

SUPPLY & INSTALLATION OF BIOGAS PLANT



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Sealed quotations are invited by the Secretary, Kollam District Co operative Hospital Society Q952 for the supply, installation & commissioning of Biogas Plant

Eligibility:

- Contractors who have sufficient experience of having successfully carried out similar works in Government Offices/Residential buildings/Office buildings/Pvt. buildings during the last three years are eligible to participate in the bidding.
- The NSMIMS reserves the right to verify the proof of having experience and expertise of the bidder in executing similar works and the bidder has to produce the proof thereof.

Submission of bid:

The tender document can be obtained in person from the below mentioned address from 10.00 am to 5.00 pm on all working days:

**“N.S Memorial Institute of Medical Sciences, Palathara, Thattamala P.O Kollam
691020 “**

Alternatively, the document can be downloaded from the website www.nshospital.org.

Last date for submission:

The last date for receipt of the bid at our office is **21.02.2024, 3.00 P.M.** The bid submitted beyond the above date and time shall not be considered for the bidding and shall be rejected

Installation & commissioning of Fixed Dome Bio Gas Plant

Capacity: 500 kg/ day

Main digester volume - 100 m³

Biomethanation technology

Biogas technology involve anaerobic fermentation of organic waste materials, such as animal dung, canteen waste, night soil, agricultural waste, poultry and slaughter waste, market waste in a bio reactor for 35 to 45 days. Generation of biogas is governed by its pH value, temperature, carbon-nitrogen ratio; total solid content, Hydraulic retention time and chemical induces etc. The biogas so generated is a mixture of methane (65 to 70%) carbon dioxide (30-35%) and traces of hydrogen sulphide. This biogas does not contain Sulphur, so it is considered as clean and cheap fuel. A biogas provides better sanitation and hygiene. This gas can be used for thermal application and for generation of electricity.

Feed materials for bio gas plants

Organic materials are used as feed materials for bio gas plants. Generally

1. Cattle dung
2. Human excreta
3. Kitchen/ vegetable waste
4. Slaughter house waste
5. Poultry droppings
6. Hotel/ Restaurants/ multistoried building wastes
7. Organic matter of higher fuel value etc

The proposed bio gas will have a total treatment capacity of 500 Kgs of food waste per day and liquid effluent of 1000 liters/day along with 1:1 ratio water. Its hydraulic retention time is 35-40 days, so the volume of the main digester is 100m³. The food waste when crushed with water in the machine, it is in a pre-digested form and the efficiency of the plant will be better.

TYPE OF BIO GAS PLANT PROPOSED

Fixed dome digester biogas plant is proposed. This digester functions on a continuous batch bases. It can digest plant waste as well as human and animal waste. It is usually built below ground level. The digester can be built from several materials.eg. Bricks, cement, RCC, lime concrete and Ferro cement. This facilitates in introduction and use of local materials and manpower. Pressure inside the digester does not cause any problem in the use of gas.

BASIC COMPONENTS OF THE PLANT/ INFRASTRUCTURE

- **Slit chamber**
- **Inlet to the main bioreactor**
- **Digester Tank**
- **Outlet tank (balancing tank)**
- **Slurry collection tank**
- **Sludge collection tank**
- **Pre filter tank**
- **Gas collection chamber (Fixed dome)**
- **Gas distribution system**
- **Moisture removal systems**
- **Manhole to the digester**
- **Initial feeding with cow dung**
- **Bio gas burner**
- **Water connection (by the hospital)**
- **Green path(by the hospital)**

A. STRUCTURAL SPECIFICATIONS: FIXED DOME for 500 Kgs/day

(As per GO(MS) No 73/LSGD/ dated 01-03-2011)

Sl no	Items	500 Kg/day (Total Volume 100 m ³)
1	Foundation	PCC, 1:4:8 at 20 cm thick, RCC 1:1.5:3, 8 & 8 mm steel @ 20/20 cc 10 cm thick
2	Vertical Wall	Inner and outer Cc block/ brick work 23 & 10 cm thick, RCC 1:1.5:3, 8 & 8 mm steel @ 20/20 cc 10 cm thick
3	Bottom portion of out let tank, pre filter and septic tank	PCC 20 cm, RCC 1:1.5:3, 8 & 8 mm steel @ 20/20 cc
4	Dome portion	One layer Brick work 10 cm and 12 cm RCC 1:1.5:3, 8 & 8 mm steel @ 20/20 cc
5	Plastering	Cement mortar at 1:4 at 10 cm thick all surface
6	Painting	Dome- two coat black paint inner side
7	Reinforcement details	Dome top 8 & 8 mm dia at 15 c/c Vertical wall 8 & 8 mm at 15 c/c and 8 mm at 20 c/c
8	Balancing tank and sludge collection tank 30 m ³ capacity 10 x 1.50 m x 2m	Bottom PCC 20 cm+ Rcc with vertical wall brick work and 10 mm plastering with slab cover
9	Pre filter tank 40 m ³ capacity 10m x 2m x 2m	Bottom PCC + Rcc with vertical wall brick work and 10 mm plastering with slab cover
10	Septic tank tank 10 m ³ capacity 10m x 2m x 2m	Bottom PCC + Rcc with vertical wall brick work and 10 mm plastering with slab cover

Technical Specification of bio gas plant

Model : Fixed dome model	
Inlet tank (2Nos)	200 mm pvc pipe 5 meter
Volume of the digester	74 m ³
Treatment capacity per day-	500 per day + Food processed effluent
HRT	35 days
Bio gas production per day	40 m ³
Inner dia of reactor	4.20 m

Outer dia of the reactor	5.00 m
Depth	3.40 m
Vertical wall	Inner and outer Brick /cement blockwork+ 10 cm RCC
Dome fabrication-	Brickwork +10 cm RCC
Bottom bowel	20 Cm PCC + 10 cm RCC
Plastering of plants-	inner and outer surface etc.
Pretreatment/inlet tank	Brick masonry 1.2 m circular
Provision for hot water supply	Using CPVC pipes
Reinforcement for vertical wall and dome	8 mm and 8mm steel at 15 c/c

OUTLET TANK

Outlet tank	Brick masonry + 10 Cm RCC =12 m ³
Pre filter tank	Brick masonry +12cm RCC =8 m ³
Sludge collection and septic tank	Brick masonry +12cm RCC =6 m ³
Gas distribution system	PVC pipe 10 kg/cm ² safety cock valve etc (50m)
Bio gas burner	24 Cft 1 nos.
Inlet pipes	3 m ³ ... 6" x 4 kg 2 nos,

TRIAL RUN & COMMISSIONING

After initial feeding with cow dung, the entire systems will put on trial run for a minimum period of 10 days. All parameters including bio gas generation will be monitored to the satisfactory and same will be handed over.