

ARRANGEMENT OF REGULATIONS

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Definitions

1. In these by-laws, unless the context otherwise indicates -

"adequate" or "effective" means adequate or effective in the opinion of the council, regard being had in all cases to all the circumstances of the particular case and to accepted principles of drainage installation and, in the case of any appliance, fitting or other object, to the purpose which it is intended to serve;

"applicant" means any person who makes an application;

"application" means an application contemplated in section 4 of the National Building Regulations and Building Standards Act, 1977;

"approval" means approval by the Council;

"approved" means approved by the Council;

"anti-siphonage pipe" means any pipe or portion of a pipe provided for the protection of the water seal of a trap against unsealing by siphonage or backpressure;

"back vent" means a ventilating pipe connecting a branch discharge pipe, to which unvented fixture discharge pipes are connected, to a vent stack or to a stack vent;

"block plan" means a plan drawn to scale showing the size, shape and measurements of any piece of land and the position thereon of any existing and proposed buildings and drainage installation or portion thereof;

"branch discharge pipe" means a horizontal discharge pipe conveying the discharge from one or more sanitary fixtures to a discharge stack;

"branch drain" means a drain which discharges into another drain;

"branch vent" means a horizontal ventilation pipe connecting two or more trap vents to a vent stack or to a stack vent;

"branch anti-siphonage pipe" means an anti-siphonage pipe connecting two or more individual anti-siphonage pipes to a main anti-siphonage pipe or to a ventilation pipe;

"branch pipe" means any pipe conveying soil-water or waste-water either separately or together to a stack or other vertical pipe;

"chemical closet" means a closet, which contains a fixed pan, the excreta from which pass into a tank or container where they are acted upon by chemicals, which sterilise and break them down;

"Chief Executive Office" means the person appointed Municipal Manager by the Council or any other person lawfully acting in that capacity and any employee of the Council duly authorised thereto by such Chief Executive Officer or the person so acting;

"cleaning eye" means any access opening to the interior of a discharge pipe or trap provided for the purposes of internal cleaning, and which remains permanently accessible after completion of the drainage installation;

"common drain" means that portion of a drain, which conveys sewage other than or in addition to that, sewage which emanates from the site through which such drain runs;

"connecting sewer" means a pipe vested in the Council, which connects a drain to a sewer;

"conservancy tank" means a covered tank used for the reception and temporary retention of sewage and which requires emptying at intervals;

"council" means the city council, town council, village council or health committee established in terms of the Local Government Ordinance, 1939, or the Transvaal Board for Development of Peri-Urban Areas established in terms of the Transvaal Board for the Development of Peri-Urban Areas Ordinance, 1943, which has adopted these by-laws in terms of the Local Government Ordinance, 1939, and includes the management committee of such council or any officer in the service of such council, acting by virtue of any power vested in such council in connection with these by-laws and delegated to him in terms of section 58 of the Local Government (Administration and Elections) Ordinance, 1960, or any other legislation thereafter;

"cross vent" means a pipe connected between a discharge stack and a vent stack;

"cycle" means any period of one month commencing on the first of the month to the last day of the same month;

"developed length" of any pipe means the length between two specified points on such pipe measured along the centre line of the pipe including any bend, junction or similar fitting;

"discharge pipe" means a pipe, which conveys the discharge from a sanitary fixture to a drain and includes a soil pipe, waste pipe, a discharge stack, a branch discharge pipe or a fixture discharge pipe;

"discharge stack" means a main vertical discharge pipe or any part of a drainage installation;

"domestic effluent" means sewage consisting of soil water or wastewater or a combination of both;

"drain" means that portion of a drainage installation, other than soil-water pipes, waste-water pipes, ventilation pipes and anti-siphonage pipes which is not vested in the council and which is laid in the ground and used or intended to be used for conveying sewage to the connecting sewer, or for conveying sewage to a conservancy tank or a septic tank and includes a conservancy tank or a septic tank;

"*drainage installation*" means an installation vested in the owner of a site and which is situated on such site and which is intended for the reception, conveyance storage or treatment of sewage and may include sanitary fixtures, discharge pipes, drains, ventilating pipes, septic tanks, conservancy tanks, sewage treatment works, or mechanical appliances associated therewith;

"*drainage work*" means any construction or reconstruction of or any alteration or addition to, or any work done in connection with a drainage installation but shall not include any work undertaken solely for purposes of repair or maintenance;

"*electrical sanitary fixture*" means a device which is connected to an electricity supply and to a water supply to perform a function such as the washing of clothes or dishes, or rendering waste matter suitable for disposal into a discharge pipe and includes a food-waste disposer, and a sanitary-towel disposer;

"*Engineer*" and "*Council's engineer*" means the person from time to time holding the said appointment or acting in the said capacity in connection with the municipality or any person duly appointed by the Council to act on his behalf or appointed or authorised by the Council to administer these by-law;

"*evapo-transpirative bed*" means an effluent disposal system comprising a shallow sand-filled excavation covered with topsoil and planted over with suitable vegetation;

"*fixture branch*" means a horizontal fixture discharge pipe;

"*fixture unit*" means a unit of measure expressing the hydraulic loading imposed by any sanitary fixture on the system of pipe work to which it discharges;

"*fixture unit rating*" means the value in fixture units assigned to a sanitary fixture from a consideration of the duration of its discharge, the interval between discharges and its mean discharge rate;

"*french drain*" means a trench filled with suitable material which is used for disposal of liquid effluent from a septic tank of wastewater;

"*group*" means a combination of sanitary fittings comprising not more than one each of a water-closet, wash hand basin, sink, shower, bidet and bath;

"*habitable room*" means a room used for designed erected adapted or intended to be used by persons for sleeping in, living in, the preparation or consumption of food or drink, the transaction of business, the rendering of professional services, the manufacture, processing or sale of goods, the performance of work, the gathering together of persons or for recreational purposes;

"*horizontal*" in relation to a discharge pipe or ventilating pipe, means inclined at less than 45E to the horizontal;

"*individual anti-siphonage pipe*" means an anti-siphonage pipe installed to protect a single sanitary fitting;

"*industrial effluent*" means any liquid whether or not containing water in solution which is given off in the course of or as a result of any industrial trade, manufacturing, mining or chemical process or any laboratory, research or agricultural activity, and includes any liquid other than soil water or storm water; ending up in the Council sewer network or disposal of in a legal manner;

"*individual anti-siphonage pipe*" means an anti-siphonage pipe installed to protect a single sanitary fitting;

"*inspection chamber*" means a chamber not deeper than arm length and such dimensions that access may is obtained to a drain without the requiring of a person to enter into such chamber;

"*inspection eye*" means any access opening to the interior of any pipe or pipe fitting in a drainage installation provided solely for the purpose of inspection and testing, and to which permanent access after completion of the drainage installation need to be provided;

"*load*" means the product of the concentration of an element in the effluent, (expressed in grams per litre) and the total volume of effluent over a fixed period of 24 hours (expressed in mega litre) and is expressed; in ton / day;

"*main anti-siphonage pipe*" means the pipe to which branch anti-siphonage pipes are connected and which is either extended independently to discharge into the open air or is connected to a ventilation pipe;

"*manhole*" means a chamber of a depth greater than arm length and such dimensions that allows entry of a person into such chamber for the purpose of providing access to a drain;

"*occupant or owner*" means in each case where the premises is not occupied by the owner, also the occupant;

"*occupancy*" means the particular use or he type of use to which a building or potion thereof is normally put or intended to be put;

"*one-pipe system*" means a drainage installation in which the discharges from soil-water fittings and waste-water fittings are carried to a drain by a common pipe and in which the water seals of the traps of all waste-water fittings connected to such installation are individually protected by anti-siphonage pipes;

"*piece of land*" means any piece of land registered in a deeds registry as an erf, stand, lot, plot or other area, or as a portion or a subdivision of such erf, stand, lot, plot or other area, or any defined portion, not intended as a public place of a piece of land proclaimed as a township, or of a piece of land which is held under surface right permit or under mining title or which, being proclaimed land not held under mining title, is used for residential purposes or for purposes not incidental to mining operations;

"*pipe*" unless the context otherwise requires, means any number of pipes and fittings joined together to form a line of pipes;

"*pitch*" means the angle between the pitch line and the horizontal;

"*pit latrine*" means a closet placed over or adjacent to an excavation which is of adequate depth;

"premises" means any area of land together with any building or improvement thereon;

"range" means a number of like sanitary fixtures closely spaced and discharging to a common branch discharge pipe which does not receive the discharge from any other sanitary fixture not in the range;

"resealing trap" means a trap so designed that some of the water forming its seal is retained during siphonic action to reseal after siphonage has been broken;

"rodding eye" means any access opening to the interior of any drain provided for the purposes of internal cleaning, and which remains permanently accessible after completion of the drainage installation;

"sanitary fitting" means any soil-water fitting and any waste-water fitting;

"sanitary fixture" means a receptacle to which water is permanently supplied, and from which waste water or soil water is discharged;

"sanitary group" means a combination of sanitary fixtures comprising not more than one each of a water closet pan, bath, shower and sink and either two wash basins or one wash basin and one bidet;

"septic tank" means any tank designed to receive sewage and to effect the decomposition of organic matter in sewage by bacterial action;

"sewage" means waste water, soil water, industrial effluent and other liquid waste, either separately or in combination. but shall not include storm water;

"treated effluent" means the liquid effluent discharged from a sewage treatment works;

"sewer" or "street sewer" means a pipe, conduit or fixture which is the property of or is vested in the Council and which is used or intended to be used for the conveyance of sewage;

"single stack system" means a modification of the one pipe system in which the water seals of the traps of the waste-water fittings or soil-water fittings are not individually protected by anti-siphonage pipes and in which the system is specifically designed in terms of these by-laws to protect the water seals of the traps of all such fittings by means of the said stack with or without the aid of a supplementary ventilation pipe;

"site" means any erf, lot, plot, stand or other piece of land on which a building has been, is being or is to be erected;

"soil branch" means a branch discharge pipe which conveys soil water only;

"soil fixture" means a sanitary fixture which receives and discharge soil water;

"soil pipe" means a discharge pipe which conveys soil water only;

"soil-water" means any liquid containing human or animal excreta;

"soil-water fitting" means any fitting used for the reception and discharge of soil-water;

"soil-water pipe" means any pipe, other than a drain, used for the conveyance of soil-water with or without waste-water;

"stack" means the main vertical component of a drainage installation or any part thereof other than a ventilation pipe;

"stack vent" means the extension of a discharge stack as a ventilating pipe above the highest connected discharge pipe;

"storm water" means water resulting from natural precipitation or accumulation and includes rainwater, surface water, sub-soil water or spring water;

"storm water drain" means a pipe, conduit of surface channel situated on a site, which is used to convey storm water to a suitable point of discharge;

"storm water sewer" means a pipe, conduit or channel, owned by or vested in the Council, which is used for the conveyance of storm water;

"street" means any street, road, thoroughfare, lane, footpath, sidewalk, subway or bridge which -

(a) is vested in the Council; or

(b) the public has the right to use; or

(c) is shown on a general plan of a township filed in a deeds registry or a surveyor-general's office and has been provided or reserved for use by the public or the owners of even in such township;

"street boundary" in relation to a site. means the boundary of such site which abuts any street;

"supplementary ventilation pipe" means a pipe installed to supplement the ventilation of a single stack drainage system;

"tariff" means the tariff of charges determined by the Council;

"Town Clerk" see Municipal Manager;

"trained plumber" means any person who in the trade of plumbing has, in terms of the Manpower Training Act 1981, (Act 56 of 1981), passed a qualifying trade test or has been issued with a certificate of proficiency;

"trap" means a pipe fitting or a part of a sanitary fixture which is designed to retain a water seal;

"trap vent" means a ventilating pipe connecting an individual trap to the open air or to another ventilating pipe;

"treated effluent" means the liquid effluent discharged from a sewage treatment works;

"trapped gully" means a pipe fitting incorporating a trap into which waste water is discharged;

"two-pipe system" means a system of piping between sanitary fixtures and a drain in which waste water and soil water discharge through separate discharge pipes and in which any trap venting or other venting that is required is via separate event stacks for the waste and soil water systems;

"ventilating pipe" or "vent" means a pipe, not being a discharge pipe, which leads to the open air at its highest point and which provides ventilation throughout a drainage installation of the purpose of preventing the destruction of water seals;

"vent stack" means a vertical ventilating pipe in a drainage installation;

"vent valve" means a one-way air valve specifically designed and constructed to be fitted near the crown of the trap serving a waste fixture to protect the water seal of such trap against excessive negative air pressure arising in the fixture discharge charge pipe;

"vertical" in relation to a discharge pipe or ventilating pipe, means inclined at 45E or more to the horizontal;

"waste branch" means a branch pipe which conveys waste water only;

"waste grinder" means any mechanically operated device which grinds and flushes matter which would not normally be disposed of in the sewer, into the waste water sewerage system or which removes from vegetables or other foodstuffs peas, skins, scales or other matter for discharge directly or indirectly into the waste sewerage system, and including effluent from a food waste grinder;

"waste pipe" means a discharge pipe which conveys waste water only;

"waste water" means used water not contaminated by spill water or industrial effluent and shall not include storm water;

"waste-water fittings" means any fitting used for the reception and discharge of waste-water;

"waste-water pipe" means any pipe, other than a drain, used for the conveyance of waste-water;

"water seal" means the water in a trap which acts as a barrier against the flow of any foul or gas;

- (1) In these regulations "SABS" followed by a number or a number and a title, is a reference to the specification of the indicated number published by the council of the South African Bureau of Standards, and all amendments thereof, and which are available for inspection at the office of the Council at any time during official office hours.
- (2) Infringement of By-laws – Any owner or occupier having or using upon his premises, and any person providing installing, laying down or connecting, or permitting or causing to be provided, installed, laid down or connected upon any premises any service or part thereof which fail to comply with the requirements of these by-laws shall be guilty of an offence under these by-laws.
- (3) Infringement of other Legislation – Any owner or occupier having or using upon his premises, and any person providing installing, laying down or connecting, or permitting or causing to be provided, installed, laid down or connected upon any premises any service or part thereof which fail to comply with the regulations of the following legislation such as:
 - (a) Municipal Structures Act (Act 117 of 1998)
 - (b) Environmental Conservation Act (Act 73 of 1989)
 - (c) National Environmental Management Act (Act 107 of 1998)
 - (d) Minerals Act (Act 50 of 1991)
 - (e) Atmospheric Pollution Prevention Act (Act 45 of 1965)
 - (f) National Building Regulations Act (Act 103 of 1977)
 - (g) Hazardous Substances Act (Act 15 of 1973)
 - (h) National Heritage Resources Act (Act 25 of 1999)
 - (i) Development Facilitation Act (Act 67 of 1995)

shall be guilty of an offence under these by-laws.

CHAPTER 1

PROVISIONS RELATING TO THE SUPPLY OF SANITATION SERVICES BY COUNCIL

Compulsory Drainage of Buildings

2. (1) (a) Where in respect of any building a suitable means of disposal of waterborne sewage is available the owner of such building shall provide a drainage installation.
(b) Where there is no such means of waterborne disposal sewage shall be disposed of in accordance with Part Q (National Building Regulations (Act 103 of 1977))
- (2) Where a sewer is available for the drainage of such building, the owner of such building shall, at his own cost, lay alter or extend any drain serving such building to terminate at a location and level as prescribed by the local authority for the connection to such sewer.

- (3) Where a connecting sewer has been provided to any site the owner of such site shall cause all sewage discharged from any building on such site to be conveyed by a drain to such connecting sewer.
- (4) Where the owner of such building has failed to lay, alter or extend any drain in terms of sub-section 2(2) the local authority may, at the cost of such owner, lay, alter or extend such drain; provided that the local authority shall, before carrying out such work, give not less than 14 days notice to such owner of its intention to carry out such work.
- (5) Any owner who fails to comply with the requirement contained in sub-section 2(1) or 2(2) shall be guilty of an offence.

Discharge to Sewerage Disposal System

3. (1) No person shall discharge, or permit the discharge or entry into the sewage disposal system of any sewage or other substance –
 - (a) which does not comply with the standards and criteria prescribed in these regulations;
 - (b) which contains any substance in such concentration as will produce or be likely to produce in the effluent produces for discharge at any sewage treatment plant or sea outfalls discharge point or in any public water any offensive, or otherwise undesirable taste, color, odor, temperature or any foam;
 - (c) which may prejudice the re-use of treated sewage or adversely affect any of the processes whereby sewage is purified for re-use, or treated to produce sludge for disposal;
 - (d) which contains any substance or thing of whatsoever nature which is not amenable to treatment to a satisfactory degree at a sewage treatment plant or which causes or is likely to cause a breakdown or inhibition of the processes in use at such plant;
 - (e) which contains any substance or thing of whatsoever nature which is of such strength, or which is amenable to treatment only to a degree as will result in effluent from the sewage treatment plant or discharge from any sea outfalls not complying with standards prescribed under the National Water Act, 1998 (Act No. 36 of 1998);
 - (f) which may cause danger to the health or safety of any person or may be injurious to the structure or materials of the sewage disposal system or may prejudice the use of any ground used by the municipality or its authorized agent for the sewage disposal system, other than in compliance with the permissions issued in terms of these bylaws; and
 - (g) which may inhibit the unrestricted conveyance of sewage through the sewage disposal system.
- (2) No person shall cause or permit any storm water to enter the sewage disposal system.
- (3) The municipality or its authorized agent may, by written notice, order the owner or occupier to conduct, at his or her cost, periodic expert inspections of the premises in order to identify precautionary measures which would ensure compliance with these bylaws and to report such findings to an authorized agent.
- (4) If any person contravenes any provision of Sub-Section 3(1) or Sub-Section 3(2) he or she shall within twelve hours, or earlier if possible, advise the municipality or its authorized agent of the details of the contravention and the reasons for it.

Compulsory Provision of Sewerage

4. (1) The owner of any property not having a drainage installation terminating at a point of discharge to the sewer prescribed by the Council shall within 20 weeks of receiving written notice from the Council requesting him to do so construct or cause to be constructed such an installation on the property and shall do all work necessary for and all things required by these by-laws in connection with the construction of such an installation, and shall pay all fees due in respect of the connection of the same to the Council's sewer.
- (2) If the owner fails within the said period of 20 weeks to comply with a notice served on him under sub-section 4(1) he shall thereafter, without prejudice to his liability for charges in respect of use of the Council's sewer as prescribed by section 18 of these by laws, pay fees at three times the prescribed rate for the said pail or conserving-tank service until a drainage installation as required by the said notice and complying with these by-laws is connected to the sewer and the Council has been notified in terms of sub-section 4(1).
- (3) The owner as aforesaid shall give written notice to the Council when any pail or conserving-tank service rendered to the property is no longer required, and shall remain liable for the charges for that service until he has done so.
- (4) If the owner fails within the said period of twenty weeks to comply with a notice served on him in terms of sub-section 4(2) he shall thereafter, without detracting from this liability for charges in respect of the use of the council's sewer as prescribed by these by-laws, pay charges at three times the prescribed tariff for the said pail or conservancy tank service until a drainage installation as required by the said notice and complying with these by-laws is connected to the sewer and the council has been notified thereof in terms of sub-section 4(3).
- (5) Notwithstanding that no sewer is available for the service of a new building to be erected on a property or of any alteration or addition to an existing building, the Council shall be entitled, in considering whether to approve any plans submitted to it in terms of these or any other of its by-laws which are relevant: to have regard to the possibility that a sewer will become available as aforesaid and to require the owner so to locate the said new building or alteration or addition -

- (a) that it is possible for its drainage installation to discharge into the said future sewer by gravity; and
 - (b) that no obstruction is caused in the expected course of the said sewer.
- (6) Notwithstanding the provisions of sub-section 4(5) where any premises are at such a level in relation to the sewer that their drainage installation, or any part of it cannot discharge to the sewer by gravitation, the Council may permit the discharge in question to be raised by means of pumps, ejectors or any other effective method through a rising main fitted with non-return valves to discharge at such level and at such place as the Council shall determine.
- (7) The owner shall be under a duty to comply with any requirement communicated to him by the Council in terms of sub-section 4(5).
- (8) Every contractor or other person employing workmen for the construction of any building or for the carrying out of any other work on any piece of land to which a sewer is available for the drainage of buildings constructed or to be constructed thereon, shall provide water closet accommodation connected to the sewer for such workmen.

Common Drains

5. The Council may in its discretion permit the drainage installations on any two or more lots, erfs, or stands whether or not in the same ownership, to discharge in the sewer through a common drain. This permission will have to be obtained in writing by the owner from the Council. Previously connected common drains may be directed by the Council to supply separate connections after consultation between the owner or occupier and the Council.

Unauthorized Drainage Work

6. (1) No person shall in any manner interfere with any sewer or connecting sewer.
- (2) No person shall break into or interfere with any part of a drainage installation other than for the purpose of repair or maintenance.
- (3) Any person who causes or permits to be caused the carrying out of any unauthorized work contemplated in this regulation shall be guilty of an offence.

Unlawful Drainage Work

7. (1) Where any drainage work has been constructed without compliance with the provisions of these by-laws concerning the submission and approval of plans the owner shall, on receiving written notice by the council so to do, comply with the said provisions within the period prescribed in that notice.
- (2) Where any drainage installation, has been constructed or any drainage work has been carried out which fails in itself in any respect to comply with any of these by-laws other than those referred to in sub-section 7(1) the owner shall, on receiving written notice by the Council so to do and notwithstanding that he may have received approval of plans in respect of the said installation or work in terms of these by-laws, carry out such alterations to the installation, remove such parts thereof and carry out such other work as, and within the time which, the notice may specify.
- (3) The Council may, instead of serving notice as aforesaid, or where such alterations or a notice has not been complied with within the time prescribed therein, proceed itself to carry out any such alterations, removals or other work as it may deem necessary for compliance with these by-laws and may recover the cost thereof from the owner by the ordinary process of law
- (4) Should the Council at any time become aware of any installation which does not comply with the provisions of these regulations or that any provision thereof has or is being contravened it may, subject to the provisions of sub-sections 7(1), 7(2) and 7(3), forthwith and without notice carry out such alterations to the installation as it may deem necessary to effect compliance with the provisions of the said section and recover from the owner the appropriate charges prescribed in the relevant schedule to these by-laws.

Duty of Maintenance

8. (1) The owner or occupier of premises shall at all times keep and maintain in a proper state of repair and in working order any drainage installation thereon.
- (2) Where two or more owners or occupiers use any part of a drainage installation they shall be jointly and severally liable in terms of this section for the maintenance and repair of the same.

Prevention of Blockages

9. No person shall cause or permit such an accumulation of grease, oil, fat, solid matter or any other substance in any trap, tank, pipe, drain or fitting as will block it or prevent its effective operation.

Clearing of Blockages

10. (1) When the owner or occupier of premises has reason to believe that a blockage has occurred in any drainage installation thereon, he shall forthwith report the fact to the Council.
- (2) Where a blockage occurs in a drainage installation any work necessary for its removal shall, subject to the provisions of sub-section 10(5), be done by or under the supervision of a plumber or drain layer licensed in terms of the Council's by-laws.
- (3) Any plumber or drain layer as aforesaid shall before proceeding to remove any blockage from a drainage installation notify the Council by telephone or otherwise of his intention to do so, and shall when he has done so notify the Council of that fact and of the nature and cause of the said blockage.

- (4) The Council itself shall, whether or not it has been requested by the owner to do so, be entitled at its own discretion to remove a blockage from a drainage installation and may recover the costs thereof from the owner in accordance with the tariff prescribed in the relevant schedule to these by-laws.
- (5) The Council itself shall, whether or not it has been requested by the owner to do so, be entitled at its discretion to remove a blockage from a drainage installation and to recover from him in respect of such work the charge prescribed in the tariff.
- (6) Should any drainage installation on any premises overflow as a result of an obstruction in the connecting sewer, and the Council be reasonably satisfied that such obstruction was caused by objects emanating from the drainage installation, the owner of the premises served by the drainage installation shall be liable for the cost of clearing the blockage in accordance with the tariff prescribed in the relevant schedule to these by-laws.
- (7) Where a blockage has been removed from a drain or portion of a drain which serves two or more pieces of land, the charges for the clearing of such blockage shall be recoverable in the first place in equal portions from each of the owners thereof, who shall, however, be jointly and severally liable for the whole charge.

Emission of Gas or Entry of Sewage

11. (1) When in the opinion of the council a nuisance exists owing to the emission of gas from any trap or sanitary fitting or any other part of a drainage installation, the council may require the owner, at his own expense, to take such action as may be necessary to prevent the recurrence of the said nuisance.
- (2) Where any sewage, after being discharged into a drainage installation, enters any soil-water fitting or waste-water fitting connected to the same drainage installation whether by reason of surcharge, back pressure or any other circumstance, the council may by notice in writing require the owner to carry out within the period specified by such notice any work necessary to abate such entry of sewage and to prevent any recurrence thereof.

Work by the Council

12. (1) Where any person has been required by the council by notice in terms of these by-laws to carry out any work whether by way of construction, repair, replacement or maintenance and has failed to do so within the time stipulated in such notice, the council may, without prejudice to its right also to proceed against him as for a contravention of these by-laws, proceed itself to carry out the work and may recover by the ordinary process of law applicable to the recovery of a civil debt the entire cost of so doing from the person to whom the notice was directed.
- (2) Where any work other than that for which a fixed charge is provided in Section to these by-laws is done by the Council the cost of which it is entitled by these by-laws to recover from any person, there may be included in such cost such sum to be assessed by the Council as will cover all expenditure reasonably incurred by it including the cost of surveys, plans, specifications, bills of quantities, supervision, labor, materials, the use of plant and tools and the cost of disturbing making good and re-making, repairing or re-building any street, ground, building or other works.
- (3) Any damage caused to the council's sewers or any part of its sewerage or sewage treatment system by or in consequence of the non-compliance with or contravention of any provision of these by-laws shall be rectified or repaired by the council at the expense, to be assessed by it, of the person responsible for the said non-compliance or contravention or of causing or permitting same.

Interference with Sewer

13. (1) No person except a person authorized by the Council to do so shall break into, enter or in any other manner whatsoever interfere with any sewer, manhole or other work or any part thereof, whether or not situated on property owned or controlled by the Council, intended for the conveyance or treatment of sewage and which is vested in it.

Disused Conservancy and Septic Tanks

14. If an existing conservancy tank or septic tank is no longer required for the storage or treatment of sewage, or if permission for such use is withdrawn, the owner shall either cause it to be completely removed or to be completely filled with earth or other suitable material: Provided that the Council may require such tank to be otherwise dealt with, or he may permit it to be used for some other purpose subject to such conditions as he may consider necessary, regard being had to all the circumstances of the case.

Obstruction and False Information

15. (1) An official authorized by the Council shall have the right to enter upon any premises at any reasonable time in order to take samples of or test sewage or industrial effluent or to carry out any inspection or work in connection with a drainage installation which it may deem necessary.
- (2) An owner or occupier of premises who denies or causes or suffers any other person to deny entry to premises to any official demanding the same under sub-section 15(1) or who obstructs or causes or suffers any other person to obstruct any such official in the performance of his duties, or who withholds or causes or suffers any other person to withhold information required by the official for the purpose of carrying out his said duties, or who gives or causes or suffers any other person to give to the official any information which is to his knowledge false shall be guilty of an offence.

CHAPTER 2

Conditions for the supply of sanitation services

Application for the supply of sanitation services

16. (1) No person shall gain access to the sewer system or a sanitation service, unless he or she applied to the Council on the prescribed form for such service for a specific purpose and to which such application has been agreed.
- (2) Application may be made to the Council by or on behalf of the owner or occupier of any premises –

- (a) for the initial connection of any premises to a sewer system; or
 - (b) for a reconnection to the sewer system where a previous service agreement in respect of the premises has been terminated, whether for the previous consumer or any subsequent owner or occupier of the premises.
- (3) An application in terms of sub-section 16(1) shall be made in the form provided by the Council for the purpose and shall be submitted to the Council -
- (a) in the case of an application for an initial connection, at least 28 days; and
 - (b) in the case of an application for a reconnection, at least 21 days, before the date on which the supply of water to the premises in question is required.
- (4) Where application is made for the initial connection of any premises to sewer system, the applicant shall, if he or she is not the registered owner of the premises, lodge, together with the applicant, the written permission of the registered owner that such connection may be made.
- (5) When submitting an application in terms of sub-section 16(1) the applicant shall pay the Council the fee determined by the Council for an initial connection or a reconnection to the sewer system as are prescribed in the tariff.
- (6) The connection to the sewer system by the Council of a consumer shall be subject to the provisions of these regulations.
- (7) Sanitation services rendered to a consumer are subject to the provisions of this By-laws.

Payment for Sewer Connection

17. (1) The fees prescribed in the tariff to all consumers that receive or want to receive sanitation services will be for each individual stand payable by the owner in full before such a connection will be made to the sewer system.
- (2) The minimum charge payable in respect to have any application shall be the published tariff.
- (3) The Council shall have the right in the case of any special service being required from the Council to recover the cost thereof.

Disconnection

18. (1) Except for the purpose of and for carrying out of any work of maintenance or repair, no soil-water fitting or soil-water pipe shall be disconnected from any soil-water pipe or drain, and no drain shall be disconnected from any other drain or from a sewer without the prior written approval of the council after the lodging of an application in the manner, so far as applicable, prescribed in terms of section 20: Provided that no charge shall be made by the council in respect of an application made in terms of this subsection.
- (2) Where any part of a drainage installation is disconnected from the remainder thereof because it will no longer be used, the said part so disconnected shall be destroyed or entirely removed from the premises on which it was being used unless the council shall otherwise permit, having regard to the impracticability of such destruction or removal, and all openings in the installation or in the said part if left in position, created by the disconnection, shall be effectively sealed to the satisfaction of the council.
- (3) Due notice in writing in advance of any disconnection shall be furnished to the engineer who shall, after the requirements of this section have been complied with and on request of the owner, issue a certificate to the effect that the disconnection has been completed in terms of these by-laws and that any sewerage charges raised in respect of the disconnected portion of the drainage installation shall cease to be raised with effect from the first day of the month following the issue of such certificate: Provided that until such certificate shall have been issued by the engineer any such charges shall continue to be raised.
- (4) When a drainage installation is disconnected from a sewer, the council shall seal the opening to the sewer so made and shall recover from the owner the charge prescribed for such work in the relevant schedule to these by-laws.
- (5) Any person, who, without the permission of the council breaks or removes or causes or permits the breakage or removal of any such seal referred to in sub-section 23(4), shall be guilty of an offence.

Termination of agreement

19. The Council may disconnect a drainage installation from the connecting sewer and remove the connecting sewer if –
- (a) the agreement for provision has been terminated and it has not received an application for subsequent provision to the premises served by the sewer within a period of 180 days of such termination; or
 - (b) the building on the premises concerned has been demolished.

CHAPTER 3

General provisions relating to drainage connections

Connections to Sewer

20. (1) No part of any drainage installation shall extend beyond the boundary of the lot erf or stand on which the building or part thereof to which it belongs is erected provided that where it considers it necessary or expedient to do so, the Council may permit the owner to lay a drain at his own expense through an adjoining lot, erf or stand on proof of the registration of the appropriated servitude or of a notarial deed of joint drainage.

- (2) Subject to the provisions of sub-section 20(4) and without prejudice to the provisions of section 25 and concerning the testing of drainage installations, the Council will, as soon as is practicable after the owner has notified it that his drainage installation is ready for connection to the sewer, at its own expense effect the connection or cause it to be effected.
- (3) Any connection required by the owner subsequent to that made by the council in terms of sub-section 20(2) shall were subject to the approval of the council and shall be effected at the owner's expense.
- (4) No person shall permit the discharge of any substance whatsoever other than clean water for testing purposes to enter any drainage installation until the same shall have been connected to the sewer.
- (5) Save as may be otherwise authorized by the Council in writing, no person other than an official duly authorized to do so shall connect any drainage installation to the sewer.

Location of connecting sewer

21. (1) A connecting sewer provided and installed by the Council or owner in terms of these regulations shall -
 - (a) be located in a position agreed to between the owner and the Council and be of a size determined by an Council;
 - (b) terminate at a connection point approximately 1 meter inside the premises from the boundary of the land owned by or vested in the Council or over which it has a servitude or other right or when Sub-section 21(3) applies, at the connecting point designated in terms of that Sub-section;
- (2) The Council shall have the right to prescribe to what point in the sewer and at what depth below the ground any drainage installation is to be connected and the route to be followed by the drain to the connection so to be made and may in its discretion, having regard to the necessity of maintaining correct levels, require the owner not to begin the construction of the drainage installation until the Council's sewer has been laid.
- (3) In reaching agreement with an owner concerning the location of a connecting sewer, the Council shall ensure that the owner is aware of
 - (a) practical restrictions that may exist regarding the location of a connecting sewer pipe;
 - (b) the cost implications of the various possible locations of the connecting sewer;
 - (c) whether or not the Council requires the owner to fix the location of the connecting sewer by providing a portion of his or her water installation at or outside the boundary of his or her premises, or such agreed position inside or outside his or her premises where the connection is required, for the Council to connect to such installation.
- (4) A Council may at the request of any person agree, subject to such conditions as he or she may impose, to a connection to a sewer other than that which is most readily available for the drainage of the premises; provided that the applicant shall be responsible for any extension of the drainage installation to the connecting point designated by Council and for obtaining at his or her cost, such servitude's over other premises as may be necessary.
- (5) An owner must pay the prescribed connection charge.
- (6) Where an owner is required to provide a sewage lift as provided for in terms of these regulations the rate and time of discharge into the sewer shall be subject to the approval of the Council.

Provisions of One Connecting Sewer for Several Consumers on Same Premises

22. (1) Notwithstanding these provisions only one connecting sewer to the sewage disposal system may be provided for the disposal of sewage from any premises, irrespective of the number of accommodation units of consumers located on such premises.
- (2) Where the owner, or the person having the charge or management of any premises on which several accommodation units are situated, requires the disposal of sewage from such premises for the purpose of disposal from the different accommodation units, the Council may, in its discretion, provide and install either –
 - (a) a single connecting sewer in respect of the premises as a whole or any number of such accommodation units; or
 - (b) a separate connecting sewer for each accommodation unit or any number thereof.
- (3) Where the Council has installed a single connecting sewer as contemplated in sub-section (2)(a), the owner or the person having the charge or management of the premises, as the case may be, -
 - (a) must if the Council so requires, install and maintain on each branch pipe extending from the connecting sewer to the different accommodation units – a separate connecting sewer; and an isolating valve; and
 - (b) will be liable to the municipality or its authorized agent for the tariffs and charges for all sewage disposed from the premises through such a single connecting sewer, irrespective of the different quantities disposed by the different consumers served by such connecting sewer.
- (4) Notwithstanding sub-section 25(1), the Council may authorize that more than one connecting sewer be provided on the sewage disposal system for the disposal of sewage from any premises comprising sectional title units or if, in the opinion of the Council, undue hardship or inconvenience would be caused to any consumer on such premises by the provision of only one connecting sewer.

- (5) Where the provision of more than one connecting sewer is authorized by the Council under sub-section 25(4), the tariffs and charges for the provision of a connecting sewer is payable in respect of each sewage connection so provided.

Interconnection between Premises

23. An owner of premises shall ensure that no interconnection exists between the drainage installation on his or her premises and the drainage installation on other premises, unless he or she has obtained the prior written consent of the Council and complies with any conditions that it may have imposed.

Loads Carried by Drainage Installations

24. (1) The load discharged into or carried by a drain, a soil-water pipe or a wastewater pipe shall be calculated in units, hereinafter referred to as discharge units.
- (2) The load at any point in a drain, soil-water pipe or wastewater pipe shall be the sum of the discharge units of all sanitary fittings the discharges from which enter such drain or pipe upstream of that particular point.
- (3) The load expressed in discharge units discharged from any sanitary fitting specified in column 3 of the following table shall be as specified in column 2, and in the case of any sanitary or other fitting not specified in the table, the hydraulic load shall be as specified in column 2 for the relevant diameter of the outlet of the trap of such fittings as specified in column 1.

TABLE

1 Nominal Diameter of Trap (mm)	2 Load in Discharge Units	3 Sanitary Fitting
32	½	Wash-hand basin, bidet
38	1	Bath, sink, shower, wash trough, wall hung urinal
50	1½	Channel type urinal
75	2½	Water closet
100	4	

- (4) The load of all sanitary fittings the discharges from which are conveyed by a drain or part of a drain having a nominal diameter set out in column 1 of the following table and a gradient set out in either column 5, 6, 7 or 8 shall not exceed the number of discharge units set out in the said table for such diameter and gradient of drain.
- (5) The nominal diameter of any drain shall be not less than 100mm, and no drain shall be laid to a gradient flatter than 1 in 60 without the consent of the council as required by the provisions of section 28(3).

CHAPTER 4

General provisions relating to drainage Installations

Standard Specifications and codes of practice applicable

25. For the purpose of these regulations the relevant SABS standards and codes shall be applicable, but the Council may also approve the use of any other specification and codes where in its opinion it is appropriate to do so, and it shall in considering any application for such approval be guided by accepted practice and international specifications and codes of practice.

Provision of drainage installation

26. Every owner or consumer shall, at his own expense, provide, install, lay down and maintain his own drainage installation.

Information and drawings

27. (1) In respect of every new drainage installation, or changes to an existing drainage installation necessitated by any alteration or extension of an existing building, the owner of such premises shall submit for approval to the Council, in the format determined by the Council, the information and drawings thereof: Provided that the information relating to a drainage installation to be installed on any premises may be indicated on the same drawing as the water installation.
- (2) A complete set of approved drawings of the sewer installation shall be kept available at the premises.
- (3) Where any installation work has been done in contravention of sub-section 27(1), the Council may by written notice require from the owner of the premises to comply within a specified period with the provisions of that sub-section, in which event –
- (a) Work in progress shall cease until the approval required by that sub-section have been granted.
- (b) Work that does not comply with these sections shall be removed from the premises.
- (4) An application as required that in terms of section 16 shall be accompanied by one or more sets of drawings as the Council may require, each set comprising a block plan of the premises and plans, elevations and sections indicating clearly the nature and extent of the proposed work: Provided that where the particulars required in terms of sub-section 27(5) sufficiently appear on the other drawings herein referred to, no block plan need be furnished with the application.

- (5) One set of the required drawings shall be made in waterproof ink or otherwise clearly reproduced on tracing cloth or other approved durable transparent material or be clearly legible prints with a white background on polyester or other approved durable material and shall be signed as prescribed in sub-section 27(1), but any additional sets of drawings required by the council may consist of white paper prints, the minimum size of all drawings to be not less than A4 (297mm by 240mm).
- (5) The plans, elevations and sections of the required drawings shall be drawn to a natural scale of not smaller than 1:200 except in the case of block plans, which shall be to a natural scale of not smaller than 1:500.
- (6) The plans, elevations and sections shall show -
- the position and arrangement in any building of every waste-water and soil- water fitting to be installed therein;
 - the size, gradient and position of every drain, the size and position of every manhole, gully trap, bend, soil-water pipe, waste-water pipe, anti-siphonage pipe and ventilation pipe, and the means of access to and inspection of drains;
 - the position and height of all chimneys, buildings, windows and other openings within a distance of 6m from the open end of any ventilation pipe;
 - the levels of the floors of the building, of any yards and in the case of sections, the level of the ground in relation to the levels of drain throughout its length; and
 - as much as is necessary of any existing drainage installation, which will be affected by the proposed work.
- (8) The block plan shall show -
- the full extent of the piece of land on which the drainage work is to be carried out and the position of the buildings and the existing and proposed drains thereon;
 - the title deed description of the piece of land on which the drainage work is to be carried out and of all pieces of land contiguous thereto, the name of the township, agricultural holding or farm, and the name of any street on which any part of the said piece of land abuts; and
 - the north point.
- (9) On the drawings referred to in subsection 21(7) the items specified in the left-hand column of the following table shall, if abbreviations are used, be identified by the abbreviations shown opposite to them in the right-hand column:

TABLE

Access eye	A E
Anti-siphonage pipe	A S P
Bath	B
Bidet	Bt
Cast-iron pipe	C I P
Cleaning eye	C E
Earthenware pipe/Vitrified clay pipe	E W P
Fresh-air inlet	F A I
Gully	G
Gully-dished	D G
Grease trap	G T
Inspection chamber	I C
Inspection eye	I E
Manhole	M H
Outlet ventilation pipe	O V P
Rainwater pipe	R W P
Rodding eye	R E
Sink	S
Shower	Sh
Slop hopper	S H
Soil-water pipe	S P
Soil-water ventilation pipe	S V P
Urinal	U
Ventilation pipe	V P
Water closet	W C
Wash trough	W T
Waste-water ventilation pipe	W V P
Waste-water pipe	W P

Payment for application fees of drawings

28. Charges regarding the approval of drawings as prescribed in the National Building Regulations and Building Standards Act (Act 103 of 1977) will be as prescribed in the tariff, section 106.

Period of validity of approved drawings

29. (1) An approval given by the council in terms of section 27 shall become invalid in respect of any work covered by such approval which has not been commenced within twelve calendar months of the date on which it was given unless the said work is associated with building operations which have commenced during the said twelve months.

- (2) Where any such work as mentioned in section 26, not being work associated with building operations, has not been commenced within the said twelve months the owner shall, before proceeding with it, submit a new drawings as prescribed in terms of section 27, which application shall be deemed for all purpose to be a new application, and the owner shall not be entitled to a refund of any fees paid in respect of the original application but shall, on marking the new application, pay the fees prescribed in terms of section 28.

Changes in application after approval of drawings

30. (1) After approval by the council of an application in terms of section 27 has been conveyed to the applicant in writing, a departure or deviation from the work as so approved may thereafter be made with the prior written consent of the council only after the owner has submitted an application for such departure or deviation, accompanied by the drawings and particulars specified in section 27 and containing a clear indication of the nature of the proposed departure or deviation and of any part of the original proposed work which is to be superseded, altered or revised.
- (2) An application made in terms of sub-section 27(4) shall be deemed to be a new application in terms of section 30 for which the fee prescribed in terms of section 28 shall be payable and in respect of which the provisions of sub-section 27(4) relating to the council's approval thereof shall apply.

Standards of drainage installations

31. (1) Where any drainage installation is required in terms of these regulations:
- (a) the Council may permit or require, subject to the requirements contained in regulation A8 (2) of the National Building Regulations and Building Standards Act(103 of 1977) , the submission for approval, of an alternative rational design of such drainage installation which shall be prepared by a professional engineer or other approved competent person and which shall be based on hydraulic calculations; and
- (b) such design shall comply with the requirements of these regulations and may be in respect of either any discharge pipe and ventilating pipe installation of the below-ground installation, or both such installations; or
- (c) any such installation or any portion thereof not included in the design contemplated in sub-section 31(a) shall be designed and constructed in accordance with the regulations contained in these regulations.

Materials, Pipes, Fittings and Joints

32. (1) For the purposes of these regulation the relevant standard specifications with regard to materials used in any drainage installation shall be as contained in the Table.
- (2) In any drainage installation any joint between pipes or between such pipes and fittings shall-
- (a) be appropriate to the materials of which such pipes and fittings are made; and
- (b) remain watertight under normal working conditions or where there may be any differential movement between such pipes and any building or ground or other construction forming part of the drainage installation; and
- (c) be able to withstand an internal water pressure of 60 kPa and an external water pressure of 30 kPa without leaking.

MATERIALS USED IN DRAINAGE INSTALLATIONS AND RELEVANT STANDARD SPECIFICATIONS

1	2
Item	SABS Standard specification
Fibre cement pipes and pipe fittings for use above ground in drainage installations (soil, waste and vent)	721
Fibre cement sewer pipes	819
Cast iron fittings for fibre cement pressure pipes	546
Concrete pipes - non pressure	677
Unplasticized polyvinyl (UPVC) sewer and drain pipes and pipe fittings	791
Vitrified clay sewer pipes and fittings	559
Cast iron pipes and pipe fittings for use above ground	746
Pitch-impregnated fibre pipes, couplings and fittings	921
Steel pipes and pipe fittings up to 150mm nominal bore suitable for screwing to ISO R7 pipe threads	62
Unplasticized polyvinyl chloride (UPVC) pipes and pipe fittings for use above ground	967
Cast iron surfact boxes and manhole and inspection covers and frames	558
WC flushing cisterns	821
Float valves (Parts I and II)	752
Plastic ball floats for ball valves	1006
Stainless steel wash-hand basins and wash troughs	906
Sanitaryware (glazed ceramic)	497
Stainless steel sink with draining boards (for domestic use)	242
Stainless steel sinks for institutional use	907
Urinal stalls (stainless steel)	924
Rubber joint rings (non-cellular)(Part 1)	974
Non-metallic water traps (Part 1:Plastic waste traps)	1321
Black polyethylene pipes for the convance of liquids	533

Design of a proposed sewer installation

33. (1) The Council may require that professional engineer designs a proposed sewer installation or other approved competent person in cases where the Council is of the opinion that a detail design is necessary due to the complexity of the installation.
- (2) Any designer of a water installation shall take the necessary care in the detail design that the sewer installation shall fully comply with the requirements as set out in these regulations.

Control over work on sewer installation

34. (1) Subject to sub-section 34(2), the installation of a sewer installation shall be carried out -
- (a) according to drawings approved in terms of section 27 and detail specification for the installation; and
- (2) Every person carrying out or exercising control over the installation of any sewer installation shall ensure that -
- (a) shall not be shallower than 300 mm

Cleaning, inspection and testing of sewer installation

35. (1) Every drainage installation shall be properly cleaned, inspected and tested in accordance with section 35
- (2) Every drainage installation shall on completion -
- (a) be properly cleaned to remove any foreign matter;
- (b) be inspected by the representative of the council;
- (c) be tested under pressure
- (3) At least 2 working days' notice shall be given to the Council for the purpose of any inspection to be carried out in terms of sub-section 35(2)(b).
- (4) After the completion of a drainage installation or any part thereof, but before it is connected to a conservancy tank, a septic tank, the council's sewer or an existing approved installation, any one or more or all of the following tests shall in the presence of one of its authorized officers be applied and withstood to the satisfaction of the council:
- (a) The interior of every pipe or series of pipes between two points of access shall be inspected throughout its length by means of a mirror and a source of light; during the inspection a full circle of light shall appear to the observer, and the pipe or series of pipes shall be seen to be unobstructed.
- (b) A smooth ball having a diameter 12mm less than the nominal diameter of the pipe shall, when inserted at the higher end of the pipe, roll down without assistance or interruption to the lower end.
- (c) All openings of the pipe or series of pipes to be tested having been plugged or sealed and all traps associated therewith filled with water, air shall be pumped into the said pipe or pipes until a manometric pressure of 38mm of water is indicated, after which without further pumping the said pressure shall remain greater than 25mm of water for a period of at least three minutes.
- (5) The aforesaid tests shall be carried out and the apparatus therefor shall be supplied at no expense to the council.
- (6) Where the Council has reason to believe that any drainage installation or any part thereof has become defective it may require the owner thereof to conduct, at no expense to the council, any or all of the tests prescribed in sub-section 35(1) and if the installation fails to withstand any such tests to the satisfaction of the council, the council may call upon the owner to carry out at his own expense, and within such period as it may stipulate, such repairs as may be necessary to enable the installation to withstand any or all of the said tests.

Approval required for drainage work.

36. (1) No person shall construct, reconstruct, alter, add to or make any permanent disconnection in or of any drainage installation without first having obtained the approval of the council in writing.
- (2) No drainage work mentioned in section 36 for which approval has been given as provided for in terms of these by-laws, shall be commenced until after the expiration of two clear days after notice in writing has been served on the council stating the day on and time at which it is intended to commence the work.
- (3) Any person who commences any drainage work without applying to the council for approval thereof or before his application has been granted, or without giving notice as prescribed in terms of sub-section 36(2), or before the expiry of such notice, or who carries out any work otherwise than in accordance with the approval thereof given by the council, may be called upon by the council by notice in writing to cease the work forthwith and for every day on which work is continued in contravention of such notice, shall without prejudice to any other penalty he may have incurred with regard to the same drainage work, be guilty of an offence.
- (4) Before any part of a drainage installation is permanently covered or otherwise rendered permanently inaccessible to visual inspection, it shall be inspected and approved by the council and any person who shall have so covered or rendered inaccessible any part of any installation before such inspection has been made and such approval has been given shall, on being required by the council to do so, at his own expense remove the covering and do whatever else may be necessary to enable the council to carry out the said inspection, and shall in addition be guilty of an offence.

Covering of drainage installation

37. When any drainage installation is being or has been installed or any alteration or extension of any existing drainage installation is being or has been carried out, no person shall cover any part of such installation, alteration or extension or cause, permit or suffer it to be covered until it has been inspected and approved by the Council.

CHAPTER 5

Technical requirements relating to drainage Installations

Drain Pipes and Fittings

38. (1) All pipes, junctions, bends and associated fittings forming part of a drain shall be made of vitrified clay or any other approved material bearing the standardization mark of the South African Bureau of Standards or of some other approved material.
- (2) All pipes, junctions, bends and associated fittings forming part of a drainage installation shall be installed in an approved manner.

Joints in and with Drains

39. (1) All joints between pipes and appliances and fittings in a drainage installation shall be such that adjacent pipe barrels are concentric, inverts are true to line and grade and there are no internal obstructions.
- (2) All joints as aforesaid shall be so made that they are air and watertight and that a badger of 6mm less in diameter than the nominal internal diameter of the pipe can pass freely through them.
- (3) Cement mortar for jointing vitrified clay pipes shall have a composition of not more than three parts of clean and sharp sand to one part of Portland cement and shall be properly caulked between the spigots and sockets of the pipes.
- (4) The joints between cast-iron spigot and socket pipes shall be formed with a gasket of hemp or yarn the depth of which shall not exceed one-half of the depth of the socket when the gasket is properly caulked, and the remainder of the socket shall be filled with molten lead run at one pouring, or with lead fibre, and thereafter solidly caulked.
- (5) Alternative approved methods of jointing pipes and associated fittings made of vitrified clay or any other approved material or cast iron may be used.
- (6) Methods of jointing pipes and fittings made of such other materials as may be approved in terms of section 39(1) shall be as approved by the Council.
- (7) Where in the opinion of the Council the nature of the soil in which any pipes and associated fittings are to be laid is such that ground movement, which may result in fracture of the pipes or fittings, is likely to occur, flexible joints shall be formed either by the use of approved special pipes and fittings or by the use of approved jointing material which will permit joint movement to take place throughout the life of the drainage installation and withstand root penetration and not swell or deteriorate when in contact with sewerage or water.

Size of Drains

40. The internal diameter of a drain shall be not less than 100mm: Provided that the Council may if it shall think fit having regard to any special circumstances require the laying of drains with a diameter exceeding 100mm.

Laying, Alignment and Gradients of Drains

41. (1) Drains shall be laid in a straight line and at a uniform gradient between the points of access referred to in section 41, they shall be everywhere so laid that the barrel of every pipe is firmly supported throughout its length, and they shall be laid at a gradient not greater than 1 in 10 or less than 1 in 60: Provided that the Council may in its absolute discretion permit.
- (a) a gradient greater than 1 in 10;
- (b) construction of vertical drops not exceeding eight feet, such drops only to be permitted in the case of glazed-earthenware pipes where they are encased in concrete; or
- (c) a gradient within the limits of 1 in 60 and 1 in 90 inclusive in the case of drains having a diameter of or exceeding 150mm.
- (2) No person other than a plumber licensed in terms of the Council's by-laws for the Licensing and Regulating of Plumbers and Drain layers shall lay cast-iron drains, nor shall any person other than a drain layer licensed as aforesaid lay glazed - earthenware drains: Provided that -
- (a) the jointing of glazed-earthenware pipes may be carried out by any person working under the supervision of a licensed drainlayer; and
- (b) where in the exercise of its discretion under sub-section 41(1) the Council has permitted a drain to be made of some material other than cast iron or glazed earthenware the drain so made may at the discretion of the Council be laid by the holder of either a plumber's or a drain layer's license.
- (3) Drains shall be laid at a gradient not steeper than 1 in 6 or flatter than 1 in 60: Provided that the Council may at its discretion and on such conditions as it may prescribe, permit -
- (a) a gradient steeper than 1 in 6 or a gradient flatter than 1 in 60;
- (b) the construction of portions of drains in the form of inclined ramps at a slope not exceeding 45° below the horizontal.
- (4) Where ramps are constructed with pipes made of materials other than cast iron, they shall be encased in concrete.

Drains in Unstable Ground

42. (1) Drains passing through ground which in the opinion of the engineer is liable to movement, shall be laid on a continuous bed of river sand or similar granular material not less than 100mm thick under the barrel of the pipe with a surround of similar material and thickness, and the joints of such drains shall be approved flexible joints complying with the requirements of section 39(7).

- (2) Every pipe, which has been laid as prescribed in sub-section 42(1), shall be properly bedded and haunched by bringing the concrete up to the level of the horizontal diameter of the pipe.

Drains within or under Buildings

43. (1) A drain or part thereof may be laid or may pass, as the case may be, within or under or through a building unless the council shall decide otherwise, having regard to considerations of health and maintenance or other matters relevant to the particular case.
- (2) A drain or part thereof shall where it is under a building be without change of direction or gradient and without means of access thereto and shall be laid on a bed of concrete at least 100mm thick having a composition of not more than six parts of coarse aggregate to three parts of fine aggregate to one part of Portland cement, and if it is made of glazed earthenware, shall also be encased in similar concrete having a minimum thickness at all points of 100mm measured from the external surface of the pipe.
- (3) Where a drain or part thereof is laid in an exposed position within a building it shall be constructed of cast-iron pipes and shall be adequately supported at intervals not exceeding 150mm along its course.
- (4) No part of the weight of a wall or foundation shall bear upon a drain, which passes under or through it.

Protection of Shallow Drains

44. Any portion of a vitrified clay drain which is 450mm or less below the surface of the ground shall be encased in concrete composed of not less than 1 part of cement to 3 parts of fine aggregate and 6 parts of coarse aggregate and having a minimum thickness at all points of 100mm measured from the external surface of the pipe.

Branch Drains

45. (1) Every branch drain shall be connected to another drain by means of a junction, not being a saddle junction, made especially for the purpose of such connection.
- (2) Every branch drain shall enter the other drain obliquely in the direction of the flow so that the included angle between the axes of the two drains does not exceed 45° C.

Access to Drains

46. (1) Every drain shall be provided as a means of access thereto with a manhole as prescribed in terms of these by-laws or with an access eye with or without a rodding eye, as the council may require, at the following points.
 - (a) within 1,5m of the point of junction with the Council's sewer;
 - (b) within 1,5m of the upper extremity of every drain or branch drain;
 - (c) at every change of direction;
 - (d) at every change of gradient; and
 - (e) at every point of junction with another drain.
- (2) There shall in any case be a point of access to every drain at intervals of not more than 25m.
- (3) Access to the interior of a drain shall be provided by means of either manholes or access pipes.
- (4) The lids of openings in access pipes shall be sealed with such approved material as will remain effective as a seal at all temperatures up to 70 ° C.
- (5) (a) Where for any reason the provision of adequate means of access within 1,5m of the point of connection with the council's connecting sewer is impracticable on any private premises, the council may, at the owners expense cause or permit a manhole to be constructed over the council's connecting sewer in such public place and in such position and of such materials and dimensions as the council may decide and in addition the owner shall bear the cost, as assessed by the council, of any alteration to existing services in the public place which may be reason of the construction of the manhole be necessary.
(b) The owner of the private premises referred to in paragraph (a) shall, if required by the council, pay to the council the charges set out in the relevant schedule to these by-laws as rental for the area of the public place occupied by the manhole.
- (6) Adequate and appropriately marked removable slabs on the surface shall cover the points of access to drains laid beneath paved areas.
- (7) Where any part of a drainage installation passes under a building, it shall be provided with adequate means of access outside and as near as possible to the building at each point of its entry to and exit from the building.
- (7) In any circumstance not provided for in these by-laws, the Engineer may require that access eyes or other approved means of access to a drain or to any part thereof be provided in such positions as he may deem necessary to render the interior of any part of such drain readily accessible for cleaning or inspection.

Rodding Eyes

47. (1) Rodding eyes required by the Council in terms of section 47(1) shall be provided in the positions specified in sub-section 47(2) and shall comply with the requirements set out in sub-section 47(3).
- (2) A rodding eye shall be provided -
 - (a) within 1,5m of the point of connection between the drain and the connecting sewer;
 - (b) at the upper extremity of every drain;

- (c) at every change of direction, whether such change of direction is horizontal or vertical;
 - (d) at the upper extremity of every branch drain the developed length of which exceeds 3m; and
 - (e) at points not exceeding 25m apart along the drain.
- (3) Every rodding eye shall -
- (a) be constructed with pipes made of vitrified clay or of other approved material and shall join the drain in the direction of the flow at an angle of not more than 45° and be continued upwards to ground level;
 - (b) be completely encased in concrete not less than 100 mm thick composed of 6 parts of stone, 3 parts of sand and 1 part cement;
 - (c) in the case of a Rodding eye which is inclined from the vertical have the concrete casing adequately supported by a pier obstructed of concrete of similar composition;
 - (d) be fitted with an approved cast iron cover plate secured by bolts or screws made of brass or other corrosion-resistant material and surmounted by an approved concrete box with a cast iron cover and frame measuring 300 mm x 300 mm and finished off with a 100 mm wide granolithic surround level with the surrounding ground level: Provided that if a Rodding eye is exposed to vehicular traffic, the cast iron cover and frame shall be of a heavy duty type approved by the council.

Manholes

48. (1) Every manhole in a drainage installation shall, unless otherwise permitted by the Council, be located in an open air space.
- (2) The chamber of every manhole shall be of adequate size generally and in particular to permit the convenient insertion of drain-cleaning rods.
- (3) The floor of the base of a manhole shall be steel trowled to a smooth base surface.
- (4) Every manhole shall be so constructed as to prevent the infiltration of water.
- (5) (a) The walls of every manhole shall be constructed of concrete or brickwork supported on a concrete base not less than 150mm thick composed of not less than 1 part by volume of cement to 2 parts of fine aggregate and 4 parts of coarse aggregate.
- (b) Except when otherwise permitted by the engineer, the walls of any manhole shall, if constructed of brickwork, be not less than 220mm thick, and if constructed of concrete be not less than 150mm thick.
- (c) All bricks used in the construction of a manhole shall be hard and well burnt and shall be laid in mortar consisting of not more than 3 parts of sand to 1 part of cement, and if the walls are constructed of concrete, such concrete shall be composed of not less than 1 part of cement to 2 parts of fine aggregate and 4 parts of coarse aggregate.
- (d) Where the base of a manhole is traversed by an open channel -
- (i) the sides of the channel shall be brought up vertically to the soffit of the outgoing pipe and from that level the floor of the base of the manhole shall rise continuously to its walls at a slope of not less than 1 in 5;
 - (ii) the walls shall be plastered internally with cement plaster not less than 12 mm thick composed of not more than 4 parts of sand to 1 part of cement; and
 - (iii) the walls and floor shall be steel trowled to a smooth finish.
- (e) The walls of the manhole or the walls of any shaft giving access thereto shall be carried up to the level above the surrounding ground or floor.
- (f) Access to the interior of the manhole shall be provided by means of a cast iron cover and frame complying with South African Bureau of Standards Specification No 558, supported by a reinforced concrete slab; or the walls may be corbelled to support such frame and cover.
- (g) The top of the manhole shall be finished off with a granolithic surround not less than 150mm wide trowled to a smooth finish.
- (h) Where a manhole is constructed in a place traversed by -
- (i) heavy vehicles, it shall be provided with a heavy-duty cover;
 - (ii) motor cars or similar light vehicles, it shall be provided with either a medium or heavy-duty cover.
 - (iii) Every manhole exceeding 2m in depth shall have an unobstructed internal working height of at least 1,8 m measured from the highest point of the floor thereof, and where the floor of a manhole is more than 1m below the cover, such cast iron step-irons shall be provided in its walls as will ensure safe and convenient access to its base.
- (6) Where the base of a manhole is more than three feet below ground level such cast-iron step-irons shall be provided in its walls as will ensure safe and convenient access to the said base.
- (7) Every manhole shall be fitted with a cover sufficiently strong to support cover the load imposed by any traffic likely to pass over it and the cover shall have a double seal where the base is traversed by glazed-earthenware channels, but

need only have a single seal if the sad base is traversed by pipes access to the interior of which is obtained only through an access pipe.

- (8) Where a pipe leading into a manhole is at a higher level than the outlet pipe of the manhole it shall be brought down to the invert level of the manhole by means of a vertical or sufficiently inclined pipe encased in concrete and located outside the manhole which pipe shall also be continued upwards to the surface of the ground and shall there terminate in a removable watertight cover or such other device as may be approved by the Council.
- (9) (a) The internal length and width of a manhole shall be determined according to the depth between the cover and the lowest invert level of the manhole and shall in no case be less than the dimensions set out in the following table:

TABLE

Depth	Length	Width
Not exceeding 750mm	600 mm	450mm
Exceeding 750mm but not exceeding 2m	900 mm	600mm
Exceeding 2m	1m	750mm

- (b) The dimensions of the access opening to a manhole provided with -
- (i) a rectangular cover, shall not be less than 450mm by 600mm;
 - (ii) a square cover, shall not be less than 600mm by 600mm;
 - (iii) a circular cover, shall not be less than 550mm in diameter.
- (10) Where a pipe leading to a manhole is at a higher level than the outlet pipe of the manhole, it shall be brought down to the invert level of the manhole by means of an inclined pipe encased in concrete and located outside the manhole, which pipe shall also be continued upwards to the surface of the ground and shall there terminate in a removable watertight cover or other similar approved device: Provided that where permitted or required by the Council, the pipe at the higher level may be extended horizontally to terminate with or without a watertight cover in the manhole and in this case the inclined pipe need to be continued upwards to the surface of the ground.
- (11) The recess in the frame of every manhole cover having a single seal shall be filled with grease having a high melting point and the cover shall be set therein to form an airtight seal.

Gully Traps

49. (1) Every drainage installation shall have one gully trap provided with a dished gully and a tap above supplied with running water and, except where a mechanical appliance for the raising of sewage is installed, the top of such gully shall be not less than 150mm below the crown of the lowest situated trap of any sanitary fitting connected to the drainage installation.
- (2) No drainage installation shall have more than one gully trap connected to it, unless otherwise authorized by the council.
- (3) Where it is impracticable for any waste-water pipe to be made to discharge into the gully trap required in terms of sub-section 49(1) or into a gully trap authorized in terms of sub-section 49(2), such waste-water pipe shall be connected directly to a drain or to a soil-water pipe and the water seal of every trap connected to such waste-water pipe shall be protected in accordance with the requirements of these by-laws for the protection of water seals of traps installed on the one-pipe system.
- (4) The level of the water in the trap of any gully should not be more than 450mm below the top of the benched dishing referred to in sub-section 49(3) and when in the opinion of the Council regard being had to the relevant positions of waste-water fittings and any existing proposed adjacent drainage installation, the level of the water in the trap of any gully is required to be at a greater depth than aforesaid the gully shall be placed in an unroofed chamber constructed in the manner prescribed for manholes in section 48 the walls of which have been brought up to a height at least three inches above the surrounding ground.
- (5) A tap supplied with running water shall discharge over every gully or trap which does not receive a discharge wastewater.

Requirements for Trapped Gullies

50. (1) Every gully trap shall have a minimum internal diameter of 100mm and a water seal at least 65mm in depth.
- (2) Every gully trap shall be kept covered with a grating made of cast iron or other approved material. The spaces between the bars of the grating shall be not less than 10mm or more than 12mm wide, and shall have an effective open area at least equal to the minimum cross-sectional area of the trap.
- (3) Every gully trap laid in the ground shall be bedded on concrete not less than 100mm thick
- (4) Every dished gully shall rise at least 75mm above the level of the grating covering the gully trap and in no case less than 150mm above the level of the surrounding ground; and the levels of the tops of all other gullies shall be at least 150mm above the surrounding ground.
- (5) Subject to the provisions of sub-section 50(6), the surface level of the water in any gully trap shall not be more than 500mm below the top of the dished gully referred to in sub-section 50(4).

- (6) Where it is impracticable to comply with the dimensional requirements of sub-section 50(5), the gully trap shall be located in a manhole the walls of which shall be brought up to a height of at least 150mm above the surrounding ground and covered with an approved metal grating.
- (7) Every wastewater pipe, which discharges into a gully, shall discharge at a point below the grating but above the surface of the water seal of the gully trap.

Grease Traps

51. A grease trap of approved type, size and capacity shall be provided instead of, or in addition to, a gully as the council may decide, to take the discharge of waste-water from every sink or other fitting in -
- (a) every building the waste-water from which is disposed of in French drains or other similar works, and
 - (b) any place where in the opinion of the council the discharge of grease, oil or fat is likely to cause an obstruction to the flow in sewers or drains, or interference with the proper operation of any sewage treatment system.

Industrial Grease Traps

52. (1) Industrial effluent which contains or, in the opinion of the council, is likely to contain grease, oil, fat or inorganic solid matter in suspension shall, before it is allowed to enter any sewer, be passed through one or more tanks or chambers of approved type, size and capacity designed to intercept and retain such grease, oil, fat or solid matter.
- (2) Oil, grease or any other substance which is contained in any industrial effluent or other liquid which gives off a flammable or noxious vapor at a temperature of or exceeding 20 ° C, shall be intercepted and retained in a tank or chamber so as to prevent the entry thereof into the sewer.
- (3) A tank or chamber as referred to in sub-section 52(2), shall comply with the following requirements:
- (a) It shall be of adequate capacity, constructed of hard durable materials and watertight when completed;
 - (b) the water-seal formed by its discharge pipe shall be not less than 300mm in depth; and
 - (c) it shall be provided with such number of manhole covers as may be adequate for the effective removal of grease, oil, fat and solid matter.

Clogging of Traps, Tanks and Similar Fittings

53. No person shall cause or permit such an accumulation of grease, oil, fat, silt or solid matter in any trap, tank or other fitting as will prevent its effective operation.

Location of Gullies

54. (1) Without prejudice to the provisions of section 50(1), the inlet of every gully trap, grease trap or stable gully shall be situated outside of any building or in a place permanently open to the external air of an approved extent, and shall at all times be readily accessible for purposes of cleaning or maintenance to the satisfaction of the council.
- (2) Every floor in a factory, stable or other premises from which liquid is discharged continuously or intermittently to a gully shall have an impervious, smooth and durable surface and notwithstanding the provisions of sub-section 54(1) such gully may be situated within a building, provided that the pipe receiving the discharges from such gully discharges into another gully trap the inlet of which is situated as required in terms of sub-section 54(1).
- (3) A gully trap or traps may be situated within any building in which an automatic water sprinkler system is installed to receive the water from such system, provided that the pipe or pipes receiving the discharges from such trap or traps is made to discharge into another gully trap the inlet of which is situated as required in terms of sub-section 54(1).

Construction of Pipes

55. (1) Waste-water pipes, soil-water pipes, and ventilation pipes with their associated traps and fittings shall be constructed of cast iron, mild steel, copper, brass or drawn lead, in each case of a quality satisfactory to the Council, or of such other materials as the Council may in its discretion approve, the Council's discretion in terms of this sub-section to be exercised by reference to established codes of practice and to the appropriate standard specifications issued by the South African Bureau of Standards specification.
- (2) Cast-iron pipes and their associated traps and fittings shall have both their inside and their outside surfaces adequately coated with a bituminous or other corrosion-resisting material, and mild-steel pipes shall be adequately galvanized or otherwise rendered resistant to corrosion.
- (3) No soil-water pipe or wastewater pipe shall have an internal diameter less than that of any pipe or fitting discharging into it.

Joints

56. (1) Every connection between a pipe, trap or fitting and another pipe, trap or fitting or a drain shall be made in such a manner as to be gas and water tight end to end to cause no internal obstruction, and shall be carried out to the satisfaction of the Council in accordance with established plumbing and drainage practice.
- (2) Where the use of generally recognized methods of jointing requires a reduction in the internal diameter of any part of a pipe or trap, the amount of the reduction shall be not greater than twice the thickness of the wall of the trap or pipe or one quarter of an inch, whichever is the less, and the reduction so made shall in no case extend further along the line of flow than one and one-half times the internal nominal diameter of the trap or pipe.

Size of Pipes

57. (1) The internal diameter of waste-water pipes shall be determined according to the number and kind of fittings and shall in no case be less than that prescribed in the right-hand column of the following table in respect of the fitting or fittings appearing opposite to it in the left-hand column thereof.

TABLE

FITTINGS	MINIMUM INTERNAL DIAMETER IN MM
One wash-hand basin	30
Two, three or four wash-hand basin	40
Five or more wash-hand basins	50
One bath or sink	40
Two, three or four baths or sinks	50
Five or more baths or sinks	75
Overflow pipes	35

- (2) Notwithstanding the provisions of sub-section 57(1) of this section, where the one-pipe system is used no wastewater pipe receiving the discharge of two or more fittings shall have an internal diameter of less than 50mm.

Location of Pipes

58. (1) Every soil-water Pipe, waste-water pipe, ventilation pipe and anti-siphonage pipe shall be readily accessible for inspection and repair, and in particular no such pipe shall be built into any wall, floor, beam, column or other part of a building save in so far as it may be necessary to pass it into or out of the building.
- (2) Where any such pipe as aforesaid is attached to the outside of a building it shall be effectively protected against damage, and where it is fixed inside a building it may be encased in a chase having removable covers or a ventilated duct constructed of approved impervious material which shall have an area at least four feet square in cross section and shall be provided with means of access to its interior adequate for inspection and repair.

Access to Pipes

59. (1) Subject to the provisions of sub-section 59(2) an access eye shall be provided within six feet above the point of entry into the ground of every soil-water pipe, at each change of direction in a soil-water or waste-water pipe, at every junction of any such pipe as aforesaid with any other positions as are necessary to render the whole of the interior of any such pipe as aforesaid readily accessible for cleaning and inspection, and, in the case of a ventilation pipe, within 1m of its point of entry into the ground.
- (2) Where a soil-water pipe or waste-water pipe, not being a waste-water pipe connected to a fitting in the room, passes through a kitchen, pantry, or other room used or intended for use for the preparation, handling storage or sale of food, means of access necessary for the cleaning and inspection of that part of the said pipe which passes through the room shall be located outside the room.
- (4) An inlet to a waste-water pipe as referred to in sub-section 59(2) may be provided in the floor of such a room as there referred to so long as the said inlet is equipped with a trap situated in the open air.
- (5) No bend or junction shall be permitted in any such pipe as is referred to in sub-section 59(2) unless its position in relation to an access eye is such as to permit the ready cleaning and inspection from outside the room of every part of the pipe passing through such room.
- (6) Every ventilation pipe and every anti-siphonage pipe shall be so graded as to provide a continuous fall without the interposition of a trap from its open end to the point of connection to the waste-water pipe, soil-water pipe or drain which it serves.
- (7) Every ventilation and every anti-siphonage pipe shall unless carried up independently be connected to a main ventilation pipe at a point at least 150mm above the top of the highest fitting, which it serves.
- (8) Where the two-pipe system is used a pipe which ventilates a soil-water pipe or fitting and a pipe which ventilates a waste-water pipe or fitting shall not be connected to one another unless the waste-water fitting so ventilated as provided with a trap having a water seal not less than 60mm in depth.
- (9) Where access to a soil-water pipe within a building is permitted it shall be effected through an adequate screwed or bolted airtight cover.

Ventilation Pipes - Where Required

60. (1) A ventilation pipe complying with the relevant requirements of section 55 shall be provided for -

Every drain, every branch drain and every soil water pipe and every combination thereof the course of which exceeds 6m in length measured from its junction with a ventilated drain or a ventilated soil-water pipe to its point of connection with the soil-water fitting which it serves and every waste-water pipe and branch waste-water pipe the course of which exceeds 6m in length measured from its point of discharge over a gully or from its junction with a ventilated waste-water pipe or ventilated soil-water pipe as the case may be, to its point of connection with the waste-water fitting which it serves shall be provided with a ventilation pipe leading upwards from its highest convenient point;

- (a) every branch drain the developed length of which exceeds 6m measured from the outlet of any sanitary fitting or trap served by it to its point of connection with a ventilated drain;

- (b) every soil-water pipe the developed length of which, inclusive of the developed length of any unventilated drain into which it discharges, exceeds 6m measured from the outlet of any sanitary fitting served by it to the point of connection to a ventilated drain;
 - (c) every branch soil-water pipe which receives the discharges from only one sanitary fitting and which has a developed length greater than 6m measured from the outlet of such fitting to the point of connection to a ventilated soil-water pipe;
 - (d) every waste-water pipe the developed length of which exceeds 6m measured from the outlet of the trap of any waste-water fitting served by it to its point of discharge into a gully or similar trap; or in the case of the one-pipe system to its point of connection to a ventilated soil-water pipe or a ventilated drain;
 - (e) every branch wastewater pipe the developed length of which exceeds 6m measured from the outlet of the trap of any wastewater fitting served by it to its point of connection to a ventilated wastewater pipe.
- (2) Every soil-water stack which carries a hydraulic load greater than 50% of the load specified in column 2 of the table in section 44(4) shall, in addition to any ventilation pipe required in terms of the provisions of this section, be provided with a 100mm diameter ventilation pipe connected to such stack below the lowest point of entry to the stack of any branch waste-water pipe or soil-water pipe.
- (3) No ventilation pipe shall have an internal diameter less than that of the drain, soil-water or wastewater pipes which it ventilates.

Ventilation Pipes - Outlets

61. (1) Every ventilation pipe or anti-siphonage pipe shall be carried upwards without diminution of diameter to a height of at least 5m above the ground or to such greater height or to such position as the Council may require.
- (2) The open end of any ventilation pipe passing through or attached to a building shall be higher than that part of the roof which is closest to it and not less than six feet above the head of any window, door or other opening in the same or any other building, whether forming part of the same property or not, which is within a horizontal distance of 6m of the said open end: Provided that where a roof or any part thereof is used or capable of being used for any purpose other than that of maintenance or repair the pipe shall, unless the Council shall otherwise permit extend at least eight feet above such roof or any part thereof.
- (3) Whenever in the opinion of the Council a nuisance exists owing to the emission of gas from ventilation pipe the Council may require the owner at his own expense to extend the pipe upwards so far as the Council may prescribe.
- (4) Where any new building or any addition to an existing building has any window, door or other openings so placed that the provisions of sub-section 61(2) become contravened in respect of an existing ventilation pipe, whether on the same or any other property, the owner of such new building or addition shall at his own expense extend or cause such ventilation pipe to be extended upwards so far as may be necessary for compliance with the said sub-section.

Chimneys or Flues

62. No chimney or other flue shall be used for ventilating any drain, soil-water pipe or wastewater pipe.

Ventilation Pipes and Anti-siphonage Pipes - General

63. (1) Every ventilation pipe shall throughout its length have a nominal diameter not less than the diameter of the drain or soil-water pipe or waste-water pipe which it ventilates: Provided that if any branch drain or branch soil-water pipe carries the discharge from not more than one gully or other trap or from not more than one soil-water fitting, the diameter of the ventilation pipe may be less than the diameter of the said drain or soil-water pipe but not less than 50mm.
- (2) The connection between a ventilation pipe and any drain or pipe mentioned in section 54(1) shall be made immediately downstream of the point of discharge into such drain or pipe of the uppermost connected sanitary fitting, gully or similar trap.
- (3) Every individual anti-siphonage pipe shall be connected to the crown or soffit of the soil-water pipe or waste-water pipe on the outlet side of the protected trap obliquely in the direction of flow at a point not less than 75mm or more than 750mm from the crown of such trap.
- (4) The nominal diameter of any anti-siphonage pipe shall be in accordance with the provisions of section 46.
- (5) Every ventilation pipe and every anti-siphonage pipe shall be carried upwards without any reduction in diameter and shall, throughout its length, be so graded as to provide a continuous fall from its open end back to the waste-water pipe or soil-water pipe or drain to which it is connected.
- (6) The open end of any ventilation pipe or any anti-siphonage pipe which passes through or is attached to a building, shall be not less than 600mm higher than that part of the roof which is closest to it and not less than 2m above the head of any window, door or other opening in the same building or any other building, whether forming part of the same premises or not, which is within a horizontal distance of 6m of the said open end: Provided that -
- (a) where a roof slab or any part thereof used or is intended to be used for any purpose the pipe shall, unless the engineer shall otherwise permit, extend at least 2,5m above such roof or part thereof; and
 - (b) the open end of any ventilation pipe or anti-siphonage pipe shall in no case be less than 3,6m above ground level.
- (7) Every individual anti-siphonage pipe shall, unless carried up independently, be connected to another anti-siphonage pipe or to a ventilation pipe at a point at least 150mm above the flood level of the sanitary fitting, which it serves.

- (8) Where the two-pipe system is used, a pipe which ventilates a soil-water pipe or protects the water-seal of the trap of a soil-water fitting shall not be connected to a pipe which ventilates a waste-water pipe or a pipe which protects the water seal of the trap of a waste-water fitting.
- (9) Whenever, in the opinion of the council, a nuisance exists owing to the emission of gas from a ventilation pipe or an anti-siphonage pipe, the council may require the owner at his own expense to extend the pipe upwards for so far as the council may prescribe as being necessary to eliminate such nuisance.
- (10) Where any new building or any addition to an existing building has any window, door or other opening so placed that the provisions of sub-section 63(6) in respect of any existing ventilation pipe or anti-siphonage pipe, whether on the same or any other premises, are being contravened, the owner of such new building or addition shall, at his own expense, take such action as may be necessary for compliance with the provisions of the said sub-section 63(6).
- (11) Where the top of a ventilation pipe or an anti-siphonage pipe is more than 1m above the topmost point of its attachment to a building or other means of support, that part of the pipe which is above the said point shall be adequately stayed or shall otherwise be made secure.

Anti-Siphonage pipes - Where Required

64. (1) Subject to the provisions of sections 61, 62, 63 and 64, the water seal of the trap of a soil-water fitting shall be protected by an individual anti-siphonage pipe complying with the relevant requirements of sections 44 and 46, in all cases where the discharges from such soil-water fitting are conveyed -
- (a) by an unventilated branch drain or an unventilated soil-water pipe or a combination thereof in which there is a fall of more than 1,2m within a horizontal distance of 300mm of the crown of the trap of such fitting; or
 - (b) by an unventilated branch drain or an unventilated soil-water pipe which receives the discharges from any other soil-water fitting; or
 - (c) by a vertical pipe or stack, including any inclined part thereof, which receives at a higher level the discharges from one or more other soil-water fittings; or
 - (d) by a branch soil-water pipe which receives the discharges from any other soil-water fitting;
- Provided that individual anti-siphonage pipes may be omitted in the case of those soil-water fittings the discharges from which are carried by a branch soil-water pipe if -
- (i) the hydraulic load carried by such branch soil-water pipe does not exceed 25 discharge units;
 - (ii) such branch pipe is connected to a 100mm diameter ventilation pipe in accordance with the requirements of section 55(2); and
 - (iii) not more than 16 such branch pipes discharge into the same soil-water stack or vertical pipe.
- (2) The water seals of the traps of waste-water fittings installed in accordance with the requirements of these by-laws for the two-pipe system shall be protected by individual anti-siphonage pipes, unless approved re-sealing traps are installed: Provided that this requirement shall not apply to a single bath, shower or sink having an independent discharge to a gully trap and situated not more than 2m above or 3m from such gully trap.
- (3) Subject to the provisions of sections 61, 62 63 and 64, individual anti-siphonage pipes shall protect the water seals of the traps of wastewater fittings installed in accordance with the requirements of these by-laws for the one-pipe system.

Sizes of Anti-siphonage Pipes

65. (1) The nominal diameter of an individual anti-siphonage pipe for the protection of the water seal of the trap of a water closet pan shall be not less than 50mm.
- (2) The nominal diameter of an individual anti-siphonage pipe for the protection of the water seal of the trap of a urinal or a waste-water fitting shall be not less than 32mm or one half the diameter of the soil-water pipe or waste-water pipe to which the said individual pipe is connected, whichever is the greater diameter.
- (3) (a) For the purpose of this subsection -
- (i) the developed length of a branch anti-siphonage pipe shall be the length of the pipe measured from its point of connection to a main anti-siphonage pipe or from its point of connection to a ventilation pipe, as the case may be, to the farthest individual anti-siphonage pipe connected to it;
 - (ii) the developed length of a main anti-siphonage pipe shall be the length of the pipe measured from the open end of such main anti-siphonage pipe, or from the open end of a ventilation pipe if the said main anti-siphonage pipe is connected to it, to its farthest point of connection to a soil-water pipe or waste-water pipe.
- (b) Where at any point on a branch anti-siphonage pipe or on a main anti- siphonage pipe, as the case may be, the sum of the discharge units of all sanitary fittings, the individual anti-siphonage pipes of which are connected either directly or indirectly to the aforesaid branch or main anti-siphonage pipe downward of such point, falls within the sum of discharge units specified in column 1 of the following table the nominal diameter of the branch or main pipe at that point shall, subject to the provisions of sub-sections 65(1) and 65(2), be not less than the diameter specified in column 3 for the applicable developed length of such pipe as set out in column 2 of the table.

TABLE

1	2	3
Sum of discharge units of sanitary fittings connected to the branch or main anti-siphonage pipe	Developed length of branch or main anti-siphonage pipe (meters)	Nominal diameter of branch or main anti-siphonage pipe

		Internal diameter (metallic pipes), (mm)	Outside diameter (non-metallic pipes) (mm)
1	unlimited	32	40
1½ to 3	unlimited	38	40
3½ to 8	not exceeding 30	38	50
	exceeding 30 but not exceeding 51	50	50
	not exceeding 51	50	75
8½ to 16	not exceeding 9	38	40
	exceeding 9 but not exceeding 30	38	50
	exceeding 30 but not exceeding 51	50	50
	exceeding 51	50	75
16½ to 24	not exceeding 9	38	50
	exceeding 9 but not exceeding 30	50	50
	exceeding 30 but not exceeding 51	50	75
	exceeding 51	65	75
24½ to 42	not exceeding 5	38	50
	exceeding 5 but not exceeding 9	50	50
	exceeding 9 but not exceeding 21	50	75
	exceeding 21 but not exceeding 51	65	75
	exceeding 51 but not exceeding 75	75	75
42½ to 64	exceeding 75	75	110
	not exceeding 7	50	50
	exceeding 7 but not exceeding 15	50	75
	exceeding 15 but not exceeding 36	65	75
	exceeding 36 but not exceeding 60	75	75
64½ to 95	exceeding 60 but not exceeding 90	75	110
	exceeding 90	100	110
	not exceeding 5	50	50
	exceeding 5 but not exceeding 7	50	75
	exceeding 7 but not exceeding 27	65	75
	exceeding 27 but not exceeding 51	75	75
95½ to 500	exceeding 51 but not exceeding 75	75	110
	exceeding 75	100	110
	not exceeding 7	65	75
	exceeding 7 but not exceeding 18	75	75
	exceeding 18 but not exceeding 24	75	110
500½ to 1 100	exceeding 24 but not exceeding 96	100	110
	exceeding 96	125	160
	not exceeding 5	65	75
	exceeding 5 but not exceeding 9	75	75
	exceeding 9 but not exceeding 15	75	110
	exceeding 15 but not exceeding 57	100	110
1 100½ to 1 900	exceeding 57 but not exceeding 177	125	160
	exceeding 177	125	160
	not exceeding 5	75	75
	exceeding 5 but not exceeding 7	75	110
	exceeding 7 but not exceeding 27	100	110
	exceeding 27 but not exceeding 75	125	160
1 900½ to 3 600	exceeding 75 but not exceeding 195	150	160
	exceeding 195	200	-
	not exceeding 7	100	110
	exceeding 7 but not exceeding 21	125	160
	exceeding 21 but not exceeding 57	150	160
1 900½ to 3 600	exceeding 57 but not exceeding 222	200	-
	exceeding 222	225	-

Soil-water Pipe and Waste-water Pipe Systems - General

66. Soil-water pipe and wastewater pipe installations shall comply with the requirements, as hereinafter set out, for either of the following systems:

- (a) The one pipe system, or
- (b) the two pipe system, or
- (c) the single stack system:

Provided that the engineer may permit any combination of the requirements of each system if, in his opinion such combination will result in an adequately ventilated drainage installation and the effective protection of the water seals of all traps connected thereto.

Requirements for the One-Pipe System

67. The following requirements shall apply to the one-pipe system:

- (a) All soil-water pipes shall be connected directly to a drain or to another soil-water pipe similarly connected;
- (b) all waste-water pipes shall be connected directly to a drain or to a soil-water pipe; and
- (c) the depth of the water seal of the trap of every waste-water fitting shall be not less than 65mm nor more than 100mm, and each such water seal shall be protected by means of an anti-siphonage pipe in accordance with the relevant provisions of sections 55 and 57.

Requirements for the Two-Pipe System

68. The following requirements shall apply to the two-pipe system:

- (a) Every wastewater pipe or system of wastewater pipes shall discharge into a gully trap connected to a drain or to a soil-water pipe;
- (b) every soil-water pipe shall be connected directly to a drain or to another soil-water pipe similarly connected; and
- (c) the depth of the water seal of the trap of every wastewater fitting shall be not less than neither 38mm nor more than 100mm and the protection of the water seal of each such trap shall be effected in accordance with the provisions of section 56(2).

General Requirements for the Single Stack System

69. The following provisions and requirements shall apply in the case of the single stack system:

- (a) The single stack system shall be installed only in a building of the office class or a residential building.
- (b) The single stack system shall not be installed in any building the height of which exceeds 25 stories above the lowest ground level abutting on such building.
- (c) Notwithstanding anything to the contrary in these by-laws contained individual anti-siphonage pipes for the protection of the water seals of the traps of sanitary fittings may be omitted in any drainage installation carried out in accordance with the requirements of sections 62, 63 and 64.

Single Stack System: Requirements for Residential and Office Buildings

70. The following requirements shall apply in the case of the single stack system in both residential and office buildings:

- (a) The soil-water stack shall, at its topmost end, be continued upwards as a ventilation pipe to comply with the relevant provisions of section 55 and may, in addition, be provided with a supplementary ventilation pipe.
- (b) A supplementary ventilation pipe as required in terms of paragraph (a), shall have a nominal diameter of not less than 50mm and shall be connected to the soil-water stack at a point below the lowest branch pipe connected to such stack, and shall be continued upwards and be interconnected to such stack to the intervals prescribed for the buildings as required in sections 63 and 64.
- (c) The interconnection between a supplementary ventilation pipe and any other pipe shall be so located and made that no soil-water or wastewater can, under any circumstances, be discharged through any ventilation pipe.
- (d) The radius of the centerline of any bend installed at the lowest extremity of the soil-water stack shall not be less than 300mm.
- (e) No offset shall be made in any soil-water stack or waste-water stack unless a supplementary ventilation pipe is provided to relieve any pressure caused by the offset, and the nominal diameter of such ventilation pipe shall not be less than one half the diameter of the stack.
- (f) Every wastewater trap shall be either a "P" trap of the resealing type or other approved "P" trap with a water seal of not less than 75mm in depth.
- (g) The vertical distance between the invert of the lowest branch pipe connected to the stack and the invert of the drain at the point of connection between the stack and the drain shall be not less than 500mm in the case of a stack serving a building of not more than three stories in height, and 3m in the other cases.
- (h) Where soil-water fittings and waste-water fittings are installed in ranges or batteries, the branch pipe conveying the discharges from the soil-water fittings shall be separate from the branch pipe conveying the discharges from the waste-water fittings, and each such branch pipe shall individually be connected to the stack.
- (i) The gradient of any branch pipe conveying wastewater shall in no part be steeper than 1 in 25 or flatter than 1 in 50.
- (j) The point of connection between a branch waste-water pipe and a stack shall be so located that the center line of the branch pipe meets the center line of the stack at or above the level at which the center line of any water closet branch pipe meets the center line of the stack or at least 200mm below such level.

Single Stack System: Additional Requirements for Residential Buildings

71. The following additional requirements shall apply to a single stack system installed in a residential building:

- (a) The branch pipe of each fitting in a group of sanitary fittings shall be separately connected to the stack.
- (b) Where the trap fitted to a wash-hand basin has a nominal diameter of 32mm, the diameter of the branch pipe, which connects such trap to the stack, shall not be less than 38mm.
- (c) The gradient of the branch pipe referred to in paragraph (b) shall in no part be steeper than 1 in 25, and the length of such pipe measured between its point of connection with the soil-water stack and the crown of the trap shall not exceed 3m.
- (d) Not more than 2 groups of sanitary fittings installed in any one story shall be connected to the same stack.
- (e) The nominal diameter of a stack serving a residential building, the height of which exceeds 20 stories above the lowest ground level abutting on such building, shall not be less than 150mm.
- (f) Where a stack with a nominal diameter of 100mm serves a residential building which -
 - (i) does not exceed a height of 10 stories, a supplementary ventilation pipe shall not be required;
 - (ii) exceeds 10 stories but does not exceed 15 stories in height and such stack receives the discharges from one group of sanitary fittings installed at each story, a supplementary ventilation pipe with a nominal diameter of

- (iii) not less than 50mm shall be provided and interconnected with the stack above the level of the highest branch pipe connection of each alternate story; exceeds 10 stories but does not exceed 15 stories in height and such stack receives the discharges from 2 groups of sanitary fittings installed in each story, a supplementary ventilation pipe with a nominal diameter of not less than 50mm shall be provided and interconnected with the stack above the level of the highest branch pipe connection at each story;
 - (iv) exceeds 15 stories but does not exceed 20 stories in height and such stack receives the discharges from one group of sanitary fittings installed in each story, a supplementary ventilation pipe with a nominal diameter of not less than 75mm shall be provided and interconnected with the stack above the level of the highest branch pipe connection at each alternate story;
 - (v) exceeds 15 stories but does not exceed 20 stories in height and such stack receives the discharges from 2 groups of sanitary fittings installed in each story, a supplementary ventilation pipe with a nominal diameter of not less than 75mm shall be provided and interconnected with the stack above the level of the highest branch pipe connection at each story.
- (g) Where a stack with a nominal diameter of 150mm serves a residential building not exceeding 25 stories in height, a supplementary ventilation pipe shall not be required.

Single Stack System: Additional Requirements for Office Buildings

72. The following additional requirements shall apply in the case of a single stack system installed in a building of the office class:

- (a) Subject to the provisions of paragraph (e), individual anti-siphonage pipes may be omitted in the case of sanitary fittings installed in ranges or batteries as envisaged in the table below, if the branch pipes to which such fittings are connected are themselves separately connected to the stack, and a supplementary ventilation pipe as specified in the said table is provided.
- (b) The supplementary ventilation pipe referred to in paragraph (a) shall be interconnected with the stack above the level of the highest branch pipe connection at each story.
- (c) The nominal diameter of the supplementary ventilation pipe shall be not less than the diameter specified in the table below, regard being had to the diameter of the stack, the number of stories served by such stack and the number of sanitary fittings installed in a range or battery in each story.
- (d) For the purposes of the table below, more than one urinal but not more than four urinals may be regarded as equivalent to one water closet pan.
- (e) The single stack system shall not be used in any building of the office class if the number of sanitary fittings installed in a range or battery in any story exceeds the number specified in the table below for the relevant diameter of stack, or if the number of stories served by such stack exceeds the number specified in the said table.

TABLE

Nominal diameter of stack	Number of stories served by the stack	Number of sanitary fittings installed in a range or battery in each story	Nominal diameter of supplementary ventilation pipe
100mm	8 stories	not exceeding 2W.C. pans and 2 hand basins	not required
		exceeding 2W.C. pans and 2 hand basins but not exceeding 5 W.C. pans and 5 hand basins	50mm
	12 stories	not exceeding 4 W.C. pans and 4 hand basins	50mm
150mm	8 stories	not exceeding 4 W.C. pans and 4 hand basins	not required
	24 stories	not exceeding 3 W.C. pans and 3 hand basins	not required

Protection of Soil-Water Traps

73. Subject to the provisions of section 63, the water seal of the trap of a soil-water fitting shall in the following cases be protected by means of an anti-siphonage pipe of such location and dimensions as are prescribed in section 61, that is to say, in all cases where the said fitting -
- (a) discharges into an unventilated drain or soil-water pipe or a combination thereof in which there is a fall of more than four feet within a horizontal distance of eight feet of the crown of the trap; or
 - (b) discharges into a soil-water pipe or drain having an inclination from the horizontal greater than 45° and receiving at a higher level the discharge from another soil-water fitting; or

Ventilation of Soil-Water Fittings

74. Where a number of soil-water fittings is installed on a branch soil-water pipe which is continued beyond the end of the last fitting and there connected to a ventilation pipe at a point not less than six inches above the top of any of the fittings served, anti-siphonage pipes may be omitted: Provided that where more than four fittings are so installed an additional ventilation pipe having an internal diameter of not less than two inches shall be connected to the branch soil-water pipe at a point beyond every fourth fitting and shall be connected to a ventilation pipe at a point not less than six inches above the top of any of the fittings served.

Protection of Waste-Water Traps

75. (1) In the one-pipe system the water seal of the trap of every wastewater fitting shall be protected by means of an anti-siphonage pipe.
- (2) In the two-pipe system the water seal of the trap of every waste-water fitting shall be protected by means of an anti-siphonage pipe unless an approved re-sealing trap is installed: Provided that this sub-section shall not apply in the case of a single bath, shower or sink having an independent discharge to a gully.

Design and Installation of Soil-water Pipes and Waste-water Pipes

76. (1) No soil-water pipe or wastewater pipe shall have an internal diameter less than the diameter of any other pipe or of the trap of any sanitary fitting discharging into it.
- (2) No pipe having an internal diameter of less than 100mm shall receive the discharges from any water closet pan.
- (3) Save as otherwise provided in sections 61, 62, 63 and 64 in respect of the single stack system -
- (a) the hydraulic load carried by a vertical pipe or stack having a nominal diameter set out in column 1 of table 2 under section 24, shall not exceed the number of discharge units specified in column 2 of that table for such pipe or stack: Provided that where the angle of any inclined part of a stack is less than 45° above the horizontal, such part shall be deemed to be a horizontal pipe and the diameter of such part shall be determined in accordance with the provisions of paragraph (b) and the diameter of the stack below such inclined part shall be not less than the diameter of the inclined part;
- (b) the hydraulic load carried by a horizontal pipe, other than a branch pipe, having a nominal diameter set out in column 1 of the said table 2, shall not exceed the number of discharge units specified in column 4 for such pipe;
- (c) the load carried by a branch pipe having a diameter set out in column 1 of the said table 2 shall not exceed the number of discharge units specified in column 3 for such pipe;
- (d) and notwithstanding anything to the contrary in these by-laws contained, any waste-water pipe having a diameter of 100mm or greater than 100mm and any soil-water pipe shall be deemed to be a drain from that point downstream of which the inclination of such pipe and of any drain to which it is connected does not in any part exceed 45° C below the horizontal, and the permissible hydraulic load for that part of the waste-water pipe and soil-water pipe deemed to be a drain shall not exceed the number of discharge units prescribed in column 5, 6, 7 or 8 of the said table 2 for a drain of equivalent diameter and gradient;
- (e) and where the diameter of any soil-water stack or any waste-water stack is greater than the diameter of any drain into which it discharges, the pipe at the base of such stack shall be extended horizontally for a length of not less than 2m without any reduction in diameter before it is connected to the drain, and when required by the council, a manhole shall be provided at such point of connection.

Location of Soil-water, Waste-water, Ventilation and Anti-siphonage Pipes

77. (1) Every soil-water pipe, wastewater pipe, ventilation pipe and anti-siphonage pipe shall be effectively protected against damage by vehicular impact or shall be so located as to be effectively protected against such damage.
- (2) No pipe mentioned in sub-section 77(1) should be so installed that the removal of any part of a building for the purpose of gaining access to renew, maintain or repair such pipe will endanger the structural stability of the building or any part thereof.
- (3) The shape and dimensions of a recess or chase containing any part of a drainage installation and the arrangement of all pipes and any other services therein shall be such as the Council considers adequate to permit the renewal, replacement, maintenance or repair of such installation or service, and if such recess or chase is provided with a cover or covers, it shall be adequately ventilated.
- (4) If an enclosed shaft or duct contains any part of a drainage installation it shall be adequately ventilated, shall have a minimum cross-sectional area of 1,5m² and a minimum width of 1m and shall be provided with means of access to its interior adequate for inspection and repair of the drainage installation and of any other services therein: Provided that the council may, subject to the provisions of sub-section 77(2) and to such further conditions as it may consider necessary, permit any part of a drainage installation to be located in an unventilated enclosed shaft or duct having a smaller cross-sectional area and width in any case where the whole of the interior of every soil-water pipe and waste-water pipe contained therein is otherwise rendered readily accessible for cleaning.
- (5) Unless otherwise permitted by the council, regard being had to the aesthetics of external appearance and the amenities of the neighborhood, no pipe, bend or junction forming part of a drainage installation serving a building shall be exposed to view from the outside of such building.

Access to Interior of Soil-water Pipes and Waste-water Pipes

78. (1) Subject to the provisions of sub-section 78(2), adequate means of access to the interior of the pipe shall be provided within 2m above the point of entry into the ground of every soil-water pipe and in such other positions as are necessary to render the whole of the interior of every soil-water pipe, waste-water pipe and every bend and junction associated therewith readily accessible for cleaning.
- (2) Where a soil-water pipe or waste-water pipe, not being a waste-water pipe connected to a fitting in the room, passes through a kitchen, pantry or other room used or intended for use for the preparation, handling, storage or sale of food, the means of access necessary for the cleaning of that part of the said pipe which passes through the room, shall be located outside the room.
- (3) An inlet to a waste-water pipe as referred to in sub-section 78(2) may be provided in the floor of such a room as is referred to in sub-section 78(2) so long as the said inlet is equipped with a trap connected to a pipe discharging over a gully or other trap situated in the open air.
- (4) No bend or junction shall be permitted in any such pipe as is referred to in sub-section 78(2), unless its position in relation to any access eye is such as readily permit the ready cleaning from outside the room of every part of the part passing through such room.
- (5) If access to a soil-water pipe is permitted and provided within a building, access to a soil-water pipe located within a building shall be provided only through an adequate screwed or bolted airtight cover.

Waste, water, Soil-water, Ventilation and Anti-Siphonage Pipes and Fittings

79. (1) Waste-water pipes, soil-water pipes, ventilation pipes and anti-siphonage pipes and their associated traps and fittings shall be made of cast iron, mild steel, copper, brass, drawn lead, asbestos cement or unplasticised polyvinyl chloride, in each case of approved quality in accordance with the relevant South-African Bureau of Standards Specification, if applicable, or of such other materials as the council may at its discretion approve. The council's discretion in terms of this subsection shall be exercised by reference to established codes of practice and to the appropriate standard specifications issued by the South African Bureau of Standards from time to time, or in the absence of any such specifications, to the appropriate British Standard Specification.
- (2) An approval given by the council in terms of sub-section 79(1) may include such conditions as it may deem necessary to prevent the spread of fire or the spread of noxious fumes in dangerous quantities given off by pipes, traps or other fittings made of such other materials in the event of an outbreak of fire.
- (3) Cast iron pipes and their associated traps and fittings shall have both their inside and outside surfaces adequately coated with a bituminous or other corrosion-resisting material, and mild steel pipes and fittings shall be adequately galvanized or otherwise rendered resistant to corrosion.
- (4) Where the axes of two or more branch waste-water pipes or branch soil-water pipes intersect at a common point on the axis of a waste-water pipe or a soil-water pipe, the included angle between the axes of the said branch pipes shall not exceed 90°.

Joints between Pipes and Pipes and Fittings

80. Every connection between a pipe, trap or fitting and another pipe, trap or fitting shall be made in such a manner as to be gas and water-tight and to cause no internal obstruction, and shall be carried out to the approval of the council in accordance with established plumbing and drainage practice.

Traps to Waste-water Fittings

81. (1) There shall be provided immediately beneath every wastewater fitting traps an approved self-cleansing tubular trap having an adequate cleaning eye protected by the water seal and having a removable cover.
- (2) Except in the case of a trap made of rubber or other approved flexible material, every trap on terms of sub-section 81(1) shall be provided with an adequate cleaning eye protected by a water seal and having a removable cover.
- (3) The nominal diameter of any trap shall be not less than 32mm in the case of a trap serving a wash-hand basin and 38mm in the case of traps serving other wastewater fittings.
- (4) The depth of the water seal in a trap shall in no case exceed 100mm and shall be not less than 40mm in the two-pipe system and not less than 65mm in the one-pipe system.
- (5) Notwithstanding the provisions of sub-section 81(1), it shall be permissible -
- (a) for a bath, wash-hand basin or shower to discharge without the interposition of a trap as aforesaid into an open channel semi-circular in cross section having a diameter of at least 100mm, made of glazed earthenware, porcelain or other approved material, accessible for cleaning throughout its length and fixed immediately beneath the point or points of discharge into a trapped gully constructed and fixed as prescribed in terms of these by-laws;
- (b) for a bath, wash-hand basin or shower installed in a compartment containing a urinal to discharge without the interposition of a trap as aforesaid into the urinal channel: Provided that such channel is constructed in accordance with the provisions of section 68 and 73.
- (6) Every inlet to a drain other than that from a ventilation pipe, a soil-water fitting, a soil-water pipe or another drain shall be closed by an approved trap and so formed and fixed as to be capable of maintaining a water seal at least two and a half inches in depth and no other trap shall be placed between that trap and the Council's sewer.
- (7) Wastewater fittings forming part of a two-pipe system shall discharge into a gully of approved type, and the point of such discharge shall be above the surface of the water seal in the trap.

Soil-water Fittings

82. (1) Every room or compartment containing any soil-water fitting shall have a rigid floor of non-absorbent material.
- (2) Without prejudice to the particular provisions of sections 72 and 73, every soil-water fitting shall be made of earthenware, section 67, 68, 72 and 73 fireclay, porcelain, vitreous china or other approved material having in every case a glazed or smooth finish, shall be of approved type and shall be provided with a trap having a water seal not less than 50mm in depth.

Water Closet Soil-water Fittings

83. (1) Every water closet pan of the wash-down or siphonic type and its associated trap shall be made in one piece, shall be provided with an integral flushing rim so constructed that the entire surface of the bowl is effectively flushed, and shall have a minimum standing water-level area of 130cm²: Provided that the trap used with a squatting pan may be an independent unit.
- (2) Any such trap as referred to in sub-section 83(1) shall have an exposed outlet of sufficient length to be conveniently accessible for jointing: Provided that the provisions of this subsection may be relaxed in the case of water closet pans connected to a soil-water pipe by bolts or flanges or other approved devices.
- (3) If a ventilating horn is provided on the trap referred to in sub-section 83(1), such horn shall have an internal diameter of not less than 50mm and shall be placed at the side of and not less than 75mm from the crown of the trap on its outlet side.

- (4) The following requirements shall be applicable to "P" traps fitted to water closet pans:
 - (a) they shall not be fitted with ventilating horns; and
 - (b) their outlet pipes shall slope downwards at an angle of not less than five degrees to the horizontal.
- (5) The minimum internal diameter of the outlet of every trap shall be 90mm in the case of a wash-down or squatting pan and 80mm in the case of a siphonic water closet pan.
- (6) The distance between the invert and the lip of the trap of a wash-down water closet pan shall be not less than 70mm or more than 75mm.
- (7) Except in the case of squatting pans, pans shall be provided with hinged or other seats of approved type and material.
- (8) Any pad or packing inserted between the base of the pan and the floor shall be of non-absorbent material.
- (9) The council may at its absolute discretion and subject to such conditions as it may impose, permit the use of trough closets of approved design in separate buildings provided for the purpose.

Urinals

84. (1) Urinals shall be of the stall, slab, wall hung or other approved type made to discharge, without the interposition of a trap, into a channel uniformly graded to a trap connected to a drain or soil-water pipe: Provided that a wall hung urinal may, subject to the provisions of sub-section 84(3), have a trap attached to or formed integrally with the urinal directly connected to a soil-water pipe or drain.
- (2) No automatic flush urinals will be allowed
- (3) Wall hung urinals shall have -
 - (a) a minimum overall height, excluding any trap, of 600mm; and
 - (b) a minimum overall width of 380mm; and
 - (c) a minimum horizontal projection from the back of the fixture to the front of the lip of 380mm
- (4) Where urinals of any type are installed for public use or are installed in a factory, hostel or educational institution, or where more than three wall hung urinals are installed in the same room or compartment in any building, such urinals shall discharge into a channel complying with the relevant requirements of this section.
- (5) Where urinals are directly connected to a soil-water pipe or drain, the floor of the room or compartment containing the urinals shall be graded and drained to an approved floor trap similarly connected.
- (6) All surfaces liable to fouling in any room or compartment containing a urinal shall be protected with an approved impervious material having a glazed or other smooth finish.
- (7) The floor of a room or compartment containing a urinal channel shall slope towards and drain into the channel: Provided that where the channel is raised above the level of the floor, a platform at least 400mm wide shall be provided and only the said platform shall be required to slope and drain as aforesaid.
- (8) Every channel and trap forming part of a urinal or receiving the discharges from a urinal shall be made of approved impervious material having a glazed or smooth finish and shall be located in the same room or compartment as the urinal itself.
- (9) The nominal diameter of a trap receiving the discharges from a channel in a compartment or room containing a urinal shall be not less than 75mm and the diameter of a trap attached to or formed integrally with a wall hung urinal shall be not less than 38mm.
- (10) At least one trap having a diameter of 75mm shall be provided for every 5 urinal stalls or for every 3,5m length of slab urinal; or at least one trap having a diameter of 100mm for every 10 stalls or 7m length of slab urinal.
- (11) Except in the case of a siphonic urinal, every urinal trap shall be provided with a hinged and domed grating designed to retain solid matter without obstructing the flow of liquids.

Flushing of Soil-water Fittings

85. (1) Every soil-water fitting shall be capable of being effectively flushed by means of a flushing cistern, flushing valve or other device approved by the Council as being except suitable for the purpose: Provided that urinals may, except where they form part of a conserving-tank drainage installation, be flushed by a continuous flow of water.
- (2) Notwithstanding the generality of sub-section 85(1) the flushing action shall be effective to flush the entire fouling surface of the fitting and clear the trap completely at each flush.

Flushing Cisterns

86. (1) No mechanism of a flushing cistern shall so operate that the cistern is automatically refilled after every flushing, that the inflow of water is automatically stopped when the cistern is full and that no water can escape from the cistern otherwise than by the manual operation of the flushing mechanism or through an overflow pipe.
- (2) A flushing cistern shall have an overflow pipe of adequate diameter the discharge from which shall be reasonably detectable and so directed that it cannot cause damage to the building.
- (3) The ball valve in a cistern shall be so located and constructed that no back-siphonage from the cistern can take place.

- (4) The flow of water into a flushing cistern shall be separately controlled by a stop tap or other approved device situated within 2m thereof in the same room or compartment as the cistern.
- (5) Flushing cisterns for water closets slop hoppers and bedpan sinks and washers shall discharge at each flush not less than 11 liters of water.
- (6) Automatic flushing cisterns for trough closets shall at each flush and at intervals of not more than 30 minutes discharge not less than 13l of water for each seat.

Mechanical supplies for lifting sewage

87. (1) Every person shall before installing any mechanical appliance for the raising or transfer of sewage in terms of sub-section 4(5), make application in writing to the Council for permission to do so in the form, to be completed in duplicate, set out in the relevant appendix to these by-laws and shall thereafter give such additional information as the engineer may require.
- (2) A professional engineer who is full conversant with the technical details of the appliance shall complete the form prescribed by sub-section 87(1), and the owner of the premises shall sign the undertaking annexed to such form.
- (3) The application mentioned in sub-section 87(1) shall be accompanied by drawings prepared in accordance with the relevant provisions of section 27 and shall show details of the compartment containing the appliance, the sewage storage tank, the stilling chamber and the position thereof, and the positions of the drains, ventilation pipes, rising main and the connecting sewer.
- (4) Notwithstanding any permission given in terms of sub-section 87(1), the council shall not be liable for any injury or damage to life or property caused by the use, malfunctioning or any other condition arising from the installation or operation of such appliance.
- (5) Every mechanical appliance installed for the raising or transfer of sewage shall be specifically designed for the purpose and shall be fitted with a discharge pipe, sluice valves and non-return valves located in approved positions.
- (6) Unless otherwise permitted by the engineer, such mechanical appliances shall be installed in duplicate and each such appliance shall be so controlled that either will begin to function automatically immediately in the event of failure of the other.
- (7) Every mechanical appliance forming part of a drainage installation shall be so located and operated as not to cause any nuisance through noise or smell or otherwise and every compartment containing any such appliance shall be effectively ventilated.
- (8) The maximum discharge rate from any mechanical appliance and the times between which the discharge may take place shall be as prescribed by the engineer who may, at any time, require the owner to install such fittings and regulating devices as may be necessary to ensure that the said prescribed maximum discharge rate shall not be exceeded.
- (9) (a) except where sewage storage space is incorporated as an integral part of a mechanical appliance, a sewage storage tank shall be provided in conjunction with such appliance.
- (b) Every sewage storage tank required in terms of paragraph (a) shall -
 - (i) be constructed of hard, durable materials and shall be watertight and the internal surfaces of the walls and floor shall be rendered smooth and impermeable;
 - (ii) have a storage capacity below the level of the inlet equal to the quantity of sewage discharged thereunto in 24 hours or 900 liters, whichever is the greater quantity; and
 - (iii) be so designed that the maximum proportion of its sewage content shall be emptied at each discharge cycle of the mechanical appliance.
- (10) If the mechanical appliance consists of a pump, the starting mechanism shall be set for pumping to commence when the volume of sewage contained in the storage tank is equal to not more than one-fifth of its storage capacity.
- (11) When required by the engineer, a stilling chamber shall be installed between the outlet of the mechanical appliance and the connecting drain or connecting sewer, as the case may be, and such chamber shall have a depth of not less than 850mm.
- (12) Every storage tank and stilling chamber shall be provided with a ventilation pipe having a diameter of not less than 10mm carried upwards in accordance with the relevant provisions of section 55.

Septic Tanks and Treatment Plants

88. (1) No person shall construct, install, maintain or operate any septic tank or other plant for the treatment, disposal or storage of sewage without the prior written consent of the Council, the giving of which shall be without prejudice to any of the provisions of these by-laws and in any event without complying with its Public Health By-laws so far as relevant, or any other relevant by-laws.
- (2) No part of any septic tank or other sewage treatment plant shall be situated nearer than 3m to any building used for human habitation or to any boundary of the piece of land on which it is situated or in any such other position as may be prohibited or limited by the council's Public Health By-laws or any other relevant by-laws.
- (3) The effluent from a septic tank or other sewage treatment plant shall be disposed of to the satisfaction of the council.
- (4) Every septic tank shall be watertight, securely covered and provided with gas-tight means of access to its interior adequate to permit the inspection of the inlet and outlet pipes and adequate for the purpose of removing sludge.

- (5) (a) A septic tank serving a dwelling house shall -
 - (i) have a capacity below the level of the invert of the outlet pipe of not less than 500 liters per bedroom, subject to a minimum capacity below such invert level of 2 500 liters;
 - (ii) have an internal width of not less than 1 m measured at right angles to the direction of the flow;
 - (iii) have an internal depth between the cover and the bottom of the tank of not less than 1,7m;
 - (iv) retain liquid to a depth not less than 1,4m.
- (b) Septic tanks serving premises other than a dwelling house shall be of approved design, construction and capacity.

French Drains

- 89. (1) The council may, at its discretion and on such conditions as it may prescribe having regard to the quantity and the nature of the effluent and the nature of the soil as determined by the permeability test prescribed by the South African Bureau of Standards, permit the disposal of waste-water or other effluent by means of French drains, soakage pits or other approved works.
- (2) No part of a French drain, soakage pit or other similar work shall be situated nearer than 5m to any building used for human habitation or to any boundary of the piece of land on which it is situated, or within such other distance or in such position as may be prescribed by the council's Public Health By-laws or any other relevant by-laws, nor in any such position as will, in the opinion of the council, cause contamination of any borehole or other source of water which is or may be used for drinking purposes, or cause dampness in any building.
- (3) The dimensions of any French drain, soakage pit or other similar work shall be determined in relation to the absorbent qualities of the soil and the nature and quantity of the effluent.

Conservancy Tanks

- 90. (1) The council may at its discretion permit the owner of any premises to construct a conservancy tank and ancillary appliances for the retention of soil-water or such other sewage or effluent as it may decide and such tank and appliances shall be of such capacity and located in such position and at such level as it may prescribe.
- (2) No rainwater or stormwater and no effluent other than that, which the council shall have permitted in terms of subsection 90(1), shall be discharged into a conservancy tank.
- (3) No conservancy tank shall be used as such unless -
 - (a) it is constructed of hard and durable materials;
 - (b) the walls, if made of brick, are at least 220mm thick and made of approved bricks, laid in cement mortar, or if made of reinforced concrete, are at least 150mm thick;
 - (c) the floor is made of concrete not less than 150mm thick;
 - (d) the roof is made of concrete of adequate strength to withstand the loads to which it may be subjected;
 - (e) the exposed surfaces of the walls, floor and roof are rendered smooth and impermeable;
 - (f) the invert of the tank slopes towards the outlet at a gradient of not less than 1 in 10;
 - (g) the tank is gas and water-tight;
 - (h) the tank has an outlet pipe, 100mm in internal diameter, made of wrought iron, cast iron or other approved material, and except if otherwise permitted by the council, terminating at an approved valve and fittings for connection to the council's removal vehicles;
 - (i) the valve and fittings referred to in paragraph (h) or the outlet end of the pipe, as the case may be, are located in a chamber, having an approved hinged cover and situated in such position as the council may require;
 - (j) access to the conservancy tank is provided by means of an approved manhole fitted with a removable cast iron cover placed immediately above the visible spigot of the inlet pipe.
- (4) The council may at its discretion, having regard to the position of a conservancy tank or of the point of connection for a removal vehicle, make it a condition of its emptying the tank that the owner or user thereof shall indemnify the council, in writing, against any sum which it may become liable to pay to any person as a result direct or indirect, of the rendering of that service.
- (5) Where the council's removal vehicle has to traverse private premises for the emptying of a conservancy tank, the owner thereof shall provide for the purpose of roadway at least 3,5m wide, so hardened as to be capable of withstanding a wheel load of 4 metric tons in all weather, and shall ensure that no gateway through which the vehicle is required to pass to reach the tank, shall be less than 3,5m wide.
- (6) The council shall be entitled to empty or to draw of part of the contents of any conservancy tank at any reasonable time on any day of the week and in such matter as it may decide having regard to the general requirements of the service and in particular to the necessity for avoiding separate or unnecessary journeys by the council's removal vehicles.
- (7) The owner or occupier of premises on which a conservancy tank is installed shall at all times maintain such tank in good order and condition to the satisfaction of the council.

CHAPTER 6

Industrial Effluent and Other Discharges

Sewage or other Prohibited Discharges not to Enter Storm water Drains

- 91. (1) No person shall discharge or cause or permit to be discharged any sewage directly or indirectly into a storm water drain, river, stream of other watercourse, whether natural or artificial.

- (2) The owner or occupier of any piece of land on which steam or any liquid, other than potable water, is stored, processed or generated shall provide all facilities necessary to prevent any discharge, leakage or escape of such liquid to any street, storm water drain or water course except where, in the case of steam, the council has specifically permitted such discharge in writing.
- (3) Where the hosing down or flushing by rainwater or an open are on any private premises is in the opinion of the council likely to cause the discharge of objectionable matter into any street gutter, storm water drain, river stream or other watercourse, whether natural or artificial. Or to cause or contribute toward the pollution of any such watercourse, the council may instruct the owner of the premises to execute at his own cost whatever measures by way of alteration to the drainage installation or roofing of the area it may consider necessary to prevent or minimise such discharge or pollution.

Storm water not to Enter Sewers

92. (1) No part of a drainage installation shall at any time be such or capable of being rendered such that water from any source, not being soil-water or wastewater, can enter the installation without the intervention of human agency.
- (2) No person shall discharge or cause or permit to be discharged any substance other than sewage into a drainage installation.
 - (3) No pipe, channel or other device used for or capable of being used to conduct rainwater from any roof or other surface shall be permitted to discharge into any gully forming part of a drainage installation.

Discharges from Swimming Pools

93. (1) No person shall discharge or permit the discharge of water from any swimming pool directly or indirectly over any road or into a gutter, storm water drain, watercourse, open ground or private premises other than the premises of the owner of such swimming pool.
- (2) Water from fountains, reservoirs or swimming pools situate on private premises shall be discharged to a drainage installation only with the prior written consent of the council and subject to such conditions as to place, time rate of discharge and total discharge as the council may impose.
 - (3) The discharge of water referred to in sub-section 93(2) shall be subject to the payment of the charges specified in terms of the tariff.

Permission to Discharge Industrial Effluents

94. (1) No person shall discharge or cause or permit to be discharged into any sewer any industrial effluent or other liquid or substance other than soil-water or waste-water without the written permission of the Council first and had and obtained or, if such permission has been obtained, otherwise than in strict compliance with any and all of the conditions of such permission.
- (2) Every person shall, before discharging any industrial effluent into a sewer, make application in writing to the council for permission to do so in Appendix II, to be completed in duplicate, set out in the relevant appendix to these by-laws and shall thereafter furnish such additional information and submit such samples as the Council may require.
 - (3) The Council may at its discretion, having regard to the capacity of any sewer or any mechanical appliance used for sewage or any sewage treatment plant, whether or not vested in the Council and subject to such conditions as it may deem fit to impose, including the payment of any charge assessed in terms of the tariff, grant permission for the discharge of industrial effluent from any premises into any sewer.
 - (4) A person to whom permission has been granted in terms of sub-section 94(3), to discharge industrial effluent into a sewer shall, before doing or causing or permitting to be done anything to result in any change in the quantity or discharge or nature of that effluent, notify the Council in writing of the date on which it is proposed that the change shall take place and of the nature of the proposed change. The Council must grant permission before the proposed changes may be implemented.
 - (5) Any person who discharges or causes or permits to be discharged any industrial effluent into the sewer without having first obtained permission to do so in terms of sub-section 94(3), shall be guilty of an offence and liable, in addition to the penalties prescribed in terms of these by-laws, to such charge as the Council may assess for the conveyance and treatment of the effluent so discharged and for any damage caused as a result of such unauthorised discharge.
 - (6) Without prejudice to its rights in terms of sub-section 94(5), the Council shall be entitled to recover from any person who discharges to a drain or sewer any industrial effluent or any substance which is prohibited or restricted in terms of section 15 or which has been the subject of an order issued in terms of section 106(2) of Chapter 7 all costs, expenses or charges incurred or to be incurred by the Council as a result of any or all the following:
 - (a) Injury to persons, damage to the sewer or any sewage treatment works or mechanical appliance or to any property whatsoever, as the result of the breakdown, either partial or complete, of any sewage treatment plant or mechanical appliance, whether under the control of the Council or not; or
 - (b) any costs including fines and damages which may be imposed or awarded against the Council and any expense incurred by the Council as a result of a prosecution in terms of the National Water Act, 1998 (Act 36 of 1998), as amended, or any action against it consequent on any partial or complete breakdown of any sewage treatment plant or mechanical appliance caused directly or indirectly by the said discharge.
 - (7) Due to any change in circumstances arising from a change in the method of sewage treatment or the introduction of new or revised or stricter or other standards by the Council or in terms of the National Water Act, 1998 (Act 36 of 1998), as amended, or as a result of any other reason, the Council may from time to time or at any time review, amend, modify or revoke any permission given or any conditions attached to such permission and/or impose new conditions for the acceptance of any industrial effluent into the sewer or prohibit the discharge of any or all of such effluent to the sewer on giving adequate written notice in advance of its intention to do so, and on the expiration of such period of notice the

previous permission or conditions, as the case may be, shall be regarded as having fallen away and the new of amended conditions, if any, as the case may be, shall forthwith apply.

Control of Industrial Effluent

95. (1) The owner or occupier of any premises from which industrial effluent is discharged to a sewer shall provide adequate facilities such as overflow level detection devices, standby equipment, overflow catch-pits or other appropriate means effectively to prevent the accidental discharge into any sewer, whether through the negligence of operators, power failure, failure of equipment or control gear, overloading of facilities, spillage during loading or unloading or for any other like reason, of any substance prohibited or restricted or having properties outside the limits imposed in terms of these by-laws.

The owner or occupier of any premises from which industrial effluent is discharged to a sewer shall inform the Council of the accidental discharge into any sewer.

- (2) The Council may, by notice served on the owner or occupier of any premises from which industrial effluent is discharged, require him without prejudice to any other provision of these by-laws to do all or any of the following:
- (a) to subject the effluent before it is discharged to the sewer, to such pre-treatment as well ensure that it at no time will fail to conform in all respects with the requirements of section these regulations, or to modify the effluent cycle of the industrial process to an extent and in such a manner as in the opinion of the Council is necessary to enable any sewage treatment works receiving the said effluent, whether under the control of the Council or not, to produce treated effluent complying with any standards which may be laid down in respect of such works in terms of the National Water Act, 1998 (Act 36 of 1998), as amended;
 - (b) to restrict the discharge of effluents to certain specified hours and the rate of discharge to a specified maximum and to install at his own expense such tanks, appliances and other equipment as in the opinion of the Council may be necessary or adequate for compliance with the said restrictions;
 - (c) to install a separate drainage installation for the conveyance of industrial effluent and to discharge the same into a sewer through a separate connection as directed by the Council and to refrain from discharging the said effluent through any drainage installation intended or used for the conveyance of domestic sewage or from discharging any domestic sewage through the said separate installation for industrial effluent;
 - (d) to construct at his own expense in any drainage installation conveying industrial effluent to the sewer one or more inspection, sampling or metering chambers of such dimensions and materials and in such positions as the Council may prescribe;
 - (e) to pay in respect of the industrial effluent discharged from the premises such charge as may be assessed in terms of the tariff: Provided that where, owing to the particular circumstances of any case the method of assessment prescribed in terms of the Tariff of Charges does not reflect the true chemical oxygen demand value (COD) of the industrial effluent, the engineer may adopt such alternative method of assessment as does reflect the said value and shall assess the charge accordingly;
 - (f) to provide all such information as may be required by the engineer to enable him to assess the charges payable in terms of the tariff;
- (3) (a) if any person in contravention of any provision of these by-laws discharges industrial effluent into a sewer, or causes or permits it to be so discharged or is about to do so, the authorised official may, if he is of the opinion that such effluent is likely to cause damage to any sewer, mechanical appliance, sewage treatment works, forthwith after notifying the owner or occupier of the premises conceded of his intention to do so, close and seal off the drain conveying such effluent of the sewer for such period as he may deem expedient so as to prevent such effluent from entering the sewer.
- (b) The Council shall not be liable for any damage occasioned by any action taken in terms of subparagraph hereof.
- (c) No person shall without the written permission of the Council open or break the seal of a drain closed and sealed off in terms of item (a) hereof or cause or permit this to be done.

Metering and Assessment of Industrial Effluent

96. (1) The Council may incorporate, in such position as it shall determine in any drainage installation conveying industrial effluent to the sewer, any meter or gauge or other device for the purpose of ascertaining the volume or composition of the said effluent, and it shall be an offence for any person to by-pass, open, break into or otherwise interfere with or to damage any such meter, gauge or other device: provided that the Council may at its discretion enter into an agreement with any person discharging industrial effluent into the sewer, establishing an alternative method of assessing the quantity of effluent so discharged.
- (2) The Council shall be entitled to install and maintain any such meter, gauge or device as aforesaid at the expense of the owner of the premises on which it is installed.
- (3) The owner of any premises on which there is situated any borehole used for a water supply for trade or industrial purposes shall -
- (a) register such borehole with the Council as prescribed in the Water supply By-laws
 - (b) provide the Council with full particulars of the discharge capacity of the borehole; and
 - (c) if the Council has reason to doubt the reliability of the particulars given, carry out at the expense of the owner such tests on the discharge capacity of the borehole as may, in the opinion of the Council; be necessary for the purpose of these by-laws.
 - (d) for the purpose of item (f) of sub-section 95(2), to provide and maintain at his own expense a meter measuring the total quantity of water drawn from any borehole, spring or other natural source of water and used on the property.

Prohibited Discharges

97. (1) No person shall discharge or cause or permit the discharge or entry into any sewer of any sewage, industrial effluent or other liquid or substance -
- (a) which in the opinion of the authorised official may be offensive to or may cause a nuisance to the public;
 - (b) which contains any material of whatsoever nature, including oil, grease, fat or detergents capable of causing an obstruction to the flow in sewers or drains or interference with the proper operation of a sewage treatment works;

- (c) which shows any visible signs of tar or associated products or distillates, bituminous or asphalts;
- (d) which contains any substance in such concentration as is likely in the final treated effluent from any sewage treatment works to produce an undesirable taste after chlorinating or an undesirable odour or colour, or excessive foam;
- (e) which contains any substance specified in the said relevant Appendix in concentration greater than those there listed:

Provided that the Council may approve or limit such smaller or greater limits or concentrations in respect of any such substance for such period or on such conditions as it may specify on consideration of the effect of dilution in the sewer and of the effect of such substance on the sewer or any sewage treatment process if the Council is satisfied that in the circumstances the discharge of such substance would not-

- (i) harm or damage any sewer, mechanical appliance, sewage treatment works or equipment; or
 - (ii) prejudice the use of sewage effluent for re-use; or
 - (iii) adversely affect any waters, into which treated sewage effluent is discharged, or any land or crops irrigated with the sewage effluent;
- (f) which contains any substance of whatsoever nature which in the opinion of the Council -
- (i) is not amenable to purification or treatment at the sewage treatment works, or which causes or may cause a breakdown or inhibition of the normal sewage treatment processes; or
 - (ii) is of such nature as is or may be amenable to purification or treatment only to such degree as to prevent the final treated effluent from the sewage treatment works from satisfactorily complying in all respects with any requirements imposed in terms of the National Water Act, 1998(Act 36 of 1998), as amended; or
 - (iii) whether listed in the relevant Appendix to these by-laws or not, either alone or in combination with other matter may
- (aa) generate or constitute a toxic substance dangerous to the health of persons employed at the sewage treatment works or entering the Council's sewers or manholes in the course of their duties; or
- (2) (a) Any person receiving from an official duly authorised thereto by the Council a written order instructing him or her to stop the discharge to the sewer of any substance referred to in sub-section 97(1) of section 15, shall forthwith stop such discharge.
- (b) Any person who contravenes the provisions of sub-section 97(1), or who fails to comply with an order issued in terms of paragraph (a) of sub-section 97(2), shall be liable to the inspection fees as per approved tariff.
- (c) Notwithstanding the provisions of item (b) of sub-section 97(2), should any persons have valid to comply with the terms of an order served in terms of item (b) of sub-section 97(2) and such discharge is likely in the opinion of the Council seriously to prejudice the efficient operation of any sewage treatment works, the Council may, after further written notice, refuse to permit the discharge of any industrial effluent into the sewer until such time as the industrial effluent complies in all respects with the Council's requirements as prescribed in terms of these by-laws, in which event the discharge shall forthwith be stopped by the person responsible for the discharge or by the Council in the event of his or her failure to do so.

Withdrawal of written permission for disposal of industrial effluent

98. (1) The municipality or its authorized agent may withdraw any permission, after giving at least 14 (fourteen) days written notice if its intention to a person permitted to discharge industrial effluent into the sewage disposal system if the person –
- (a) fails to ensure that the industrial effluent discharged conforms to the industrial effluent standards prescribed in Schedules A and B of these bylaws or the written permission;
 - (b) fails or refuses to comply with any notice lawfully served on him or her in terms of these bylaws or contravenes any provisions of these bylaws or any condition imposed in terms of any permission granted to him or her; or
 - (c) fails to pay the assessed charges in respect of any industrial effluent discharged.
- (2) The municipality or its authorized agent may on withdrawal of any written permission –
- (a) in addition to any steps prescribed in these bylaws, and on 14 (fourteen) days' written notice authorize the closing or sealing of the connecting sewer of the said premises to any sewer for such charge as may be prescribed in the municipality or its authorized agent's tariff of charges; and
 - (b) refuse to accept any industrial effluent until it is satisfied that adequate steps to ensure that the industrial effluent to be discharged conforms to the standards prescribed in these bylaws.

Private Treatment Plants

99. No person shall construct, fix, maintain or operate any septic tank, French drain, conserving tank or other plant for the treatment, disposal or storage of sewage without the written consent of the Council, the giving of which shall be without prejudice to the provisions of section 9, and in any event without complying with its Public Health By-laws so far as relevant.

CHAPTER 7

General Provisions

Stables and Similar Premises

100. (1) Subject to the provisions of sub-section 100(2), the council may at its discretion permit stables, cowsheds, dairies, kennels and similar premises or other premises for the accommodation of animals to be connected to a drainage installation.
- (2) The floor of any premises connected to a drainage installation in terms of subsection (1), shall be paved with approved impervious materials and graded to a silt trap, grease trap or gully of adequate capacity.
- (3) Every part of the floor of premises mentioned in sub-section 100(1) should be covered by a roof and otherwise effectively protected to prevent the entry of rain or stormwater into the drainage installation.

Waste Food or other Disposal Units

101. (1) The Council may in its discretion and subject to the payment of the charges prescribed in part VI of Schedule B to these by-laws permit the discharge from a waste-food disposal unit to enter a drainage installation.
- (2) Waste-food disposal units shall be of approved type and the installation and connections thereof shall comply with these by-laws as if it were a waste-water fitting and with the Council's Water Supply By-laws and Electricity Supply By-laws so far as applicable.
- (3) No person shall incorporate into a drainage installation a mechanical waste food or other disposal unit or garbage grinder unless -
- (a) the owner of the premises has registered such unit or garbage grinder with the council and the Council is satisfied that the working of the council's sewerage and sewage treatment system shall not thereby be impaired; and
- (b) such unit or garbage grinder is of an approved type and has been installed in conformity with the council's Electricity By-laws.
- (4) The Council may require the owner or occupier of any premises on which a waste food or other disposal unit or a garbage grinder has been installed, or the owner of such unit or grinder either to remove, repair or replace any unit which, in the opinion of the engineer, is functioning inefficiently or which may impair the working of the council's sewerage system.
- (5) The owner shall, upon the removal of any such unit or grinder, notify the council within 14 days of its removal.

Disposal of Sludge, Compost and Manure

102. (1) Except when prohibited by any competent authority, the Council may sell or dispose of sewage sludge, compost or animal manure resulting from the operation of any sewage treatment works operated by the council or farm associated therewith on such conditions regarding the loading and conveyance thereof, the place to which it is conveyed and the manner in which it is to be used, applied or processed as the Council may impose.
- (2) Save in the case of long term contracts entered into for the purpose of removal thereof, such sludge, compost or manure shall be sold or disposed of at the charges set out in the tariff.

Offences and Penalties

103. (1) Without prejudice to any provision of these by-laws wherein an offence is expressly specified, any person who contravenes or fails to comply with any provision of these by-laws or who shall be in default in complying therewith, shall be guilty of an offence and shall be liable, on first conviction, to a fine not exceeding the determined amount or, in default of payment, to imprisonment for a period not exceeding three months, and on any subsequent conviction to a fine not exceeding the determined amount or, in default of payment, to imprisonment as aforesaid.
- (2) Any person who fails to comply in any respect with any notice served on him by the council directing him to do or not to do anything, shall be guilty of an offence and shall in addition be guilty of a further offence for every day or part of a day during which non-compliance continues and he shall be liable in respect of each offence as aforesaid to a fine not exceeding the determined amount or, in default of payment, to imprisonment for a period not exceeding six months.

Scope of By-laws

104. (1) These by-laws shall apply to every drainage installation, and in particular to the design and construction of such an installation in any new building or existing building, to any installation required by the Council to be constructed and to alterations or additions to an existing drainage installation whether or not required by the Council to be made in terms of these by-laws.
- (2) Every drainage installation shall both during its construction and on its completion be subject to such inspection; approval, tests and control as the council shall deem fit or require.

Right of Appeal

105. (1) Any person aggrieved by any decision given or act done by any officer in terms of these by-laws in connection with a drainage installation or any work connected therewith, shall have the right to appeal to the committee of the council appointed to supervise the administration of these by-laws or if there is no such committee to the council itself.
- (2) Notice of intention to appeal in terms of sub-section 105(1) shall be given to the Council within seven days of the decision or act complained of and shall be followed within a further fourteen days by a full statement of the appellant's case in writing to be furnished by the appellant to the Council.

Notices

106. (1) Every notice, order or other document issued or served by the council in terms of these by-laws shall be valid if signed by an officer of the council duly authorized thereto.
- (2) Any notice, order or other document served in terms of these by-laws on any person shall be so served by delivering it, or a true copy thereof, to the person to whom it is addressed personally or at his last known residence or place of business or by posting it in which case it shall be deemed to have been served five days after it was posted.
- (3) Every notice, order or other document issued or served in terms of these by-laws shall specify the premises to which it relates, but may refer to the person for whom it is intended as "the owner" or "the occupier" if which does not know his name.

Tariffs

107. Charges for sewerage services as determined from time to time by the council in terms of the relevant legislation.

APPENDIX I

LIMITS OF pH, ELECTRICAL CONDUCTIVITY AND MAXIMUM CONCENTRATION OF CERTAIN SUBSTANCES

Subject to the provisions of section 7(1)(i), the following are:

- a) The limits of the pH and electrical conductivity; and
- b) the substances and the maximum permissible concentrations thereof, expressed in milligrams per litre (mg/l) referred to in section 7(1)(i):

(i) **GENERAL**

- pH - within the range: 6,0 - 10,0
- Electrical conductivity - not greater than: 500 mS/m at 20° C.
- Caustic alkalinity (expressed as CaCO₃): 2 000 mg/l.
- Substances not in solution (including fat, oil, and grease, waxes and like substances) and where the volume of effluent discharged per month do not exceed 10 000 kl: 2 000 mg/l.
- Substances not in solution (including fat, oil, and grease, waxes and like substances) and where the volume of effluent discharged per month do exceed 10 000 kl: 500 mg/l.
- Substances soluble in petroleum ether: 500 mg/l
- Sulphides, (expressed as S): 20 mg/l and Hydrogen Sulphide (expressed as H₂S): 1 mg/l
- Substances from which hydrogen cyanide can be liberated in the drainage installation, sewer or sewage treatment works (expressed as HCN): 20 mg/l
- Formaldehyde (expressed as HCHO): 50 mg/l
- Non-organic solids in suspension: 100 mg/l
- Chemical oxygen demand (COD): 5 000 mg/l
- All sugars and/or starch (expressed as glucose): 1 500 mg/l
- Available chlorine (expressed as C1): 100 mg/l
- Sulphates (expressed as SO₄): 1 800 mg/l
- Fluorine-containing compounds (expressed as F): 5 mg/l
- Sodium (expressed as Na): 120 mg/l
- Anionic surface active agents: 500 mg/l

METALS:

Group 1

Iron (expressed as Fe)
Chromium (expressed as CeO₃)
Copper (expressed as Cu)
Nickel (expressed as Ni)
Zinc (expressed as Zn)
Silver (expressed as Ag)
Cobalt (expressed as Co)
Tungsten (expressed as W)
Titanium (expressed as Ti)
Cadmium (expressed as Cd)

The **total collective concentration of all metals In-Group 1** (expressed as indicated above) in any sample of the effluent shall not exceed 50 mg/l, nor shall the concentration of any individual metal exceed 20 mg/l.

Group 2

Lead (expressed as Pb)
Selenium (expressed as Se)
Mercury (expressed as Hg)
Manganese (expressed as Mn)

The **total collective concentration of all metals in Group 2** (expressed as indicated above) in any sample of the effluent shall not exceed 20 mg/l, nor shall the concentration of any individual metal in any sample exceed 5 mg/l.

(iii) **OTHER ELEMENTS**

Arsenic (expressed as As)
Boron (expressed as B)

The total collective concentration of all elements (expressed as indicated above) in any sample of the effluent shall not exceed 20 mg/l.

(iv) **RADIO-ACTIVE WASTES:**

Radio-active wastes or isotopes: Such concentration as may be laid down by the Atomic Energy Board or any State Department: Provided that, notwithstanding the requirements set out in this Appendix, the Council reserves the right to limit the total mass of any substance or impurity discharged per 24 hours into the sewers from any premises.

NOTE: The method of testing in order to ascertain the concentration of any substance here mentioned shall be the test normally used by the Council for the purpose. Any person discharging any substance referred to in Appendix I shall ascertain the details of the appropriate test from the Council.

APPENDIX II

APPLICATION FORM

APPLICATION TO DISCHARGE INDUSTRIAL EFFLUENT INTO THE COUNCIL'S SEWER SYSTEM

I (Name) _____ authorised to act on behalf of

_____ and hereinafter referred to as the applicant, hereby apply in terms of sub-section (2) of section 4 of the Sewerage By-laws, of the Midvaal Local Municipality for permission to discharge industrial effluent into the Council's Sewer on the basis of the facts stated herein.

PART I

GENERAL INFORMATION

Name of the industry : _____

Nature of industry : _____

Street address of industry : _____

Stand/s number/s : _____

Township : _____

Municipal Account Number : _____

Postal address of industry : _____

Contact person(s) : _____

Tel. No.: () _____ Fax. No.: () _____

Cell. No.: _____

E-Mail address: _____

Internet Web Site: _____

PART II

INFORMATION REGARDING THE CONSUMPTION OF WATER

The following information is required for the purpose of estimating the quantity of industrial effluent discharged into the Council's sewer. All figures given shall relate to a total, in kiloliters, (estimated or measured) taken over a period of 12 months.

TOTAL VOLUME OF WATER CONSUMED IN KILOLITRES - ESTIMATED OR MEASURED

	Meter no.	Meter no.	Meter no.	Meter no.	Meter no.	Total	
							kl
Section of plant served by meter							kl
Water purchased							kl
Water from borehole							kl
Water entering with raw materials							kl
Total volume:(A)							kl

WATER USED BY STAFF FOR DOMESTIC PURPOSES

	(a) Number	(b) Shifts per day	(c) Days per week	(d) Allowance litres/person/day	(a)x(b)x(c)x(d)x52/1000 Total	
Daily employees: Office						kl
Factory						kl
Resident persons						kl
Canteen						kl
Other						kl
Total volume: (B)						kl

WATER LOST DUE TO PROCESSES

	Total	
Water lost/absorbed by goods manufactured		kl
Water lost due to evaporation from cooling towers		kl
Water lost due to the operation of boilers		kl
Water lost/used for coal wetting		kl
Water lost/used for quenching		kl
Water lost due to other reason/s (state reason)		kl
Total volume: (C)		kl

INDUSTRIAL EFFLUENT DISCHARGED INTO THE COUNCIL'S SEWER SYSTEM

Blow-down water from boilers into the sewer system (D) _____ kl

The estimated volume of process water discharged to the Council's sewer is: (A-B-C+D) _____ kl. (E)

The estimated percentage of water consumed, discharged as industrial effluent: $E/A * 100 =$ _____ %.

NUMBER AND DESCRIPTION OF DISCHARGE POINTS

NUMBER	DESCRIPTION

Please attach a layout plan indicating the discharge points.

APPLICANT	COUNCIL
Name:	Name:
Authority:	Authority:
Signature:	Signature:
Date:	Date:

PART III

INFORMATION REQUIRED CONCERNING THE CHEMICAL AND PHYSICAL CHARACTERISTICS OF THE EFFLUENT TO BE DISCHARGED:

- (1) Maximum temperature of effluent: _____ ° Celsius
- (2) pH value: _____
- (3) Nature and amount of settleable solids: _____ mg/l
- (4) Chemical Oxygen Demand strength as determined according to Council's method: _____ mg/l
- (5) Maximum total daily discharge: _____ Kiloliters
- (6) Maximum rate of discharge: _____ Kiloliters p/h
- (7) Periods of maximum discharge:

DAY	FROM	TO
Mondays		
Tuesdays		
Wednesdays		
Thursdays		
Fridays		
Saturdays		
Sundays		

If any of the substances or their salts, specified in the table below, are formed on the premises, then a cross must be placed in the space in which the substance appears and if possible, the average concentration of the substance likely to be present in any effluent must be stated.

TABLE

Cyanide		Chromium		Nickel		Cadmium	
	mg/l		mg/l		mg/l		mg/l
Copper		Zinc		Iron		Ammonium	
	mg/l		mg/l		mg/l		mg/l
Sulphide		Sulphates		Nitrates		Others	
	mg/l		mg/l		mg/l		mg/l
Starch or sugars		Tar or Tar oil		Grease or oil		Synthetic detergents	
	mg/l		mg/l		mg/l		mg/l
Volatile solvents		Others		Others		Others	
	mg/l		mg/l		mg/l		mg/l

Any other information as to kind and character, chemical composition and concentrations peculiar to the industrial effluent?

**PART IV
CONDITIONS OF ACCEPTANCE OF INDUSTRIAL EFFLUENT**

This application shall only be granted on the applicant's undertaking, as he is by virtue of his signature hereto appended deemed to do, to observe the following terms and conditions and any further special conditions which the engineer may think fit to impose in any particular case:

The applicant shall annex hereto descriptions and a statement of the dimensions of grease and oil traps, screens, dilution and neutralising-tanks and any other provision made by him for the treatment of the industrial effluent before it is discharged to the sewer.

The applicant shall submit to the Council, if requested, plans showing the reticulation systems on his premises for water and industrial effluent.

The applicant shall, in addition to complying with the provisions of the Council's Drainage By-laws concerned with the protection of its employees, sewers and treatment plant from injury or damage, comply with any direction concerned with such protection given to him by the engineer verbally or in writing for the purpose of ensuring the applicant's compliance with the said by-laws.

The applicant shall notify the Council, as soon as possible after he becomes aware of or at least 14 days before anything is done to cause any material alteration in the nature or quantity of discharge of the industrial effluent specified in this application or in any of the facts stated by him therein.

The applicant shall within 30 days from the date of signature of this application procure an approved accurately representative sample of not less than five litres of the industrial effluent to be discharged to the sewer, which sample shall be free of domestic sewage, and shall submit one half thereof to the Council for analysis and also submit to the engineer a report on the sample made by an analyst appointed by him: Provided that in the case of a newly established industry the period specified in this rule may be extended by the Council for a period not exceeding six months or such further extended periods as the Council in its discretion may from time to time in writing permit.

The applicant hereby declares and warrants that the information given by him on this form or otherwise in connection with this application is to the best of his knowledge and belief in all respects correct.

The applicant agrees that the said information, being in all respects correct, shall form the basis on which the Council grants this application.

Thus done at _____ by the applicant on this _____ day of _____.

Name of applicant Capacity of applicant Signature of the applicant

Permission is hereby granted by me on behalf of the Council, I being duly thereunto authorised, for the discharge into the Council's sewer in accordance with the Council's Drainage By-laws of industrial effluent as described in this form and the circumstance therein set forth: Provided that this permission shall be revocable by the Council at any time at its absolute discretion on the expiry of reasonable notice on writing given by it to the applicant.

The said permission is given subject also the following special conditions:

SIGNED
Council's representative

Date:

APPENDIX III

APPLICATION FORM

PERMISSION TO INSTALL APPLIANCES TO PUMP SEWAGE INTO COUNCIL'S SEWER SYSTEM

NOTE : On premises where it is not possible to drain all sanitary fittings by gravitation to a connecting sewer, the Council will consider applications for pumping sewage in compliance with regulation P3 of the National Building Regulations and Building Standards Act only in respect of those parts of a premises which cannot be drained by gravitation.

In the case of single basements, consideration will be given to the use of sanitary fittings on the ground floor.

In all cases where lifting of sewerage is permitted, the engineer will stipulate the rate of discharge, which will be normally limited to a maximum of 4 litres per second.

INFORMATION TO BE FURNISHED BY APPLICANT

The applicant shall furnish the following information, as well as and the relevant literature and characteristic curves and must sign the application and undertaking:

INDUSTRY/BUSINESS INFORMATION:

Name of the industry/business: _____
Nature of industry/business : _____
Street address of industry/business: _____
Stand/s number/s : _____
Township : _____
Municipal Account Number: _____
Postal address of industry/business: _____
Contact person(s) : _____
Tel. No.: () _____ Fax. No.: () _____
Cell. No.: _____
E-Mail address: _____
Internet Web Site: _____

TECHNICAL INFORMATION:

Make of appliance, name of supplier and purpose for which the appliance is designed

kW rating and speed of motor/pump: _____

Maximum rate of discharge in litres per second: _____

(d) Size of rising main and velocity of discharge: _____

(e) Capacity and dimensions of storage tank - depth to be given as liquid depth below inlet drain: _____

(f) Descriptions of stand-by equipment, automatic controls, warning systems, and other relevant information:

Any matters relating to the electric power connection and switchboard will be referred to the Electricity Department and will be subject to the approval of that Department.

The engineer may require the owner to supply a key to enable Council employees to gain access to the mechanical appliance installation at all times.

APPLICATION AND UNDERTAKING BY OWNER

I, the undersigned, hereby make application to install mechanical appliances for the lifting of sewage and accept without reservations, and undertake to abide by, the following conditions:

- (a) The maximum discharge rate shall not exceed _____ litres per second.
- (b) The onus shall be on the owner of the premises to have the installation regularly serviced and maintained in a hygienic and efficient working condition at all times. Any necessary repairs or replacements are to be effected immediately, so that interruptions in operation are reduced to a minimum.

(c) In the event of breakdowns from any cause whatsoever, the owner shall take immediate precautions to ensure that unhygienic conditions do not develop.
 The Council shall not be held responsible for any damages or claims, which may arise through unhygienic conditions, installation stoppages, and inefficient operation, explosion or other causes.
 Council employees shall, at all times, be given unhindered access to the installation for the purpose of inspection.

Signed

_____ Applicant _____ Owner

ERF No.: _____ TOWNSHIP: _____

DATE: _____

FOR OFFICE USE ONLY

This application is approved and permission to install the proposed mechanical appliances for pumping sewage into the Council's sewerage system is hereby granted on the under-mentioned conditions (if any):

CONDITIONS:

SUPPLIER	APPLICANT	COUNCIL
Name:	Name:	Name:
Authority:	Authority:	Authority:
Signature:	Signature:	Signature:
Date:	Date:	Date:

SCHEDULE "A"
ACCEPTABLE DISCHARGE LIMITS

(i) GENERAL:

Determinants	Lower limits of concentrations
pH at 25°C	6.0 pH Units

Determinants	Upper limits of concentrations
pH at 25°C	10.0 pH Units
Electrical conductivity at 25°C	500 mS/m
Caustic alkalinity (expressed as CaCO ₃)	2000 mg/l
Substances not in solution (including fat, oil, grease, waxes and like substances) and where the volume of effluent discharged per month does not exceed 10 000 kl	1000 mg/l
Substances not in solution (including fat, oil, grease, waxes and like substances) and where the volume of effluent discharged per month does exceed 10 000 kl	500 mg/l
Fat, oil grease, waxes and like substances soluble in petroleum ether	500 mg/l
Sulphides, (expressed as S)	10 mg/l
Hydrogen sulphide (expressed as H ₂ S)	5 mg/l
Substances from which hydrogen cyanide can be liberated in the drainage installation, sewer and sewage treatment works (expressed as HCN)	20 mg/l
Formaldehyde (expressed as HCHO)	50 mg/l
Non-organic solids in suspension	100 mg/l
Chemical oxygen demand (COD)	5000 mg/l
All sugars and/or starch (expressed as glucose)	1500 mg/l
Available chlorine (expressed as Cl)	100 mg/l
Sulphates (expressed as SO ₄)	1800 mg/l
Fluorine-containing compounds (expressed as F)	5 mg/l
Sodium (expressed as Na)	500 mg/l
Anionic surface active agents	500 mg/l
Ammonium Nitrogen as N	200 mg/l
Orthophosphate as P	50 mg/l
Phenols	150 mg/l
Chloride (Cl)	500 mg/l

(ii) METALS AND OTHER ELEMENTS:

Group A

Determinants	Upper limits of concentrations
Nickel (expressed as Ni)	20 mg/l
Zinc (expressed as Zn)	20 mg/l
Cobalt (expressed as Co)	20 mg/l
Chromium (expressed as Cr)	20 mg/l

Should the total collective concentration of all metals in Group A (expressed as indicated above) in any sample of the effluent exceed 40 mg/l, or the concentration of any individual metal in any sample exceed the upper limits as indicated above, the provisions of items 6.1 and 8.4.2 shall apply.

Group B

Determinants	Upper limits of concentrations
Lead (expressed as Pb)	5 mg/l
Copper (expressed as Cu)	5 mg/l
Cadmium (expressed as Cd)	5 mg/l
Arsenic (expressed as As)	5 mg/l
Boron (expressed as B)	5 mg/l
Selenium (expressed as Se)	5 mg/l
Mercury (expressed as Hg)	5 mg/l
Molybdenum (expressed as Mo)	5 mg/l

Should the total collective concentration of all metals and elements in Group B (expressed as indicated above) in any sample of the effluent exceed 20 mg/l, or the concentration of any individual metal or elements in any sample exceed the upper limits as indicated above, the provisions of items 6.1 and 8.4.2 shall apply.

Group C

Determinants	Upper limits of concentrations
Aluminium (expressed as Al)	20 mg/l
Iron (expressed as Fe)	20 mg/l
Silver (expressed as Ag)	20 mg/l
Tungsten (expressed as W)	20 mg/l
Titanium (expressed as Ti)	20 mg/l
Manganese (expressed as Mn)	20 mg/l

Should the individual concentration of all metals in Group C (expressed as indicated above) in any sample of the effluent exceed the upper limits as indicated above, the provisions of items 6.1 and 8.4.2 shall apply.

(iii) RADIO-ACTIVE WASTE:

Radio-active waste must comply to safety standards as contemplated in section 36 of the National Nuclear Regulation Act, 1999.