

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL  
PRINCIPAL BENCH, NEW DELHI**

**EXECUTION APPLICATION NO. 24 OF 2023  
IN  
ORIGINAL APPLICATION NO. 44 OF 2022**

**SAKET GIRLS P.G. COLLEGE**

**APPLICANT**

**VERSUS**

**STATE OF UTTAR PRADESH &  
ORS**

**RESPONDENTS**

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**Date:-08/11/2025**

**Through**

**Place: New Delhi**

**PRIYANKA SWAMI**

Advocate

Counsel for Nagar Palika Parishad, belha, Pratapgarh

F-13, Jangpura, New Delhi 110014

E-mail:[advpriya\\_nkaswami@gmail.com](mailto:advpriya_nkaswami@gmail.com)

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**STATUS REPORT ON BEHALF OF THE EXECUTIVE OFFICER,  
NAGAR PALIKA PARISHAD, BELHA, PRATAPGARH**

**MOST RESPECTFULLY SHOWETH:**

1. This affidavit is filed in compliance with the Hon'ble NGT's Order dated 01.07.2022. As directed, we acknowledge the Joint Committee (constituted vide order 15.02.2022) and its recommendations. The Tribunal's order extracts the Committee's findings and advice, which have been noted and acted upon. In particular, the Committee recommended immediate interim measures such as pumping accumulated wastewater from the College area into the nearby Bhuliyapur drain (where bioremediation is in place), and coordinating with the State Urban Development Department to secure budget and plan a long-term sewage-treatment solution for the proposed drain. The Nagar Palika Parishad implemented these recommendations: suction pumps were operated to transfer water to the bio-remediated Bhuliyapur wetland (until the drain was constructed), and the College and other

stakeholders were kept informed. A formal request for additional funding (approximately ₹ 2.96 crore) for the remaining 1.2 km drain was submitted to the Secretary, Urban Development, U.P. (via the District Magistrate) on 12.05.2022, in line with the Committee's advice.

- 2.** The Parishad has worked with an extremely limited budget. As the Committee noted, a full drain (approx. 1.2 km) was estimated to cost about ₹ 2.96 crore—far beyond the Parishad's capacity (historically capped at ₹ 20–25 lakh). Despite this, the Parishad mobilised State funds, and the works were carried out within that constraint. Under the approved plan, about 1,288 metres of the required drain have now been laid (as verified by the District Magistrate's inspection) to relieve the low-lying area around the College. Additional budget was arranged from the State Government and this portion of drain construction completed as directed by the Tribunal's order. This achievement is notable given the initial budget shortfall.
- 3.** Any delay in execution was due to factors beyond the Parishad's control, not willful non-compliance. The existing drain was originally built by the Gram Sabha and only came under municipal jurisdiction in December 2020. Shortly thereafter, administrative re-organisation and local elections (2021) affected sanctioning of works. These circumstances were fully explained in earlier affidavits. The Parishad respectfully submits that these unavoidable delays should not be construed as deliberate disobedience; at all times the Municipality remained committed to the Tribunal's directions and took prompt action once approvals and funds were secured.

4. It bears emphasis that the ultimate disposal or treatment of sewage is the responsibility of U.P. Jal Nigam (the State sewerage authority), not the local Municipality. Indeed, the Tribunal itself directed the Executive Engineer, U.P. Jal Nigam (Pratapgarh) alongside the Nagar Palika to complete the sewerage system and STP at Belha. This underscores that installing or operating an STP or directing flow into wetlands lies outside the Parishad's jurisdiction. The Municipal Council's role is confined to collection of local sewage up to its drain network; treatment and final discharge rest with Jal Nigam or other State agencies. Thus, any issues concerning the wetlands or 8.96 MLD STP are matters for Jal Nigam and the State authorities, not for the Parishad to resolve unilaterally.
5. The Hon'ble Tribunal has itself recognised that neither budgetary shortfall nor inter-agency division can justify non-compliance. As recorded, "*Budget is not our concern —the environment protection being the absolute liability of the State.*" Remedial action—completion of the drain and prevention of water-logging—was to be taken under the supervision of the District Magistrate and the Municipal Council. The Municipality has acted fully within its legal and practical limits: carrying out the drain work within available means, following the District Magistrate's directions, and coordinating with higher authorities for remaining measures. The Parishad thus reiterates that it has not shirked any duty.
6. In concrete terms, the following steps have been completed:
  - a) **Pump-based discharge:** Continuous pumping of waterlogged sewage was being done from the College area to

the STP under the jurisdiction of Nagar Plaika Parishad for scientific disposal till the drain was not

**b) Constructed-wetland connection:** A subsurface vertical-flow constructed-wetland system has been developed downstream of the Bhuliyapur drain to biologically treat incoming sewage.

**c) Drain completion:** 1.288 km of the drain within municipal jurisdiction has been constructed and connected, covering critical low-lying stretches. These works align with the Tribunal's mandate and have been verified by municipal engineers and acknowledged by the Sub-Divisional Magistrate.

**7.** As a result, the primary environmental goals ordered by this Tribunal have been substantially achieved. The incomplete open drain at the College site now connects to the main sewer network; water-logging has been significantly reduced through pumping interventions; and untreated sewage no longer stagnates on the surface but is conveyed to the bio-remediation wetland (and ultimately to the sewer) for treatment. The Parishad reiterates its commitment that no untreated effluent will enter the Sai River. Accordingly, the intent of the Tribunal's orders has been fulfilled to the fullest extent possible.

**8.** That the answering respondent has duly complied with the specific directions contained in paragraph 8 of the Hon'ble Tribunal's Judgment dated 01.07.2022, which, inter alia, states as follows:

***“On due consideration of the issue, we find it difficult to accept the stand that the College is required to take CTE/CTO or to install STP. Remedial action needs to be taken to complete the drain and to prevent and control waterlogging by the District Magistrate, Pratapgarh and the Municipal Council, Pratapgarh. The Applicant College or other stakeholders may also be associated in the process. Budget is not our concern which is to be dealt with by the concerned authorities, environment protection being an absolute liability of the State.”***

That, as per the above directions, the Hon'ble Tribunal specifically directed the answering respondent and the District Magistrate, Pratapgarh to ensure that waterlogging does not occur and that the concerned drain is duly completed and connected to the sewage treatment system.

In strict compliance thereof, and under the supervision of the District Magistrate, Pratapgarh, the said drain was completed and connected to the Bhuliyapur Wetland for the purpose of treatment of sewage water. The Uttar Pradesh Jal Nigam, being the competent technical authority possessing the requisite scientific and engineering expertise in sewage and wastewater management, was entrusted with the execution and technical supervision of the work.

It is respectfully submitted that the answering respondent had specifically sought clarification from the U.P. Jal Nigam as to why

the drain was being connected to the wetland instead of the existing Sewage Treatment Plant (STP). In response, the Jal Nigam submitted its detailed report justifying the said decision on technical and feasibility grounds, stating that the design, funding, discharge management, and treatment testing were undertaken and approved by the State Government through the Secretary, Urban Development Department, under the overall supervision of the District Magistrate, Pratapgarh.

It is further submitted that the said system has been constructed, commissioned, and is currently being operated and maintained by the U.P. Jal Nigam on a trial and run basis, and has not yet been formally handed over to the answering respondent. The treatment of sewage water is presently being carried out effectively at the Bhuliyapur Wetland. Once the system becomes fully operational and successful upon completion of the trial phase, it shall be formally handed over to the answering respondent, after which the responsibility of its day-to-day operation and maintenance shall vest with the answering respondent. **True copies of the designs, photos, test reports and the communication from the Jal Nigam substantiating the above are annexed herewith and collectively marked as Annexure P/1.**

9. That, in conclusion, it is respectfully submitted that all practicable steps required of the Nagar Palika Parishad, Belha, Pratapgarh have been duly completed in strict adherence to the directions of the Hon'ble Tribunal. The recommendations of the Joint Committee have been fully implemented; the drain measuring 1.288 km has been completed with the support of State funding, and interim

arrangements such as pumping of wastewater to bioremediated drains continue to function effectively. Any delay that occurred was purely due to lawful administrative procedures and not due to negligence or inaction on the part of the answering respondent. Wherever matters involved the U.P. Jal Nigam or other technical agencies, particularly with regard to the final connection of the drain to the STP, the Nagar Palika Parishad has diligently coordinated as per directions and under the supervision of the District Magistrate, Pratapgarh. As observed by the Hon'ble Tribunal, financial or jurisdictional constraints cannot be pleaded as an excuse for environmental protection; the answering respondent has acted responsibly within the limits of its jurisdiction and resources. Therefore, in compliance with paragraphs 8 and 9 of the Hon'ble Tribunal's judgment dated 01.07.2022, and through the collective efforts of the District Administration, Jal Nigam, and the answering respondent, the environmental objectives and directions of the Hon'ble Tribunal stand substantially complied with, and it is humbly prayed that the matter may kindly be disposed of accordingly.

**Date:-08/11/2025**

**Through**



**Place: New Delhi**

**PRIYANKA SWAMI**

Advocate

Counsel for Nagar Palika Parishad, belha, Pratapgarh

F-13, Jangpura, New Delhi 110014

E-mail:[advpriyankaswami@gmail.com](mailto:advpriyankaswami@gmail.com)

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**APPLICANT**

**VERSUS**

**STATE OF UTTAR PRADESH.**

**RESPONDENT**

**AFFIDAVIT**

I, Rakesh Kumar, Aged About 50 Years S/O Sh. Lakshmi Prasad Jaiswal  
Is Presently Posted As Executive Officer, Nagar Palika Parishad, Belha,  
District- Pratapgarh, Uttar Praadesh.

1. That I am posted as stated above and well conversant with the facts of the present case and as such competent to swear this affidavit before this Tribunal.
2. That the accompanying Reply has been drafted by our counsel upon my instructions.
3. That the contents of the accompanying Reply are true and correct, and the knowledge has been derived from official records and nothing material has been concealed therefrom.



*(Handwritten signature)*

**DEPONENT**

**VERIFICATION**

Verified on solemn affirmation at 8<sup>th</sup> day of November 2025, that the contents of the foregoing affidavit are true and correct to the best of my knowledge and no part of it is false and nothing material has been concealed therefrom.

*(Handwritten signature)*

**DEPONENT**



*(Handwritten signature and date)*  
01/11/2025



## कार्यालय अधिशासी अभियन्ता

निर्माण खण्ड(द्वितीय), उ0प्र0 जल निगम (नगरीय), प्रयागराज  
8, महर्षि दयानन्द मार्ग, सिविल लाइन,  
प्रयागराज, 211001

Letter No: 1409 / W-46 / 37 Date: 27-10-25

सेवा मे,

अधिशासी अधिकारी,  
नगर पालिका परिषद,  
प्रतापगढ़।

विषय:- नगर पालिका परिषद बेल्हा प्रतापगढ़ अन्तर्गत निर्मित भुलियापुर वेटलैण्ड के सम्बन्ध मे।

महोदय,

उपरोक्त विषयक नगर पालिका परिषद बेल्हा प्रतापगढ़ अन्तर्गत निर्मित भुलियापुर वेटलैण्ड के सम्बन्ध में वांछित सूचना संलग्न कर आपको अग्रेतर कार्यवाही हेतु प्रेषित है।

भवदीय  
27/10/25

(अमित राज)  
अधिशासी अभियन्ता

### 1. Sub- Surface Vertical Upflow Constructed Wetland Technology at 2.5 MLD Bhuliyapur Drain:

A Constructed Wetland is constructed for onsite treatment of sewage before discharging in the Sai River. A sub surface vertical upflow constructed wetland is constructed at downstream of Bhuliyapur drain. Constructed Wetland at Bhuliyapur Drain is built at the downstream of the habitation to tap all the incoming sewage for treatment in the constructed wetland and currently no sewer is directly being discharged or by passed in the Sai River on this drain without treatment. Flow diagram of wetland is enclosed. The retention period of sewage in the constructed wetland at Bhuliyapur drain is around 17 hours. The test report of the wetland at Bhuliyapur Drain is enclosed (**Annexure 1**). The test reports show reduction in the Key Performance Indicators.

Typical input and output characteristics considered in the design of wetland are:

S No	Parameter	Unit	Inlet	Outlet
1	pH	-	7.5 to 8.5	6.5 to 9.0
2	BOD	mg/l	250	<30
3	COD	mg/l	450	<100
4	TSS	mg/l	350	<50

#### Working of Subsurface Vertical Tidal Flow(SVTF) Constructed Wetland :-

Subsurface Vertical Tidal Flow (SVTF) constructed wetlands (CWs) can be used as part of decentralized wastewater treatment systems and are a robust and "low tech" technology with low operational requirements. CWs can be used for the treatment of various types of wastewater, and play an important role in many ecological sanitation concepts.

There are many different types of CWs designed for a variety of wastewater types. This project design deals only with subsurface vertical tidal flow constructed wetlands with a substrate of pebbles & gravels for treatment of greywater, domestic or municipal wastewater in developing countries and countries in transition. Subsurface vertical tidal flow CWs are reliable treatment systems with very high treatment efficiencies for the removal of organic matter as well as for nutrients.

The treatment process of CWs is based on a number of biological and physical processes such as adsorption, precipitation, filtration, nitrification, decomposition, etc. The most important process is the biological filtration by a biofilm composed of facultative bacteria. Furthermore, the planning always has to consider the specific local circumstances, such as temperature, land availability and the intended reuse or disposal of the treated wastewater.

Constructed wetlands can be considered as a secondary treatment step since suspended solids, larger particles including toilet paper and other rubbish as well as some organic matter need to be removed before wastewater can be treated in subsurface vertical tidal flow CWs. Pre-treatment is extremely important to avoid clogging of subsurface flow CWs, which is an obstruction of the free pore spaces due to accumulation of solids.

The main pre-treatment technologies which are used upstream of the CW filter bed are:

1. Bar screen
2. Sand and grit removal
3. Grease trap
4. Collection cum Baffled tank (or anaerobic baffled reactor)
5. Plant bed

The design for Bhuliyapur wetland had been vetted by MNNIT, Prayagraj. The vetted design and drawing is being enclosed (**Annexure-2**). Flow diagram of Bhuliyapur wetland is being enclosed (**Annexure-3**).



A handwritten signature in blue ink, consisting of a stylized, cursive script.

### Test Report of 2.50 MLD Wetland Bhuliyapur Drain

S No	Parameter	Unit	Inlet STP	Final Outlet	Standards
<b>Date 11-08-2025 (NABL Lab)</b>					
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
1	pH	-	7.54	7.82	6.5-9.0
2	TSS	mg/l	163	14.00	<100
3	BOD		357	19.60	<30
4	COD		1154	103.80	<250
5	Faecal Coliform	MPN/100 ml	900	110.00	<1000
<b>Date 15-09-2025 (NABL Lab)</b>					
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
1	pH	-	7.96	7.31	6.5-9.0
2	TSS	mg/l	129	15.00	<100
3	BOD		303	19.20	<30
4	COD		987	109.00	<250
5	Faecal Coliform	MPN/100 ml	500	90.00	<1000
<b>Date 10-10-2025 (NABL Lab)</b>					
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
1	pH	-	8.12	7.28	6.5-9.0
2	TSS	mg/l	133	10.00	<100
3	BOD		342	18.70	<30
4	COD		1022	98.00	<250
5	Faecal Coliform	MPN/100 ml	900	70.00	<1000



**TEST REPORT**

Test Report No.: URLS/2025/1428		Issued On: 11.08.2025
1.	Name & Address of Customer	Techno Crafts & Solutions; 2 <sup>nd</sup> Floor, Plot No. 49, Dayal Bhawan, Patel Nagar, Mint Huse Road, Cantonment, Nadeshwar, Varanasi, Uttar Pradesh- 221002.
2.	Registration Reference Details	Order Code/Job Order No.: URLS/O/25-0903/1; Dated: 04.08.2025
3.	Material Identification with Details	Waste Water; 1 Litre.
4.	Source / Location	STP Inlet Water / 2.5 MLD STP Plant -Bhuliyapur Wetland
5.	Sample Collected by / Condition	Customer / Sealed & Satisfactory
6.	Sample Collection Plan & Procedure	NA
7.	Date / Time of Sample Collection	NA
8.	Date of Sample Registration	04.08.2025
9.	Date of Sample Testing	04.08.2025 to 11.08.2025
10.	Environmental Conditions	Room Temperature (°C): 24.2   Relative Humidity (%): 61

**RESULTS**

S. No.	Name of Test	Test Result	Units	Method of Test
<b>Discipline- Chemical</b>				
<b>Group- Waste Water</b>				
1	pH value at 25°C	7.54	-	IS:3025 (Part 11) 2022
2	Total Suspended Solids	163	mg/L	IS:3025 (Part 17) 2022
3	Chemical Oxygen Demand	1154	mg/L	IS:3025 (Part 58) 2023
4	Biochemical Oxygen Demand @ 27°C -3 Days	357	mg/L	IS:3025 (Part 44) 2023
<b>Discipline- Biological</b>				
<b>Group- Waste Water</b>				
5	Feacal Coliform	900	MPN/100mL	APHA 23 Ed. 9221 E

*Suryabhan Singh*  
Checked By  
Suryabhan Singh  
Quality Manager

*J.P. Nautiyal*  
Authorized Signatory  
J.P. Nautiyal  
Technical Manager

\*\*\*End of Report\*\*\*

⚠The test-results relate only to the sample analysed. ⚠The test-results may not be reproduced except in full, without a written approval of the laboratory and cannot be used as an evidence in the court of law. ⚠The sample will be destroyed after 15 days from the date of issue of test certificate unless otherwise specified. ⚠Complaints pertaining to this test report should be communicated within 7 days of issue of test report. ⚠All disputes subject to Lucknow Jurisdiction.

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**TEST REPORT**

Test Report No.: UURLS/2025/1429		Issued On: 11.08.2025
1.	Name & Address of Customer	Techno Crafts & Solutions; 2 <sup>nd</sup> Floor, Plot No. 49, Dayal Bhawan, Patel Nagar, Mint Huse Road, Cantonment, Nadeshwar, Varanasi, Uttar Pradesh- 221002.
2.	Registration Reference Details	Order Code/Job Order No.: UURLS/O/25-0903/2; Dated: 04.08.2025
3.	Material Identification with Details	Waste Water; 1 Litre.
4.	Source / Location	STP Inlet Water / 0.5 MLD Plant -Ramleela Maidan Wetland
5.	Sample Collected by / Condition	Customer / Sealed & Satisfactory
6.	Sample Collection Plan & Procedure	NA
7.	Date / Time of Sample Collection	NA
8.	Date of Sample Registration	04.08.2025
9.	Date of Sample Testing	04.08.2025 to 11.08.2025
10.	Environmental Conditions	Room Temperature (°C): 24.2   Relative Humidity (%): 61

**RESULTS**

S. No.	Name of Test	Test Result	Units	Method of Test
<b>Discipline- Chemical</b>				
<b>Group- Waste Water</b>				
1	pH value at 25°C	8.39	-	IS:3025 (Part 11) 2022
2	Total Suspended Solids	142	mg/L	IS:3025 (Part 17) 2022
3	Chemical Oxygen Demand	1096	mg/L	IS:3025 (Part 58) 2023
4	Biochemical Oxygen Demand @ 27°C -3 Days	382	mg/L	IS:3025 (Part 44) 2023
<b>Discipline- Biological</b>				
<b>Group- Waste Water</b>				
5	Feecal Coliform	≥1600	MPN/100mL	APHA 23 Ed. 9221 E

  
Checked By  
Suryabhan Singh  
Quality Manager

  
Authorized Signatory  
J.P Nautiyal  
Technical Manager

\*\*\*End of Report\*\*\*

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GSTIN: 09AAGFU3889F1ZN | LLPIN: ACC-7927

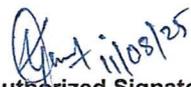
**TEST REPORT**

Test Report No.: URLS/2025/1430		Issued On: 11.08.2025
1.	Name & Address of Customer	Techno Crafts & Solutions; 2 <sup>nd</sup> Floor, Plot No. 49, Dayal Bhawan, Patel Nagar, Mint Huse Road, Cantonment, Nadeshwar, Varanasi, Uttar Pradesh- 221002.
2.	Registration Reference Details	Order Code/Job Order No.: URLS/O/25-0903/3; Dated: 04.08.2025
3.	Material Identification with Details	Waste Water; 1 Litre.
4.	Source / Location	STP Treated Water / 2.5 MLD STP Plant -Bhuliyapur Wetland
5.	Sample Collected by / Condition	Customer / Sealed & Satisfactory
6.	Sample Collection Plan & Procedure	NA
7.	Date / Time of Sample Collection	NA
8.	Date of Sample Registration	04.08.2025
9.	Date of Sample Testing	04.08.2025 to 11.08.2025
10.	Environmental Conditions	Room Temperature (°C): 24.2   Relative Humidity (%): 61

**RESULTS**

S. No.	Name of Test	Test Result	Units	Limits as per Schedule VI, EPA Rules 1986	Method of Test
<b>Discipline- Chemical</b>					
<b>Group- Waste Water</b>					
1	pH value at 25°C	7.82	-	5.5 to 9.0	IS:3025 (Part 11) 2022
2	Total Suspended Solids	14	mg/L	100	IS:3025 (Part 17) 2022
3	Chemical Oxygen Demand	103.8	mg/L	Max.250	IS:3025 (Part 58) 2023
4	Biochemical Oxygen Demand @ 27°C -3 Days	19.6	mg/L	Max.30	IS:3025 (Part 44) 2023
<b>Discipline- Biological</b>					
<b>Group- Waste Water</b>					
5	Feacal Coliform	110	MPN/100 mL	1000	APHA 23 Ed. 9221 E

  
Checked By  
Suryeshan Singh  
Quality Manager

  
Authorized Signatory  
J.P. Nautiyal  
Technical Manager

\*\*\*End of Report\*\*\*

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GSTIN: 09AAGFU3889F1ZN | LLPIN: ACC-7927


**TEST REPORT**

Test Report No.: URLS/2025/1431		Issued On: 11.08.2025
1.	Name & Address of Customer	Techno Crafts & Solutions; 2 <sup>nd</sup> Floor, Plot No. 49, Dayal Bhawan, Patel Nagar, Mint Huse Road, Cantonment, Nadeshwar, Varanasi, Uttar Pradesh- 221002.
2.	Registration Reference Details	Order Code/Job Order No.: URLS/O/25-0903/4; Dated: 04.08.2025
3.	Material Identification with Details	Waste Water; 1 Litre.
4.	Source / Location	STP Treated Water / 0.5 MLD Plant -Ramleela Maidan Wetland
5.	Sample Collected by / Condition	Customer / Sealed & Satisfactory
6.	Sample Collection Plan & Procedure	NA
7.	Date / Time of Sample Collection	NA
8.	Date of Sample Registration	04.08.2025
9.	Date of Sample Testing	04.08.2025 to 11.08.2025
10.	Environmental Conditions	Room Temperature (°C): 24.2   Relative Humidity (%): 61

**RESULTS**

S. No.	Name of Test	Test Result	Units	Limits as per Schedule VI, EPA Rules 1986	Method of Test
<b>Discipline- Chemical</b>					
<b>Group- Waste Water</b>					
1	pH value at 25°C	7.44	-	5.5 to 9.0	IS:3025 (Part 11) 2022
2	Total Suspended Solids	15	mg/L	100	IS:3025 (Part 17) 2022
3	Chemical Oxygen Demand	109	mg/L	Max.250	IS:3025 (Part 58) 2023
4	Biochemical Oxygen Demand @ 27°C -3 Days	22	mg/L	Max.30	IS:3025 (Part 44) 2023
<b>Discipline- Biological</b>					
<b>Group- Waste Water</b>					
5	Feecal Coliform	170	MPN/100 mL	1000	APHA 23 Ed. 9221 E

  
 Checked By  
**Suryabhan Singh**  
 Quality Manager

  
 Authorized Signatory  
**J.P. Nautiyal**  
 Technical Manager

\*\*\*End of Report\*\*\*

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 Chinhat, Lucknow-226028  
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 GSTIN: 09AAGFU3889F1ZN | LLPIN: ACC-7927


**TEST REPORT**

Test Report No.: URLS/2025/1612		Issued On: 15.09.2025
1.	Name & Address of Customer	Techno Crafts & Solutions; 2 <sup>nd</sup> Floor, Plot No. 49, Dayal Bhawan, Patel Nagar, Mint Huse Road, Cantonment, Nadeshwar, Varanasi, Uttar Pradesh- 221002.
2.	Registration Reference Details	Order Code/Job Order No.: URLS/O/25-0987/1; Dated: 08.09.2025
3.	Material Identification with Details	Waste Water; 1 Litre.
4.	Source / Location	STP Inlet Water / 2.5 MLD STP Plant -Bhuliyapur Wetland
5.	Sample Collected by / Condition	Customer / Sealed & Satisfactory
6.	Sample Collection Plan & Procedure	NA
7.	Date / Time of Sample Collection	NA
8.	Date of Sample Registration	08.09.2025
9.	Date of Sample Testing	08.09.2025 to 15.09.2025
10.	Environmental Conditions	Room Temperature (°C): 25.3   Relative Humidity (%): 59

**RESULTS**

S. No.	Name of Test	Test Result	Units	Method of Test
<b>Discipline- Chemical</b>				
<b>Group- Waste Water</b>				
1	pH value at 25°C	7.96	-	IS:3025 (Part 11) 2022
2	Total Suspended Solids	129	mg/L	IS:3025 (Part 17) 2022
3	Chemical Oxygen Demand	987	mg/L	IS:3025 (Part 58) 2023
4	Biochemical Oxygen Demand @ 27°C -3 Days	303	mg/L	IS:3025 (Part 44) 2023
<b>Discipline- Biological</b>				
<b>Group- Waste Water</b>				
5	Feacal Coliform	500	MPN/100mL	APHA 23 Ed. 9221 E

  
 Checked By  
 Suryabhan Singh  
 Quality Manager

  
 Authorized Signatory  
 J.P. Nautiyal  
 Technical Manager

\*\*\*End of Report\*\*\*

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**TEST REPORT**

Test Report No.: URLS/2025/1613		Issued On: 15.09.2025	
1.	Name & Address of Customer	Techno Crafts & Solutions; 2 <sup>nd</sup> Floor, Plot No. 49, Dayal Bhawan, Patel Nagar, Mint Huse Road, Cantonment, Nadeshwar, Varanasi, Uttar Pradesh- 221002.	
2.	Registration Reference Details	Order Code/Job Order No.: URLS/O/25-0987/2; Dated: 08.09.2025	
3.	Material Identification with Details	Waste Water; 1 Litre.	
4.	Source / Location	STP Inlet Water / 0.5 MLD Plant -Ramleela Maidan Wetland	
5.	Sample Collected by / Condition	Customer / Sealed & Satisfactory	
6.	Sample Collection Plan & Procedure	NA	
7.	Date / Time of Sample Collection	NA	
8.	Date of Sample Registration	08.09.2025	
9.	Date of Sample Testing	08.09.2025 to 15.09.2025	
10.	Environmental Conditions	Room Temperature (°C): 25.3	Relative Humidity (%): 59

**RESULTS**

S. No.	Name of Test	Test Result	Units	Method of Test
<b>Discipline- Chemical</b>				
<b>Group- Waste Water</b>				
1	pH value at 25°C	8.32	-	IS:3025 (Part 11) 2022
2	Total Suspended Solids	119	mg/L	IS:3025 (Part 17) 2022
3	Chemical Oxygen Demand	887	mg/L	IS:3025 (Part 58) 2023
4	Biochemical Oxygen Demand @ 27°C -3 Days	294	mg/L	IS:3025 (Part 44) 2023
<b>Discipline- Biological</b>				
<b>Group- Waste Water</b>				
5	Feacal Coliform	300	MPN/100mL	APHA 23 Ed. 9221 E



Checked By  
Suryabhan Singh  
Quality Manager



Authorized Signatory  
J.P. Nautiyal  
Technical Manager

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## TEST REPORT

Test Report No.: URLS/2025/1614		Issued On: 15.09.2025
1.	Name & Address of Customer	Techno Crafts & Solutions; 2 <sup>nd</sup> Floor, Plot No. 49, Dayal Bhawan, Patel Nagar, Mint Huse Road, Cantonment, Nadeshar, Varanasi, Uttar Pradesh- 221002.
2.	Registration Reference Details	Order Code/Job Order No.: URLS/O/25-0987/3; Dated: 08.09.2025
3.	Material Identification with Details	Waste Water; 1 Litre.
4.	Source / Location	STP Treated Water / 2.5 MLD STP Plant -Bhuliyapur Wetland
5.	Sample Collected by / Condition	Customer / Sealed & Satisfactory
6.	Sample Collection Plan & Procedure	NA
7.	Date / Time of Sample Collection	NA
8.	Date of Sample Registration	08.09.2025
9.	Date of Sample Testing	08.09.2025 to 15.09.2025
10.	Environmental Conditions	Room Temperature (°C): 25.3   Relative Humidity (%): 59

## RESULTS

S. No.	Name of Test	Test Result	Units	Limits as per Schedule VI, EPA Rules 1986	Method of Test
<b>Discipline- Chemical</b>					
<b>Group- Waste Water</b>					
1	pH value at 25°C	7.31	-	5.5 to 9.0	IS:3025 (Part 11) 2022
2	Total Suspended Solids	15	mg/L	100	IS:3025 (Part 17) 2022
3	Chemical Oxygen Demand	109	mg/L	Max.250	IS:3025 (Part 58) 2023
4	Biochemical Oxygen Demand @ 27°C -3 Days	19.2	mg/L	Max.30	IS:3025 (Part 44) 2023
<b>Discipline- Biological</b>					
<b>Group- Waste Water</b>					
5	Faecal Coliform	90	MPN/100 mL	1000	APHA 23 Ed. 9221 E

Checked By  
Surabhan Singh  
Quality Manager

Authorized Signatory  
J.P. Nautiyal  
Technical Manager

\*\*\*End of Report\*\*\*

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**TEST REPORT**

Test Report No.: URLS/2025/1615		Issued On: 15.09.2025
1.	Name & Address of Customer	Techno Crafts & Solutions; 2 <sup>nd</sup> Floor, Plot No. 49, Dayal Bhawan, Patel Nagar, Mint Huse Road, Cantonment, Nadeshar, Varanasi, Uttar Pradesh- 221002.
2.	Registration Reference Details	Order Code/Job Order No.: URLS/O/25-0987/4; Dated: 08.09.2025
3.	Material Identification with Details	Waste Water; 1 Litre.
4.	Source / Location	STP Treated Water / 0.5 MLD Plant -Rameela Maidan Wetland
5.	Sample Collected by / Condition	Customer / Sealed & Satisfactory
6.	Sample Collection Plan & Procedure	NA
7.	Date / Time of Sample Collection	NA
8.	Date of Sample Registration	08.09.2025
9.	Date of Sample Testing	08.09.2025 to 15.09.2025
10.	Environmental Conditions	Room Temperature (°C): 25.3   Relative Humidity (%): 59

**RESULTS**

S. No.	Name of Test	Test Result	Units	Limits as per Schedule VI, EPA Rules 1986	Method of Test
<b>Discipline- Chemical</b>					
<b>Group- Waste Water</b>					
1	pH value at 25°C	7.39	-	5.5 to 9.0	IS:3025 (Part 11) 2022
2	Total Suspended Solids	11	mg/L	100	IS:3025 (Part 17) 2022
3	Chemical Oxygen Demand	117	mg/L	Max.250	IS:3025 (Part 58) 2023
4	Biochemical Oxygen Demand @ 27°C -3 Days	23	mg/L	Max.30	IS:3025 (Part 44) 2023
<b>Discipline- Biological</b>					
<b>Group- Waste Water</b>					
5	Feecal Coliform	110	MPN/100 mL	1000	APHA 23 Ed. 9221 E

Checked By  
Suryabhan Singh  
Quality Manager

Authorized Signatory  
J.P. Nautiyal  
Technical Manager

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**TEST REPORT**

Test Report No.: URLS/2025/1821		Issued On: 10.10.2025
1.	Name & Address of Customer	Techno Crafts & Solutions; 2 <sup>nd</sup> Floor, Plot No. 49, Dayal Bhawan, Patel Nagar, Mint Huse Road, Cantonment, Nadeshar, Varanasi, Uttar Pradesh- 221002.
2.	Registration Reference Details	Order Code/Job Order No.: URLS/O/25-1106/1; Dated: 03.10.2025
3.	Material Identification with Details	Waste Water; 1 Litre.
4.	Source / Location	STP Inlet Water / 2.5 MLD STP Plant -Bhuliyapur Wetland
5.	Sample Collected by / Condition	Customer / Sealed & Satisfactory
6.	Sample Collection Plan & Procedure	NA
7.	Date / Time of Sample Collection	NA
8.	Date of Sample Registration	03.10.2025
9.	Date of Sample Testing	03.10.2025 to 10.10.2025
10.	Environmental Conditions	Room Temperature (°C): 25.1   Relative Humidity (%): 66

**RESULTS**

S. No.	Name of Test	Test Result	Units	Method of Test
<b>Discipline- Chemical</b>				
<b>Group- Waste Water</b>				
1	pH value at 25°C	8.12	-	IS:3025 (Part 11) 2022
2	Total Suspended Solids	133	mg/L	IS:3025 (Part 17) 2022
3	Chemical Oxygen Demand	1022	mg/L	IS:3025 (Part 58) 2023
4	Biochemical Oxygen Demand @ 27°C -3 Days	342	mg/L	IS:3025 (Part 44) 2023
<b>Discipline- Biological</b>				
<b>Group- Waste Water</b>				
5	Feecal Coliform	900	MPN/100mL	APHA 23 Ed. 9221 E

  
 Checked By  
 Suryabhan Singh  
 Quality Manager

  
 Authorized Signatory  
 J.P. Nautiyal  
 Technical Manager

**\*\*\*End of Report\*\*\***

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## TEST REPORT

Test Report No.: URLS/2025/1822		Issued On: 10.10.2025
1.	Name & Address of Customer	Techno Crafts & Solutions; 2 <sup>nd</sup> Floor, Plot No. 49, Dayal Bhawan, Patel Nagar, Mint Huse Road, Cantonment, Nadeshwar, Varanasi, Uttar Pradesh- 221002.
2.	Registration Reference Details	Order Code/Job Order No.: URLS/O/25-1106/2; Dated: 03.10.2025
3.	Material Identification with Details	Waste Water; 1 Litre.
4.	Source / Location	STP Inlet Water / 0.5 MLD Plant -Ramleela Maidan Wetland
5.	Sample Collected by / Condition	Customer / Sealed & Satisfactory
6.	Sample Collection Plan & Procedure	NA
7.	Date / Time of Sample Collection	NA
8.	Date of Sample Registration	03.10.2025
9.	Date of Sample Testing	03.10.2025 to 10.10.2025
10.	Environmental Conditions	Room Temperature (°C): 25.1   Relative Humidity (%): 66

## RESULTS

S. No.	Name of Test	Test Result	Units	Method of Test
<b>Discipline- Chemical</b>				
<b>Group- Waste Water</b>				
1	pH value at 25°C	7.99	-	IS:3025 (Part 11) 2022
2	Total Suspended Solids	97	mg/L	IS:3025 (Part 17) 2022
3	Chemical Oxygen Demand	862	mg/L	IS:3025 (Part 58) 2023
4	Biochemical Oxygen Demand @ 27°C -3 Days	279	mg/L	IS:3025 (Part 44) 2023
<b>Discipline- Biological</b>				
<b>Group- Waste Water</b>				
5	Feacal Coliform	350	MPN/100mL	APHA 23 Ed. 9221 E

  
Checked By  
Suryabhan Singh  
Quality Manager

  
Authorized Signatory  
J.P. Nautiyal  
Technical Manager

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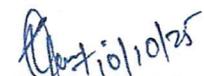
**TEST REPORT**

Test Report No.: URLS/2025/1823		Issued On: 10.10.2025
1.	Name & Address of Customer	Techno Crafts & Solutions; 2 <sup>nd</sup> Floor, Plot No. 49, Dayal Bhawan, Patel Nagar, Mint Huse Road, Cantonment, Nadeshar, Varanasi, Uttar Pradesh- 221002.
2.	Registration Reference Details	Order Code/Job Order No.: URLS/O/25-1106/3; Dated: 03.10.2025
3.	Material Identification with Details	Waste Water; 1 Litre.
4.	Source / Location	STP Treated Water / 2.5 MLD STP Plant -Bhuliyapur Wetland
5.	Sample Collected by / Condition	Customer / Sealed & Satisfactory
6.	Sample Collection Plan & Procedure	NA
7.	Date / Time of Sample Collection	NA
8.	Date of Sample Registration	03.10.2025
9.	Date of Sample Testing	03.10.2025 to 10.10.2025
10.	Environmental Conditions	Room Temperature (°C): 25.1   Relative Humidity (%): 66

**RESULTS**

S. No.	Name of Test	Test Result	Units	Limits as per Schedule VI, EPA Rules 1986	Method of Test
<b>Discipline- Chemical</b>					
<b>Group- Waste Water</b>					
1	pH value at 25°C	7.28	-	5.5 to 9.0	IS:3025 (Part 11) 2022
2	Total Suspended Solids	10	mg/L	100	IS:3025 (Part 17) 2022
3	Chemical Oxygen Demand	98	mg/L	Max.250	IS:3025 (Part 58) 2023
4	Biochemical Oxygen Demand @ 27°C -3 Days	18.7	mg/L	Max.30	IS:3025 (Part 44) 2023
<b>Discipline- Biological</b>					
<b>Group- Waste Water</b>					
5	Feecal Coliform	70	MPN/100 mL	1000	APHA 23 Ed. 9221 E

  
Checked By  
Suryabhan Singh  
Quality Manager

  
Authorized Signatory  
J.P. Nautiyal  
Technical Manager

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## TEST REPORT

Test Report No.: URLS/2025/1824		Issued On: 10.10.2025
1.	Name & Address of Customer	Techno Crafts & Solutions; 2 <sup>nd</sup> Floor, Plot No. 49, Dayal Bhawan, Patel Nagar, Mint Huse Road, Cantonment, Nadeshwar, Varanasi, Uttar Pradesh- 221002.
2.	Registration Reference Details	Order Code/Job Order No.: URLS/O/25-1106/4; Dated: 03.10.2025
3.	Material Identification with Details	Waste Water; 1 Litre.
4.	Source / Location	STP Treated Water / 0.5 MLD Plant -Ramleela Maidan Wetland
5.	Sample Collected by / Condition	Customer / Sealed & Satisfactory
6.	Sample Collection Plan & Procedure	NA
7.	Date / Time of Sample Collection	NA
8.	Date of Sample Registration	03.10.2025
9.	Date of Sample Testing	03.10.2025 to 10.10.2025
10.	Environmental Conditions	Room Temperature (°C): 25.1   Relative Humidity (%): 66

## RESULTS

S. No.	Name of Test	Test Result	Units	Limits as per Schedule VI, EPA Rules 1986	Method of Test
<b>Discipline- Chemical</b>					
<b>Group- Waste Water</b>					
1	pH value at 25°C	7.22	-	5.5 to 9.0	IS:3025 (Part 11) 2022
2	Total Suspended Solids	13	mg/L	100	IS:3025 (Part 17) 2022
3	Chemical Oxygen Demand	121	mg/L	Max.250	IS:3025 (Part 58) 2023
4	Biochemical Oxygen Demand @ 27°C -3 Days	19.4	mg/L	Max.30	IS:3025 (Part 44) 2023
<b>Discipline- Biological</b>					
<b>Group- Waste Water</b>					
5	Feecal Coliform	90	MPN/100 mL	1000	APHA 23 Ed. 9221 E

  
Checked By  
Suryabhan Singh  
Quality Manager

  
Authorized Signatory  
J.P. Nautiyal  
Technical Manager

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**DESIGN CALCULATION OF 2.5 MLD SEWAGE TREATMENT PLANT BASED ON  
SUB-SURFACE VERTICAL UPFLOW CONSTRUCTED WETLAND (CW) TECHNOLOGY,  
BHOLIYAPUR, PRATAPGARH, UTTAR PRADESH**

**DESIGN CALCULATION SHEET**

The proposed STP is designed to treat the wastewater with following characteristics:

Mode of Operation	: Manual
Nature of Wastewater	: Drainage
Wastewater Daily Average Flow	: 1000 cum/day
Peak factor	: 2.5
Designed Peak flow	: $1000 * 2.5 = 2500$ cum/day

**DESIGN CONSIDERATION**

**INLET CHARACTERISTICS**

pH	7.5 to 8.5
BOD <sub>5</sub>	Up to 250 mg/l
COD	450 mg/l
Suspended solids	350 mg/l
Oil & Grease	30 mg/l

**OUTLET CHARACTERISTICS**

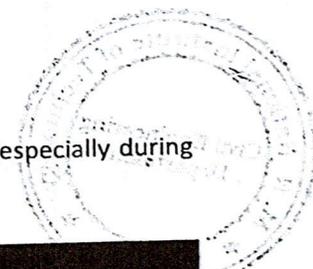
pH	6.5 to 9.0
BOD <sub>5</sub>	Not more than 30 mg/l
COD	Not more than 100 mg/l
Suspended solids	Not more than 50 mg/l
Oil & Grease	Less than 10 mg/l

**SCREEN CHAMBER & APPROACH CHANNEL**

The approach channel is the unit from where the sewage will enter screen chamber. It is the first unit in the STP, so all the incoming sewage passes through its grill. Therefore, it should be able to handle the sewage (especially the peak flows) without overflowing.

There are two major factors to be considered:

1. Adequacy of the cross-sectional area of the chamber itself
  - Obstruction posed by the bars of the screen.
  - Remove floating particle larger than 10 mm.
  - Net opening should be adequate to allow proper flow of the sewage (especially during peak inflow).



Parameter	Value/Calculation	Remarks
Designed daily flow	2.5 MLD	Quantity of sewage to be handled by the STP on daily basis.

*Design  
checked by  
Saidy  
24/04/2024*

*24.4.24*

Consultant- Emerging Enviro-Tech Solution & Services Pvt. Ltd., Lucknow

**WASEEM AHMAD**  
Environmental Consultant  
Enviro-Tech Environmental Engg

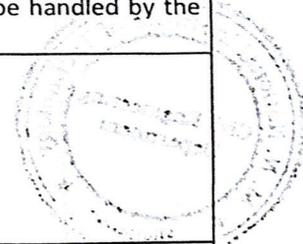
DESIGN CALCULATION OF 2.5 MLD SEWAGE TREATMENT PLANT BASED ON SUB-SURFACE VERTICAL UPFLOW CONSTRUCTED WETLAND (CW) TECHNOLOGY, BHOLIYAPUR, PRATAPGARH, UTTAR PRADESH

<b>Designed hourly flow</b>	$= 2500 / 24$ $= 104.17 \text{ m}^3/\text{hr.}$ $= 104.17 / 3600 \text{ m}^3/\text{sec}$ $= 0.0289 \text{ m}^3/\text{sec}$	Average flow in respect with hour and second.
<b>Approach Channel Length</b>	3 m	<i>Reference: Technical Instructions on Sewage Management in MES, Page 35 of 64.</i>
<b>Design flow velocity</b>	0.6 m/ sec	This is the optimal velocity: <ul style="list-style-type: none"> <li>• Sewage flowing at a higher velocity will forcibly push the debris through the screen.</li> <li>• Sewage flowing at a lower velocity will leave an excessive amount of sedimentation on the floor of the screen chamber.</li> </ul>
<b>Cross-sectional area of screen channel</b>	$= 0.0289 / 0.6$ $= 0.04816 \text{ m}^2$	
<b>Adjust for the flow-area blocked by the bars</b>	$= 0.04816 \text{ m}^2 \times 1.8$ $= 0.0867 \text{ m}^2$	Cross-sectional area is increased by 80% to compensate for the obstruction posed by the bars of the grill.  In general, the multiplication factor is $(1 + W/ G)$ Where: G = Gap between two bars of the screen (here, 10 mm) W = Width of a bar (here, 5 mm).

**GRIT SETTLING CUM OIL AND GREASE CHAMBER**

Grit chambers are long narrow tanks that are designed to slow down the flow so that solids such as sand, coffee grounds and eggshells will settle out of the water. Grit causes excessive wear and tear on pumps and other plant equipment.

Parameter	Value/Calculation	Remarks
<b>Designed daily flow</b>	2.5 MLD	Quantity of sewage to be handled by the STP on daily basis.
<b>Designed hourly flow</b>	$= 2500 / 24$ $= 104.17 \text{ m}^3/\text{hr.}$ $= 104.17 / 3600 \text{ m}^3/\text{sec}$ $= 0.0289 \text{ m}^3/\text{sec}$	
<b>Retention time</b>	1.5 min or 90 sec	Retention time to maintain optimal velocity for removal of oil and grease:



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CHNOLOG)  
TAR PRADESH  
with hour and

		<ul style="list-style-type: none"> <li>• Minimum 0.5 min.</li> <li>• Maximum 1.5 min.</li> </ul> <p>And using this tank also as an oil and grease tank for removing most of the skimming particles.</p>
<b>Volume of Receiving Chamber</b>	$= 0.0289 \text{ m}^3/\text{sec} \times 90 \text{ sec}$ $= 2.601 \text{ m}^3$	Volume = retention time x Volume/sec.

Reference: Wastewater Engineering by Metcalf Eddy. Chapter 5, page no. 387.  
 Reference: Technical Instructions on Sewage Management in MES, Page 37 of 64.

**OIL AND GREASE CHAMBER**

The fats that are separated in this unit are disposed of along with other biodegradable waste, and can be used as feed for piggeries. The grease is placed at the discharge point of the canteen/ kitchen area itself to arrest solid and fatty matter at source. The wastewater output from this unit is taken to the collection / Anaerobic Baffle Reactor.

Parameter	Value/Calculation	Remarks
<b>Designed daily flow</b>	2.5 MLD	Quantity of sewage to be handled by the STP on daily basis.
<b>Designed hourly flow</b>	$= 2500/ 24$ $= 104.17 \text{ m}^3/\text{hr.}$ $= 104.17/ 3600 \text{ m}^3/\text{sec}$ $= 0.0289 \text{ m}^3/\text{sec}$	
<b>Retention time</b>	15 min or 900 sec	Retention time to maintain optimal velocity for removal of oil and grease: <ul style="list-style-type: none"> <li>• Minimum 3 min.</li> <li>• Maximum 20 min.</li> </ul>
<b>Volume of Receiving Chamber</b>	$= 0.0289 \times 900 \text{ sec}$ $= 26.01 \text{ m}^3$	Volume = retention time x volume/sec.

Reference: Technical Instructions on Sewage Management in MES, Page 37 of 64.



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**COLLECTION CUM ANAEROBIC BAFFLE REACTOR**

Anaerobic Baffle reactors are simply a tank in which nitrified wastewater is mixed with a carbon source, typically septic tank effluent. In some cases, nitrified wastewater is discharged back to the primary treatment stage, such as a septic tank, for denitrification.

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Parameter	Value/Calculation	Remarks
STP Capacity	2.5 MLD = 2500 m <sup>3</sup> /day	Quantity of sewage to be handled by the STP on daily basis.
Hourly inflow	= 2500/ 24 m <sup>3</sup> /hr. = 104.17 m <sup>3</sup> /hr.	
Anoxic tank volume	= 104.17 m <sup>3</sup> /hr. x 8 hr. = 833.33 m <sup>3</sup>	Tank is designed to hold 6 to 24 hours of average flow. <i>Minimum Retention time is taken due to the variability of influent BOD that may vary from 60 to 250 mg/l in the Drainage System.</i>
No. of Tanks	= 16 No.	

Reference: Wastewater Engineering : Metcalf & Eddy , page no. 1017

DISTRIBUTION TANK

For equal distribution of the outlet of anaerobic tank before entering it into plant bed.

Parameter	Value/Calculation	Remarks
Designed daily flow	2.5 MLD	Quantity of sewage to be handled by the STP on daily basis.
Designed hourly flow	= 2500/ 24 = 104.17 m <sup>3</sup> /hr. = 104.17/ 60 m <sup>3</sup> /sec = 1.74 m <sup>3</sup> /min	
Retention time	45 min	This tank is designed to break the flow of waste water before equally distributing it to the plant Bed.
Volume of Receiving Chamber	= 1.74 x 45 = 78.3 m <sup>3</sup>	Volume = retention time x volume/sec.

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ANAEROBIC CUM UP FLOW VERTICAL PLANT BED SYSTEM

Area of the tank,  $A = \frac{Q (\ln (BOD_{in}) - \ln (BOD_{out}))}{K_{BOD}}$

(Reference: Manual on Constructed Wetland as an alternative Technology, CPCB 2019, Page 83)

Where,

A = Area of Constructed Wetland (m<sup>2</sup>)

Q = Volume of Wastewater

BOD<sub>in</sub> = Influent concentration of BOD (mg/l)

BOD<sub>out</sub> = Effluent concentration of BOD (mg/l)

K<sub>BOD</sub> = Removal Rate Constant (d<sup>-1</sup>)

$$k_{BOD} = KTdn$$

$$K_T = K_{20} (1.06)^{(T-20)}$$

K<sub>20</sub> = rate constant @ 20°C (d<sup>-1</sup>) = 0.12 to 0.46 d<sup>-1</sup>

(Reference: Wastewater Engineering, Metcalf & Eddy, page no. 85)

d = Depth (m)

n = Porosity of CW (percentage expressed as fraction)

So,

Taking BOD<sub>in</sub> = 250 mg/l, BOD<sub>out</sub> = 30mg/l, Q = 2500 m<sup>3</sup>/d, d = 3.0 m, n = 0.75

$$K_{BOD} = K_T \times 25^\circ C \times 3.0 \text{ m} \times 0.75$$

$$K_T = K_{20} (1.06)^{(T-20)}$$

$$K_T = 0.363 \times (1.06)^{(25-20)} = 0.4857 \text{ d}^{-1}$$

(Reference: Guideline for Constructed wetland systems, Namami Gange, National Mission for Clean Ganga, GOI, page no. 26)

$$K_{BOD} = 27.32 \text{ d}^{-1}$$

$$\text{Area of CW} = A = \frac{2500 \times (\ln(250) - \ln(30))}{27.32}$$

$$A = 194.02 \text{ m}^2.$$

Provided Area = 230 m<sup>2</sup>

, Providing total 24 no. of tanks in 4 phases of 6 tanks each.



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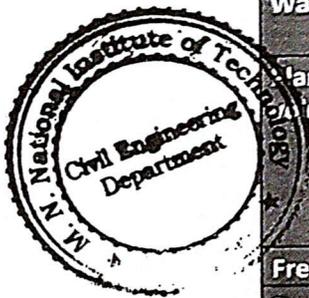
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PLANT BED – Phase I

Parameter	Value/Calculation	Remarks
STP Capacity	2.5 MLD = 2500 m <sup>3</sup> /day	Quantity of sewage to be handled by the STP on daily basis.
Hourly sewage inflow	= 2500/ 24 m <sup>3</sup> /hr. = 104.17 m <sup>3</sup> /hr.	
Water Depth	= 3 m	
Plant Bed volume	= 63 m <sup>2</sup> x 3 m = 189 m <sup>3</sup>	Providing 10.5 m <sup>2</sup> area for each plant bed and each phase has 6 PB. Therefore, Total Area = 10.5 x 6 = 63 m <sup>2</sup> . <i>Note: Select length and width to suit the site conditions.</i>
Freeboard	0.3 to 0.5 m	Selected by convention.
Depth of tank (including freeboard)	= 3.5 m	

PLANT BED – Phase II

Parameter	Value/Calculation	Remarks
STP Capacity	2.5 MLD = 2500 m <sup>3</sup> /day	Quantity of sewage to be handled by the STP on daily basis.
Hourly sewage inflow	= 2500/ 24 m <sup>3</sup> /hr. = 104.17 m <sup>3</sup> /hr.	
Water Depth	= 3 m	
Plant Bed volume	= 63 m <sup>2</sup> x 3 m = 189 m <sup>3</sup>	Providing 10.5 m <sup>2</sup> area for each plant bed and each phase has 6 PB. Therefore, Total Area = 10.5 x 6 = 63 m <sup>2</sup> . <i>Note: Select length and width to suit the site conditions.</i>
Freeboard	0.3 to 0.5 m	Selected by convention.
Depth of tank (including freeboard)	= 3.5 m	



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PLANT BED – Phase III

Parameter	Value/Calculation	Remarks
STP Capacity	2.5 MLD = 2500 m <sup>3</sup> /day	Quantity of sewage to be handled by the STP on daily basis.
Hourly sewage inflow	= 2500/ 24 m <sup>3</sup> /hr. = 104.17 m <sup>3</sup> /hr.	
Water Depth	= 3 m	
Plant Bed volume	= 52.2 m <sup>2</sup> x 3 m = 156.6 m <sup>3</sup>	Providing 8.7 m <sup>2</sup> area for each plant bed and each phase has 6 PB. Therefore, Total Area = 8.7 x 6 = 52.2 m <sup>2</sup> .  Note: Select length and width to suit the site conditions.
Freeboard	0.3 to 0.5 m	Selected by convention.
Depth of tank (including freeboard)	= 3.5 m	

PLANT BED – Phase IV

Parameter	Value/Calculation	Remarks
STP Capacity	2.5 MLD = 2500 m <sup>3</sup> /day	Quantity of sewage to be handled by the STP on daily basis.
Hourly sewage inflow	= 2500/ 24 m <sup>3</sup> /hr. = 104.17 m <sup>3</sup> /hr.	
Water Depth	= 3 m	
Plant Bed volume	= 52.2 m <sup>2</sup> x 3 m = 156.6 m <sup>3</sup>	Providing 8.7 m <sup>2</sup> area for each plant bed and each phase has 6 PB. Therefore, Total Area = 8.7 x 6 = 52.2 m <sup>2</sup> .  Note: Select length and width to suit the site conditions.
Freeboard	0.3 to 0.5 m	Selected by convention.
Depth of tank (including freeboard)	= 3.5 m	



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**CLEAR WATER TANK**

Clear Water tanks are commonly used to hold treated water prior to distribution or for disinfection purposes before releasing the treated water.

Parameter	Value/Calculation	Remarks
STP Capacity	2.5 MLD = 2500 m <sup>3</sup> /day	Quantity of sewage to be handled by the STP on daily basis
Hourly inflow	= 2500/ 24 m <sup>3</sup> /hr. = 104.17 m <sup>3</sup> /hr.	
Tank volume	= 104.17 m <sup>3</sup> /hr. x 1 hr. = 104.17 m <sup>3</sup>	Tank is designed to hold: - • Minimum 20 minutes. • Maximum 60 minutes. <i>Note: This is the usable volume, and does not include the freeboard.</i>
Freeboard	= 0.5 m	Selected by convention.
Water depth in tank	= 3.0m	
Tank area	= 104.17/ 3 = 34.72 m <sup>2</sup>	Area = Volume/ Depth <i>Note: Select length and width to suit the site conditions.</i>



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