTICE OF INTENTION TO BUILD.

290. The owner or occupier of any land supplied with water who shall erect, or make, or cause to be erected or made any building or addition to an existing building on such land, shall, before the commencement of same, give notice in writing thereof to the Board.

LOCKING OF TAPS, ETC.

291. The occupier of any premises to which the water has been laid on, or in the event of there being no occupier, the owner shall cause proper means to be taken, by locks or otherwise, subject to the approval of the Board, to prevent the use of the water from the main by persons not connected with the said premises.

TURNING OFF WHEN REPAIRING AND TAPPING.

292. The Board may from time to time, and without giving prior notice to the consumer or consumers affected, when necessary for the purpose of tapping or repairing the main, or otherwise, cut off the supply of water from any part or parts of the Area.

REWARD—REPORTING LEAKAGE.

293. The Board may in its discretion reward any person (not being the person in fault) who shall communicate timely information to the Board of any leakages or waste of water, whether the same be accidentally, negligently, or wilfully occasioned or suffered, or who shall give such information as shall lead to the conviction of any person or persons who shall steal or cause to be stolen or improperly appropriated the water of the Board.

AUTHORITY TO ENTER PREMISES.

294. Any officer acting under the Board's authority may at all reasonable times enter any house or premises connected, or intended to be connected with the water mains or sewers, in order to examine whether the water pipes, drains, and other fittings in such house or premises are in proper order, and any person refusing such admission or in any way hindering such officer in the execution of his duty shall be guilty of an offence and liable to a penalty as prescribed in by-law 289.

STANDARD DRAWINGS FOR FIXTURES AND FITTINGS.

295. (1) Approved standard drawings of fixtures and fittings will be exhibited at the Board's office.

(2) Due consideration shall be given by the Board to the claims of any other fittings which may be presented for approval, and, if considered satisfactory, the same may be placed among and become one of the approved standard fittings.

(3) The Board may, from time to time, amend, alter, or cancel any or all of the standard fittings or type drawings, and replace them by such other approved fittings or drawings.

SCHEDULE "A".

1. **Special Conditions applying to—**

(a) Single Pipe Unvented Plumbing for flat or similar type buildings up to 5 storeys in height.

(b) Single Pipe Partially Vented Plumbing for flat or similar type buildings from 6 to 11 storeys in height.

In the case of (b) the partial venting required is as follows.

Commencing at the second top floor one water closet on each alternate floor shall be back vented using a 2 in. diameter individual vent, 2 in. diameter horizontal branch vent pipe and 2 in. main vent stack. The vent stack shall inter-connect with the stack below the lowest fixture connected to the stack.

2. **Special Conditions applying to (a) and (b) above as follows:—**

(a) Not more than 2 W.C.'s, 2 kitchen Sinks, 2 Basins and 2 groups of 2 fixtures of the following 3 groups,

2 Baths.

2 Showers.

2 Single Wash Troughs,

shall discharge into the one stack at each floor level.

(b) Each W.C., each Bath, each Basin, each Sink, each Shower and each Single Wash Trough to be connected to an individual horizontal branch waste line which is of limited length and size according to the following table.

Horizontal Branch Pipe	Size	Maximum Length without Venting
W.C. with P or S Trap	4 in.	5 ft. 0 in.
Kitchen Sink	2 in.	7 ft. 6 in.
Bath Waste	1½ in.	7 ft. 6 in.
Shower Waste	2 in.	7 ft. 6 in.
Basin Waste with P Trap	1¼ in.	5 ft. 6 in.
Basin Waste with S Trap	1¼ in.	5 ft. 6 in.
Single Wash Trough	See Detail 1½ in.	7 ft. 6 in.

Lengths to be measured from near face of stack to outlet side of water seal.

(c) The combined waste and soil stack or separate waste and soil stacks, shall be 4 in. in diameter and must be straight up to the highest horizontal branch connection.

(d) Unvented Waste branches serving any fixtures shall be laid at the following grades.

Waste Pipe Lengths up to 2 Feet maximum grade 1 in 12.

Waste Pipe Lengths from 2 Feet to 3 Feet 6 inches maximum grade 1 in 24.

Waste Pipe Lengths 3 Feet 6 inches to 7 Feet 6 inches maximum grade 1 in 48.

The minimum grade shall be 1 in 48.

(e) The maximum grade at which unvented W.C. branches shall be laid is 1 in 12 and minimum grade 1 in 48.

(f) More than 1 branch connection into the stack at 1 level is not permitted unless a double Y junction is used (the included angle of which is approximately 90°) in which case 2 branches only may connect at the one level.

Single branch connections shall be made with fittings having the invert curved to not less than a 2 in. radius for W.C. branches and not more than a 1 in. radius for waste branches. Special approval may be granted to fittings made to other curves provided that in no case may a single Y junction be used.

(g) All Waste Traps shall be furnished with a 3 in. water seal, however W.C. pans with the normal 2 in. seal are satisfactory.

(h) For buildings 4 to 11 storeys in height all ground floor fixtures shall be separately connected to the house drain at a minimum distance of 8 feet from the vertical stack. For buildings up to 3 storeys in

height fixtures may be connected directly to the stack provided the 3 feet height shown on the drawing is available. For all buildings a charged disconnector trap shall be provided at ground floor level separately connected to the house drain.

(i) Soil and Waste branches which are longer than the specified maximum length shall be vented using 2 in. diameter vent stack extended to open air.

(j) "S" traps shall not be used for unvented or partially vented systems but provided that the arrangement shown on the drawing is adopted "S" traps may be used for unvented basin wastes.

(k) A floor waste shall be provided on each floor, connected to an independent vertical vented waste stack and drained to an external position.

(l) Connections to the stack must be connected as shown in standard details on the drawings attached.

(m) The minimum size of a subsidiary waste stack erected in conjunction with Unvented and Partially Vented systems is 3 in. diameter and this stack is limited load of 40 fixture units. The distances for unvented waste fixtures applicable to 4 in. stacks shall apply to 3 in. stacks. Up to 5 floors no relief vent is required but from 6 to 11 storeys in height a 2 in. relief vent is required to which one fixture on each alternate floor is vented commencing at the second topmost floor. The 3 in. stack may be connected directly to the drainage system providing one disconnector trap taking ground floor fixtures as provided.

(n) For Unvented and Partially Vented Systems only one fixture per flat or home unit which is over the maximum distance to which unvented conditions apply, will be permitted.

(o) For these combined waste and soil installations an interceptor trap is required as per by-law 102.

3. **House Drains for Unvented and Partially Vented Systems shall be sized from the following table:—**

SIZES OF HOUSE DRAINS FOR UNVENTED AND PARTIALLY VENTED SYSTEMS.

SCHEDULE A

Allowable Fixture Units

1	2	3	4	5	6
Pipe diameter	Grade 1 in				
	20	40	60	90	More than 90
inches					
4	120	100	90		
5	314	262	236		
6	550	490	420		
7	865	680	630	550	550
8	1,230	1,050	950	840	760
9	1,740	1,470	1,280	1,150	1,050
10	2,260	1,940	1,720	1,520	1,310
12	4,600	3,920	3,450	3,060	2,660
15	8,340	7,000	6,230	5,600	4,670

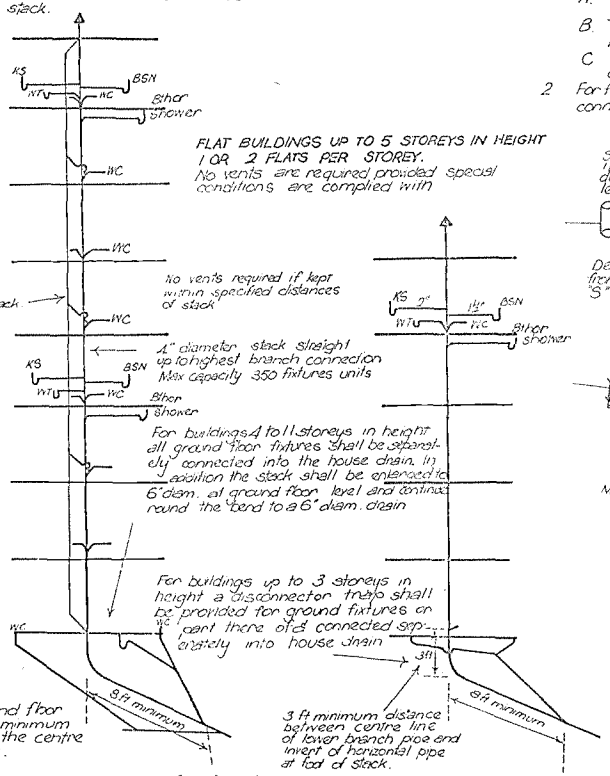
N.B.—As indicated on the drawing where the stack is enlarged to 6 in. diameter at its base the house drain will be automatically enlarged to 6 in. diameter, i.e., for buildings 4 to 11 storeys in height.

SCHEDULE A

STACK CONNECTIONS FOR UNVENTED AND PARTIALLY VENTED PLUMBING

FLAT BUILDINGS 6 TO 11 STOREYS IN HEIGHT 1 OR 2 FLATS PER STOREY

Venting Required. Commencing at the second top floor one water-closet on each alternate floor shall be vented using a 2" diameter fixture vent 2" diameter horizontal branch vent and 2" diameter vent stack. This vent stack shall interconnect at the base of the stack and below the lowest fixtures connected to this stack.

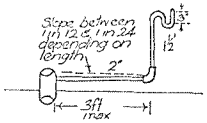


FLAT BUILDINGS UP TO 5 STOREYS IN HEIGHT 1 OR 2 FLATS PER STOREY.

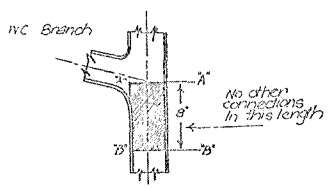
No vents are required provided special conditions are complied with

CONDITIONS APPLYING TO WC's ON THE GROUND FLOOR.

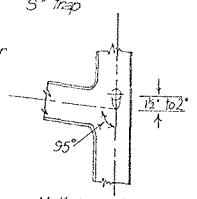
1. For flats up to 5 storeys in height a WC on the ground floor separately connected into the house drain need not be vented provided that
   - A. the WC apartment floor is not more than 6 ft above the finished ground level.
   - B. the branch drain serving the WC is not connected to the main house drain within 8 ft from the centre line of the vertical stack.
   - C. The maximum length of the branch drain does not exceed 20ft. A disconnector trap branch drain can be included in this length.
2. For flat buildings 6-11 storeys in height. W.C.s on the ground floor separately connected into the house drain shall be vented to the 2" vertical vent stack.

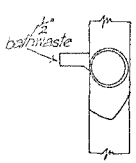


Design of 1½"-2" diameter waste from wash basin with 3" seal S" trap

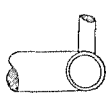


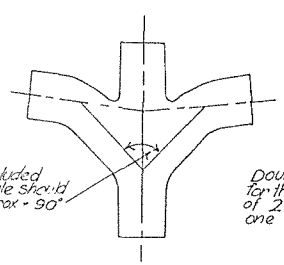
Position for connection of branches to stack





Multi-branch junction for bath and WC branches





Double 'Y' junction for the connection of 2 W.C's at the one level

SCHEDULE "B".

Method of Computing the Sizes of Soil Wastes, Combined Waste and Vent Pipes in accordance with by-laws 164, 165 and 166, and arrangements for Stacks and Vent Stacks.

1. **Sizing Sanitary Plumbing:**

1.1 **General—**

The sizing of waste and/or soil pipes and vents is required for 3 types of plumbing systems—

(a) Fully vented system (see Diagram 1).

(b) Modified Vented System (see Diagram 2).

(c) Unvented and Partially Vented Systems as applicable to flat buildings up to 11 storeys in height (see Schedule A).

In general by-laws Nos. 164, 165 and 166 will apply to Fully Vented and Modified Vented Systems but will not apply to Unvented and Partially Vented Systems where special conditions are laid down (see Schedule A).

Modified Venting requirements are indicated under by-law 166, Section 3.1 and for this system Table 2, Column 3 should be used for sizing vertical stacks.

1.2 **Sizing Procedure and Arrangement for Stacks and Vent Stacks.**

The sizes of soil or waste pipes serving individual fixtures or fittings are fixed by the nominal outlet diameter of the fixture or fitting concerned. (Table 1, Column 1.)

The size of any other soil or waste pipe or combined soil and waste pipe or vent pipe shall be determined by the following procedure:—

(a) **Determine the loading into each stack and branch on the basis of the number of each type of fixture and the fixture unit allowance in Table 1.**

(b) **Determine the diameter of the horizontal waste and/or soil pipes from the maximum allowable number of fixture units in Table 2, Column 2.**

(c) **Determine the diameter of the vertical waste and/or soil pipes from the maximum allowable number of fixture units in Table 2, Column 3 or 4.**

The loading on a stack is affected by not only the number of units carried but also by the spacing of the branch entries. Thus a 3 storey stack taking the maximum allowable load in Column 3 would be more heavily laden than a 20 storey stack taking the same maximum. Also a stack which has to accommodate the maximum allowable load through one branch connection is more heavily laden than a similar stack which has the same total admitted through a number of branch connections on different floor levels. Therefore NOTES E, F, G and H which accompany Table 2 have to be taken into account when sizing the stack on the basis of Column 3 and 4 to ensure that overloading does not occur with buildings which are not very high and in which great numbers of fixtures are installed.

An individual stack which is offset as shown in Diagram 3 should be sized first as if straight and then the offset sized as a house drain (Table 3) the larger size to be adopted throughout for both stack and offset.

Multiple stacks, i.e., stacks which are joined by offsets above the house drains as shown in Diagram 3 shall be sized in the following manner.

Type A:

The main stack which extends from the house drains to the roof shall be sized in the normal manner, regarding the flow from the offset as a horizontal branch. The branch stack (above the offset) and offset shall be sized as an individual offset stack.

Type B:

The vertical pipe which extends from the house drain to the highest offset shall be sized as a normal stack considering the flow from each of the offsets as from a horizontal branch. The branch stacks shall be sized as individual offset stacks. The main vertical pipe shall not be less than the largest offset leading into it.

(d) **Determine the diameter of the vertical main vent pipes and any secondary vent pipes from Table 4.**

That is having determined the stack diameter, the total fixture unit load in that stack in the manner already prescribed and the total length of the main or secondary vent from the plans of the building, the required main or secondary vent diameter may be obtained from Table 4. The stack vent (i.e., extension of the stack as a vent) shall be the same diameter as the stack.

(e) **Determine the diameter of horizontal branch vent pipes from Table 5.**

(f) **Determine the diameter of the individual fixture back vents from Table 6.**

2. **Sizing House Drains:** The size of house drains for buildings of the type stated shall be determined by the following procedure:—

(a) **Determine the total load into the house drains on the basis of the number of each type of fixture and the fixture unit allowance per fixture in Table 1.**

(b) **Determine the diameter of house drains from the maximum allowable number of fixture units in Table 3.**

The diameter so determined will differ for lines laid at different grades but where grades are not dictated by necessity they should not be flatter than a grade of 1 in 40 for 4 in. pipes, 1 in 60 for 6 in. pipes, 1 in 90 for 9 in. pipes, 1 in 120 for 12 in. pipes and 1 in 150 for 15 inch diameter pipes. Flatter grades than these shall be the subject of special approval and when that situation arises the loads should not exceed the allowance shown in column 6 of Table 3.

(c) **Determine the diameter of branch house drains in the same manner as for (b) above using the loading for that branch determined from Table 1 and the pipe sizes from Table 3.**

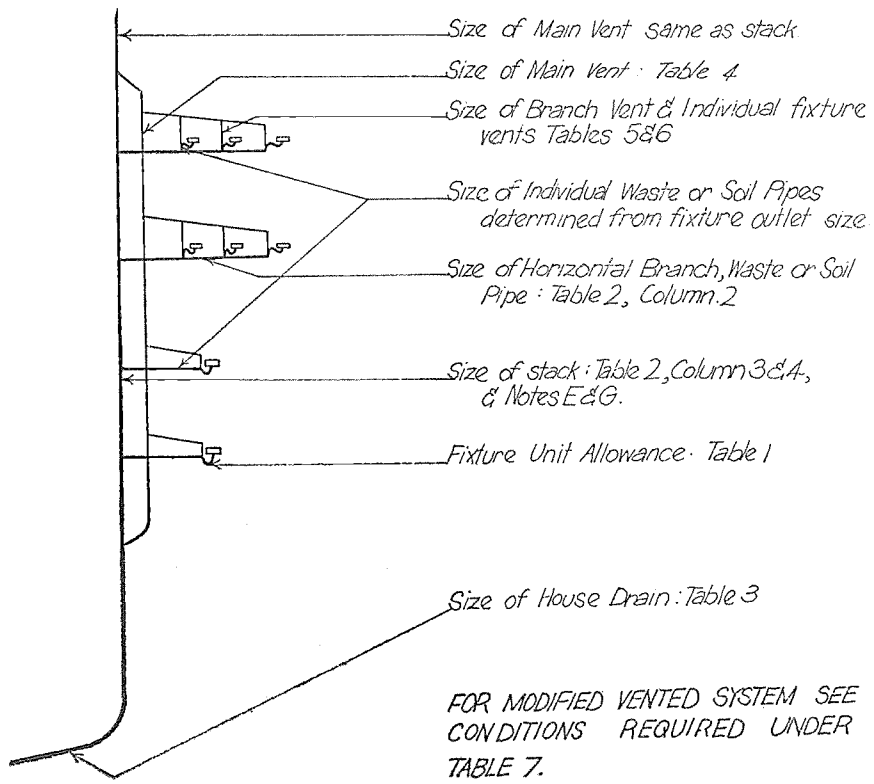
SCHEDULE B

SIZE OF SEWERAGE SERVICE PIPES.

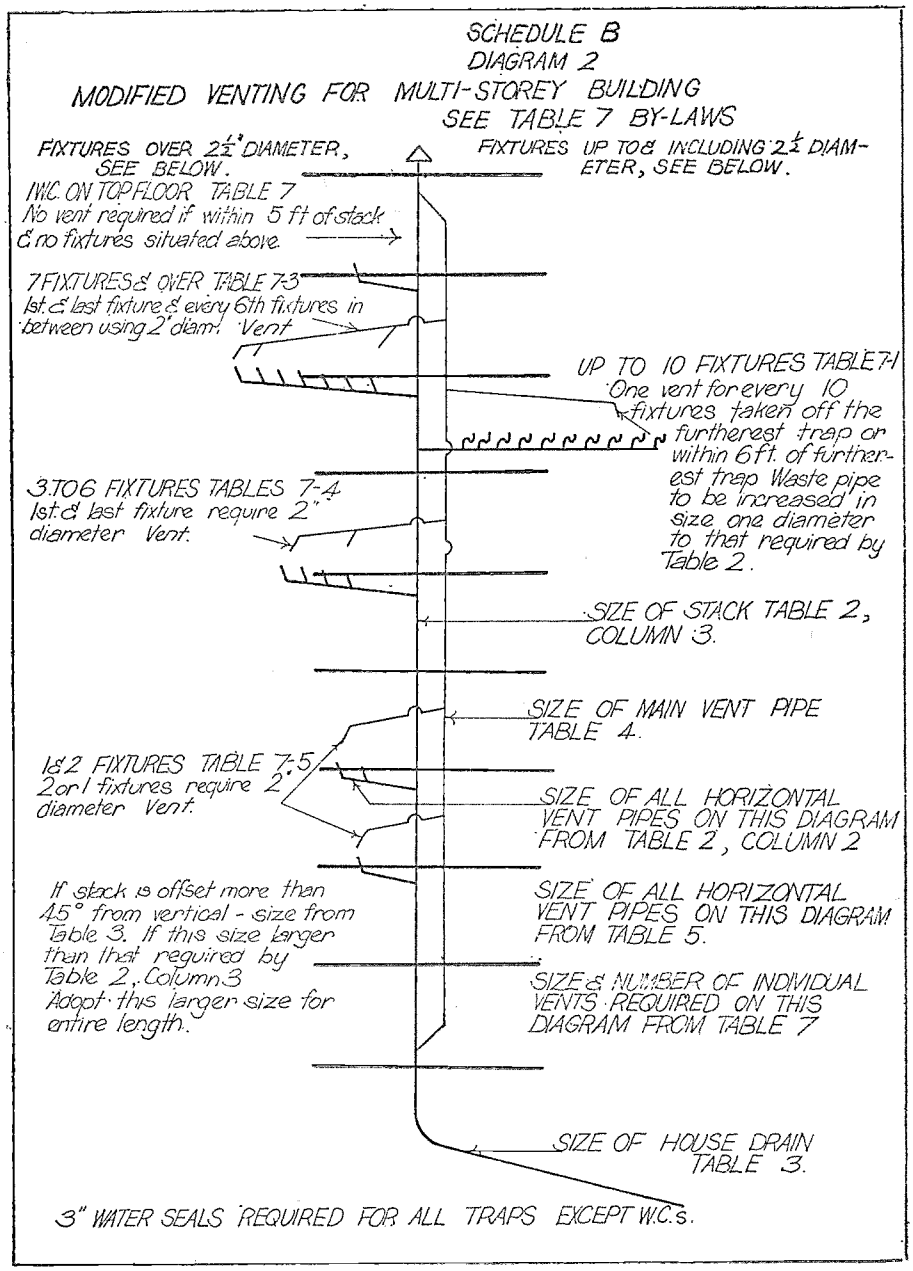
DIAGRAM 1

FULLY VENTED SYSTEM.(FOR MODIFIED VENTED SYSTEM SEE NOTE BELOW AND DIAGRAM 2.).

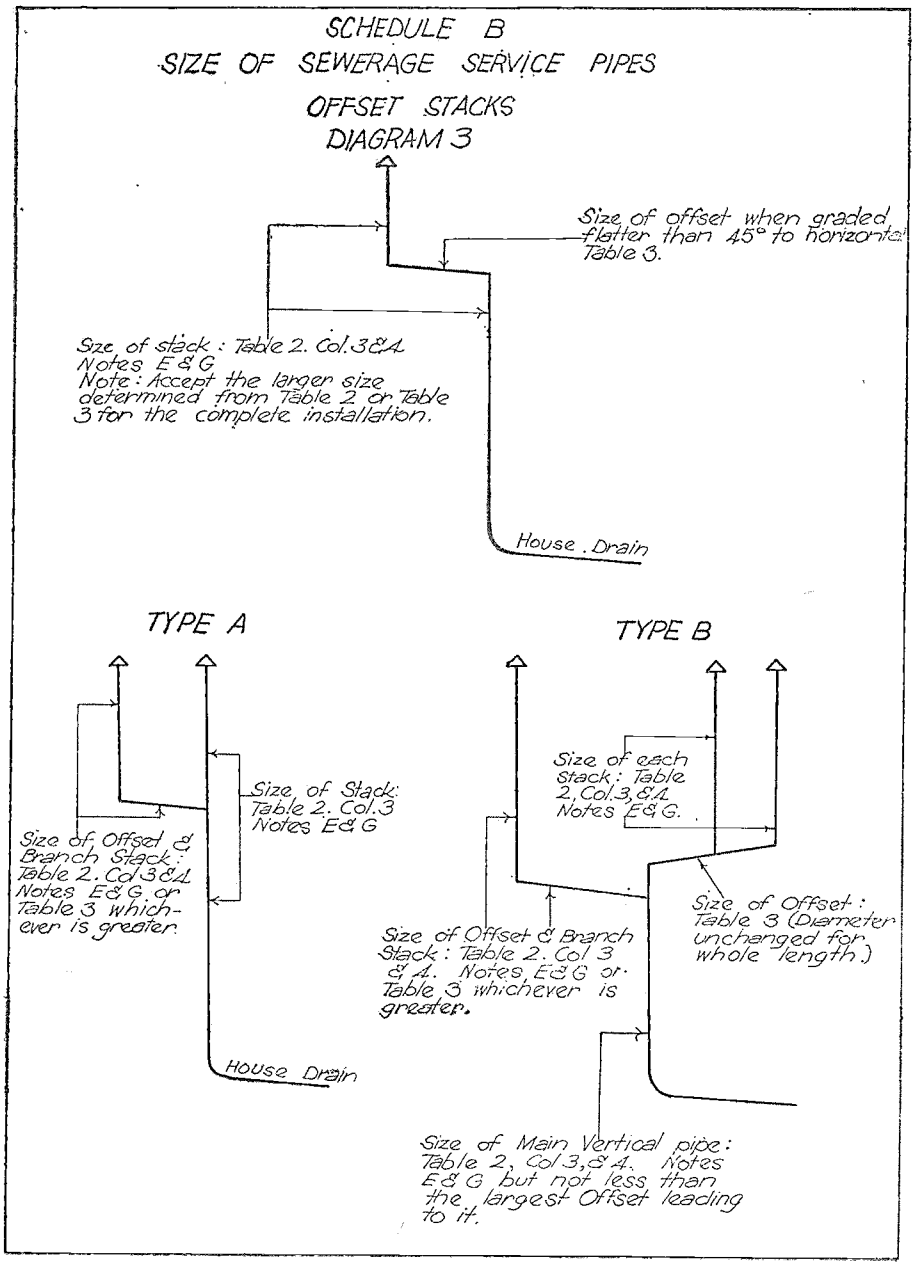
STRAIGHT STACKS (OR STACKS WITH OFFSETS STEEPER THAN 45° TO HORIZONTAL.).



FOR MODIFIED VENTED SYSTEM SEE CONDITIONS REQUIRED UNDER TABLE 7.


SCHEDULE B
DIAGRAM 2
MODIFIED VENTING FOR MULTI-STOREY BUILDING
SEE TABLE 7 BY-LAWS
FIXTURES OVER 2½" DIAMETER, SEE BELOW.
FIXTURES UP TO & INCLUDING 2½ DIAMETER, SEE BELOW.
1 W.C. ON TOP FLOOR TABLE 7 No vent required if within 5 ft of stack & no fixtures situated above.
7 FIXTURES & OVER TABLE 7-3 1st & last fixture & every 6th fixtures in between using 2" diam. Vent
UP TO 10 FIXTURES TABLE 7-1 One vent for every 10 fixtures taken off the furtherest trap or within 6 ft. of furtherest trap. Waste pipe to be increased in size one diameter to that required by Table 2.
3 TO 6 FIXTURES TABLES 7-4 1st & last fixture require 2" diameter Vent.
SIZE OF STACK TABLE 2, COLUMN 3.
SIZE OF MAIN VENT PIPE TABLE 4.
1 & 2 FIXTURES TABLE 7-5 2 or 1 fixtures require 2" diameter Vent.
SIZE OF ALL HORIZONTAL VENT PIPES ON THIS DIAGRAM FROM TABLE 2, COLUMN 2
If stack is offset more than 45° from vertical - size from Table 3. If this size larger than that required by Table 2, Column 3 Adopt this larger size for entire length.
SIZE OF ALL HORIZONTAL VENT PIPES ON THIS DIAGRAM FROM TABLE 5.
SIZE & NUMBER OF INDIVIDUAL VENTS REQUIRED ON THIS DIAGRAM FROM TABLE 7
SIZE OF HOUSE DRAIN TABLE 3.
3" WATER SEALS REQUIRED FOR ALL TRAPS EXCEPT W.C.s.

SCHEDULE B
SIZE OF SEWERAGE SERVICE PIPES
OFFSET STACKS
DIAGRAM 3

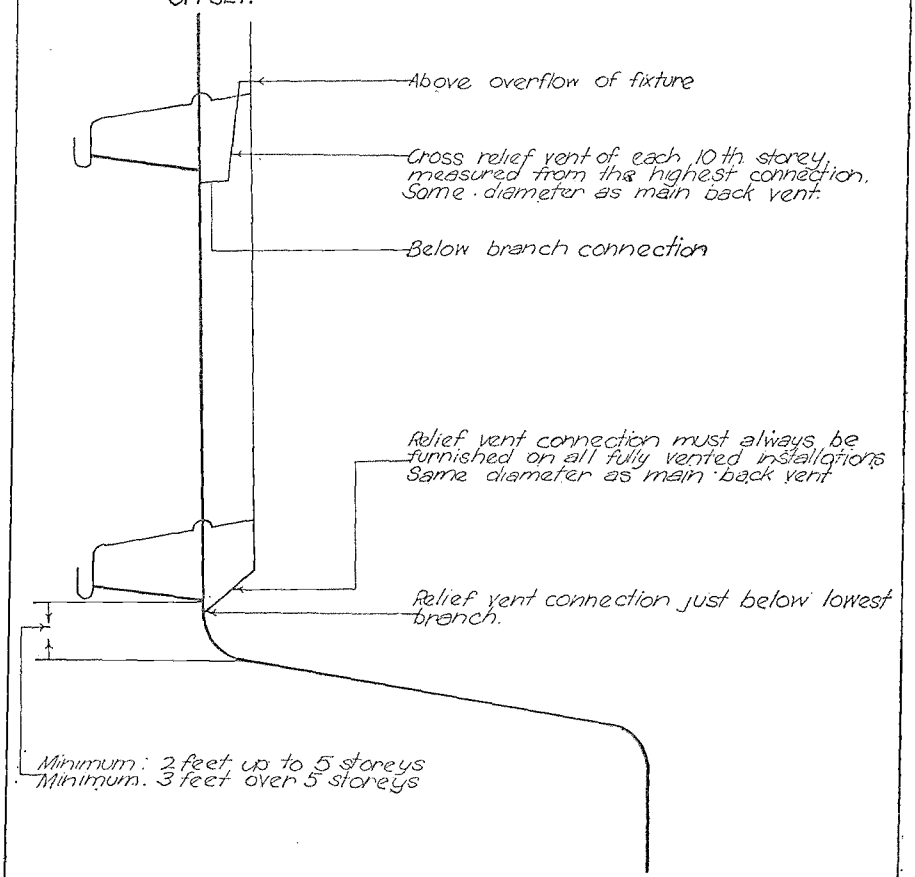


SCHEDULE B

ARRANGEMENT AT STACK OFFSETS

DIAGRAM A.

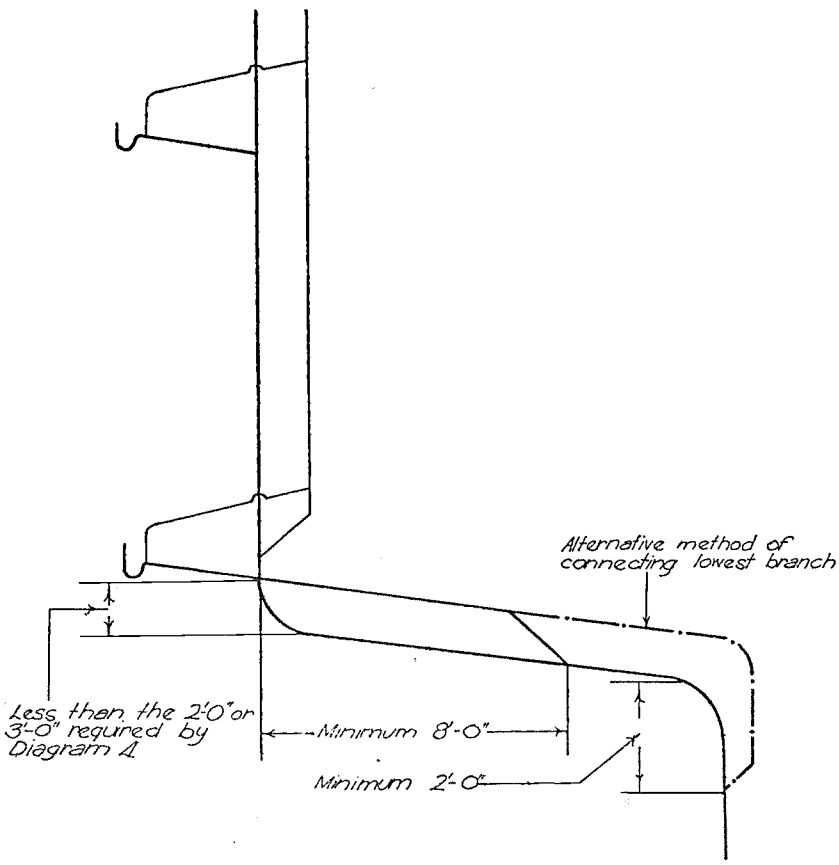
LOWEST BRANCH CONNECTION MORE THAN SPECIFIED MINIMUM HEIGHT ABOVE THE OFFSET.



With a building up to 5 storeys, the minimum distance between the invert of the lowest branch fitting & the offset shall be 2 feet; over 5 storeys the minimum distance shall be 3 feet. In the case of tall buildings a cross relief vent shall be fitted at each 10th storey measured from the highest connection.

SCHEDULE B
ARRANGEMENT AT STACK OFFSETS
DIAGRAM 5

LOWEST BRANCH CONNECTION LESS THAN SPECIFIED MINIMUM LENGTH ABOVE THE OFFSET.

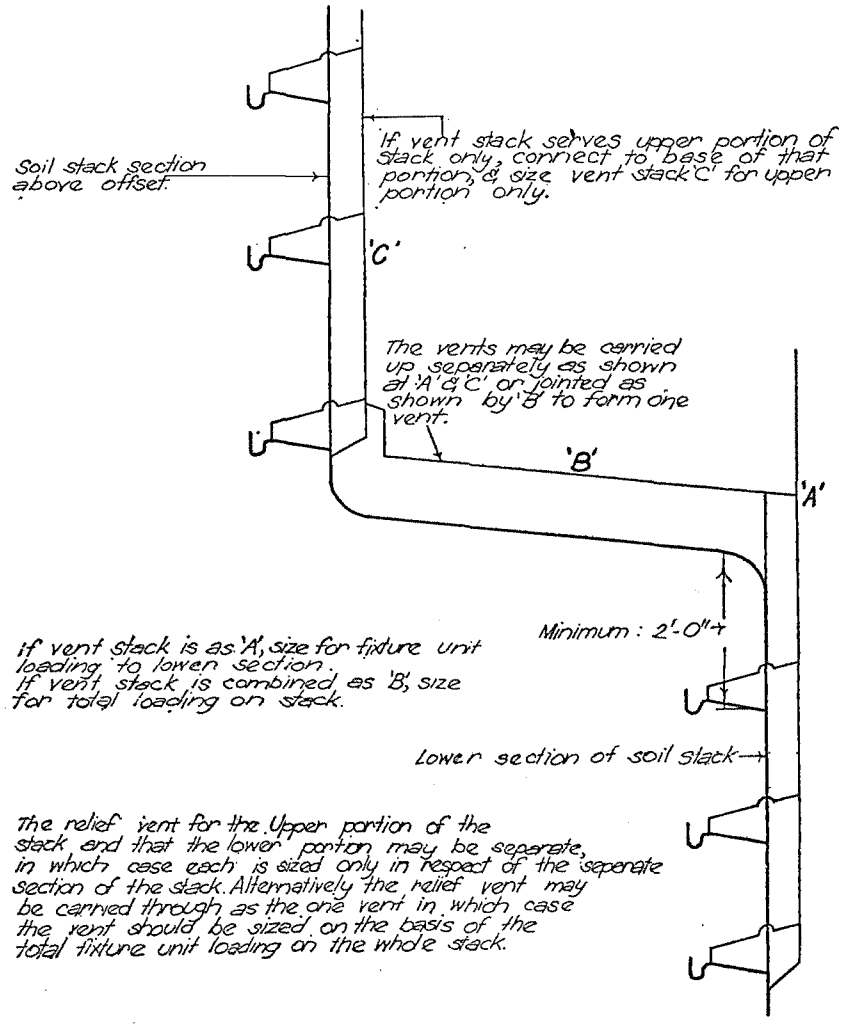


Where the minimum distance of 2 feet (or 3 feet as the case maybe) between the invert of the branch & the offset cannot be obtained the fixture branch of this level shall be extended for a minimum of 8 feet along the horizontal or alternatively down the lower vertical stack for a minimum distance of 2 feet.

SCHEDULE B

VENTING ARRANGEMENTS FOR STACK OFFSETS

DIAGRAM 6.



SCHEDULE "C."

Copper Tube for Use in Private Water and Sewerage Services.

A. **Water Services:**

Copper tube complying with AS B158-1969 will be permitted in private water services under the following conditions:—

(i) From the Board's meter, to and including the foot of the outlet riser: Types 1 and 2 tube in accordance with Tables 1 and 2.

(ii) Beyond the foot of the outlet riser to the service outlets: Types 1, 2, 3, 4 and 5 tube, in accordance with Tables 1, 2, 3, 4 and 5. Types 4 and 5 tube are to be used in accessible positions only.

(iii) Changes of direction: Types 1, 2, 3 and 4 tube may be bent or set as required without the use of fittings.

Type 5 tube shall be used only in straight lengths except that slight bends or sets of large radius may be permitted in situations where approved fittings cannot be used, provided that the tube is not deformed or otherwise adversely affected.

Branch connections with all types tubes included in this standard may be formed in the tube itself using approved methods or by the use of approved fittings.

At points where fittings such as screwed bib or stop taps are to be installed, provision shall be made to secure the pipe so as to avoid deformation or other damage when the fittings are connected to services.

(iv) Condition: Types 1, 2, 3 and 4 tube may be used either in the "as drawn" or annealed condition, but Types 1, 2 and 3 are normally supplied "as drawn" and Type 4 is normally supplied annealed.

Type 5 shall be used only in the "as drawn" condition, except that local annealing shall be permitted where necessary in joining the pipe.

(v) **Jointing**:

"As drawn" Type 1 tubes shall be jointed by either:—

(a) Approved screw threaded fittings, using either tinning and sweating or bronze welding.
(b) Slipping and brazing.
(c) Flaring and bronze welding.
(d) Other approved methods.

"As drawn" Types 2, 3, 4 and 5 tubes shall be jointed by either:—

(a) Slipping and brazing.
(b) Flaring and bronze welding.
(c) Approved compression joints.
(d) Approved capillary fittings using soft solder.
(e) Approved capillary fittings using hard solder.
(f) Other approved methods.

Annealed Types 1, 2, 3 and 4 tubes shall be jointed by either:—

(a) Slipping and brazing.
(b) Flaring and bronze welding.
(c) Approved compression joints.
(d) Approved capillary fittings using hard solder only. Soft solder capillary joints shall **not** be used with annealed tube.
(e) Other approved methods.

(vi) **Fittings**: All fittings manufactured from drawn copper tube shall be tested and stamped by the Board. Such fittings shall be manufactured so as to be not lighter at any point than the minimum thickness specified in Column 7 of Table 2 for Type 2 tube.

(vii) **Standpipes**: All standpipes made from copper tube or connected to copper tube water services shall be securely supported by fixing to suitable hardwood posts, walls of buildings or other rigid structures. Timber fences shall not be used for this purpose.

B. **Sewerage Services:**

Copper tube complying with AS B158-1969 will be permitted in the soil waste and vent pipes of the sanitary plumbing installations of sewerage services and the vent pipes of the house drainage installations of sewerage services under the following conditions:—

(i) **Pipes conveying soil and waste discharges**: For all soil and waste discharges other than urinal soil pipes, Types 1, 2, 3, 4 or 5 copper tube may be used. Types 4 and 5 are to be used in accessible positions only.

(ii) **Vent Pipes**: Type 1, 2, 3, 4 or 5 tube may be used for the internal and external vent pipes of sanitary plumbing and of house drains. (Where special approval has been obtained, non-standard solid drawn copper tube having a minimum thickness of 20 gauge may be used for internal and external soil or waste pipe vents or fixture vents or for house drain vents, provided that such vent pipes do not convey soil or waste discharges (i.e., "dry" vents).

(iii) **Bends at Foot of Stacks**: Copper tube fittings shall **not** be used at the foot of stacks of more than 3 storeys unless specially approved for a particular installation. Cast or hot pressed metal fittings shall otherwise be provided in these situations.

(iv) **Changes of direction**: All type tubes shall be used only in straight lengths; approved fittings shall be used to achieve bends except that the Board's inspector may permit tube to be slightly bent or set to large radius in situations where the use of fittings is not possible or is impracticable, provided that the tube is not deformed or otherwise adversely affected.

Branch connections for all type tubes may be formed in the tube itself using approved methods or by the use of approved fittings.

At points where fittings incorporating screwed connections are to be installed, provision shall be made to secure the pipe so as to avoid deformation or other damage when the installations are being made.

(v) **Condition**: All type tubes shall be used only in the "as drawn" condition; annealed tube shall not be used in any soil, waste or vent pipe, except that local annealing shall be permitted where necessary in joining the pipe.

(vi) **Jointing**:

Type 1 tubes shall be jointed by either:—

(a) Approved screw threaded fittings, using either tinning and sweating or bronze welding.
(b) Slipping and brazing.
(c) Flaring and bronze welding.
(d) Other approved methods.

Types 2, 3, 4 and 5 tubes shall be jointed by either:—

(a) Slipping and brazing.
(b) Flaring and bronze welding.
(c) Approved compression joints.
(d) Approved capillary fittings using soft solder.
(e) Approved capillary fittings using hard solder.
(f) Other approved methods.

(vii) **Fittings**: All fittings manufactured from drawn copper tube shall be tested and stamped by the Board. Such fittings shall be manufactured so as to be not lighter at any point than the minimum thickness specified in column 7 of Table 5 for Type 5 tube.

(viii) **Protection**: All tubes lighter than Type 1 shall be adequately protected where necessary, from external injury.

(ix) **Owner's Responsibility**: Each proposal to use copper tube for soil pipes and for soil vent pipes shall be the subject of a written request by the owner of the premises, who shall accept therein, responsibility for the use of this material in these applications.

(The granting of special approval to the use of non-standard 20 gauge copper tube for soil or waste pipe vents or fixture vents or for house drain vents shall be the subject of written request by the owner, who shall accept therein, responsibility for the use of this material in these applications.)

SCHEDULE "D".

1. Unplasticised polyvinyl chloride pipe conforming to AS-K138-1969 Class PF up to and including 1" diameter is approved for water supply plumbing when laid according to the following conditions:—

(a) Approval is at owner's risk.

(b) Work is to be carried out by a licensed plumber.

(c) uP.V.C. piping located underground shall have a minimum cover of 18 in. and joints with other types of metallic piping shall be made at least 6 in. below ground surface.

(d) uP.V.C. piping is not to be used externally or in any situation where it may be subject to direct sunlight.

(e) Pipes shall be located so as to be accessible for repair or maintenance purposes.

(f) Fittings in accordance with AS-A159-1969 shall be made by the same manufacturer as the piping unless prior approval has been obtained from the Board.

(g) Where solvent joints are used the solvent shall be that approved by the fitting manufacturer.

(h) uP.V.C. piping shall be joined to other pipe materials using only approved screwed or compression joints.

(i) The pipe shall be indelibly marked every 18 in. with the name of the material from which they are made, the trade name under which they are manufactured, the pipe classification, the number of the relevant Australian Standard and the Standards Association Trade Mark.

2. High Density Polythene pipe conforming to AS-K119-1969 Type 50 Class D is approved in sizes up to and including 1 in. diameter for water supply plumbing when laid according to the following conditions:—

(a) Approval is at owner's risk.

(b) Work to be carried out by a licensed plumber.

(c) H.D. Polythene piping located underground shall have a minimum cover of 18 in. and joints with other types of piping shall be made at least 6in. below ground surface.

(d) H.D. Polythene piping is not to be used externally or in any situation where it may be subject to direct sunlight.

(e) Pipes shall be located so as to be accessible for repair or maintenance purposes.

(f) H.D. Polythene fittings used shall be made by the same manufacturer as the piping unless prior approval to use alternative methods of jointing has been obtained from the Board.

(g) H.D. Polythene piping shall be joined to other pipe materials using only approved screwed or compression joints.

(h) The pipe shall be indelibly marked every 18 in. with the name of the material from which they are made, the trade name under which they are manufactured, the pipe classification, the number of the relevant Australian Standard and the Standards Association Trade Mark.

3. Unplasticised polyvinyl chloride piping type N non-pressure heavy duty type, according to Australian Standard K 138-1969 and in sizes $1\frac{1}{4}$ in. diameter $1\frac{1}{2}$ in. diameter and 2 in. diameter, is approved when laid according to the following conditions:—

(a) Approval is at owner's risk.

(b) Work to be carried out by a licensed plumber.

(c) Approved unplasticised polyvinyl chloride piping and fittings will be permitted for the internal branch waste and vent pipes, and vent stacks of multi-storey buildings and the internal sanitary plumbing of single occupancies, in houses, flats, factories and commercial or other buildings.

(d) Plastic piping is to be so situated as to be readily accessible for observation and replacement without damage to the rest of the plumbing installation.

(e) The total length of any one branch waste pipe connecting to a vitrified clay drain or metal stack to be not more than 7 ft. 6 in.

(f) No limit to be placed on branch vent pipe or vent stack lengths but adequate allowance for thermal movement is to be made.

(g) Plastic plumbing installed in accordance with this approval to be adequately supported against sagging or distortion and in the case of horizontal lines at not more than 4 feet intervals; the support used shall also include provision for thermal movement if necessary.

(h) Plastic piping or fittings not to be used externally or in any situation where they may be subject to direct sunlight. Their use is not permitted for soil and waste stacks.

(i) Where solvent joints are used the solvent shall be that approved by the fitting manufacturer.

(j) Pipes shall be indelibly marked every 18 in. with the name of the material from which they are made, the trade name under which they are manufactured, the pipe classification, the number of the relevant Australian Standard and the Standards Association Trade Mark.

4. Unplasticised polyvinyl chloride fittings (not traps) for use with uP.V.C. waste piping shall comply with Australian Standard AS A160-1969 and Board specifications. They shall be durably marked or moulded with the following information:—

(a) The manufacturers name or trademark.

(b) The nominal size and "P.V.C."

(c) The angle of the fitting in the case of bends or junctions.

5. Plastic traps made from Polyprypolene are approved if they comply with Australian Standard A162-1969 and comply with Board Specifications.

67457/1/70

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