To,

Mr.Atul Nivargi

Neel Operations

G-3,A9,Aurangabad Coop Industrial Estate

M.I.D.C Railway Station ,Aurangabad -431005

Subject :-Regarding Purchase Order of Sewage Treatment Plant 30cum/Day Based on MBBR Technology with Ozonator Green Technology .

Ref:- Your Quotation No.Ref.1617007A/STP/2016 -17 dated 03/05/2016 and subscequant Negociation meeting with your revised offer.

Respected Sir,

with reference to subject mentioned above, we are glad to place purchase oreder of STP Plant 30Cum/day Based on MBBR Technology with ozonator Green Technology under following terms and Conditions .

1) The total cost of the project :- Rs.8,00,000/- Lakh (Rupees Eight Lakh only)

2) Taxes :- VAT -12.5% will be extra

3) Fright :- Inclusive

4) Installation , commissioning and supervision charges :- Nil

5) Delivery Peraid :- Within 4-5 weeks after receiving the purchase order.

6) Gurantees and Warantees :- All pumps and blower will be having one year warranty and gurantee The MS and P.V.C Pipeline will be having one year waranty and Gurantee

7) You will analyze the treated water parameters From independant laboratories and it will be your responsibility to achieve the prescribed Values of all parameters of treated water below the MPCB norms or within MPCB Limits .

8) You will train our operational staff for effecent and smooth working of STP

9) You will submit the detail design along with 01 set of Operating Mannual to conern MPCB authorities as well as to the institute

10) You will provide the STP Plant Strictly as per technical specifications mentioned in your quotation.

11) We are herewith giving 40% advance alongwith this P.O.,that is Rs.3,20,000/- (Three Lakh and twenty thousand only) by Cheque No.-------------------------Dated------------------of IDBI Bank Nashik you are requested to give acknowledgment stamp receipt of the same.

Thanking You.

Yours Sincerely

Secretary

Ayurved Seva Sangh ,Nashik

OPERATION & INSTRUCTIONS MANUAL

PROJECT: SEWAGE TREATMENT

PLANTCAPACITY : 30 CUM/DAY

CLIENT: Ayurved Seva Sangh,

Address : Ganeshwadi, Nasik, Maharashtra.

NEEL OPERATIONS

An ISO 9001:2000 Certified Company

G3,A9,'UDYAM' Aurangabad Coop Indl Estate,

MIDC Railway Station Road,

Aurangabad.-431005(M S) India.

Phone 0240 -2970075

Mobile :09326082892

Email : services@neeloperations.com

Web : www.neeloperations.com

I/C Principal -

Ayurved Mahavidyalaya, Nashik

Ayurved Mahavidyalaya Nashik

INDEX

A) SEWAGE TREATMENT PLANT

STANDARD OPERATING PROCEDURE

Purpose: Purpose of this SOP is to explain the operating procedure for Sewage Treatment plant of - Ayurved Seva Sangh ,Nasik.

Responsibility: To be decided by client. Reference: Operation & instruction manual.

Procedure :

SN.	Activity	Procedure No
1	Collection & pumping	STP/OPN/001
2	Primary Tube Settler	STP/OPN/002
3	Aeration	STP/OPN/003
4	Secondary Tube Settler	STP/OPN/004
4	Chemical Dosing	STP/OPN/005
5	Sand/Carbon bed filter	STP/OPN/006
6	Sludge Drying Beds	STP/OPN/007
7	Quality Control	STP/OPN/008

STANDARD OPERATING PROCEDURE

Procedure no : **STP/OPN/001**

Activity : **Sewage Collection & Pumping**

Description:

Sewage will be collected to Collection tank. STP inlet sewage pump is provided on the tank.

Operation:

Sewage pump operate asper level control switch provided

Along with pump. Sewage pump will shift on ON/OFF mode automaticallyas per sewage level in the septic tank and feed to sewage treatment plantControl 1.25 m3/ hour or 3o cum/day flow of sewage being feed to plant.

STANDARD OPERATING PROCEDURE

Procedure no : **STP/OPN/002**

Activity : **T.S.S. Settling at Primary Tube Settler**

Description:

Total Suspending Solids in the sewage will settle in the Primary Tube Settler Over flow of Primary Tube Settler will pass to Aeration.

Operation:

Sewage will be directed to bottom & heavy partials will settle down atbottom.

Ensure clear water over flow.

Over flow water will be directed to Aeration tank.

Drain the sludge collected in the hopper bottom of Primary Tube Settler toSludge Drying Beds.

Stained water will pass to collection tank.

Allow sludge accumulated above sand bed to dry by sun light and collectthe same after completely dry for land filing or handover the same for further disposal as per MPCB Norms.

STANDARD OPERATING PROCEDURE

Procedure no : **STP/OPN/003**

Activity : **Aeration.**

Description:

Aeration is being done to increase dissolved oxygen level in water which inturns increase no. of bacteria colonies which will develop on MBBR Media. Increased bacteria will consume organic load in effluent as food & ultimately reducing B.O.D/C.O.D.

Operation:

1) Ensure Aeration tank completely filled.
2) Start/Stop of Air Blower is automatic as per set limits.
3) Ensure smooth running of Air Blower. In case of abnormal sound, refer maintenance manual.
4) For culture development, put the bacteria with the cow dung,domestic sewage.
   If needed Put UREA & DAP as a food to bacteria ratio shall be100kg/5 kg/1kg.
   i.e. for 100 kg of BOD load 5 kg UREA & 1 kg DAP.
5) Start taking neutralized & non-toxic Sewage/effluent and for acclimatization of the biological process keep running continuously re-circulation Pump. Allow develop the Bacteria Colonies on MBBR Media to desire level by returning 100% bio sludge from the Secondary Tube Settler tank.
6) Keep on increasing effluent (uniform loading) as per increasingBiological activity.
   As per experience it can be achieved within 15-20 Days.
7) Keep monitoring the effluent & biological activity periodically.
8) Don't allow escaping any biological sludge till sufficient Biological colonies get develops on the media so as to get desired result.
9) Allow over flow of aeration to pass to Secondary Tube Settler for bio-sludge settling.

STANDARD OPERATING PROCEDURE

Procedure no : **STP/OPN/004**

Activity : **Bio- Mass Settling at Secondary Tube Settler**

Description:

Over flow of aeration will pass to Secondary Tube Settler in which part of excess Sludge developed during aeration will also pass. To settle this Bio-Sludge, Secondary Tube Settler is being used.

Operation:

Sewage will be directed to bottom & heavy partials will settle down atbottom.

Ensure clear water over flow.

Over flow water will be directed to clarified water tank. Recirculate

the Bio-Sludge to aeration if needed.

Drain out Excess Sludge to Sludge Drying Beds.

STANDARD OPERATING PROCEDURE

Procedure no : **STP/OPN/005Activity** **:** **Ozone Dosing**

Description:

Overflow of Secondary Tube Settler will pass to Clarified water tank.

To make this treated water biologically free- Ozone gas will be used as adisinfectant.
Disinfection is done by Ozonator and recirculation Pump system.This system will be start/stop automatically as per auto set limits.You can also start /stop in manual mode if needed.

Operation:

1) This operation will be start/stop automatically as per auto set limits

STANDARD OPERATING PROCEDURE

Procedure no : **STP/OPN/006**

Activity : **Filtration**

Description:

Overflow of Secondary Tube Settler will pass to Clarified water tank.

To make this treated water free from suspended solids, Treated sewage is passed through Sand Bed Filter and Activated Carbon Filter.

Operation:

Level switches are provided to ON /OFF filter feed pump so that filtration process will be controlled by water level in the storage tank.

Back Wash of filters-

Auto backwash multiport valve is provided for auto back wash of Sand BedFilter in auto mode. However you can also choose for manual back wash if needed .For Manual operations follow the procedure given below-

Stop inlet pump.

Adjust the mutiport valve position to back wash.Start feed pump.

Suspended solids trapped above the filter beds will be removed and passed through the drain line. Drain line is connected to sludge drying bedsso that sludge from back wash will be trapped above sludge drying beds and water will be send to collection pit.

Stop inlet pump.

Put Mutiort valve position to Rinse position.

Start pump and allow water to pass for 10 -15 min,ensure clear water at outlet.

Stop pump and adjust the mutiport valve position to fulter operation mode. Start pump and now filter is in operation. ___________________

STANDARD OPERATING PROCEDURE

Procedure no : **STP/OPN/007**

Activity : **Waste Disposal Sludge Drying Beds**

Description:

Sludge generated in Tube Settler to be send to sludge drying beds. Dewatering take place & drained sludge can be disposed off safe means.

These sludge drying beds to be used turn by turn, fill one bed allow it for drying, use another for filling till first get ready after taking out dry sludge.

Operation:

Dry sludge collected from sludge drying beds to be dumped in separate area or can be disposed off for earth filling or to be hand over to hazardous waste management authority for further disposal.

Collect sludge from beds weekly periodically.

STANDARD OPERATING PROCEDURE

Procedure No: **STP/OPN/008**

Activity: **Quality Control**

It is very essential to maintain STP operations to avoid disturbances in operation & to avoid pollution.

Four major aspects cover quality of operating STP.

1) Raw water & Treated water quality & quantity monitoring. Ensure outletWater quality should match MPCB pollution norms.

2) Maintaining all records about process control & output.

3) Maintenance of equipment /machines.

4) Disposal of waste.

Design Basis :

Flow Volume : **30 cu.m/day - max**

Characteristics	**Raw Effluent**	**Desired**	**quality of treated effluent**
TSS	130 mg/l	100 mg/l	(max.)
BOD	400 mg/1	100 mg/1	(max.)
COD	600 mg/1	250 mg/1	(max.)
Oil & Grease	20 mg/1	10 mg/1	(max.)

TREATMENT SCHEME:

The various effluent/Sewage streams from Utility blocks are led into an Septic tank, where raw sewage will be digested anaerobic way.

⇓

Over flow of the sepic tank will be passed to the collation tank.

⇓

Sewage will be pumped from collection tank to Primary Tube Settler.

Sewage pumped to the Primary settling tank where sewage will be directed towards bottom and then upside through Tube settler media, here suspended solids will be settled on the tube media and sludge will slide back by gravity in to the bottom conical portion of settling vessel, from whereit will be pumped to sludge drying beds.

⇓

The sewage from Primary Tube Settler will be passed to an aeration tank for biological oxidation of organic impurities in presence of activated (biomass) bacterial sludge. The aeration is impartedby means of Air Blowers and Fine bubble air Diffusers installed in the tank. The biological treatment method followed is of `MBBR' process.

⇓

The over flow of the aeration tank will be passed to secondary Tube Settler where sludge will be settled and it will slide back by gravity in to the bottom conical portion of settling vessel, from where it will be pumped back in to the aeration tank again. Excess sludge shall be taken to sludge Drying Bed. Major part of the settled sludge is recycled into the aeration tank for maintaining adequate bacterial concentration in the system, while the surplus sludge is taken onto Sludge Drying Beds for Dewatering and disposal as solid waste.

⇓

The clarified effluent that overflows from secondary Tube Settler will be collected in the intermediate Storage Tank.

⇓

Treated water Disinfection get done with the help of ozonation and recirculation pump.

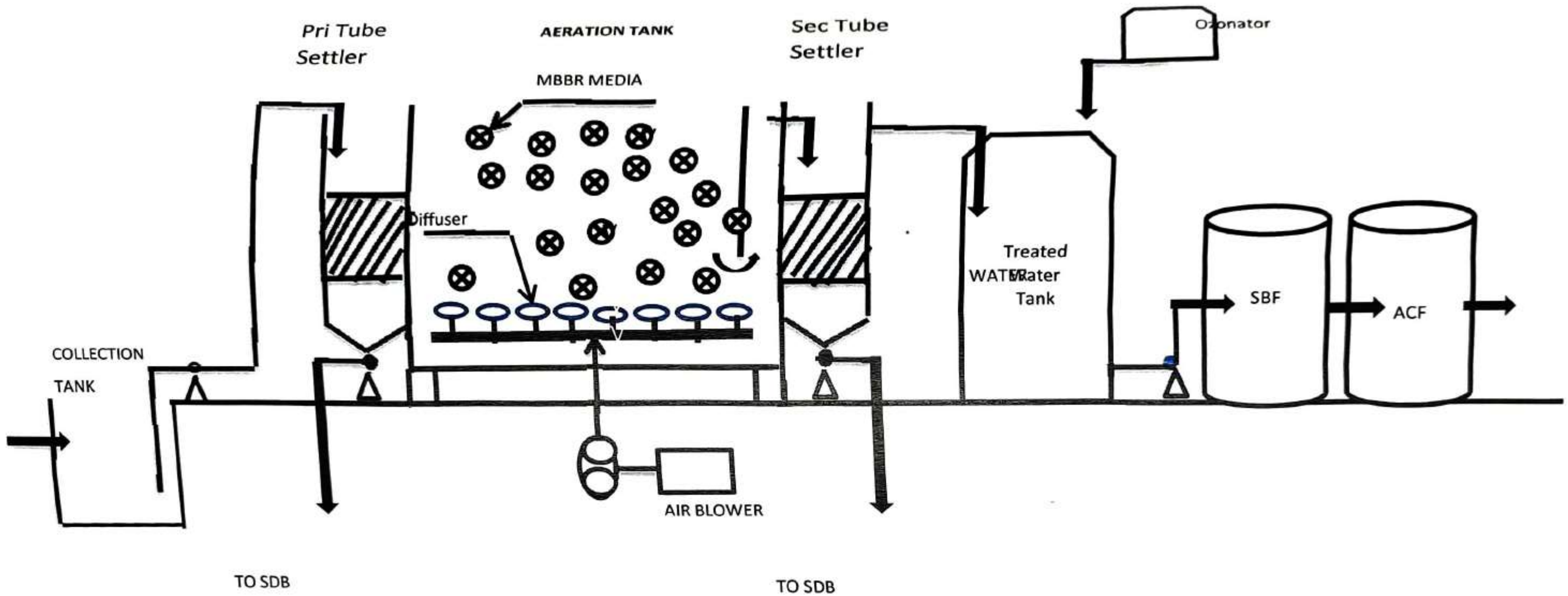
⇓

Ozonated Sewage will then pump to pressure filter and Activated Carbon Filter for tertiary Treatment.

⇓

The filtered, treated sewage water can very well be used for inland irrigation or discharged intodrains as it confirms to the standards stipulated by Pollution Control Board.

FLOW DIAGRAM



FLOW DIAGRAM FOR STP - 30 CUM/DAY