

23 CONTROL OF DRAINS, SEWERS, DRAINAGE AND SEWAGE WORKS

Regulations for regulating the construction maintenance and control of drains, sewers, drainage and sewage works of any description within Development Area.

23.1 DEFINITIONS :

In these regulations unless the content specifically indicates otherwise. the meaning of the terms used shall be as under :

- 1) "Sewer System" shall mean the sewage disposal system.
- 2) "Engineer" shall mean the Engineer of Authority or the authorised person or its deputy or representative duly authorised from time to time to act on his behalf.
- 3) "Person" shall mean any individual firm, company, association, society, corporation or group.
- 4) "Sewer" shall mean a pipe, or conduct or other construction provided for carrying sewage.
- 5) "Building Sewer" shall mean the sewer under the control of the property owner and extending from the building to the first inspection chamber or manhole.
- 6) "Public sewer" shall mean a sewer in which all owners of abutting properties may discharge. and which is controlled by the public body.
- 7) "Sanitary Sewer" shall mean a sewer which carries sewage and to which storm. surface and ground water are not admitted.
- 8) "Storm Sewer" shall mean sewer which carries storm and surface water and drainage but excludes sewage and industrial wastes. other than unpolluted cooling water.
- 9) "Combined Sewer" shall mean a sewer receiving both sewage and surface run off.
- 10) "Sewage" shall mean a combination of the waters carried from residences. business buildings. institutions and industrial establishments. to go there with such ground surface and storm waters as may be present.
- 11) "Industrial waters" shall mean the liquid wastes from industrial manufacturing process. trade. business or from of any development, recovery or processing operation. as distinct from sanitary sewage.
- 12) "Garbage" shall mean solid wastes from the domestic and commercial preparation. cooking and dispensing of food and from the handling storage. and sale of produce.
- 13) "Property Shredded Garbage" shall mean the waste from the preparation. cooking and dispensing of food that have been shredded to such a degree that all particles will be of 1 cm. carried freely under the flow conditions normally prevailing in sewers with no particle greater than 1 cm. in any dimension.
- 14) "Sewage Treatment Plant" shall mean any arrangement or devices and structures used for treating sewage.
- 15) "Sewage works" shall mean all facilities for collecting pumping treating and dispensing of sewage.
- 16) "Water Course" shall mean a channel in which a flow of water occurs other continuously or intermittently.
- 17) "Natural Outlet" shall mean a channel in which a flow of ground water occurs continuously.
- 18) "Sludge" shall mean any discharge of water sewage industrial waste which in concentration of any given constituent or in quantity of flow exceeds for any duration longer than 15 minutes. five times the average 24 hour concentration or flow during normal operation.
- 19) "pH" shall mean the logarithm of the reciprocal of the weight of hydrogenous in grams per litre of solution as determined by procedures outlined in standard methods.
- 20) "Biochemical Oxygen Demand" (abbreviated as B.O.D.) shall mean the quantity of oxygen utilised in the biochemical oxidation of organic matter in five days at 20° C expressed in milligrams per liter as determined by procedures outlined in standard methods.
- 21) "Suspended Solids" shall mean solids that either float on the surface or are in suspension in water sewage or other liquids or which are removable by a laboratory filtering device quantitative determination shall be done in accordance with methods.
- 22) "Gallon" shall mean Imperial Gallon.
- 23) "Control Manhole" shall be the manhole so designated for the express purpose of collecting waste effluent samples and facilitating observation and measurement of waste as necessary from

a property. It shall be the manhole at the junction of the building sewer with the public sewer or the nearest manhole on the public sewer down stream of the junction of the building sewer with the public sewer as may be decided by the Engineer.

- 24) "Standard Methods" shall mean the examination and analytical procedures set forth in the most recent edition of Standard Methods for the examination of water sewage and Industrial wastes published jointly by the American Public Health Association, the American Water Works Association and the Water Pollution Control Federation. However, the use of identical analytical procedure outlined by the World Health Organisation or the Indian Standards Institution of the Government of India, from time time whenever such procedures exist will be permitted.

23.2 REGULATIONS :

- 1) It shall be unlawful for any person to place, deposit, or permit to be deposited in any incinerate manner on public or private property within the jurisdiction of Competent Authority any human or animal excrement, garbage or other objectionable waste.
- 2) It shall be unlawful for any person to discharge to any natural outlet or any where, within the area under the jurisdiction of Competent Authority any sewage or other polluted waters except where suitable treatment has been provided in accordance with subsequent provisions of these regulations.
- 3) For permission to discharge into the sewage system from establishments producing industrial wastes, the owner or his authorised agent shall make application on a special form furnished by the Competent Authority as the case may be. The permit application shall be supplemented by any plans, specifications, sample test reports or other information considered pertinent in the judgement of the Engineer. An inspection fee of Rs. 100/- for an industrial building sewer permit shall be paid at the time application is filed. All industrial and trade establishment existing and discharging industrial wastes into the sewer system at the time of enactment of these regulations shall also require permission to discharge into the sewer under these regulations.
- 4) No person shall discharge or cause to be discharged any storm water surface water, ground water, roof run-off, or subsurface drainage to any sanitary sewer uncontaminated cooling water or unpolluted industrial process water be permitted to be discharged to any sanitary sewer by Engineer if storm sewer is not available.
- 5) Storm water and all other unpolluted drainage shall be discharged to such sewer as are specifically designated as storm sewers or to a natural outlet approved by the Engineer. Industrial cooling water or unpolluted process waters may be discharged with the prior approval of the Engineer to a storm sewer or natural outlet.
- 6) Grease, oil and sand interceptors of approved type and capacity shall be provided when in the opinion of the Engineer they are necessary for the proper handling of liquid wastes containing grease in excessive amounts or any inflammable wastes, sand or other harmful ingredients such interceptors shall be so located as to be readily accessible for cleaning and inspection.
- 7) No storage rooms where acids, cyanide, cyanogen compound or other dangerous substances are stored, shall be connected directly to the public sewers or to any natural outlet, curing holding pit, or other approved arrangement may be required to be provided so that accidental discharge can be caught and disposed off in a safe manner.
- 8) All permits granted under Regulation No. 23.2(3) shall be valid for a period of 3 years and it shall be incumbent on the owner or his authorised agent to make an application for renewal with payment of renewal fee of Rs. 75/- three months before the expiry of the permit period furnishing sample test reports and any other information considered pertinent in the judgment of the Engineer.
- 9) No person shall discharge or cause to be discharged any of the following described kinds of sewage, industrial or factory waste into any sewer or body of water within or entering the area.
 - i) Any liquid or vapor having a temperature higher than 111° F(45)° C).
 - ii) Any water or waste having a pH Lower than 5.5 or higher than 9.5
 - iii) Any water containing fats, wax grease, tars or oils whether emulsified or not, in excess of 100 MGL or containing substance which may solidify or become viscous at

temperatures between 32 of and 150 of (0 °C and 65° C).

- iv) Any petroleum products. fuel oil, calcium carbide benzene, haphthane, cleaning solvents or other inflammable or explosive materials in liquid. or gaseous form and having a flash point lower then 187 of.
- v) Any solid or viscous substances in quantities or of such size or specific gravity as would be capable of causing obstruction to the flow in sewers or other interference with the proper operation of sewage work such as but not limited to ashes, cinders, sand stone dust, mud, straw, shaving metal, glass, rags, feat hers, star, plastics, wood fuller's earth, lime slurries and residues, pulp and paper mill wastes, ungrounded garbage, paper dishes, cups, food cont ainers, etc. either whole or grounded by garbage grinders.
- vi) Any paunch manure or intestinal contents from animal. grease oil, hooves, toenails, bees, bristles, whole blood, fleshing and har regulting from slaughtering, tanning and other operations, which may cause difficulty to the sewer system.
- vii) Any garbage that has not been properly shredded as defined in definition 23.1 (13). The installation and operation of any garbage grinder equipped with a motor of 3.4 H.P. (0.76 H.P.) metric or greater shall be subject to review and approval of the engineer.
- viii) any soluble substances in such concentration as to inerease the viscosity of the water or greater than 1:10 specific viscosity.
- ix) Any waters or water containing toxic. poisonous. solids. liqoid or gases in sufficient quantity either singli or by interaction with other wastes likely to injure or interfere with any sewage treatment process. constitute a hazard to human or animals. create a public nuisance or create any hazard in the rceiving waters of the sewage treatment plant. including but not limited to
 - a) Cyanides in excess of 2Mg. L as CN:
 - b)Haxavelent chromium in excess of 3MG. L as GO.
 - c)total iron excess of MG.L as Fe
- x) Any waters or wastes constituents such as but not limited to the following objectionable limit which in the opinion of the Engineer are likeli to interlere with of the sewage to meet the requirements sewage treatment or exceed limits after treatment of the State. or other public or local authorities for discharge to the receiving water.

Copper	UPTO	3Mg.l
Zine	UPTO	15Mg.l
Lead	UPTO	1Mg.l
Nickel	UPTO	2Mg.l
- xi) Any waters or waste containing phenols or other tastes or odor producing substances in concenetrations exceeding 0.005 Mg l.
- xii) Any radio active waste should not exceed following limits.

Radio active material		
i) Alpha	27	
Emitters Max	1-0 mc.ml.	
ii) Beta	-6	
Emitters Max	1-0 mc.ml.	
- xiii) Any malodorous gases and acetylene generation sludge.
- xiv) Any water or waste containing sulfides. sulphurdioxide, nitrousoxide or any of the halogens exceeding 10 Mg. l in concentration.
- xv) Any water or waste containing sulphates in excess of 1000 Mg L. concentration.

- xvi) Any water or waste having B.O.D. more than 300 Mg. L.
- xvii) Any water or waste having average suspended solids more than 600 Mg.L.
- xviii) Any water or waste having dissolved solids in excess of 2100 Mg.L. concentration.
- ixx) Any water or waste containing following elements in excess of respective proportion mentioned against them:

Parameters	Standard-Mg/Lit.
Chloride (as CL) max	600
Fluoride	15
Ammonia Nitrogen (as N)max	50
Boron (as B) max	2
% Sodium max	60
Free Ammonia (as NH)	5
Pesticide	Absent
Arsenic (as As)	0.2
Mercury (as Hg)	0.01
Cadnuyn (as cd)	2.0

- xx) No person shall discharge or caused to be discharged any of the following kinds of sewerage. industrial or factory wast into any river or creeks. exceeding respective levels as shown in Appendix attached. at the end of this chapter.
- 10) No person shall discharge or caused to be discharged substances. materials. waters or wastes, if it appears likely in the opinion of the Engineer that such wastes are not amenable to satisfactory treatment or can harm either sewers sewage treatment process or equipment have an adverse effect on the reviving stream or can otherwise endanger life. limb. public property or constitute a nuisance In forming his opinion as to the acceptability of such wastes the Engineer will give consideration to such factors as the quantities of wastes in relation to flows and velocities in the sewers. materials of construction of the sewers, nature of the sewage treatment process, degree of treatability of wastes and other pertinent factors.
 - 11) At such time as the sewage works are not overloaded. the engineer may at his discretion permit greater degree of pollution than set out in this regulation No. 9(xvii) but in no case exceeding the following :
 - a) B.O.D. of 600 Mg.L. and
 - b) Average suspended solids 1200 Mg.L.
 - 12) The permission mentioned in regulation will be given only upon payment of surcharge in addition to the usual sewer charges. and it will be liable to the withdrawn on 3 months notice The rate for surcharge will be decided by the Authority from time to time.
 - 13) If any waters of wastes which are discharged. or are proposed to be discharged to the public sewers. contain the substances or process characteristics enumerated in these regulations and which in the judgment of the Engineer may have a deleterious effect upon the sewage works. processes. equipment or reviving waters. or which otherwise create a hazard to lift or constitute a public nuisance. the Engineer may.

- a) reject the wastes.
 - b) require pre-treatment in a private waste treatment system to an acceptable condition for discharge to the public sewers.
 - c) require provision of flow equalizing facilities for control over the quantities and rates of discharge to avoid unusual volumes or flow or concentration of waste constituting slugs as defined.
 - d) require payment of surcharge as detailed in regulation 12 above.
- 14) The owner shall operate and maintain continuously and effectively at his expense the private waste treatment of flow equalization system in a sanitary and safe manner at all times.
 - 15) When required by the Engineer, the owner of any property serviced by a building sewer carrying industrial wastes shall install a suitable control manhole together with such necessary appurtenances in the building sewer to facilitate observation sampling and measurement of the wastes. Such manhole when required shall be accessible at all times. In a default of the owner to install and maintain a control manhole and any required appurtenance within 1 month of a written notice from the Engineer to do so, the latter shall be entitled to estimate the quality and quantity in any manner or method practicable for computing the amount of the surcharge and the presence of the objectionable constituents laid down in Regulation No. 9, 10 and 11 above.
 - 16) In the event that no special manhole has been required, the control manhole shall be connect to the nearest down stream manhole in the public sewer to the point at which the building sewer is connected.
 - 17) Smpling shall be carried out to reflect the effect of constituents upon the sewage works and to determine the existance of hazards to life limb and property. The particular analysis involved will at the discretion of Engineer be done either on basis of a 24 hours composite of all discharge of a property or as a grade sample or samples. Normally B.O.D. and suspended solids analysis are determined from 24 hours composites whereas pH is determined by grade samplings.
 - 18) All tests and analysis of the characteristics of water and wastes to which reference is made in these Regulations shall be determined in accordance with Standard Methods as mentioned in definition 24.1(24) and shall be determined at the said control manhole in the presence of representatives of all parties concerned and tested at a Municipal or any other laboratory approved by the Engineer.
 - 19) The Engineer may at time before or after issue of permit or grant of connection, run additional tests of the sewage or wastes being discharged by any trade or industry over such period as it may deem necessary cost of such test shall be borne by the Competent Authority.
 - 20) In the event of taste showing greater degree of pollution than permissible under the Regulation at No. 234.2.9(xvi) and (xvii): above the surcharge if any to be paid shall be computed on the basis of the latest test and shall be levied from the billing period in which the tests are carried out. If any such testing by the Competent Authority shall show reduced degree of pollution in the wastes sufficient to exempt from payment of surcharge the same shall become effective from the next billing period.
 - 21) If the owner is of the opinion that for any reason the nature of the sewage presently being discharged in to the sewer has a substantially lessened degree of pollution than as shown by prior tests, he may request the Competent Authority to make new test more than once in each billing period to be made at his expense. Such test will be taken by the Engi- neer at his discretion within three months from the date of application. If the Engineer is satisfied that such tests were made when the plant was operating under normal conditions, the results of the latest tests shall be used in computing or exempting from the surcharge.
 - 22) The Engineer or other duly authorised employees of the Competent Authority shall be permitted to enter all properties for the purposes of inspection, observations of these regulations and having a direct bearing on the nature and source of discharge.
 - 23) Any person found to be violating any provision of these regulations shall be served by the Competent Authority with written notice stating the violation and providing a reasonable time limit not less than one month for the satisfactory correction thereof. The offender shall within the period of time stated in such notice, permanently cease all violations.

- 24) Any person who shall continue any violation beyond the time limit. provided for in regulation No. 23.2.(23) above. shall be liable for prosecution and be punished with a fine which may extend to Rs. 500/- for each violation and in case of a continuing breach to Rs. 50/- per day after the date of first conviction.
- 25) Any person violating any of the provisions of these regulations shall become liable to the Competent Authority for any expenses. loss or damage occasioned to the Competent Authority by the reason of such violation and shall be liable to suspension. revocation or cancellation. if any permissions were granted under the regulations.
- 26) Should any court of competent jurisdiction declare any provision of this regulation ultravires then the decision shall effect only such provision so declared to be ultravires and shall not effect any other provisions.
- 27) The above mentioned Regulations shall be subject to modification from time to time as required by Gujarat Pollution Control Board and Competent Authority.

23.3 SEPTIC TANK

- (i) Location and sub-soil dispersion:-A sub soil dispersion system shall not be closer than 12 mts. to any source of drinking water. such as a well to mitigate the possibility of bacterial pollution of water supply. It shall also be as far removed from the nearest habitable building is economically feasible not close than 2 mts. to avoid damage to the structure.
- (ii) Dimensions etc.
- (iii)
 - (a) Septic tank shall have a minimum inner width of 75 cm. a minimum depth of -meter below the water level and a per capital minimum liquid capacity of 85 liters. The length of the tanks shall be least twice the width.
 - (b) Septic tanks may be constructed of brick work. masonry. concrete or other suitable material as approved by the competent authority.
 - (c) Under no circumstances should effluent from a septic tank or allowed into an open channel drain or body of water without adequate treatment.
 - (d) The minimum normal diameter of the pipe shall be 100 mm. Further at junction of pipes in manholes. the direction of flow from a branch connection should not make an angle exceeding 45 with the direction of flow in the main pipe.
 - (e) The gradients of land-drains. under-drainage as well as the bottom of dispersion trenches and soakwells should be between 1:300 and 1:1400.
 - (f) Every septic tank shall be provided with a ventilating pipe of a least 50 mm. diameter The top of the pipe shall be provided with a suitable cage of mosquito proof wire mesh. The ventilating pipe shall extend to a height which would cause no smell or nuisance to any building in the area. Generally. the ventilating pipe should extend to a high of above 2 mts. above the septic tank building when it is located closer than 15 mts.
 - (g) When the disposal of a septic tank effluent is to a seepage pit. the seepage pit may be of sectional dimension of 90 cm. and not less than 100 cm. in depth below the inner level of the inlet pipe. The pit may be lined with stone. brick and concrete blocks with dry open joint which should be backed with at least 7.5 cm. of clean coarse aggregate. The lining above the inlet level should be narrowed to reduce the size of the R.C.C. cover slabs. Where no lining is used. Specially near trees the entire pit should be filled with loose stones. A masonry ring should be constructed at the top of the pit to prevent damage by flooding of the pit by surface run off. The inlet pipe should be taken down to a depth of 90 cm. from the top an anti Mosquito Measure.
 - (h) When the disposal of septic tank effluent is to a dispersion trench. the dispersion trench shall be 50 to 100 cm. wide excavated to a slight gradient and shall be provided with a layer of shed gravel or crushed stones 15 to 25 cm. deep. Open joined pipes placed inside the trench shall be made of unglazed earthenware clay or concrete and shall have a minimum internal diameter or 70 to 100 mm. Each dispersion trench should not be longer than 30 mts. and trenches should not be placed closer than 1.8 mts. to each other.

23.4

The above mentioned Regulations shall be subject to modification form time to time as required by Gujarat Pollution Control Board Bhavnagar Municipal Corporation Competent Authority.

APPENDIX

(See Regulation No. 24.2.9(XX))

PROPOSED STANDARDS FOR DISPOSAL OF EFFLUENT INTO RIVER OR NEARBY CREEKS :

PARAMETER	MAXIMUM PERMISSIBLE CONCENTRATION.
Temperature 0° C max.	40° C
pH value.	5.5 - 9.0
Colour	100 Units.
Totalsuspended solids max.	100 Mg.L.
Oil & Grease max.	10"
Biochemical Oxygen demand (5days at 20°)Max	30"
Chemical Oxygen Demand max.	100"
Ammonical Nitrogen (as N) max.	50"
Free Ammonia (as NH ³)max.	5"
Total Kjeldahl Nitrogen (as N) max.	100"
Total Residual Chlorine max.	1"
Phenolic Compounds max.	1"
Total dissolved solids (inorganic) max.	2100"
Cyanides (as CN) max	0.2"
Fluorides (Total as F) max.	1.5"
Phosphate (as P) max.	5"
Sulphides (as S) max.	2"
Boron (as B) max.	2"
Arsenic (as Aso) max.	0.2"
Mercury (as Hg) max.	0.01"
Lead (as PB) max.	0.1"
Cadmium (as CD) max.	1.0"

Hexavalent Chromium (as Cr 6) max	0.1"
Total Chromium (as Cr) max.	2"
Copper (as Cu) max.	3"
Zinc (as Zn) max.	5"
Selenium (as Se) max.	0.05"
Nickel (as Ni) max.	3"
Pesticides.	Absent.