



GOVERNMENT OF KERALA

Abstract

Local Self Government Department- Guidelines for setting up of Packaged/containerized Wastewater/Sewage Treatment Plants in establishments vested under the Local Self Government Institutions in Kerala. -Orders issued.

LOCAL SELF GOVERNMENT (WM)DEPARTMENT

G.O.(Rt)No.1727/2023/LSGD Dated,Thiruvananthapuram, 24-08-2023

Read: 1)Letter No. 4215/G/2022/SM dated 24/07/2023 from Executive Director Schitwa Mission.

ORDER

Government are pleased to approve the guidelines for setting up of Packaged/Containerised Wastewater/Sewage Treatment Plants(STPs) in establishments under the Local Self Government Institutions in Kerala, which is annexed along with this order.

(By order of the Governor)

PREETHA K S

ADDITIONAL SECRETARY

To:

The Principal, Director, (LSGD), Thiruvananthapuram.

Executive Director, Suchitwa Mission.

The Principal Accountant General (Audit) , Thiruvananthapuram.

Accountant General (A&E) Thiruvananthapuram.

Web & New Media(I&PRD)

Director, Information Kerala Mission

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Forwarded /By order

Signed by

M.k.pradeesh Kumar

Section Officer

Date: 24-08-2023 12:44:26

Copy to:CA to ACS, LSGD.

Guidelines for setting up of packaged/containerized wastewater/Sewage Treatment Plants (STPs) in establishments vested under the Local Self Government Institutions (LSGIs) in Kerala

As a matter of practice, Detailed Project Reports (DPRs) for Liquid Waste Management (LWM) projects such as Sewage Treatment Plants (STPs) and Faecal Sludge Treatment Plants (FSTPs) are prepared by agencies approved by Suchitwa Mission or the relevant Local Self Government Institution (LSGI). The construction work is then carried out by a different agency chosen through competitive bidding. This process can be time-consuming due to the administrative and technical procedures involved. To address this issue, the Government of Kerala (GoK) has approved the use of the Design-Build-Operate-Transfer (DBOT) model for LWM projects.

Suchitwa Mission has observed that many institutions under LSGI require STPs with capacities below 50 KLD. However, even for these small capacity plants, the current system requires limited tenders for DPR preparation, scrutiny, and issuance of Technical Sanction (TS), followed by an open tender for execution. This process can take over a year.

To reduce commissioning time and standardize requirements, Suchitwa Mission has considered using packaged or containerized wastewater treatment plants with capacities between 5 and 50 KLD in DBOT model with minimum 5 years O&M. For wastewater treatment less than 5 KLD, the use of a septic tank with a soak pit, a biodigester, or improved on-site systems is recommended. The matter was placed before the Technical Committee of Suchitwa Mission, which decided that prefabricated or containerized systems can be used for capacities under 50 KLD.

Accordingly, Suchitwa Mission invited agencies to submit Expression of Interests (EoI) for setting up packaged/containerized wastewater/Sewage treatment Plants for various establishments under the Local Self Government Institutions (LSGI) in Kerala. After evaluation and based on the recommendation of the Technical Committee proceedings were issued for empaneling agencies for the work.

In order to streamline the procedure for execution of the work, the following guidelines are issued. These shall be included as special conditions in the contract during the tendering process and will form part of the agreement when the work is awarded. Any existing conditions that conflict with these special conditions should be omitted from the tender document and agreement. A clause should also be added to the tender document stating that in the event of any disagreement between the clauses in the tender document and the special conditions, the provisions of the special conditions will take precedence.

Guidelines (Special Conditions of Contract)

1. The packaged/ containerized wastewater/sewage treatment plants shall be employed only for capacities above 5 KLD and up to and including 50 KLD. For capacities less than 5 KLD, the use of a septic tank with a soak pit, a biodigester, or improved on-site systems is recommended.
2. The agency for executing the work has to be selected through a transparent but limited bidding process among the agencies empaneled as per the Proceedings No: 4215/G/2022/SM dated 24.05.2023. Suchitwa Mission, may after due evaluation consider other agencies also eligible for empanelment in due course and all such agencies empaneled by Suchitwa Mission for the purpose becomes eligible for participating in the tender.
3. The LSGIs will be using the empanelment as a prequalification for getting an offer for establishing the packaged/ containerized wastewater/sewage treatment plants. Under no circumstances, work will be awarded directly to any empaneled agency by the LSGIs. Work will be awarded only to the lowest bidder through a limited tender among the empaneled agencies.
4. The design shall be accompanied with the functional flow diagram of the proposed treatment system and it should be approved by the technical committee constituted by Suchitwa Mission.
5. The treatment plant shall be designed based on monitoring the quality and quantity of wastewater generated from the building where the STP is to be setup. In case the building is new, standard data obtained from similar sources may be used. The treatment system is to be designed to treat the wastewater produced by the entire establishment, but not exceeding 50 KLD in capacity. If the calculated capacity is less than 50 KLD, the plant should be designed in a modular way that allows for expansion up to 50 KLD.
6. The selected agency should be required to comply with all the standards and specifications pertaining to wastewater treatment plants. The treated effluent quality shall be confirmed to the standards fixed by Kerala State Pollution Control Board (KSPCB). The technologies shall not cause inconvenience to the users and it should be free of odour, noise, emissions or any other disturbances. Counter measures should be taken by the vendor in case of any such disturbances.
7. The empanelment does not guarantee that the agencies will be awarded work. The selection of agency for a particular work in an LSGI will be based on a limited tender among the empaneled agencies on lowest cost basis, subject to the acceptance of the technical specifications and performance standards
8. The agency shall specify the specifications and standards that the packaged wastewater treatment plant must meet. These standards should be measurable, and the agency should be held accountable for meeting them. A quality assurance plan to ensure that the construction and operation of the plant are in compliance with the technical specifications and performance standards shall also be submitted. The plan should include regular testing and monitoring of the plant's performance.

9. The agency shall submit chronological program for execution of the work as per time limit stipulated in the tender, in the form of Bar Chart which should also indicate the details of milestones of physical stages of each sub work. If it is found that agency is not adhering to the approved programme fine shall be imposed / contract terminated as detailed in clause 42 below. If however the failure of the agency to complete the work on the stipulated date is due to any departmental delays or due to design and construction problems faced during execution, then he may apply for extension of time to the agreement authority before the expiry of the period of completion and the authority, after due verification may grant extension of time which shall not exceed 25% of the original completion time.
10. The contract should require the selected agency to provide regular reports on the construction and operation of the plant. These reports should include documentation of all work done, tests performed, and maintenance procedures carried out. The contract should also require the agency to maintain detailed records of all activities related to the plant's construction and operation.
11. The contract includes manufacturing, shop testing, pre-dispatch inspection, packaging, transportation to site, providing transit insurance, storage, handling at site, installation, sectional testing, pre commissioning testing, trial runs and commissioning of all components of the system including the pipes, fittings, hydraulic, mechanical, electrical, electro-mechanical and instrumentation equipment. The documents pertaining to these shall be submitted during the supply of the plant.
12. The contract should include a trial run period of 30 days, a performance evaluation period of 90 days after which the plant will be declared as commissioned. After commissioning there will be 360 days of defect liability period. Upto the completion of the defect liability period, all the defects has to be made good by the agency and the plant shall be kept running with the specified standard of effluent discharge, without any additional payment by LSGI. The regular O&M of the plant shall start from the next date of completion of the defect liability period. The proposed treatment plant shall be operated and maintained by the agency for a period of 60 months after the defect liability period as per the mutually agreed terms and conditions.
13. Regular inspection and audit of the plant's construction and operation by an independent third party will be carried out. The results of these inspections and audits should be made available to the relevant authorities.
14. In case, it is evident that the plant has not been designed properly and is not giving the desired output consistently (not able to treat the entire waste water load, not able to meet the effluent parameters, causing noise/air pollution etc) during the operation itself or has been remarked during the inspection or audit, then it will be the responsibility of the agency to make good the defects and make the plant working as envisaged. In case if the agency is unable to meet this objective, all the pending payments will be deferred, extending to blacklisting of the agency and the expenditure for making the plant working as per standards will be recovered from the agency

15. The system shall be robust and the structural design including durability must be authenticated by a qualified engineer or a third-party inspection agency as mentioned by the LSGI or Suchitwa Mission.
16. All equipment and the materials used therewith shall comply with the relevant Indian Standards unless a more rigorous requirement is specifically stipulated. If no applicable Indian Standard is available for any item of equipment or materials, the corresponding international standard shall be adopted. In every situation the latest specifications, standards etc. shall apply unless otherwise stated. In instances where there is a conflict between two codes (the Indian Standards excepted), the more restrictive of the two shall apply.
17. In respect of the work, the agency shall quote for the indigenous equipment as far as possible. Foreign exchange and import licence required by the contractor if any shall have to be arranged by the contractor independently. Department shall not take any responsibility in this regard. Delay in getting any materials shall not be entertained for extension of time limit of the contract.
18. All obstructions such as electric cables, telephone line, water and sewer mains, manholes, natural drainage, culverts, storm water drains etc. coming in the way shall be carefully looked after against any damages which otherwise will have to be made good by the contractor at his own cost. Any work of removing, repairing or remaking etc will be carried out by the contractor without any extra claims for the same in the contract with the respective departments.
19. The agencies shall not indulge in any fraudulent practices and doing so will invite legal and administrative action against the agency.
20. In the event of the agency failing to execute the work as per scheduled programme submitted by him or in the event of unreasonable delay on the part of the agency, he shall be liable to give compensation to the employer/ULB of an amount at the fixed rate subject to maximum amounting to 10% of the contract value.
21. Any marginal and minor changes with respect to the location of the plant as may be found necessary by the Engineer-in-charge during execution shall have to be carried out by the agency without extra cost complying to existing statutory siting norms.
22. The agency shall be responsible during the progress as well as maintenance for any liability imposed by law for any damage to the work or any part thereof or to any of the materials or other things used in performing the work or for injury to any person or persons or for any property damaged in or outside the work limit.
23. As instructed by the KSPCB, the STPs need to be constructed above ground preferably so as to facilitates proper maintenance and monitoring.
24. There shall be easy access to every treatment units for inspection. Sufficient sampling points shall be provided to facilitate collection of samples. Proper lighting and ventillation shall be provided in the sewage treatment plant area.
25. TOD type energy meter shall be installed exclusively for STP. Water meter shall be fixed to record consumption of water.

26. The agency shall indemnify and hold the owner and the local body harmless against any and all liability, claims, loss or injury, including costs, expenses, and attorney's fees incurred in the defence of same, arising from any allegation, whether groundless or not, of damage or injury to any person or property resulting from the performance of the work or from any material used in the work or from any condition of the work or work site, or from any cause whatsoever during the progress and maintenance of the work.
27. The contractor shall supervise and direct the works efficiently and with his best skill and attention. He shall be solely responsible for means, methods, techniques, procedures and sequences of construction. The agency shall co-ordinate all parts of the work and shall be responsible to see that the finished work complies fully with the requirement.
28. The agency shall take all precautions and furnish and maintain protection to prevent damage, injury or loss to other persons who may be affected thereby. All the compensation claims arising out of negligence on the part of the agency to maintain the safety standards will be the sole responsibility of the contractor.
29. Except for those improvements and facilities required to be permanently removed by the agency, the agency shall make satisfactory and acceptable arrangements with the appropriate owners, and shall repair, restore all improvements, structures, private and public roads, property, utilities and facilities disturbed, disconnected, or damaged as a result or consequence of his work or the operations of those for whom he is responsible
30. The bidder has to make his own assessment of the ground water table and safe bearing capacity while costing their proposal.
31. The agency shall monitor the quality of raw and treated sewage. The raw and treated sewage analysis pH, SS, BOD and oil & grease shall be carried out as prescribed by the regulatory bodies.
32. The agency shall submit a weekly report to the Employer, about the operation and maintenance indicating the manpower, electric power, chemicals and other consumables consumed and also problems faced and rectified.
33. In the event of any damage/loss of life/theft of property, due to negligence on the part of the agency, the agency shall be solely responsible and liable for compensation and damages, regarding negligence and the decision of Engineer-in-charge shall be final.
34. The agency shall ensure proper running of the plant to give the desired effluent quality for safe discharge / reuse, in cases as prescribed by the Kerala State Pollution Control Board from time to time. The discharge standards now prevailing is indicated below.

Parameters	Unit	Discharge standards	
		For Soak pit release	For reuse
pH	-	6.5 to 9.0	6.5 to 8.5
BOD	mg/l	30	3
COD	mg/l	250	50
Suspended solids	mg/l	100	10

Oil & Grease	mg/l	10	1
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The agency shall also be responsible for overall maintenance of the plant i.e. civil, electrical, and mechanical system including all repair of equipment/machinery without causing interruption to the treatment process. The agency shall intimate and take adequate action to ensure smooth and satisfactory running of the plant.

35. The agency shall also ensure for the safe disposal of sludge generated by the sewage treatment process in consultation with the LSG concerned. The process flow shall be designed in such a way that the quality of the sludge generated is as per the standards prescribed for enduse of the sludge. For deciding on the recycling application of the sludge the standards and guidelines prescribed by CPHEEO and CPCB has to be followed. For the use of the sludge as soil conditioner/agricultural applications either directly or as compost the standards as prescribed in EPA: 40 CFR- Part 503- Standards for Bioslids Class A or Class B or the Fertiliser Control Order norms as the case may be adhered to.
36. Random sampling and testing on inlet and outlet of the STP shall be conducted by Suchitwa Mission to ensure the efficiency of sewage treatment process. The agency shall facilitate the necessary arrangements for the same.
37. During the operation and maintenance period electricity charges will be borne by the LSGI. The electricity charges will be paid directly to Kerala State Electricity Board (KSEB) by the local body on an actual basis as per electricity bill raised by the KSEB. All other consumables, materials and required staff for Operation & Maintenance will be provided by the contractor. The operation & Maintenance cost approved by the Employer shall be payable on monthly basis on completion of every month on submission of bill by the contractor. The agency shall maintain the attendance record of the staff employed by him, which can be checked by the employer any time. The contractor will also submit a copy of all the data sheets every month for evaluation.
38. Any operational issue brought to the attention of the agency may be rectified within 24 hrs of reporting failing with proportionate deduction in O&M payment along with suitable fine may be levied from the agency till the plant is put back to operation. Continued failure to attend to the complaint for more than a week from date of reporting of complaint may lead to cancellation of contract and arrangement of work under the risk and cost of the agency.
39. The plant will be taken over once after the satisfactory completion of the defect liability period. All the machinery shall be in working conditions while taking over and an inspection of facilities and working of equipment will be carried by a team/officer at the time of take over. The agency shall be ready to take up Operation & Maintenance (O&M) of the sewage treatment plant and allied sewer network for a period of 5 years which is mandatory and further AMC will be done based on mutually agreed terms and conditions.
40. In case of delay in commissioning and take over on account of agency's failure, the O&M period will be extended further till it meets the above requirement without any extra cost.

41. The specification of materials used for repairs shall be the same as that have been used in the original work/during plant execution.
42. The completion period for the installation and starting of the trial run shall be six months from the date of work order.
43. If the agency fails to complete the work within the stipulated completion date for the work, he shall pay penalty for delay at 0.2% (Zero point two percent) of contract value per day of delay in completion and handing over the work or part thereof as the case may be to the agreement authority. The amount of penalty for delay shall, however, be subjected to a maximum of 10% (ten percent) of the contract value. In such cases the period of completion will be extended upto a maximum period of 90 days. Delays in excess of one hundred days will be a cause for termination of the contract and forfeiture of all security for performance. The balance work to be completed shall be arranged at the risk and cost of the original contractor.
44. The agency shall engage a qualified technical person for the execution of work who will remain present for all the time on the site and will receive instructions and orders from the implementing officer or his authorized representative. The instructions and orders given to the Contractor's representative on the site shall be considered as given to the contractor himself.
45. The working of the plant along with the influent and effluent flow shall be made available in a dashboard utilising IoT based monitoring tools. Any sensors installed for measuring the parameters shall conform to the respective Indian Standards and the sensor type and communication protocol shall be as prescribed by CPCB.
46. The treated water quality shall be suitable for reuse/safe disposal.

ANNEXURE

1. Evaluation Criteria

1.1 Trial Run Period

The plant will be declared as successfully completed the trial run provided that the following conditions are satisfied

- a. The plant has been working all days with at least 80% of the designed load capacity with all effluent parameters within the prescribed limits on 90 % of the testing provided that the testing is carried out with a minimum gap of 3 days and maximum gap of 6 days between testing (min 5 samples and maximum 10 samples during the trial period). In case, the plant is not continuously working for 30 days then the trial run period will be recalculated so that continuous evaluation for a period of 30 days is possible. In case, the break in continuous evaluation has happened due to reasons like non-availability of power, or other reasons that are beyond the control of the contractor, then such days may be exempted provided that total period of such exemption shall not exceed 10% of the total

period of evaluation

- b. A certificate to the effect that the trial run is successful is issued by the Technical Consultant of Suchitwa Mission

1.2 Performance Evaluation Period

The plant will be declared as successfully completed provided that the plant has been working all days during the performance evaluation period at the designed load capacity with all effluent parameters within the prescribed limits on testing carried out on a weekly basis with the gaps between testing not exceeding 8 days. A completion certificate shall be issued by the implementing officer once the performance evaluation is successfully completed.

1.3 Commissioning

The plant shall be commissioned within one month of completion as indicated above and the agency shall apply for taking over of the asset by the concerned LSGI.

2. Payment Criteria

For the payment indicated below, the capital cost excluding the operation and maintenance charges quoted will be taken as base. 10% of the cost shall be normally retained till the defect liability period and will be released on completion of the period without any issues.

Stage	Payment	Milestone	Period	Criteria
1	60%	Trial Run	30 days after successful installation	Trial Run to be successfully completed
2	10%	Commissioning	90 days after successful trial run	Performance evaluation to be successfully completed
3	20%	Defect Liability period completion	360 days from commissioning	Defect liability period to be successfully completed
4	10%	Retention	Any time after completion of defect liability period	Commissioned and run successfully during the defect liability period.

O&M payments shall start after the completion of the defect liability period. During the O&M period, the agency may claim quarterly bills and the payments may be made within 15 days of receipt of bills, provided the operation and maintenance of the plant has been done successfully.