Umnotho Development

DRAINAGE BY-LAWS

v June 2004

Greater Tzaneen Municipality

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To provide for the design, construction, inspection and maintenance of drainage installations, the connection thereof to the Council's drainage system, installation and maintenance of sanitary equipment, prescription of drainage levels, discharge of effluents, prohibit certain acts and matters in connection therewith.

CHAPTER 1
DEFINITIONS

1. Definitions

1.1 In these by-laws, unless the context otherwise indicates –

"adequate" or "**effective**" means adequate or effective in the opinion of the Council;

"**approved**" means approved by the Council, regard being had in all cases to all the circumstances of the particular case and to accepted principles and legal requirements of drainage installation and, in the case of any appliance, fitting or other object, to the purpose which it is intended to serve;

"**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 back pressure;

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

"**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;

"**conservancy tank**" means a tank used for the reception and temporary retention of the discharge from a drainage installation;

"**connecting sewer**" means that part of a sewerage system which is vested in the Council and which connects a drain to the Council's sewer;

"**Council"** means the Council of the Greater Tzaneen Local Municipality, established in terms of section 12 of the Local Government: Municipal Structures Act, no 117 of 1998;

"**development 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;

"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 and includes any drain, soil-water pipe, stack, waste-water pipe, ventilation pipe, anti-siphonage pipe, soil-water fitting, waste-water fitting, mechanical appliance or any other work or fitting or combination thereof for the conveyance of sewage and which is not vested in the Council;

"**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;

"**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 authorized by the Council to administer these by-laws;

"**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;

"**horizontal pipe**" means any soil-water pipe or waste-water pipe, other than a branch pipe, which is inclined at an angle of less than 45 degrees above the horizontal;

"industrial effluent" means any liquid, whether or not containing matter in solution or suspension, which is given off in the course of or as a result of any trade or industrial operation, including mining operations, and includes any liquid other than soil-water or waste-water or storm water;

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

"**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;

"**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;

"**officer"** means a person authorized by the Council or the engineer, to make decisions or otherwise act on behalf of the Council or the engineer, as the case may be;

"**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;

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

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

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

"sewage" means soil-water, waste-water or industrial effluent whether separately or together;

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

"SABS" means the South African Bureau of standards;

"**sewer**" means any pipe or device vested in the Council and used or designed or intended for use for or in connection with 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;

"**soil-water**" means any liquid containing human or animal ex-creta;

"**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;

"**storm water"** means any liquid from natural precipitation or accumulation and includes rain-water, spring-water and ground-water;

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

"**tariff**" means the tariff of charges as determined from time-to-time by the Council in terms of section 10 G (7) of the Local Government Transition Act, 1993;

"**two-pipe system**" means a drainage installation in which the discharges from soil-water fittings and waste-water fittings are conveyed to a drain by separate pipes and in which the waste-water pipes are separately ventilated and are separated by traps from the drain;

"**ventilation pipe**" means any pipe or portion of a pipe, not conveying any liquid, used to ventilate a drainage installation;

"**vertical pipe**" means any soil-water pipe or waste-water pipe, other than a branch pipe, which is inclined at an angle of more than 45 degrees above the horizontal;

"waste-water" means any liquid other than soil-water, industrial effluent or 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.

CHAPTER 2
SCOPE OF BY-LAWS

2. Application of By Law

2. (1) These by-laws will apply to every drainage installation, including the design and construction of any such installation in any new building or existing building or to any installation required by the Council to be constructed in terms of section 6 or to any alteration or addition to an existing drainage installation.

(2) Every drainage installation must 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.

(3) These by-laws will be subject to the National Building Regulations and Building Standards Act, no 103 of 1977, and any regulations promulgated under the said Act.

(4) Only SABS approved pipes, drains, taps, stacks, fittings, mechanical appliances or other drainage material or combination thereof, may be used in any drainage work.

CHAPTER 3
RIGHT OF APPEAL

3. Appeal

3 (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, will have the right to appeal to the Municipal Manager of the Council.

(2) The appeal in terms of subsection (1) must be given in writing to the Municipal Manager within twenty one days from the date on which such person is notified of the decision or act complained of, including reasons for the appeal.

CHAPTER 4
NOTICES

4. Council Notices and Documents

4 (1) Every notice, order or other document issued or served by the Council in terms of these by-laws will 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 may be served in one of the following manner:

(a) by personal delivery to the person to whom it is addressed;

(b) by delivery to a person apparently above the age of 18 years at the last known place of residence of the person to whom it is addressed;

(c) by delivery to a person apparently above the age of 18 years at the place of business of the person to whom it is addressed, or

(d) by posting it by pre-paid registered post to an address meant in (b) or (c) above, in which instance it will be deemed to have been received by the person to whom it is addressed on the fifth day after posting thereof.

(3) Every notice, order or other document issued or served in terms of these by-laws must 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 his name is not known.

CHAPTER 5

SEWERAGE CHARGES

5. Charges

All charges for the use of the Council's sewers or for discharges into the Council's sewers or otherwise in connection with the Council's sewerage services will be as prescribed in terms of the tariff determined by Council and shall be payable by the owner of the premises in respect of which the charges are raised.

CHAPTER 6
GENERAL PROVISIONS

6. Compulsory Provision Of Sewerage

6. (1) Where a sewer is available for the drainage of any premises in or on which sewage is produced, such premises will be provided with a drainage installation connected to the sewer.

(2) The owner of any premises not having a drainage installation terminating at a point of discharge into the sewer prescribed by the Council, must, within twenty weeks of receiving written notice from the Council requiring him or her to do so, construct or cause to be constructed a drainage installation on the premises and must do all work necessary for and all things required in terms of these by-laws in connection with the construction of such drainage installation, and must pay all charges due in respect thereof.

(3) The owner as aforesaid will give written notice to the Council when any pail or conservancy tank service rendered to the property is no longer required, and will remain liable for the charges for that service until he or she has done so.

(4) If the owner fails within the said period of twenty weeks to comply with a notice served on him or her in terms of subsection (2) he or she will thereafter, without detracting from his or her 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 subsection (3).

(5) Where any part of a building or premises is at such a level in relation to the sewer that a drainage installation serving that part cannot discharge into the sewer by gravitation the engineer may, subject to the provisions of section 66 and to any conditions he may deem necessary, permit the sewage from such part to be raised by a mechanical appliance to discharge at such point and such level as he or she will determine, for which purpose the Engineer may require that a registered professional civil engineer must submit a plan of such drainage work.

(6) 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, must if so instructed by Council, provide water closet accommodation connected to the sewer for such workers or such other toilet facilities as the Council may determine.

7. Connection To Sewer

7. (1) No part of any drainage installation must extend beyond the boundary of the piece of land on which the building or part thereof served by the drainage installation is erected:

(2) Where Council considers it necessary or expedient to do so, the Council may permit the owner to lay a drain at his or her own expense through an adjoining piece of land on proof of the registration of an appropriate servitude or of a notarial deed of joint drainage, as the Council may require.

(3) The Council will 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, at its discretion, having regard to the necessity of maintaining correct levels, require the owner not to commence the construction or the connection of the drainage installation, as the case may be, until the Council's connecting sewer has been laid.

(4) Subject to the provisions of subsection (4), and without prejudice to the provisions of section 24 concerning the testing of drainage installations, the Council will, within seven (7) days from being notified by the owner that the drainage installation on his premises is ready for connection to the sewer, at the owner's own expense, effect the connection or cause it to be effected.

(5) Any connection required by the owner subsequent to that made by the Council in terms of subsection (3) will be subject to the approval of the Council and will be effected at the owner's expense, further subject thereto that only one connection per piece of land will be allowed unless the engineer approved otherwise.

(6) No person must permit the discharge of any substance whatsoever other than clean water for testing purposes to enter any drainage installation until the drainage installation has been connected to the sewer.

(7) Save as may be otherwise authorized by the Council, in writing, no person other than an officer duly authorized to do so, shall connect any drainage installation to the sewer.

8. Common Drains

The Council may at its discretion permit the drainage installation on any two or more pieces of land, whether or not in the same ownership, to discharge into the Municipal sewer through a common drain.

9. Disconnection

9 (1) Except for the purpose of and for carrying out of any work, maintenance or repair, no soil-water fitting or soil-water pipe shall be disconnected from any soil-water pipe or drain, and no drain may 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 will 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 must be destroyed or entirely removed from the premises on which it was being used unless the Council 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, must be effectively sealed to the satisfaction of the Council.

(3) Due notice in writing in advance of any disconnection must be furnished to the engineer who will, 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 has 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 will seal the opening to the sewer so made and will recover from the owner the charge prescribed for such work in the tariff.

(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 subsection (4), will be guilty of an offence.

10. Unlawful Drainage Work

10. (1) Where any drainage work has been constructed without complying with the provisions of these by-laws concerning the submission and approval of plans the owner must, 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 any respect to comply with any of these by-laws, including any standard specified under SABS 0400 of 1987 other than those referred to in subsection (1), the owner must on receiving written notice by Council to do so and notwithstanding that he or she may have received approval of plans in respect of the said installation or work in terms of these by-laws, carry out such alteration 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 a notice has not been complied with within the time prescribed therein, proceed itself to carry out any such alteration, removal or other work as it may deem necessary for compliance with these by-laws and may recover the cost thereof from the owner or occupier as the case may be.

(4) Should the Council at any time become aware of any installation which does not comply with the provisions of section 75 or that any provision thereof has or is being contravened it may, subject to the provisions of subsections (1), (2) and (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 or the occupier the appropriate charges prescribed in the tariff.

11. Maintenance

11. (1) The owner or occupier of premises must at all times keep and maintain in a proper state of repair and in working order any drainage installation thereon.

(2) Where any part of a drainage installation is used by two or more owners or occupiers, they will be jointly and severally liable in terms of this section for the maintenance and repair of such drainage installation.

12. Prevention Of Blockages

No person must 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.

13. Clearing Of Blockages

13. (1) When the owner or occupier of premises has reason to believe that a blockage has occurred in any drainage installation thereon, he or she must forthwith report the fact to the Council.

(2) Where a blockage occurs in a drainage installation, any work necessary for its removal will, subject to the provisions of subsection (4), 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 licensed as aforesaid must, before proceeding to remove any blockage from a drainage installation, notify the Council of his or her intention to do so, and must when he or she has done so, notify the Council of that fact and of the nature, location and cause of the said blockage.

(4) The Council itself will, 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.

(5) Should the clearing by the Council of any blockage in a drainage installation necessitate the removal or disturbance of paving, lawn or other artificial surfacing on any premises, the Council will not be liable for the reinstatement thereof or compensation for any damage caused thereto.

(6) Should any drainage installation on any premises overflow as a result of an obstruction in the connecting sewer 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.

(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 will be recoverable from the owners thereof, who shall be jointly and severally liable for the whole charge.

14. Emission Of Gas Or Entry Of Sewage

14. (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 at the cost of the owner, take such action or instruct the owner 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 or stop such entry of sewage and to prevent any recurrence thereof.

15. Work By The Council

15. (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 or her as for a contravention of these by-laws, proceed itself to carry out the work and may recover 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 any schedule to these by-laws is done by the Council, the cost of which it is entitled in terms of these by-laws to recover from any person, there may be included in such costs such sum to be assessed by the Council as will cover all expenditure reasonably incurred by the Council.

(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.

16. Interference With Sewers And Drains

16. (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, connecting sewer, manhole or other work or any part thereof intended for the conveyance or treatment of sewage and which is vested in the Council, whether or not situated on premises owned or controlled by the Council.

(2) No person shall break into, enter or in any other manner whatsoever interfere with any drain, trap, screen, inspection chamber or other work

or any part of any drainage installation: Provided that this prohibition shall not apply to alterations to any drainage installation undertaken by a licensed drain layer carrying out work in accordance with plans approved by the Council nor to any maintenance work carried out by a licensed drain layer or other person authorized by the Council to undertake such work.

17. Disused Conservancy And Septic Tanks

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 engineer may require such tank to be otherwise dealt with, or he or she may permit it to be used for some other purpose subject to such conditions as he or she may consider necessary, regard being had to all the circumstances of the case.

18. Obstruction And False Information

18 (1) An officer 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 or any other person who denies or causes any other person to deny entry to premises to any officer in terms of subsection (1), or who obstructs or causes any other person to obstruct any such officer in the performance of his or her duties, or who withholds or causes any other person to withhold information required by the officer for the purpose of carrying out his or her said duties, or who gives or causes or suffers any other person to give to the officer any information which is to his knowledge false, shall be guilty of an offence.

CHAPTER 7
APPROVAL OF PLANS, APPROVAL AND TESTING OF DRAINAGE INSTALLATIONS AND FITTINGS

19. Approval Required For Drainage Work

19. (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 subsection (1) for which approval has been given as provided for in terms of these by-laws, shall be commenced with 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 or her application has been granted, or without giving notice as prescribe in terms of subsection (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 or she 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 must be inspected and approved by the Council and any person who has 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 or her 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.

20. Application For Approval

20. (1) Every person shall, before commencing to construct, reconstruct, alter, add to, open or disconnect from a drain or from a sewer or connecting sewer any drainage installation, lodge with the Council an application on a form provided by the Council and signed by the owner of the premises concerned or his architect or other authorized agent, for approval of the work proposed, together with the fees prescribed in terms of section 23.

(2) An application as required in terms of subsection (1) 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 subsection (5) sufficiently appear on the other drawings herein referred to, no block plan need be furnished with the application.

(3) One set of the required drawings shall be made in waterproof ink or otherwise clearly reproduced on SABS approved durable transparent material or be clearly legible prints with a white background on SABS approved durable material and shall be signed as prescribed in subsection (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).

(4) 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.

(5) The plans, elevations and sections shall show –

(a) the position and arrangement in any building of every waste-water and soil-water fitting to be installed therein;

(b) the size, gradient and position of every drain, the size and position of every manhole, gulley trap, bend, soil-water pipe, anti-siphonage pipe and ventilation pipe, and the means of access to and inspection of drains;

(c) 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;

(d) 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

(e) as much as is necessary of any existing drainage installation which will be affected by the proposed work.

(6) The block plan shall show –

(a) 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;

(b) 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

(c) the north point, and

(d) the geographical contours of the piece of land.

(7) On the drawings of drainage installations submitted in terms of these by-laws the items specified in the left-hand column of the following table shall be depicted in the colour opposite to them in the right-hand column:

TABLE

Drains and soil-water pipes	Brown
Ventilation pipe to drains and soil-water pipes	Red
Waste-water pipes	Green
Pipes for the conveyance of industrial effluent	Orange
Ventilation pipes to waste-water pipes	Blue
Existing approved drainage installations	Black

(8) On the drawing referred to in subsection (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
Gulley	G
Gulley-dished	G D
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

(9) Approval by the Council of an application made in terms of this section shall be conveyed to the applicant in writing.

21 Changes In Applications After Approval

21. (1) After approval by the Council of an application in terms of section 20 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 20 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 subsection (1) shall be deemed to be a new application in terms of section 20 for which the fee prescribed in terms of section 23 shall be payable and in respect of which the provisions of subsection (1) relating to the Council's approval thereof shall apply.

22. Period Of Validity Of Approval

22. (1) An approval given by the Council in terms of section 20 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 subsection (1), 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 application form as prescribed in terms of section 20, which application shall be deemed for all purposes 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 making the new application, pay the fees prescribed in terms of section 23.

23. Application Fees

23. (1) The fees prescribed in the relevant tariff shall be payable to the Council in advance for the consideration of an application in terms of section 20 or for any such testing of any fitting as may be deemed necessary by the Council prior to giving its approval thereto and no consideration shall be given to the application until the said fees have been assessed and paid.

(2) Where an application made in terms of section 20 is refused or withdrawn, the Council may at its absolute discretion retain or refund the whole or any part of the fees paid in respect thereof.

24. Testing And Approval Of Drainage Installations

24. (1) 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, the following test shall in the presence of one of its authorized officers be applied and succeed to the satisfaction of the Council: -

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 35 kPa (35mm Head of Water) is indicated, after which without further pumping the said pressure shall remain greater than 25 kPa (25mm Head of Water) for a period of at least three minutes.

(2) The aforesaid tests shall be carried out and the apparatus therefore shall be supplied by the owner at no expense to the Council.

(3) 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, the test prescribed in subsection (1) and if the installation fails to withstand any such test to the satisfaction of the Council, the Council may call upon the owner to carry out at his or her own expense, and within such period as it may stipulate, such repairs as may be necessary to enable the installation to withstand the said test.

CHAPTER 8
HYDRAULIC LOADS

25. Hydraulic Loads Carried By Drainage Installations

25. (1) The hydraulic load discharged into or carried by a drain, a soil-water pipe or a waste-water pipe shall be calculated in units, hereinafter referred to as discharge units.

(2) The hydraulic load at any point in a drain, soil-water pipe or waste-water 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 hydraulic load expressed in discharge units discharged from any sanitary fitting specified in column 3 of the following table will 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 fitting as specified in column 1.

TABLE

1 **Nominal diameter of Trap (mm)**	**2** **Hydraulic 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	
75	2½	Channel type urinal
100	4	Water closet

(4) The hydraulic 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.

TABLE

1	2	3	4	5	6	7	8
MAXIMUM PERMISSIBLE HYDRAULIC LOAD IN DISCHARGE UNITS							
Nominal pipe or Drain (mm)	Carried by Vertical Pipe or Stack	Carried by a Branch Pipe	Carried by a Horizontal Pipe	Carried by a Drain Having a Gradient			
				Flatter than 1:100	Between 1:50 And 1:100	Between 1:25 And 1:50	Steeper Than 1:100
32	1	½	½				
38	8	2	2				
40 OD	3	1	1				
50 OD	16	3	3				
50	24	4	4				
65	42	10	10				
75 OD	64	12	18				
75	95	20	30				
100 (110 OD)	500	90	175	1 400	2 000	2 850	4 000
125	1 100	200	400	2 600	3 500	5 100	7 000
150 (160 OD)	1 900	350	700	4 100	6 000	8 500	12 000
200	3 600	600	1 400	8 700	13 000	18 000	25 000
225	-	-	1 900	12 000	17 500	24 500	30 000
250	-	-	2 500	16 000	23 000	32 000	45 000
300	-	-	3 900	26 000	37 500	52 000	73 500
375	-	-	7 000	46 500	67 500	74 000	132 500

(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 9
DRAINS AND MANHOLES

26. Drain Pipes And Fittings

26. (1) All pipes, junctions, bends and associated fittings forming part of a drain shall be made of SABS approved material.

(2) All pipes, junctions, bends and associated fittings forming part of a drainage installation shall be installed to comply with the SABS 1200 specification.

27. Joints In And With Drains

27. (1) All joints between pipes and appliances and fittings in a drainage installation must 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 must be so made that they are air and water-tight and that a badger of 6mm less in diameter than the nominal internal diameter of the pipe can pass freely through them.

(3) Methods of jointing pipes and fittings made of such other materials as may be approved in terms of section 26 (1) shall be as approved by the Council.

(4) Where in the opinion of the engineer 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.

28. Laying, Alignment And Gradients Of Drains

28. (1) 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 or other applicable legislation, shall lay drains: Provided that –

(a) the jointing of pipes may be carried out by any person working under the supervision of a licensed drain layer;

(b) where in terms of section 26 (1) the Council has permitted a drain to be made of some material other than SABS approved material, the drain so made may at the discretion of the Council be laid by the holder of either a plumber's or drain layer's licence.

(2) Drains shall be laid in a straight line and at a uniform gradient between the points of access referred to in section 33 and in such manner that the barrel of every pipe is firmly supported throughout its length, and when so required by the Council, shall be laid on a bed of concrete.

(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 or such other materials the engineer may approve.

29. Drains In Unstable Ground

29. 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 27 (7).

30. Drains Within Or Under Buildings

30. (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, where it is laid in an inaccessible position under a building, without means of access to the part under the building, and except where the engineer permits a change of direction or gradient to or from the vertical, must be without change of direction or gradient.

(3) A drain or part thereof constructed or pipes must, where it is laid in an inaccessible position under a building and except where otherwise permitted by the Council, be laid on a bed of concrete at least 100mm thick having a composition of not less than 1 part of cement to 3 parts of fine aggregate.

(4) Where a drain or part thereof is laid in an exposed position within a building, it must be adequately supported at intervals not exceeding 2m along its course.

(5) If a drain passes through or under a wall, foundation or other structure, adequate precautions shall be taken to prevent the transmission of any load to such drain.

31. Protection Of Shallow Drains

31. Any portion of a drain which is 450mm or less below the surface of the ground must 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.

32. Branch Drains

32. (1) Every branch drain must be connected to another drain by means of a junction, not being a saddle junction, made specially for the purpose of such connection.

(2) Every branch drain must 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°.

33. Access to Drains

33. (1) Every drain must 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 connection with the Council's connecting sewer;

(b) within 1,5m of the upper extremity of every drain or branch drain;

(c) at every change of direction of the drain, whether horizontal or vertical;

(d) at every point of junction with another drain.

(2) There must 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 must be sealed with such approved material as will remain effective as seal at all temperatures up to 70℃.

(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 must notify and submit plans for approval by the Council, of any alteration to existing services in the public place which may by reason of the construction of the manhole be necessary.

(b) The owner of the private premises referred to in paragraph (a) must, if required by the Council, pay to the Council the charges set out in the tariff as rental for the area of the public place occupied by the manhole.

(6) The points of access to drains laid beneath paved areas must be covered by adequate and appropriately marked removable slabs on the surface.

(7) Where any part of a drainage installation passes under a building, it must 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.

(8) 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 or she may deem necessary to render the interior of any part of such drain readily accessible for cleaning or inspection.

34. <u>Rodding Eyes</u>

34. (1) Rodding eyes required by the Council in terms of section 33 (1) must be provided in the positions specified in subsection (2) and must comply with the requirements set out in subsection (3).

(2) A rodding eye must 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 must be constructed with SABS approved pipes and 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 groun d level;

35. Manholes

35. (1) Every manhole in a drainage installation must, unless otherwise permitted by the engineer, be located in an open air space.

(2) Every manhole must be so constructed as to prevent the infiltration of water.

(3) 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.

(4) The walls of any manhole must, if constructed of brickwork, be not less than 215mm thick, and if constructed on concrete be not less than 150mm thick, except when otherwise permitted by the engineer.

(5) All bricks used in the construction of a manhole must be hard and well burnt and must be laid in mortar consisting of not more than 3 part of sand to 1 part of cement, and if the walls are constructed of concrete, such concrete must be composed of not less than 1 part of cement to 2 parts of fine aggregate and 4 parts of coarse aggregate.

(6) Where the base of a manhole is traversed by an open channel –

(a) the sides of the channel must 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;

(b) the walls must be plastered internally with cement plaster not less than 12mm thick composed of not more than 4 parts of sand to 1 part of cement; and

(c) the walls and floor shall be steel trowelled to a smooth finish.

(7) The walls of the manhole or the walls of any shaft giving access thereto must be carried up to the level of the surrounding ground or floor.

(8) Access to the interior of the manhole must 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.

(9) The top of the manhole must be finished off with a granolithic surround not less than 150mm wide trowelled to a smooth finish.

(10) Where a manhole is constructed in a place traversed by –

(a) heavy vehicles, it must be provided with a heavy duty cover;

(b) motor cars or similar light vehicles, it must be provided with either a medium or heavy duty cover.

(11) Every manhole exceeding 2m in depth must have an unobstructed internal working height of at least 1,8m 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 must be provided in its walls as will ensure safe and convenient access to its base.

(12) The internal length and width of a manhole must be determined according to the depth between the cover and the lowest invert level of the manhole and must in no case be less than the dimensions set out in the following table:

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

(13) The dimensions of the access opening to a manhole provided with –

(a) a rectangular cover, must not be less than 450mm by 600mm;

(b) a square cover, must not be less than 600mm by 600mm;

(c) a circular cover, must not be less than 550mm in diameter.

(14) Where a pipe leading to a manhole is at a higher level than the outlet pipe of the manhole, it must 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 must also be continued upwards to the surface of the ground and wall there terminate in a removable watertight cover or other similar approved device: Provided that where permitted or required by the engineer, 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.

(15) The recess in the frame of every manhole cover having a single seal must be filled with grease having a high melting point and the cover must be set therein to form an airtight seal.

CHAPTER 10
GULLIES AND TRAPS

36. Gulley Traps

36. (1) Every drainage installation shall have only one gulley trap provided with a dished gulley 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 gulley must 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 gulley 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 gulley trap required in terms of subsection (1) or into a gulley trap authorized in terms of subsection (2), such waste-water pipe must 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 must 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.

37. Requirements For Trapped Gullies

37. (1) Every gulley trap must have a minimum internal diameter of 100mm and a water seal at least 65mm in depth.

(2) Every gulley trap must be kept covered with a grating made of cast iron or other approved material. The spaces between the bars of the grating must be not less than 10mm or more than 12mm wide, and must have an effective open area at least equal to the minimum cross-sectional area of the trap.

(3) Every gulley trap laid in the ground must be bedded on concrete not less than 100mm thick.

(4) Every dished gulley must rise at least 75mm above the level of the grating covering the gulley 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 must be at least 150mm above the surrounding ground.

(5) Subject to the provisions of subsection (6), the surface level of the water in any gulley trap must not be more than 500mm below the top of the dished gulley referred to in subsection (4).

(6) Where it is impracticable to comply with the dimensional requirements of subsection (5), the gulley trap must 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 waste-water pipe which discharges into a gulley must discharge at a point below the grating but above the surface of the water seal of the gulley trap.

38. <u>Grease Traps</u>

38. (1) A grease trap of approved type, size and capacity must be provided instead of, or in addition to, a gulley 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.

39. Industrial Grease Traps

39. (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 SABS 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 vapour at a temperature of or exceeding 20℃, shall be interc epted 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 subsection (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 or grease, oil, fat and solid matter.

40. Clogging Of Traps, Tanks And Similar Fittings

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

41. Location Of Gullies

41. (1) Without prejudice to the provisions of section 39 (1), the inlet of every gulley trap, grease trap or stable gulley must be situated outside of any building or in a place permanently open to the external air of an approved extent, and must 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 gulley must have an impervious, smooth and durable surface, and notwithstanding the provisions of subsection (1) such gulley may be situated within a building, provided that the pipe receiving the discharges from such gulley discharges into another gulley trap the inlet of which is situated as required in terms of subsection (1).

(3) A gulley 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 gulley trap the inlet of which is situated as required in terms of subsection (1).

CHAPTER 11

VENTILATION PIPES AND ANTI-SIPHONAGE PIPES

42. Ventilation Pipes – Where Required

42. (1) A ventilation pipe complying with the relevant requirements of section 44 shall be provided for –

(a) every drain;

(b) 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;

(c) 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;

(d) 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;

(e) 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 gulley 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;

(f) every branch 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 connection to a ventilated waste-water 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 25 (4) must, 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.

43. Chimneys Or Flues

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

44. Ventilation Pipes And Anti-Siphonage Pipes – General

44. (1) Every ventilation pipe must throughout its length have a nominal diameter not less than 50mm nominal diameter.

(2) The connection between a ventilation pipe and any drain or pipe mentioned in section 42 (1) must be made immediately downstream of the point of discharge into such drain or pipe of the uppermost connected sanitary fitting, gulley or similar trap.

(3) Every individual anti-siphonage pipe must 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 must be in accordance with the provisions of section 46.

(5) Every ventilation pipe and every anti-sihponage pipe must be carried upwards without any reduction in diameter and must, 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, must 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 is used or is intended to be used for any purpose the pipe shall, unless the engineer must otherwise permit, extend at least 2,5m above such roof or part thereof.

(b) the open end of any ventilation pipe or anti-siphonage pipe must in no case be less than 3,6m above ground level.

(7) Every individual anti-siphonage pipe must, unless carried up independently, be connected to another anti-siphonage pipe or to a ventilation pipe at a point at least 150m 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 must 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 subsection (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 subsection (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 must be adequately stayed or must otherwise be made secure.

45. <u>Anti-Siphonage Pipes – Where Required</u>

45. (1) Subject to the provisions of sections 50, 51, 52 and 53, the water seal of the trap of a soil-water fitting must 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 44 (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 must be protected by individual anti-siphonage pipes, unless approved resealing traps are installed: Provided that this requirement must not apply to a single bath, shower or sink having an independent discharge to a gulley trap and situated not more than 2m above or 3m from such gulley trap.

(3) Subject to the provisions of sections 50, 51, 52 and 53, the water seals of the traps of waste-water fittings installed in accordance with the requirements of these by-laws for the one-pipe system must be protected by individual anti-siphonage pipes.

46. Sizes Of Anti-Siphonge Pipes

46. (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 not be less than 50mm.

(2) The normal 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) For the purpose of this subsection –

(a) the developed length of a branch anti-siphonage pipe will 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-psiphonage pipe connected to it;

(b) the developed length of a main anti-siphonage pipe will 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.

(4) 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 must, subject to the

provisions of subsections (1) and (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.

1	2	3	
		Nominal diameter of branch or main anti-siphonage pipe	
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 (metres)	Inter 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
	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	50	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	50	75

1	2	3	
		Nominal diameter of branch or main anti-siphonage pipe	
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 (metres)	Inter diameter (metallic pipes) (mm)	Outside diameter (non-metallic pipes) (mm)
	Exceeding 51 but not exceeding 75	75	75
	Exceeding 75	75	110
42½ to 64	Not exceeding 7	50	50
	Exceeding 7 but not exceeding 15	50	75
	Exceeding 15 but not exceeding 36	50	75
	Exceeding 36 but not exceeding 60	75	75
	Exceeding 60 but not exceeding 90	75	110
	Exceeding 90	100	110
64½ to 95	Not exceeding 5	50	50
	Exceeding 5 but not exceeding 7	50	75
	Exceeding 7 but not exceeding 27	50	75
	Exceeding 27 but not exceeding 51	75	75
	Exceeding 51 but not exceeding 75	75	110
	Exceeding 75	100	110
95½ to 500	Not exceeding 7	65	75
	Exceeding 7 but not exceeding 18	75	75
	Exceeding 18 but not exceeding 24	75	110
		100	110
	Exceeding 96	110	160

1	2	3	
		Nominal diameter of branch or main anti-siphonage pipe	
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 (metres)	Inter diameter (metallic pipes) (mm)	Outside diameter (non-metallic pipes) (mm)
500½ to 1 100	Not exceeding 5	50	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
	Exceeding 57 but not exceeding 177	125	160
	Exceeding 177	110	160
1 100½ to 1 900	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	110	160
	Exceeding 75 but not exceeding 195	150	160
	Exceeding 195	200	-
1 900½ to 3 600	Not exceeding 7	100	110
	Exceeding 7 but not exceeding 21	125	160
	Exceeding 21 but not exceeding 57	150	160
	Exceeding 57 but not exceeding 222	200	-
	Exceeding 222	225	-

CHAPTER 12

SOIL-WATER AND WASTE-WATER PIPE SYSTEMS

47. Soil-Water And Waste-Water Pipe Systems – General

Soil-water pipe and waste-water pipe installations shall comply with the equirements, 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 for each system if, in his or her opinion, such combination will result in an adequately ventilated drainage installation and the effective protection of the water seals of all traps connected thereto.

48. Requirements For The One-Pipe System

The following requirements will apply to the one-pipe system:

(a) All soil- water pipes must be connected directly to a drain or to another soil-water pipe similarly connected;

(b) All waste-water pipes must 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 must be not less than 65mm nor more than 100mm, and each such water seal must be protected by means of an anti-siphonage pipe in accordance with the relevant provisions of sections 44 and 46.

49. Requirements For The Two-Pipe System

The following requirements will apply to the two-pipe system:

(a) Every waste-water pipe or system of waste-water pipes must discharge into a gulley trap connected to a drain or to a soil-water pipe;

(b) Every soil-water pipe must 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 waste-water fitting must be not less than 38mm nor more than 100mm, and the protection of the water seal of each such trap must be effected in accordance with the provisions of section 45 (2).

50. General Requirements For The Single Stack System

The following provisions and requirements must apply in the case of the single stack system:

(a) The single stack system must be installed only in a building of the office class or a residential building;

(b) The single stack system must not be installed in any building the height of which exceeds 25 storeys 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 51, 52 and 53.

51. Single Stack Sytem: Requirements For Residential And Office Buildings

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

(a) The soil-water stack must, at its topmost end, be continued upwards as a ventilation pipe to comply with the relevant provisions of section 44 and may, in addition, be provided with a supplementary ventilation pipe.

(b) A supplementary ventilation pipe as required in terms of paragraph (a), must have a nominal diameter of not less than 50mm and must be connected to the soil-water stack at a point below the lowest branch pipe connected to such stack, and must be continued upwards and be interconnected to such stack at the intervals prescribed for the buildings as required in sections 52 and 53.

(c) The interconnection between a supplementary ventilation pipe and any other pipe must be so located and made that no soil-water or waste-water can, under any circumstances, be discharged through any ventilation pipe.

(d) The radius of the centre line of any bend installed at the lowest extremity of the soil-water stack must not be less than 300mm.

(e) No offset must 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 must not be less than one half the diameter of the stack.

(f) Every waste-water trap must be either a “P or “S”” trap of the resealing type or other approved “P” or “S” 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 invest of the drain at the point of connection between the stack and the drain must be not less than 500mm in the case of a stack serving a building of not more than three storeys 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 must 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 waste-water must in no part be steeper than 1 in 25 nor flatter than 1 in 50.

(j) The point of connection between a branch waste-water pipe and a stack must be so located that the centre line of the stack at or above the level at which the centre line of any water closet branch pipe meets the centre line of the stack or at least 200mm below such level.

52. <u>Single Stack System: Aditional Requirements For Residential Buildings</u>

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 must 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 must not be less than 38mm.

(c) The gradient of the branch pipe referred to in paragraph (b) must in no part be steeper than 1 in 25, and the length of such pipe

measured between its point of connection with the soil-waste stack and the crown of the trap must not exceed 3m.

(d) Not more than 2 groups of sanitary fittings installed in any one storey must be connected to the same stack.

(e) The nominal diameter of a stack serving a residential building, the height of which exceeds 20 storeys above the lowest ground level abutting on such building, must 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 storeys, a supplementary ventilation pipe will not be required;

(ii) exceeds 10 storeys but does not exceed 15 storeys in height and such stack receives the discharges from one group of sanitary fittings installed at each storey, a supplementary ventilation pipe with a nominal diameter of not less than 50mm must be provided and interconnected with the stack above the level of the highest branch pipe connection of each alternate storey.

(iii) Exceeds 15 storeys but does not exceed 20 storeys in height and such stack receives the discharges from one group of sanitary fittings installed in each storey, a supplementary ventilation pipe with a nominal diameter of not less than 75mm must be provided and interconnected with the stack above the level of the highest branch pipe connection at each alternate storey;

(iv) Exceeds 15 storeys but does not exceed 20 storeys in height and such stack receives the discharges from 2 groups of sanitary fittings installed in each storey, a supplementary ventilation pipe with a nominal diameter of not less than 75mm must be provided and interconnected with the stack above the level of the highest branch pipe connection at each storey.

(g) Where a stack with a nominal diameter of 150mm serves a residential building not exceeding 25 storeys in height, a supplementary ventilation pipe will not be required.

53. <u>Single Stack System: Additional Requirements For Office Buildings</u>

53 (1) 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) must be interconnected with the stack above the level of the highest branch pipe connection at each storey.

(c) The nominal diameter of the supplementary ventilation pipe must be not less than the diameter specified in the table below, regard being had to the diameter of the stack, the number of storeys served by such stack and the number of sanitary fittings installed in a range or battery in each storey.

(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 must not be used in any building of the office class, if the number of sanitary fittings installed in a range or battery in any storey exceeds the number specified in the table below for the relevant diameter of stack, or if the number of storeys served by such stack exceeds the number specified in the said table.

TABLE

Nominal diameter of stack	Number of storeys served by the stack	Number of sanitary fittings installed in a range or battery in each storey	Nominal diameter of supplementary ventilation pipe
100m	8 storeys	Not exceeding 2 WC pans and 2 hand basins	Not required
		Exceeding 2 WC pans and 2 hand basins but not exceeding 5 WC pans and 5 hand basins	50mm
	12 storeys	Not exceeding 4 WC pans and 4 hand basins	50mm
150mm	8 storeys	Not exceeding 4 WC pans and 4 hand basins	Nor required
	24 storeys	Not exceeding 3 WC pans and 3 hand basins	

CHAPTER 13
WASTE-WATER, SOIL-WATER, VENTIALTION, AND ANTI-SIPHONAGE PIPES AND JOINTS

54. Design And Installation Of Soil-Water Pipes And Waste-Water Pipes

54. (1) No soil-water pipe or waste-water 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 50, 51, 52 and 53 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 25, 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 in less than 45° above the horizontal, such part must be deemed to be a horizontal pipe and the diameter of such part must be determined in accordance with the provisions of paragraph (b) and the diameter of the stack below such inclined part must 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 hydraulic 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° 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 must be provided at such point of connection.

55. Location Of Soil-Water, Waste-Water, Ventilation And Anti-Siphonage Pipes

55. (1) Every soil-water pipe, waste-water pipe, ventilation pipe and anti-siphonage pipe must be effectively protected against damage by vehicular impact or must be so located as to be effectively protected against such damage.

(2) No pipe mentioned in subsection (1) may 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 must be such as the engineer 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 must be adequately ventilated.

(4) If an enclosed shaft or duct contains any part of a drainage installation it must be adequately ventilated, must have a minimum cross-sectional area of 1,5m² and a minimum width of 1m and must 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 subsection (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, may be exposed to view from the outside of such building.

56. <u>Access To Interior Of Soil-Water Pipes And Waste-Water Pipes</u>

56. (1) Subject to the provisions of subsection (2), adequate means of access to the interior of the pipe must 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, must be located outside the room.

(3) An inlet to a waste-water pipe as referred to in subsection (2) may be provided in the floor of such a room as is referred to in subsection (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 must be permitted in any such pipe as is referred to in subsection (2), unless its position in relation to any access eye is such as readily to 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.

57. Waste-Water, Soil-Water, Ventilation And Anti-Siphonage Pipes And Fittings

57. (1) Waste-water pipes, soil-water pipes, ventilation pipes and anti-siphonage pipes and their associated traps and fittings must be made of cast iron, mild steel, copper, brass, drawn lead, asbestos cement or unplasticised polyvinyl choloride, 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 subsection (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) SABS approved cast iron pipes and their associated traps and fittings must have both their inside and outside surfaces adequately coated with a bituminous or other corrosion-resisting material.

(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°.

58. <u>Joints Between Pipes And Pipes And Fittings</u>

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

CHAPTER 14

WASTE-WATER AND SOIL-WATER FITTINGS AND FIXTURES

59. Traps To Waste-Water Fittings

59. (1) An approved self-cleansing trap will be provided immediately beneath every waste-water fitting.

(2) Except in the case of a trap made of rubber or other approved flexible material, every trap in terms of subsection (1) must be provided with an adequate cleaning eye protected by a water seal and having a removable cover.

(3) The nominal diameter of any trap must 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 waste-water fittings.

(4) The depth of the water seal in a trap must in no case exceed 100mm and must not be less than 38mm in the two-pipe system and not less than 50mm in the one-pipe system.

(5) Notwithstanding the provisions of subsection (1), it will 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 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 gulley 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 62 (7).

60. Soil-Water Fittings

60. (1) Every room or compartment containing any soil-water fitting must have a rigid floor of non-absorbent material.

(2) Without prejudice to the particular provisions of sections 61 and 62, every soil-water fitting must be made of SABS approved earthenware, fireclay, porcelain, vitreous china or other SABS approved material having in every case a glazed or smooth finish, must be of approved type and must be provided with a trap having a water seal not less than 50mm in depth.

61. Water Closet Soil-Water Fittings

61. (1) Every water closet pan of the wash-down or siphonic type and its associated trap must be made in one piece, must be provided with an integral flushing rim so constructed that the entire surface of the bowl is effectively flushed, and must have a minimum standing water-level area of 130cm^2: Provided that the trap used with a squatting pan may be an independent unit.

(2) Any such trap as referred to in subsection (1) must 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 subsection (1), such horn must have an internal diameter of not less than 50mm and must 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 must not be fitted with ventilating horns; and

(b) Their outlet pipes must 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 must 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 closet pan must be not less than 70mm or more than 75mm.

(7) Except in the case of squatting pans, pans must 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 must 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.

62. Urinals

62. (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 subsection (3), have a trap attached to or formed integrally with the urinal directly connected to a soil-water pipe or drain.

(2) Wall hung urinals must 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.

(3) 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 must discharge into a channel complying with the relevant requirements of this section.

(4) Where urinals are directly connected to a soil-water pipe or drain, the floor of the room or compartment containing the urinals must be graded and drained to an approved floor trap similarly connected.

(5) All surfaces liable to fouling in any room or compartment containing a urinal must be protected with and approved impervious material having a glazed or other smooth finish.

(6) The floor of a room or compartment containing a urinal channel must 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 must be provided and only the said platform must be required to slope and drain as aforesaid.

(7) Every channel and trap forming part of a urinal or receiving the discharges form a urinal must be made of approved impervious material having a glazed or smooth finish and must be located in the same room or compartment as the urinal itself.

(8) The nominal diameter of a trap receiving the discharges from a channel in a compartment or room containing a urinal must be not less than 75mm and the diameter of a trap attached to or formed integrally with a wall hung urinal must not be less than 38mm.

(9) At least one trap having a diameter of 75mm must be provided for every 5 urinal stalls or fore very 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.

(10) Except in the case of a siphonic urinal, every urinal trap must be provided with a hinged and domed grating designed to retain solid matter without obstructing the flow of liquids.

63. Flushing Of Soil-Water Fittings

Every soil-water fitting must be capable of being effectively flushed by means of a flushing cistern, flushing valve or other approved device the flushing action, of which shall effectively flush the entire fouling surface of the fitting and clear the trap completely at each flush.

64. Flushing Cisterns

64. (1) The mechanism of a flushing cistern must 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 operation of the flushing mechanism or through and overflow pipe.

(2) A flushing cistern must have an overflow pipe of adequate diameter the discharge from which will be reasonably detectable and so directed that it cannot cause damage to the building.

(3) The ball valve in a cistern must 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.

(5) Flushing cisterns for water closets slop hoppers and bed-pan sinks and washers must discharge at each flush not less than 11 litres of water.

(6) Automatic flushing cisterns for urinals must discharge at each flush not less than 2 litres of water for each urinal stall or for every 600mm of the width of the urinal.

(7) Automatic flushing cisterns for trough closets must at each flush discharge not less than 22 litres of water for each seat.

65. Flushing Valves

65. (1) Flushing valves must at each operation discharge a volume of water not less than is prescribed in section 64 (5).

(2) Where flushing valves are installed, adequate measures must be taken to prevent back-siphonage from the soil-water fitting into the water supply.

CHAPTER 15

MECHANICAL APPLIANCES FOR LIFTING SEWAGE

66. Mechanical Appliances

66. (1) Every person shall before installing any mechanical appliance for the raising or transfer of sewage in terms of section 6 (5), make application in writing to the engineer 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) The form prescribed by subsection (1) shall be completed by a professional engineer who is fully conversant with the technical details of the appliance, and the undertaking annexed to such form shall be signed by the owner of the premises.

(3) The application mentioned in subsection (1) shall be accompanied by drawings prepared in accordance with the relevant provisions of section 20 and must show details of the compartment containing the appliance, and 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 subsection (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 must 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 must be installed in duplicate and each such appliance must 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 must be so located and operated as not to cause any nuisance through noise or smell or otherwise and every compartment containing any such appliance must be effectively ventilated.

(8) The maximum discharge rate from any mechanical appliance and the times between which the discharge may take place must 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 sewage storage tank must be provided in conjunction with such appliance, except where sewage storage space is incorporated as an integral part of a mechanical appliance

(10) Every sewage storage tank required in terms of subsection 9 shall –

(a) be constructed of hard, durable materials and must be watertight and the internal surfaces of the walls and floor must be rendered smooth and impermeable;

(b) have a storage capacity below the level of the inlet equal to the quantity of sewage discharged thereinto in 24 hours or 900 litres, whichever is the greater quantity; and

(c) be so designed that the maximum proportion of its sewage content will be emptied at each discharge cycle of the mechanical appliance.

(11) If the mechanical appliance consists of a pump, the starting mechanism must 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.

(12) When required by the engineer, a stilling chamber must be installed between the outlet of the mechanical appliance and the connecting drain or connecting sewer, as the case may be, and such chamber must have a depth of not less than 850mm.

(13) Every storage tank and stilling chamber must be provided with a ventilation pipe having a diameter of not less than 100mm carried upwards in accordance with the relevant provisions of section 44.

CHAPTER 16
SEPTIC AND STORAGE TANKS AND PRIVATE SEWAGE TREATMENT PLANTS, FRENCH DRAINS AND CONSERVANCY TANKS

67. Septic Tanks And Treatment Plants

67. (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 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 must be disposed of to the satisfaction of the Council.

(4) Every septic tank must 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 septic tank serving a dwelling-house must –

(a) have a capacity below the level of the invert of the outlet pipe of lot less than 500 litres per bedroom, subject to a minimum capacity below such invert level of 2 500 litres;

(b) have an internal width of not less than 1m measured at right angles to the direction of the flow;

(c) have an internal depth between the cover and the bottom of the tank of not less than 1,7m;

(d) retain liquid to a depth of not less than 1,4m;

(6) Septic tanks serving premises other than a dwelling-house must be of approved design, construction and capacity.

68. <u>French Drains</u>

68 (1) The Council may, at its discretion and on such conditions as it may prescribe having regard to the quantity 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 legislation, 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 must be determined in relation to the absorbent qualities of the soil and the nature and quantity of the effluent.

69. Conservancy Tanks

69. (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 and storm water and no effluent other than that which the Council have permitted in terms of subsection (1), may 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 215mm 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 or concrete 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 loss or damage which it may become liable 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 a 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 will be entitled to empty or to draw off part of the contents of any conservancy tank at any reasonable time on any day of the week and in such manner 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 must at all times maintain such tank in good order and condition to the satisfaction of the Council.

CHAPTER 17
MISCELLANEOUS PROVISIONS

70. Stables And Similar Premises

70. (1) Subject to the provisions of subsection (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), must be paved with approved impervious materials and graded to a silt trap, grease trap or gulley of adequate capacity.

(3) Every part of the floor of premises mentioned in subsection (1) must be covered by a roof and otherwise effectively protected to prevent the entry of rain or storm water into the drainage installation.

71. Waste Food Or Other Disposal Units

71 (1) 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 engineer 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.

(2) The engineer 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.

(3) The owner shall, upon the removal of any such unit or grinder, notify the Council within 14 days of its removal.

72. Offences And Penalties

72. (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 is in default in complying therewith, shall be guilty of an offence and shall be liable, on first conviction, to a fine not exceeding R1 500,00 or, in default of payment, to imprisonment for a period not exceeding three months, and on any subsequent conviction to a fine not exceeding R2 000,00 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 or her 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 R500,00 or, in default of payment, to imprisonment for a period not exceeding thirty days.

CHAPTER 18
STORM WATER, SEWAGE, INDUSTRIAL EFFLUENTS AND OTHER DISCHARGES

73. Sewage Or Other Prohibited Discharges Not To Enter Storm Water Drains

73. (1) No person shall discharge or cause or permit to be discharged any sewage directly or indirectly into a storm-water drain, river, stream or 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 watercourse except where,

in the case of steam the Council has specifically permitted such discharge.

(3) Where the hosing down or flushing by rainwater of an open area 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 alterations to the drainage installation or roofing of the area it may consider necessary to prevent or minimize such discharge or pollution.

74. Storm-Water Not To Enter Sewers

74. (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 waste-water, 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 gulley forming part of a drainage installation.

75. Discharges Form Swimming Pools

75. (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 subsection (2) shall be subject to the payment of the charges specified in terms of the tariff.

76. Permission To Discharge Industrial Effluents

76. (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 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 the form, to be completed in duplicate, set out in the relevant appendix to these by-laws and must 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 subsection (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.

(5) Any person who discharges or causes or permits to be discharged any industrial effluent into the sewer without having first obtain permission to do so in terms of subsection (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 assesses for the conveyance and treatment of the effluent so discharged and for any damage caused as a result of such unauthorized discharge.

(6) Without prejudice to its rights in terms of subsection (5) or of section 80 (2)(c), 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 80 or which has been the subject of an order issued in terms of section 80 (2) all costs, expenses or charges incurred or to be incurred by the Council as a result of any or all of 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 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 relevant legislation, 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 Water Act, 1956 (Act 54 of 1956), or as a result of any amendment to these by-laws or due to 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 or amended conditions, if any, as the case may be, shall forthwith apply.

77. Control Of Industrial Effluent

77. (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.

(2) The Council may, by notice served on the owner or occupier of any premises from which industrial effluent is discharged, require him or her 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 will ensure that it at no time will fail to conform in all respects with the requirements of section 80 (1) 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 standard which may be laid down in respect of such works in terms of the relevant legislation;

(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 or her 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 the 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 or her 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 Appendix to these by-laws does not reflect the true permanganate value (PV) 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 or her to assess the charges payable in terms of the tariff; and

(g) For the purpose of paragraph (f), to provide and maintain at his or her 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;

(3) 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 engineer may, if he or she is of the opinion that such effluent is likely to cause damage to any sewer, mechanical appliance, sewage treatment works or sewage farm or process, forthwith after notifying the owner or occupier of the premises concerned of his or her intention to do so, close and seal off the drain conveying such effluent to the sewer for such period as he or she may deem expedient so as to prevent such effluent from entering the sewer.

(4) The Council shall not be liable for any damage occasioned by any action taken in terms of paragraph (a).

(5) No person shall without the written permission of the engineer open or break the seal of a drain closed and sealed off in terms op paragraph (a) or cause or permit this to be done.

78. <u>Metering And Assessment Of Industrial Effluent</u>

78. (1) The Council may incorporate, in such position as it must determine in any drainage installation conveying industrial effluent to a sewer, any meter or gauge or other device for the purpose of ascertaining the volume or composition of the said effluent, and it must 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 discharge.

(2) The Council must 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;

(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.

79. <u>Prohibited Discharges</u>

79. (1) No person must 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 engineer may be offensive to or may cause a nuisance to the public;

(b) which is in the form of steam or vapour or has a temperature exceeding 44℃ at the point where it enters the sew er;

(c) which has a pH value less than 6,0 or greater than 10,0;

(d) which contains any substance of whatsoever nature likely to produce or give off explosive, flammable, poisonous or offensive gases or vapours in any sewer;

(e) which contains any substance having an open flashpoint of less than 93℃ or which gives off a poisonous vapour at a temperature below 93℃;

(f) 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;

(g) which shows any visible signs of tar or associated products or distillates, bitumens or asphalts;

(h) 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 chlorination or an undesirable odour or colour, or excessive foam;

(i) which either has a greater PV value, a lower or higher pH value or a higher electrical conductivity than specified in the relevant Appendix to these by-laws or which contains any substance specified in the said relevant Appendix in concentration greater than those there listed: Provided that the Council may approve such greater limits or concentration 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;

(j) which contains any substance of whatsoever nature which in the opinion of the engineer –

(i) is not amenable to treatment at the sewage treatment works, or which causes or may cause a breakdown or inhibition of the normal sewage treatment processes; or

(ii) if of such nature as is or may be amendable to treatment only to such degree as to prevent the final treated effluent from the sewage treatment works form satisfactorily complying in all respects with any requirements imposed in terms of the relevant legislation; 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

(bb) be harmful to sewers, treatment plant or land used for the disposal of treated sewage effluent; or

(cc) adversely affect any of the processes whereby sewage is treated or any re-use of sewage effluent.

(2) (a) Any person receiving from an official duly authorized thereto by the Council a written order instructing him to stop the discharge to the sewer of any substance referred to in subsection (1), shall forthwith stop such discharge.

(b) Any person who contravenes the provisions of subsection (1) or who fails to comply with an order issued in terms of paragraph (a), will be guilty of an offence and will, on conviction, be liable to a fine not exceeding R …….. or imprisonment for a period not exceeding six months and, I the case of a continuing offence, to a fine not exceeding R……. for each day or part of a day during which such offence continues.

(c) Notwithstanding the provisions of paragraph (b), should any person have failed to comply with the terms of an order served in terms of paragraph (b) 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 must forthwith be stopped by the person responsible for the discharge or by the Council in the event of his failure to do so.

CHAPTER 19

GENERAL PROVISIONS

80. <u>Drainage By-Laws</u>

80. These by-laws shall be known as the Drainage By-Laws.

SCHEDULE 1

LIMITS OF PERMANGANATE VALUE (PV), PH AND ELECTRICAL CONDUCTIVITY AND MAXIMUM CONCENTRATION OF CERTAIN SUBSTANCES

Subject to the provisions of section 80 (1) (i) of these by-laws, the following are –

(a) the limits of the PV, pH and electrical conductivity; and

(b) the substances and the maximum permissible concentrations thereof, expressed in mg/1 referred to in section 80 (1) (i): -

(i) General:

PV – not to exceed	500 mg/1
PH – within the range	6,0 – 9,5
Electrical conductivity – not greater than	250 mS/m at 20℃
Caustic alkalinity (expressed as $CaCo_3$	1 000 mg/1
Substances not in solution (including fat, oil, grease, waxes and like substances)	100 mg/1
Substances soluble in petroleum ether	50 mg/1
Sulphides, hydro-sulphiedes and polysulphides (expressed as S)	20 mg/1
Substances from which hydrogen cyanide can be liberated in the drainage installation, sewer or sewage treatment works (expressed as HCN)	5 mg/1
Formaldehyde (expressed as HCHO)	10 mg/1
Non-organic solids in suspension	100 mg/1
Chemical oxygen demand (COD)	2 000 mg/1
All sugars and/or starch (expressed as glucose)	500 mg/1
Available chlorine (expressed as C1)	10 mg /1
Sulphates (expressed as SO_4)	500 mg/1
Fluorine-containing compounds (expressed as F)	2 mg/1
Anionic surface active agents	100 mg/1
Sodium (expressed as Na)	100 mg/1

(ii) Metals:

Group 1

Iron (expressed as Fe)

Chromium (expressed as Cro_3)

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)

Cadium (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 20 mg/1, nor shall the concentration of any individual metal exceed 5 mg/1.

Group 2

Lead (expressed as Pb)

Selenium (expressed as Se)

Mercury (expressed as Hg)

The total collective concentration of all metals in Group 2 (expressed as indicated above) in any sample of the effluent shall not exceed 10 mg/1, nor shall the concentration of any individual metal in any sample exceed 2 mg/1.

(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 10 mg/1.

(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 Schedule, the Council reserves the right to limit the total mass of any substance or impurity, discharge per 24 hours into the sewers from any premises.

Note: The method or 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 this Schedule shall ascertain the details of the appropriate test from the Council.

SCHEDULE 2

RULES FOR DETERMINING THE FOUR-HOUR PERMANGANATE VALUE (PV) OF INDUSTRIAL EFFLUENTS

NOTE: These rules are to all intents and purposes a re-statement in the form of by-laws of the "Methods of Chemical Analysis as applied to Sewage and Sewage Effluents" as published by the British Ministry of Housing and Local Government, HM Stationery Office, 1956.

PART 1

PROCEDURE FOR THE PREPARATION OF RE-AGENTS

1. (1) For the preparation of potassium permanganate solution, being approximately,

N

80, the procedure described in this rule shall be followed.

(2) 4 grams KmnO, shall be dissolved in ole litre of hot distrilled water contained in a large beaker covered with a clock glass, the solution being maintained at 90℃ to 95℃ for not less than two hours if possible.

(3) The said solution shall be diluted to 10 litres with distilled water and set aside in darkness until complete oxidation of any organic matter has taken place and any precipitated manganese dioxide has settled.

(4) The supernatant liquid shall be carefully decanted or siphoned off so that the disturbance of any sediment is avoided.

(5) Notwithstanding anything contained in this rule, it shall be permissible alternatively to filter the solution through a funnel having a sintered-glass element, through glass wool or through asbestos fibre which has been previously digested with nitric and hydrochloric acids and then

thoroughly washed with water: Provided that the solution shall not be filtered through paper.

(6) All necessary measures shall be taken to prevent the solution from being contaminated by dust or organic matter.

(7) Daily blank determinations shall be made to check the strength of the potassium permanganate solution.

NOTE: When the method described above is carefully followed and the solution stored in amber bottles or in the dark it is stable for several months.

2. (1) For the preparation of a stock solution, N

4, sodium thiosulphate the procedure described in this rule shall be adopted.

(2) 63 grams of sodium thiosulphate, $Na_2S_2O_35H_2O$), shall be dissolved in ole litre of copper-free, freshly boiled and cooled distilled water, and one milliliter of chloroform or 10 milligrams of mercuric iodide shall be added to stabilize the solution.

(3) The solution shall be allowed to stand for several days before it is used.

3. (1) For the preparation of a working solution of N

80, sodium thiosulphate the procedure described in this rule shall ……

(2) 50 millilitres of stock solution shall be diluted to one litre with copper-free, freshly-boiled and cooled distilled water, and one milliliter of chloroform or 10 milligrams of mercuric iodide shall be added.

(3) The resulting solution shall be standardized against potassium iodate at frequent intervals.

(4) The solution shall be stored in an amber glass bottle having a rubber stopper.

(5) Any solution remaining in the burette at the end of the day shall be discarded.

4. Potassium iodate solution, $\frac{N}{40}$, for standardizing a thiosulphate solution in terms of rule 3 (3) of this Appendix, shall be prepared by dissolving in a little water 0,892 gram of pure potassium iodate which has been previously dried at 120℃ and diluting the resulting solution to exactly one litre.

NOTE: The solution will keep for a very long time if stored in a glass stopped bottle.

5. (1) For the preparation of dilute sulphuric acid the procedure described in this rule shall be adopted.

(2) One volume of concentrated sulphuric acid shall be added to three volumes of water, care being taken to add the acid in small quantities at a time.

(3) Adequate and effective precautions shall be taken against the spitting of acid and the cracking of glass vessels owing to generation of heat.

(4) After the missing referred to in sub-rule (2) has been completed, sufficient N

80 permanganate

solution shall be added to give a faint permanent pink tint to the mixture.

6. For the preparation of potassium iodide solution 10 grams of potassium iodide shall be dissolved in 100 millilitres of water and stored in an amber glass bottle.

7. (1) For the preparation of a starch shall reagent the procedure described in this rule be adopted.

(2) One gram of soluble starch shall be ground into a smooth paste with a little cold distilled water.

(3) The resulting paste shall be poured into one litre of boiling distilled water and the pouring shall be accompanied by constant stirring.

(4) The resulting solution shall be boiled for one minute and shall then be allowed to cool before it is used.

(5) The solution shall only be used if it has been freshly prepared.

(6) Notwithstanding anything in this rule contained, it shall be permissible alternatively to use a solution containing a preservative so long as it is known that the preservative does not interfere with the reaction.

(7) If mercuric iodide is used, about 10 milligrams thereof shall be added to the starch when the latter is being ground with water.

(8) It shall also be permissible as an alternative to add 0,1 gram of thymol to the oiling water which is used for making the starch solution.

8. A solution of sodium starch glycollate may be used as an alternative to starch solution, one to two milliliters of a 0,5 per cent solution in cold distilled water being added at the start of the titration.

NOTE: The approach to the end-point is shown by the change from green to intense blue. At the endpoint, which is sharp, the solution becomes colourless.

9. (1) For the standardization of sodium thiosulphate solution the procedure described in this rule shall be adopted.

(2) In a glass-stoppered bottle having a capacity of about 350ml there shall be placed 5 millilitres of potassium iodide solution as referred to in rule 5, 10 millilitres of dilute sulphuric acid and 25 millilitres of $\frac{N}{40}$ iodate solution, in that order.

(3) About 100 millilitres of water shall then be added.

(4) Titration with thiosulphae solution shall be carried out immediately thereafter.

(5) One milliliter of starch solution shall be added when the liquid has become pale yellow.

(6) After the pale yellow liquid referred to in sub-rule (5) has become blue the titration shall be continued until the solution has just become colourless.

NOTE: The normality of the sodium thiosulphate solution is then

$$\frac{N}{80} \times \frac{50}{\text{milliliters of sodium thiosulphate required.}}$$

The sodium thiosulphate can be used at this strength provided that the appropriate correction factor is used, but it is preferable to adjust the strength until excactly 50 millilitres are required for a repeat titration. The sodium thiosulphate is then exactly $\frac{N}{80}$

and one milliliter is equivalent to 0,1 milligram of oxygen.

PART 2

DETERMINATION OF FOUR-HOUR PERMANGANATE VALUE (PV)

10. (1) The procedure described in this rule shall be followed for the determination of four-hour permanganate value (PV).

(2) Into a clean 350ml glass-stoppered bottle there shall be placed 10 millilitres of dilute sulphuric acid and 50 millilitres of $\frac{N}{80}$ potassium permanganate solution.

(3) There shall be added to the potassium permanganate solution a volume of distilled water equal to the difference between 100 millilitres and the volume of the sample of industrial effluent to be tested.

(4) The sample of industrial effluent shall immediately after being added to the solution referred to in sub-rule (3) be mixed by gentle rotation of the bottle.

(5) The mixture shall be maintained at a temperature of 27℃ for four hours, and shall be remixed after one hour if the sample contains much suspended matter.

NOTE: For the most accurate results all the solutions should be heated to 27℃ before mixing, but this is not necessary where a water bath is used. A water bath is preferable because, with most air incubators, any difference in temperature between the bottle and the incubator is only very slowly rectified.

(6) After four hours there shall be added to the mixture either 5 millilitres of the 10 per cent potassium iodide solution or about 0,5 gram of solid potassium iodide.

(7) Immediately after the said addition titration shall be carried out with $\frac{N}{80}$ sodium thiosulphate solution.

(8) Towards the end of the process hereinbefore described there shall be added to the mixture two milliliters of starch solution.

(9) As an alternative to the step prescribed by sub-rule (8), it shall be permissible to add two milliliters of sodium starch glycollate solution at the beginning of the titration.

(10) Titration shall be carried out until the blue colour resulting from the step prescribed by sub-rule (8) just disappears and any blueness which may return after standing shall be ignored.

(11) A blank determination shall be made by the same procedure without the sample of industrial effluent but with the use of 100 millilitres of distilled water instead.

(12) Not more than 50 per cent of potassium permanganate shall be used up during the test, and the quantity of the sample of industrial effluent added shall be proportioned accordingly.

PART 3
CALCULATION OF PERMANGANATE VALUE

The permanganate value shall be calculated from the following formula:

Permanganate value (4 hours) mg/1 = $100 \frac{(a-b)}{C}$ where –

(a) is the milliliters of N
80 sodium thiosulphate required for the blank determination;

(b) is the milliliters of N
80 sodium thiosulphate required for the sample; and

(c) is the milliliters of industrial effluent sample used.

SCHEDULE 3

FORM OF APPLICATION FOR PERMISSION TO DISCHARGE INDUSTRIAL EFFLUENT INTO THE COUNCIL'S SEWER

I (Name) …….. the undersigned, duly authorized to act on behalf of …… and hereinafter referred to as the applicant, hereby apply in terms of the provisions of the Drainage By-laws of the Council for permission to discharge industrial effluent into the Council's sewer on the basis of the information set out herein.

PART 1

INFORMATION REGARDING PERSONS EMPLOYED AND WATER CONSUMED ON THE PREMISES

1. Nature of the business or industry concerned

   ……

2. Name or style under which the business or industry is carried on

……

……

3. Address of the business or industry:

……

……

……

PO Box

……

Stand(s) Nos (No) ……Township ……..

If the business or industry is carried on by a company, state the name of the secretary and if it is a partnership state the names of the partners: ……..

……

4. Description of industrial or trade process by which the effluent will be produced

……

5. Information relating to employees:

		Office Factory
(1)	Total number of daily employees (not to include (4))	
(2)	Number of shifts worked per day	
(3)	Number of days worked per week	
(4)	Number of persons resident on the premises	
(5)	Is a canteen provided?	

6. Information relating to water consumption:

		Kilolitres/Month
(1)	Approximate average monthly quantity of water purchased form the Council for the use on the premises	
(2)	Approximate average monthly quantity of water obtained from any borehole or other source	
(3)	Quantity of water in the end-product	
(4)	Quantity of water lost by evaporation	
(5)	Quantity of water used as boiler make-up	
(6)	Is water used on the premises for any, and if so which of the following purposes: cooling, the cleaning of utensils, floor-washing, any other industrial purpose, and subsequently discharged to sewer?	
(7)	If the answer to the question in paragraph 6 (6) is “yes”, Part II of this form must be completed.	

Applicant’s Signature: ……..

PART 2

INFORMATION REGARDING THE CONSUMPTION OF WATER

1. The following information is required for the purpose of estimating the quantity of industrial effluent discharged into the Council's sewer, and all figures given shall relate to the quantity of water taken over a period of six months.

Name of consumer or his representative:

……

Stand No: …… Township ……

TOTAL NUMBER OF KILOLITRES OF WATER CONSUMED IN SIX MONTHS:

	Meter No	Meter No	Meter No	Total
Water purchased form the Council				
Water form borehole or other source				
Water entering with raw materials				
Section of plant served by meter				
Total quantity of water consumed				

2. For the purposes of this estimate the total number of kilolitres of water used in six months for any of the purposes below mentioned may be left out of account.

(1) Water used by staff for domestic purposes:

	Number	Shifts Per Day	Days Per Week	Allowance Kilolitres/ Head/Day	Total
Daily employees (excluding residents):					
Office					
Factory					
Resident Persons:					
Canteen					
Total water used (in kilolitres)					

(2) Water used in the operation of boilers

	Boiler 1	Boiler 2	Boiler 3	Total
Type of Boiler				
Rating kg steam/hr Kilowatt				
Hours steamed per month				
Total evaporation per month				
Condensate returned (in kilolitres)				
Percent of unreturned condensate discharge to sewer				
Coal burned – kg per month				
Water used for coal wetting (in kilolitres)				
Water used for ash quenching (in kilolitres)				
Quantity of blowdown (in kilolitres)				
Does blowdown enter sewer?				
Quantity of softener backwash water per month (in kilolitres)				
Total quantity of water used (in kilolitres)				

(3) Water absorbed by the goods manufactured on the premises in six months:

(a) Expressed as a percentage of the total consumption of water less the allowance for staff use.

(b) Expressed as kilolitres per six months contained in the finished product*

(i) ……

(ii) ……

(iii) ……

kilolitres per six months

(4) Kilolitres of water lost in six months by evaporation to the atmosphere:

(a) By units of plant other than cooling towers ……. Kilolitres per six months.

(b) By cooling towers:

	1	2	3	Total
Type of tower				
Quantity of water circulated per six months (in kilolitres)				
Temperature drop (℃)				
Estimated loss by evaporation (in kilolitres)				
Metered water fed to cooling towers (in kilolitres)				
Quantity of refrigerant in circulation in six months (in kilolitres)				
Total Quantity of water lost by evaporation (in kilolitres)				

(5) Quantities of water lost in six months from miscellaneous causes:

(a) ……

(b) ……

(c) ……

Total deduction (in kilolitres)

……

Grand total of deductions to be made in terms of sub-paragraphs (1) to (5) of this paragraph ……

* Example: Soap factory: Yellow soap, 4 000 metric tons manufactured at 50 per cent moisture content – water in product 2 000 kilolitres (in six months).

3. Estimated process water discharged to sewer (arrived at by deducting the total quantity of permissible deductions shown in sub-paragraphs (1) to (5) of paragraph 2 from total water consumed as shown in paragraph 1.

SIGNED:

……

By or for the Applicant

……

By or for the City/Town Engineer

……

Date

PART 3

INFORMATION REGARDING NATURE OF INDUSTRIAL EFFLUENT

Information required concerning the chemical and physical characteristics of the effluent to be discharged:

(1)	Maximum temperature of effluent ℃	
(2)	pH Value	pH
(3)	Nature and amount of settle able solids	
(4)	Permanganate value (4 hours) strength as determined according to the method prescribed in the relevant Appendix to the Drainage By-laws	
(5)	Maximum total daily discharge (kilolitres)	
(6)	Maximum rate of discharge (kilolitres/hour)	
(7)	Periods of maximum discharge (eg 07h00 to 08h00)	
(8)	If any of the substances, or their salts, specified in the table are formed on premises a cross must be placed in the space in which the substance appears, and, if possible, the average concentration of this substance likely to be present in any effluent must also be stated.	

TABLE:

Iron	Chromium	Nickel	Cadmium	Copper	Zink
Silver	Cobalt	Tungsten	Titanium	Lead	Selenium
Mercury	Arsenic	Boron	Cyanide	Nitrates	
Ammonium	Sulphides	Sulphates	Others		
Starch of sugars		Tar or tar oil		Grease and oil	
Synthetic detergents		Volatile solvents		Others	

(9) Any further information as to kind or character, chemical composition and concentrations peculiar to the industrial effluent to be furnished on a separate sheet and attached hereto.

PART 4
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 which the engineer may think fit to impose in any particular case:

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

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

3. 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.

4. The applicant shall notify the Council, as soon as possible after he becomes aware of or at least fourteen (14) days before anything is done to cause any

material alteration in the nature or quantity or discharge of the industrial effluent specified in the application or in any of the facts stated by him therein.

5. The applicant shall within thirty (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.

6. 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.

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

Thus done at …… by the applicant
this ……day of …….. 20 …….

……
Signature and capacity of the applicant

Permission is hereby granted by me on behalf of the Council, I being duly thereunto authorized, 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 in the circumstances 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 in writing given by it to the applicant.

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

SIGNED: ……

City/Town Engineer

SCHEDULE 4

FORM OF APPLICATION FOR PERMISSION TO INSTALL APPLIANCES FOR LIFTING SEWAGE

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 lifting sewage in compliance with sections 6 (5) and 66 of its Drainage By-laws only in respect of those parts of 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 24 litres per minute.

INFORMATION TO BE FURNISHED BY OWNER

The owner of the premises shall furnish the following information and the relevant literature and characteristic curves and sign the application and undertaking:

(a) Make of appliance, name of supplier and purpose for which the appliance is designed:……

(b) kW rating and speed of motor:

……

(c) Maximum rate of discharge in litres per minute:

……

(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 minute.

(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.

(d) The Council shall not be held responsible for any damages or claims which may arise through unhygienic conditions, installation stoppages, inefficient operation, explosion or other causes.

(e) 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 the lifting of sewage is hereby granted on the under mentioned conditions (if any):

CONDITIONS:

……
……
……
……

Date: …….. Signed: ……..

City Engineer