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KERALA STATE POLLUTION CONTROL BOARD
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PCB/HO/SEE-3/MISCELLANEOUS/65/2019 Dated: 15/03/2023

SOP for High Rise & Other Buildings

1. This SOP is applicable for high-rise buildings, commercial buildings, shopping malls, public buildings housing govt offices & court complexes and residential apartment projects. High rise buildings are buildings with four storeys or more. As per the norms of the Board, buildings (whether high-rise, low-rise or villa) with built-up area of 2000 sq.m or more comes under the consent purview of the Board. Also, buildings with proposed waste water discharge of 20,000 litres per day (including sewage & sullage) or more comes under the consent purview of the Board irrespective of the built-up area. In the case of villa projects, if the total built-up area of all the villas taken together is 2000 sq.m or more and/or the total waste water generation (including sewage & sullage) is 20,000 l/day or more, such projects come under the consent purview of the Board. If the total discharge is ≤ 20,000 l/day it is in green category; >20,000 l/day to ≤ 100KLD is in orange category and > 100KLD is in red category. However, projects comprising of residential apartments only (with no commercial space) up to 50,000 l/day, may be taken in green category. In this case also the distance criteria for STP, DG sets and other pollution control measures are applicable. Such projects are categorized as green in order to grant them the benefits of fee relaxation as there is no regular commercial activities involved.

2. It may be noted that hotels, restaurants and other units in commercial/residential apartments/shopping malls which already come under the consent purview of the Board have to apply and obtain the consent of the Board separately in cases where the building in which the unit is located is exempted from consent purview based on item 1 above. Also, buildings which are exempted from the consent purview based on item 1 shall be brought under the consent purview in case of complaints of pollution from such units. It may also be noted that the exemption from the consent purview granted vide paragraph 1 is to enable ease of doing business for units complying with pollution control acts & rules.
3. 90% reduction in annual consent fee may be provided for non-industrial/non-commercial government buildings coming under consent purview. The annual fee from the time of consent renewal is only 10% of the usual annual consent fee consent (that paid for ICE & first ICO) for residential apartment complexes.
4. In many cases, applications are received by the Board in the name of commercial buildings (with less than 2000 sq.m built-up area and less than 20,000 l/day of total waste water generation (including sewage & sullage) for the consent of the Board for DG sets. Such units are exempted from the consent of the Board based on item 1 & above. However, for issuing consent for DG set alone, the total capital investment of the project need not be taken. Instead the capital investment may be taken as the cost of DG set/sets, cost of foundation for DG sets, installation, electrical connections, room in which DG set is installed and the cost of land equivalent to the area of the room in which the DG set is installed/area occupied by DG set if it is installed in open. However, all buildings, irrespective of whether it comes under the consent purview or not are required to provide adequate pollution

control. In the case of DG set attached to godown/ware house falling in white category, separate application may be submitted for DG set, so that the ware house continues in white category itself and DG set in the category in which it falls.

5. Minimum size of septic tank required is 0.04- 0.05m^3 per capita. Septic tank size becomes large when serving more than 100 persons. Taking total water consumption as 150 litres per capita per day of which 30l/per capita/day is used for flushing of toilets, 100 persons will discharge 3000 l/day into the septic tank and the balance 9,000 litres as sullage (kitchen + wash water) (assuming 80% of the water consumed is discharged as waste water). Considering all these factors sewage treatment plant may be insisted if the total discharge (sewage + sullage) is greater than 5,000 l/day.
6. While processing Consent to establish/operate applications pertaining to high rise and other buildings and also after issue of consent, it is observed that the Board officials are experiencing the following difficulties concerning the Sewage Treatment Plants (STP) attached to the said projects:

(i) Occupancy certificate will be obtained only after the builder produces valid ICO of the Board. Hence, the Board is forced to issue ICO without ascertaining the adequacy of the STP.

(ii) At the time of inspection for Integrated Consent to Operate (ICO), the occupancy in the building will be zero and hence the sewage in the STP is negligible and hence not possible to ascertain the adequacy of the STP and the quality of the treatment.

(iii) Satisfactory functioning of the STP is possible only on generation of sewage quantity of at least 50% of the design capacity and it may take a while to attain 50% occupancy in the building. And in some case it may take much longer time to attain adequate occupancy.

(iv) Once sufficient quantity of sewage is generated, the STP requires additional time to stabilize.

(v) Once adequate occupancy is attained, the occupiers usually form Residents Associations (RA) or Residents Welfare Association (RWA). It cannot be ensured that the RA/RWA's have adequate information about the STP and other pollution control measures.

(vi) Skilled man power is required to ensure correct operation of the STP. Correct and timely rectification of the defects of the STP and its timely maintenance are essential. The STP fails in many cases because of the lack of skilled operators for STP and due to inadequate maintenance schedule.

(vii) Often the occupiers become the scapegoat of inoperative/defective STP's and are required to face the consequence of not getting the consent renewed on time.

(viii) Usually, the consent is issued with the condition that treated sewage shall be reused to the maximum possible by way of toilet flushing and the rest used for gardening. Balance, if any, is to be discharged into soak pits. However, in actual practise, the treated sewage (and in many cases, untreated sewage) gets discharged into the nearby drains/water bodies.

(ix) The builder/residents association neglect the annual maintenance contract (AMC) for STP. There is no correct schedule for preventive maintenance.

Because of the above reasons it has become imperative to fix the responsibilities as far as the consent management is concerned.

The following are the responsibilities of the builder (the person or agency which designs, and constructs the building) and the occupier (RA/RWA) from the Board's perspective. These matters may be incorporated as consent conditions.

Builder

(i) It is the responsibility of the builder to apply for and obtain the Integrated Consent to Establish (ICE) of the Board before starting any civil works and to apply for and obtain the Integrated Consent to Operate of the Board at the time of commissioning of the project in full compliance with all the conditions prescribed in the ICE. The builder shall also be responsible for bringing to the notice of the Board any variation from the original proposal from that submitted along with ICE by way of applying for consent variation. All these applications are to be submitted along with the prescribed consent fee online though Board's website https://keralapcbonline.com. The builder will be responsible for ensuring the correct distance criteria of the Board. The mode of treatment and disposal of sewage shall be in compliance with the guidelines/SOP of the Board. Before any civil works is done, the builder shall check the distance criteria and conditions with the help desk in the Board's offices or in the website. It is the responsibility of the builder to install STP and other pollution control measures as per the distance criteria and other conditions stipulated by the Board. The STP shall preferably be a combination of anaerobic and aerobic treatment. The aerobic treatment shall preferably be based on any of the following technologies: MBR (membrane bioreactor), MBBR (moving bed bio film reactor), Packaged/capsule/cylinder type treatment plants involving combination of anaerobic, aerobic (Moving bed bio-reactor-MBBR) and activated sludge treatment process (for small plants), MBR (membrane bio-reactor), SBR (sequence batch reactor) or SBBR (sequence batch bioreactor). De-nitrification facilities shall be mandated for the STP. Air blowers shall be provided with vibration dampers

and acoustic system to mitigate the effect of vibration and noise. Modular type STP shall be encouraged where much variation in sewage load is expected.

(ii) It is often noted that after obtaining consent of the Board, the STP part is often neglected and untreated or partially treated sewage is discharged into the nearby drains or water bodies. Hence, a combination of anaerobic digestion system with filtration and phyto/phytorid treatment using specific plants (eg: Elephant Grass) in a constructed wetland (filled with crushed bricks, gravel & stone) is a suitable option for small projects with adequate land available for the purpose. The benefits include minimal electricity and minimal operation & maintenance expense. The land area required for constructed wet land for phytorid treatment is approximately 35 sq m per $20m^3$ per day (as per NEERI specifications). It requires to be desludged periodically (depending on the quantity of sewage treated). The hydraulics needs to be maintained in such a manner that wastewater does not rise to the surface retaining a free board at the top of the filled media. Facilities for collection of treated water (using under drains) with sampling facilities shall be provided (for both phyto & phytorid treatment) & before final discharge in to soak pit/gardening. The technology involved in constructed wetland methodology is sedimentation, absorption & adsorption. Photosynthesis, fermentation, microbial removal, ammonification, nitrification, de-nitrification also occur in constructed wetland. However, such methods become obstructive in the case of hydraulic and organic shock loads. There are both horizontal & vertical constructed wetlands of which horizontal wetland require large land area.

Print version of constructed wetland technology is available from the website:

https://dbtindia.gov.in/sites/default/files/Print_Version_of_CW_Manual-23_May-2019.pdf.

Phyto treatment is also gaining popularity because of low maintenance cost & minimal electricity.

(iii) The Board do not have empanelled consultants. However, the builder can obtain details of good performing STP's in the State from the official website of the Board and also in the new module in Phoenix software (to be introduced shortly).

(iv) Common Sewage Treatment Plants (CSTP) (having valid consent of the Board) are the most preferred treatment system in areas where such system prevails. In such case, the builder is required to provide facilities for the transfer of the waste water to the sewer lines provided for this purpose and in compliance to the norms laid down by the operator of the CSTP. Such buildings also require consent based on the conditions in paragraph 1 to 4 of this SOP. However, such common treatment facilities are to be provided with online monitoring facilities for treated water quality. In such cases it has to be ensured that bye-pass of sewage into public drains from man holes and pumping stations do not occur.

(v) The builder shall upload the copy of building plan/ submitted for local body approval/fire NOC along with ICE application. The building permit also helps the Board officers to cross check the built up area.

(vi) It is expected that the builder complies with all the rules (CRZ, Prior Environmental Clearance for buildings > 20,000m^2 etc) as the case may be.

(vii) The builder shall intimate the Board regarding transfer of the building to resident association.

(viii) The builder shall enter into operation and maintenance contract with the consultant (the person or agency which designs, installs, operates and

maintains STP) for operation and maintenance of the STP for a minimum period of 5 years. The builder shall ensure that training is provided to the STP operator by the consultant regarding the operation of the STP, its defects & rectification measures, schedule of maintenance etc. This shall be displayed in the control room of the STP. Performance Guarantee shall also be provided by the consultant. These matters shall also be incorporated as a condition in both the ICE & ICO.

(ix) After obtaining ICE, any further changes in the building area, if any, shall be intimated to the Board and variation order obtained accordingly before submission of application for ICO. Failure to comply with this shall result in penalty of 5.5 times the revised annual consent fee based on the capital investment of the revised project. This is in addition to the usual consent fee payable.

(x) The builder shall also apply for the first ICO of the Board. First ICO is for a period of not less than 5 years.

(xi) The builder & the Resident Association/Resident Welfare Association or the buyer of the apartments shall enter into a mutual agreement regarding the operation & maintenance of the STP and solid waste management facilities. The builder shall produce the copy of this agreement to the Board. Once, all the apartments are legally handed over and copy of this agreement submitted to the Board, the builder will not have any responsibility for the STP & other pollution control measures. This shall be incorporated as a condition in both the ICE & ICO. However, if all the apartments are not transferred at the time of expiry of ICO, then the Board will fix as to who is responsible for consent renewal and maintenance and operation of pollution control measures based on the agreement submitted to the Board. All these details shall be incorporated in the agreement. However, if no agreement exists, then the

entire responsibility will be with the builder until full transfer of the entire building is legally completed.

(xii) The builder shall take care to ensure that disputes between residents associations regarding pollution control measures do not occur. All matters shall be made clear in the agreement. For example, in Eranakulam, there is a case where three buildings were constructed as three different projects with a common STP for the three. However, once the buildings were handed over to the concerned residents associations, the building plot in which the STP is located refused to treat the waste water from the other buildings. Hence, it is always advisable to have separate STP for each building.

(xiii) The builder shall provide all the details regarding the STP (including its design details, standard operating procedures, performance guarantee, annual maintenance contract and maintenance schedule) & other pollution control measures to the Resident Association/Resident Welfare Association or the buyer of the apartments. This matter shall also be incorporated in the mutual agreement between the builder and the occupants. This shall be incorporated as a condition in both the ICE & ICO.

(xiv) The following facilities shall be provided in the construction/demolition sites: 1. Construction & demolition waste need to be segregated into concrete, soil, steel, wood, plastic, brick & mortar, paper (eg:paper sack cement bags), glass, ceramic, electrical items and metallic items. 2. Separate storage area need to be earmarked in the construction site for segregation & storage of each type of construction/demolition waste. 3. Construction waste shall not mix with domestic waste. 4. Enclosure of the construction site using garden nets/GI sheets shall be done to prevent spreading of dust to the nearby areas. 5. Water storage facilities with adequate number of waste sprinklers shall be provided for containing the dust generated. 6. Only DG

sets having acoustic enclosure shall be used in the site. 7. Facilities for treatment of sewage generated from the workers quarters shall be provided. Domestic solid waste generated from the workers quarters shall be segregated and bio-degradable solid waste shall be treated using bio-gas plant, compost. 8. Curing water shall be disposed in separate pits and if the quantity of concrete in the wash water is high, it shall be discharged into pits lined with HDPE lining and once dry, it shall be transferred into authorized land fill site.

Occupier

(i) The occupier is responsible for all the matters pertaining to the Board, once the legal transfer of the entire building to the occupier is complete. The Board will assess this based on the agreement between the builder and the occupiers.

(ii) The occupier shall ensure that the distance criteria of the Board are not violated after the builder transfers the responsibility of operation & maintenance of the STP to the RA/RWA.

(iii) The occupier shall install all additional pollution control measures or shall augment the treatment system whenever needed to achieve the prescribed standards at that time.

(iv) The occupier shall ensure the smooth functioning and operation of the STP and ensure that sufficient skilled operators are posted for the operation of the STP.

(v) The occupier shall ensure that the maintenance of the STP is done as per schedule suggested by the consultant.

(vi) The occupier shall apply and get the consent renewed on time.

The following matters may be looked into by the Board officers while processing consent applications pertaining to such projects:

(i) The water consumption details are mentioned in the National Building code 2016, BIS are tabulated below:

Sl no	Type of Building	Domestic (litres per head per day)	Flushing (litres per head per day)	Total (litres per head per day)
1	Hostels	90	45	135
2	Hotels (up to 3 star) excluding laundry, kitchen and staff	120	60	180
3	Hotels (4 star & above) excluding laundry, kitchen and staff	260	60	320
4	Restaurant	55 per seat	15 per seat	70 per seat
5	Food Courts	25 per seat	10 per seat	35 per seat
6	Club House	25	20	45
7	Cinemas, concert halls and theatres and multiplex	5 per seat	15 per seat	20 per seat
8	Schools/Educational institutions: Without boarding facilities	25	20	45

9	Schools/Educational institutions: With boarding facilities	90	45	135
10	Shopping Malls Staff	25	20	45
11	Shopping Malls Visitor	5	10	15

As per the National Building code 2016, BIS, the population in residential dwellings are as follows:

No of bed rooms	Population
1	4
2	5
3	6
4 & above	7

For communities with population 20,000 to one lakhs, the per capita water consumption per day is 100 to 135l/day & for population above 1 lakh is 150 to 200 litres per capita per day.

For design purpose, water consumption may be taken as 150 litres per capita per day. Considering on an average basis and based on the experience in Kerala, number of persons may be taken as 2 persons in one BHK, 4 persons in two BHK, 6 persons in three BHK and so on. However, in many of the flats in Corporation areas, usually this number will be much more. Hence, in such areas water consumption may be taken as 300 litres per day for one

BHK, 600 litres per day for two BHK & 900 litres per day for three BHK. Waste water discharge is usually taken as 80% of water consumption. However, in thickly populated corporation areas it may be taken as 90% of water consumption. For usual commercial buildings, water consumption may be taken using the thumb rule: 100 sq feet→ 1 person→50litres.

(ii) The STP shall be constructed above ground level (exemption in this regard mentioned in item (iii) below). Preliminary treatment units (collection tank, screening, oil & grease trap, and grit chamber) need not be insisted to be above ground level, but needs to be ensured that there is no bypass lines or seepage in these units. The other units from equalization onwards are to be constructed above ground level. Cellar type STP with lighting & facilities for inspection is also admissible. However, if there are space constraints, the STP may be constructed below ground level. However, such STP's shall be provided with sensors which automatically stop the working of the plant and cuts off the inflow into the STP in the event of possibility of overflow, leaks, improper functioning or malfunctioning of aeration system or other electro-mechanical parts and alerts the operator and occupier through messages in the mobile phone and is such that the plant can be restarted only after the defects are rectified. Such STP's shall be provided with lighting facilities so that the inside becomes visible when manholes are removed. STP on roof tops also can be permitted in areas where there are space constraints. Distance criteria & setback is not applicable to such plants (roof top). However, it shall be installed with sensor facilities mentioned above to ensure that it is operated correctly & regularly.

(iii) The STP's complying fully with the following 3 conditions may be permitted below ground level and also relaxation in distance criteria allowed:

a. Sewage Treatment Plants provided with sensors which automatically stop the working of the plant and cuts off the inflow into the STP in the event of possibility of overflow, leaks, improper functioning or malfunctioning of aeration system or other electro-mechanical parts and alerts the operator and occupier through messages in the mobile phone and is such that the plant can be restarted only after the defects are rectified.

b. Separate electric and water meters are provided to measure the electricity consumed by the STP and the quantity of waste water treated in the unit. A facility or link is provided to the Board officers to get the real time reading of the electric and water meter.

c. Adequate odour control measures are provided. This becomes essential during maintenance/failure of STP. Providing mere vent pipe is not adequate. Control measures like bio-filter or other scientific odour control measures are to be provided.

(iv) No consent (ICE/ICO/ICO-R) shall be issued with validity less than 5 years.

(v) Violation of distance criteria for STP, DG sets and other pollution control measures attracts heavy environmental compensation (EC). EC equivalent to 10.5 times the annual consent fee should be levied in such cases. The EC shall be paid as DD in favour of the Board and it goes into the Environment Protection Fund of the Board and is to be utilized as per CPCB norms. The EC details are as follows: Name of the account holder: Chairman, KSPCB, account number: 67366954329, Bank: SBI, IFSC code: SBIN0070212. This fund shall be utilized for protection of water bodies in the State.

(vi)The adequacy of disposal of treated sewage needs to be thoroughly checked. In many cases, the project proponents claim that major portion of the treated effluent is used for gardening/toilet flushing and the rest disposed through soak

pit. In this regard, the project proponent is required to submit a water balance showing the total quantity of treated effluent generation and its total utilization through toilet flushing, gardening and soak pit. It has to be ensured that the soak pit is capable of absorbing the said quantity. For this, the project proponent (with any consultant in this field) shall conduct and produce a copy of percolation test done as per IS-2470-2 (1985) and report the standard percolation rate of the soil in the site. The spots where percolation test is done shall be informed to the Board (with photographs of the conduction of the test). The applicant is also directed to submit sectional drawing of the soak pit/soak pits. The allowable rate of application of treated effluent in the pit shall be assessed using the table below:

Percolation rate (in minutes)	Maximum rate of treated effluent application (in litres per metre square of absorption area per day)
1 or less	204
2	143
3	118
4	102
5	90
10	65
15	52
30	37
45	33
60	27

The absorption area for soak pit is the side wall area and the effective depth being measured from 150mm below the invert level of the inlet pipe to the bottom of the pit. The quantity of treated effluent absorbed in the soak pit can be calculated from the absorption areas using above table.

(vii) The water requirement for gardening has to be reported correctly by the applicant. It may be noted that no lawn or landscape plants require daily watering. The project proponent shall report the hose diameter, number of sprinklers installed (N), capacity (C) of each sprinkler in litres per minute and time of applying sprinklers each day (T) in minutes in a day. Then total flow from the sprinklers in litres = NCT in a day. Please note that the time of application of water in a day depends on several parameters like type of lawn plant, water table, ground slope, type of soil, conveyance loss etc. The area of lawn (in sq.m) irrigated, type of plant used in the lawn, capacity of tank used for storing the treated water etc may also be informed. Water meter may be installed in the gardening/toilet flushing lines for the purpose of verification of the quantity used for gardening and that discharged into soak pit.

(viii) The capacity of tanks for recycling of water shall be checked.

(ix) ToD (time of day) type energy meters & water meter shall be installed to check the quantity of water treated in the STP.

(x) The occupiers shall conduct quality check of the treated sewage using consultants and submit analysis report to the Board once in six months. They shall also ensure that the log books pertaining to the operation and maintenance of the plant is correctly kept.

(xi) For rain water harvesting, the runoff (volume of rain water that can be harvested) is calculate using the formula, Q= CIA

→Q is the rain water that can be harvested in m^3/h (cubic metre per hour), C is the runoff coefficient, I is the rainfall intensity in mm/h (millimeters per hour) and A is the surface area of the harvesting area in m^2 (square metre). Surface area that can be utilized for harvesting includes roof/terrace area, paved & unpaved surfaces. Rainwater thus harvested shall be discharged into recharge pits if the site is not a water logged area. The

number of recharge pits required have to be correctly assessed based on the maximum quantity of water likely to be harvested. However in cases where there are space constraints, rain water collection tanks may be provided.

(xii) Storm water drains have to be designed in such a way that no waste water enter the storm water drain.

(xiii) The distance criteria of the Board for STP to residence (10 log Q for ≤ 100KLD & 25 log Q for > 100KLD →Q is the maximum discharge in m^3 per day and KLD means kilo litres per day and 1 KLD= 1 m^3) and for DG set to residence (√KVA)/2 may be strictly followed (KVA is power rating in kilo volt ampere). The STP shall be provided with a setback of minimum 3m. The distance to water bodies shall not be less than 10 log Q from the discharge point of treated sewage to water bodies. In the case of DG sets, 'distance' means the shortest distance from the body of the DG set to the nearest residence. In the case of STP, 'distance' means the shortest distance from the outer point of any unit of the STP (both underground & above ground level) to the nearest residence. The distance to water body shall be the shortest distance from the water body to the soak pit or to the outlet discharge point of the STP, as fixed at the time of inspection. In the case of multiple DG sets KVA in the above formula is the biggest value of the KVA rating of individual DG sets. For example, if there are 3 DG sets of capacity 120KVA, 150KVA & 210 KVA, then the distance from each DG set to the nearest residence shall not be less (√210)/2 metres.

(xiv) The stack height of DG sets (of capacity less than 800KW) in metres shall not be less than h + 0.2(√KVA), where h is the height of the building in metres in which the DG set is installed. The DG sets shall be provided with acoustic enclosures. The existing DG sets shall be retrofitted with pollution

control measures as per the circular pertaining to retro fitment of DG sets.

The maximum permissible sound pressure level for new diesel generator (DG) sets with rated capacity up to 1000 KVA, manufactured on or after the **2**{1st January, 2005} shall be 75 dB(A) at 1 metre from the enclosure surface. For DG sets ≥1000 KVA, the noise shall not exceed the standards of noise for that area. Such DG sets shall comply with the following:

01 The manufacturer shall offer to the user a standard acoustic enclosure of 25 dB(A) insertion loss and also a suitable exhaust muffler with insertion loss of 25 dB(A).

02 The user shall make efforts to bring down the noise levels due to the DG set, outside his premises, within the ambient noise requirement by proper siting and control measures.

03 Installation of a DG set must be strictly in compliance with the recommendations of the DG set manufacturer.

04 A proper routine and preventive maintenance procedure for the DG set should be set and followed in consultation with the DG set manufacturer which would help prevent noise levels of the Dg set from deteriorating with use.

Emission Limits for DG sets up to 800KW

Power Category	Emission Limits (g/kW-hr)			Smoke Limit (light absorption coefficient, m^{-1})
	NOx +HC	CO	PM	
Upto 19 KW	≤ 7.5	≤ 3.5	≤ 0.3	≤ 0.7
More than 19 KW upto 75 KW	≤ 4.7	≤ 3.5	≤ 0.3	≤ 0.7
More than 75 KW upto 800 KW	≤ 4.0	≤ 3.5	≤ 0.2	≤ 0.7

Emission Limits for DG sets of 800KW or more

It may be noted that DG sets greater than 800KW are major power houses and such units shall be enclosed in building provided with acoustic treatment. The emission generated shall be dispersed through stack of height as mentioned in the table above. The stack shall also be provided with real time monitoring of emission for PM, NO_X and CO.

Parameter		Area Category	Total engine rating of the plant (includes existing as well as new generator sets)	Generator sets commissioning date		
				Before 1.7.2003	Between 1.7.2003 to 1.7.2005	On or after 1.7.2005
NOx (as NO_2) (At 15% O_2), dry basis, in ppmv		A	Up to 75 MW	1100	970	710
		B	Up to 150 MW			
		A	More than 75 MW	1100	710	360
		B	More than 150 MW			
NMHC (as C) (at 15% O_2), mg/Nm^3		Both A and B		150	100	
PM (at 15% O_2), mg/Nm^3	Diesel Fuels- HSD & LDO	Both A and B		75	75	
	Furnace Oils- LSHS & FO	Both A and B		150	100	
CO (at 15% O_2), mg/Nm^3		Both A and B		150	150	
Sulphur content in fuel		A		< 2%		
		B		< 4%		
Fuel specification		For A only	Up to 5 MW	Only Diesel fuels (HSD, LDO) shall be used.		
Stack height (for generator sets commissioned after 1.7.2003)		Stack height shall be maximum of the following, in meter: (i) 14 $Q^{0.3}$, Q = Total SO_2 emission from the plant in kg/hr. (ii) Minimum 6 m. above the building where generator set is installed. (iii) 30m.				

Table showing emission limits for DG sets of 800KW or more (NMHC is Non-methane hydro carbon).

For DG sets working on dedicated Natural Gas (NG) or Liquid Petroleum Gas (LPG); DG sets working on Petro & Natural Gas & Petrol and LPG; DG sets working on Diesel & Natural Gas & Diesel and LPG, the maximum

permissible sound pressure level for genset, with rated capacity upto 800 kW shall be 75 dB(A) at 1 metre from the enclosure surface. Gensets should be provided with integral acoustic enclosure at the manufacturing stage itself. All such type of DG sets shall have type approval certificates from any of the five CPCB approved agencies. For such DG sets, the emission standards prescribed in EP Rules shall be followed. The distance to nearby residence is (√ KVA/2) itself in such cases. DG sets working on NG or LPG or dual fuel needs to be promoted in place of the usual petrol/diesel DG sets. DG sets working on petrol/diesel needs to be replaced with NG in a phased manner.

(xv) First ICO is to be issued for a period not less than 5 years. The applicant may be informed well in advance of the date of inspection. At the time of inspection the operator shall demonstrate a trial run of the plant (in case adequate sewage is not available). Consent can be issued based on that trial run. In case of STP provided with sensors, the operator shall demonstrate the working and effectiveness of sensors. The applicant shall inform the Board of the commissioning of the STP through industry communication module in Phoenix software of the Board. Renewal shall be considered at 90% discount in the annual consent fee.

(xvi) The inlet parameters (for design of STP) are as follows (generally):

Parameter	unit	Value
pH	-	5.5-8.5
BOD(5 day)	mg/l	250-300
COD	mg/l	500-550
TSS	mg/l	200
Oil & grease	mg/l	50

The standards for treated discharge shall be as follows:

parameter	unit	Tolerance limits		
		For irrigation /soak pit	Gardening/ flushing/car washing	Into public drain
B.O.D (5 day)	mg/l	< 10	< 3	< 3
pH	-	6.5-9.0	6.5-8.5	6.5-8.5
C.O.D	mg/l	< 50	< 25	< 25
TSS	mg/l	< 10	< 10	< 10
Ammoniacal Nitrogen	mg/l	< 5	< 5	< 5
Oil & grease	mg/l	< 10	< 1	< 1
Fecal Coliform	MPN/ 100ml	< 230	< 230	< 100
Total Phosphorous	mg/l	< 2	< 2	< 2
Total Nitrogen	mg/l	< 10	< 10	< 10

(xvii) Discharge into storm water drain can be permitted if the standards prescribed in the table above are met and conditions suggested in item iii of this SOP under the heading “matters to be looked into by the Board” above are complied with.

(xviii) Facilities for solid waste management need to be provided. Minimum 3 type of segregation should be practised, namely, wet waste (green container), dry waste (white container) & domestic hazardous waste (black containers). Sanitary waste should be stored separately. The wet fraction should preferably used for composting; the dry fraction for recycling. Domestic hazardous waste including bio-medical waste, battery waste, e waste, paint, pesticide/insecticides, cleaning chemicals etc should not enter the municipal solid waste stream. Domestic hazardous waste is to be deposited at the designated collection centres. The applicant at the time of ICO shall specify the methodology for treatment and disposal of each type of waste and the facilities provided for the same. Bio-bins, Bio-digester, bio-gas plant, manual & automatic composting systems etc are the usual solid waste management system. If the quantity of wet waste is ≥100 kg/day or have a built-up area of 20,000 sq m or more for a building, it shall be insisted to provide own facilities for onsite composting (manual or automatic). Such units shall not be permitted to dispose the wet waste though the municipal solid waste management system. Segregated non-bio-degradable waste can be given to authorized collectors like Haritha Karma Sena.

(xix) There are many areas in Kerala where there are chances of flooding. Hence, the category of land may be checked before issuing the consent for high rise or other buildings. Or else, maximum rate of application of treated sewage may be fixed with the results of percolation tests and check whether it is feasible?

(xx) Continuous violations without consent should be viewed seriously. EC (environment compensation charges) should be charged based on the formula:

EC= PI x N x R x S x LF

PI = Pollution Index of Industrial Sector

N = No. of days of violation

R= A factor for Rupee for EC

S= Factor for scale of operation

LF = Location Factor

(xxi) It is noted that some builders are submitting separate applications in same land. The land owner will be same and applications submitted as different projects each below 20,000Sqm. If the total project area is considered, they will be coming under the purview of EC (requiring Environmental Clearance). As this seems to be aimed at getting EC exemption, the Board officer may check the projects carefully and call for explanation from the concerned applicants and also collect undertaking from the applicants that the projects are entirely different and that it is not an attempt to evade EC.

(xxii) Many apartment buildings, commissioned before 2007 have now applied for the consent of the Board. As the apartment buildings were brought in the consent purview in 2007 only, such applicants may be permitted to submit application with consent fee of 6.5 times the annual consent fee. Also, they may be granted sufficient time for installing the STP. In some cases, such buildings may not have sufficient space for construction of STP. Hence, they have to make alternate arrangements for transfer of sewage to common treatment plants having valid consent of the Board, while facilities for coagulation and settling of sullage in the area available in the plot.

Also, distance criteria may be relaxed for buildings constructed before the date of the 10 log Q circular, ie, before the year 2010.

This circular is valid from the date of issue and it supersedes all previous circulars in this regard.

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CHAIRMAN

Forwarded by order

Senior Environmental Engineer-3