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363, Arcot Road, Kodambakkam, Chennai – 600 024, Tamil Nadu, India
Ph No: 044 – 24801636 Fax: 044 - 24811103



Criterion VII - Institutional Values and Best Practices

7.1 Institutional Values and Social Responsibilities

7.1.4 Water conservation facilities available in the Institution





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MEENAKSHI SUNDARARAWN ENGINEERING COLLEGE
363, ARCOT ROAD, KODAMBAKKAM
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7.1.4 Water conservation facilities available in the Institution

Rainwater harvesting & Bore well /Open well recharge:

Rain water harvesting system involves gathering of rainwater that runs from roof top, garden, road and playground. This is done to preserve the runoff water. This is one of the best solutions to tackle the present water crisis.

Objectives of rainwater harvesting:

- Recharge the groundwater sources.
- Reduce the loss of water by runoff.

Water is the most natural resource that is essential in life, always in high demand. Hence, keeping in view, rain water harvesting system can be considered as the best solution for fighting against water scarcity in campus. The rain water runoff harvested from roof top, garden, playground and other open lands is used to recharge the underground water potential and also reduce flood risk and improve living condition.

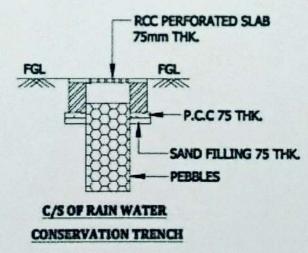


Fig. 1: Rain water Conservation Trench

The rain water conservation trenches as shown in the above figure are provided around the campus. This is one of the easiest and most effective means of harvesting rainwater. This conservation trench is about 10 feet height and also 5 feet width and 5 feet breadth in size, is filled with pebbles about a height of 7 feet. The trench is covered with perforated slabs wherever necessary. The rain water runoff collected in the trench is treated by the pebbles and the water enters into the ground in such a way that the groundwater potential is recharged. Closed canals are provided continuously around the campus to collect the rainwater runoff and discharged into the conservation trenches. These canals are provided continuously, i.e. excavated in the ground and then closed by perforated concrete slabs. During heavy rainfall, (more than the average rainfall) the excess rain water flows through the canal and enters into the conservation trench, the excess water that gets overflowed will be collected in a sump that is constructed in the nearby trench. The water collected in the sump could be lifted to an overhead tank.

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The average rainfall of Chennai city is 120 cm (Regional Meteorological Centre, Chennai). With this rainfall, our land comprising of 5 acres, harvests nearly 20 million litres of water per year. (against the total requirement of 160 million litres per year, nearly 12.5% requirement achieved by rain water harvesting system) This water directly enters in to the ground and enhances the quality and quantity of the existing ground water potential.

This type of ground water recharge improves our ground water potential, makes our garden green and provides a good environment to our students and staff. So our campus has well established system to make a sustainable environment.

Through Rain water harvesting

100 cm rain fall

Height of rain fall: 100 cm= 1m

Area: 5 acres = 20234.28 metre square

Volume = area * height

- = 1 m * 20234.28 metre square
- = 20234.28 meter cube
- = 20234.28 * 1000 (convert meter cube to litres)
- = 20234280 litres
- = 20 Million litres



Fig. 2: RAIN WATER HARVESTING

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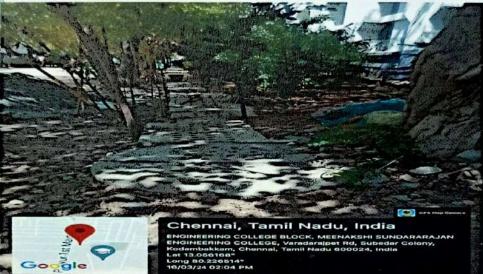


Fig. 3: RAIN WATER HARVESTING

Maintenance of water bodies and distribution system in the campus

Collected water Samples from the bore wells located in the college premises, and the water quality is tested once in six months. Manual sampling with a plastic container in compliance with established standard norms was adopted. The samples are labeled for identification. Ground Water Board guidelines are observed in sample preservation with minimum possible time lapse between collection and analysis.

Details of Sampling Locations

Bore well: Main block and Near the ground

Analysis of Samples

Analysis of the collected water samples are done in accordance with the procedures suggested in the Standard Analytical Procedure Manual for water samples which is based on 'Standard Methods for the Examination of Water and Wastewater' 19th edition, APHA, AWWA, wef 1995 (alkalinity-titrimetrically, pH-potentiometrically, HCO3 — + CO3 2- - calculation from pH and alkalinity, DOIodometrically, BOD- bottle incubation for 5days at 20°C, COD-open reflux, Ca and total hardness-EDTA titrimetric, Mg- calculation from total hardness and Ca, NO3 -&PO4 3—spectrophotometric, CI—argentometric titrimetric, total dissolved solids- calculation from conductivity).

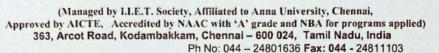
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S.NO.	Parameter	Method	Instrument/Equipment
1	Temperature	Laboratory method	0.1 0 scale thermometer
2	рН	Electrometric	pH meter
3	Turbidity	Electrometric	Turbidity Meter
4	Total solids	Evaporation	
5	Hardness, Ca	Titration with EDTA	
6	Alkalinity	Titration with Sulphuric acid	
7	Chloride	Titration with Silver nitrate	
3	Na, K	Flame Photometric	Flame photometer
9	Nitrate, Phosphate	Spectrophotometric abs. UV, Vis.	UV-Vis. Spectrophotometr

Analysis Outcome:

The collected water sample is analysed in accordance with standard procedures and assessed for its drinking requirements

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Analysis Report of Water Sample 2023

Date: 21/6/2023

Chennai-24

Sample collection was done from the bore wells located in our college premises and the water quality is tested once in six months. Manual sampling with a plastic container in compliance with established standard norms was adopted. Labels were used to prevent sample misidentification. Sample preservation was done with Ground water Board Guidelines with minimum possible time lapse between collection and analysis.

S.NO	Parameter	Standard Limit	Tested Value (Bore Well)
1	Temperature	ASS IN THE RESERVE AND INC.	35 degree c
2	pH	6.5-8.5	7.1
3	Turbidity	5-10 NTU	5 NTU
4	Total solids	500-2000mg/l	210
5	Hardness, Ca	300(mg CaCo3/I)	226
6	Alkalinity	200-600(mg CaCo3/l)	89
7	Chloride	250mg/l	87 mg/l
8	NA,K	100mg/l, 10mg/l	38, 8 (mg/l)
9	Nitrate	45 mg/l	29 mg/l

Inference: The water is tested for all the basic parameters and it is found to be within the standard desirable limit of drinking water (BIS IS: 10500:1991)

Lab In—Charge

M.Malini Gayathri

Assistant Professor

Department Of Civil Engineering

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Ph No: 044 – 24801636 Fax: 044 - 24811103



Telephone: 044-2999 7572.



To Stranger

DEPARTMENT OF PUBLIC HEALTH AND PREVENTIVE MEDICINE

From

Tmt.L.Sujatha, M.Sc., M.A., B.Ed., CHIEF WATER ANALYST, Chief Water Analysis Laboratory, King Institute Campus, Guindy, Chennai-600 032. To

The Secretary,
Meenakshi Sundararajan Engg. College,
No.363, Arcot Road,
Kodambakkam,
Chennai- 24.

R.No. 2631/C/2023 Misc - 361 & 362 Dated: 06.10.2023

Sir,

Sub: Report on examination of water samples - Regarding.

Ref: Your letter Dated: 07.09.2023.

Two samples of water stated to have been collected on 20.09.2023 from the following points by Thiru.S.B.Sivasubramaniyan at the premises of Meenakshi Sundararajan Engineering College, No.363, Arcot Road, Kodambakkam, Chennai-24 were received at this laboratory on the same day from the addressee to assess their suitability for drinking purposes.

- 1. Water collected from Bore well Source (Misc.361)
- 2. RO water collected from RO outlet tap near Hostel (Misc.362)

The results of analysis are furnished overleaf.

1. Water collected from Bore well Source (Misc.361)

The sample of Bore well water is colourless and clear in physical appearance.

Chemical analysis reveals that it is highly mineralized and hard in nature. However it is considered as acceptable chemical quality for drinking.

But, it is of poor bacteriological quality as evidenced by the presence of coliform group of organisms on this occasion.

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	The Secretary, Meenaksl Kodambakkam, Chenna ed by: Thiru, S.B. Sivasu	ni - 24.	M- 362		en Road,
Dute of Rec	elept : 20.09.2023	Water collected from Bore well Source	RO water collected from RO outlet tap near Hostel		Maximum permissible lim for drinking water as per Bl: 10500/2012
	Total colonies per mi on agar at 37°C	70	5		20
E SE	NIPH of Coliform bacteria per 100 ml.	210	0		0
Bectarlo Ecombi	Nature of coliform bacteria isolated. Results of vibrio test	K. Aerogens - II			absent
5	Colour	Colourless	Colourless		Colourless
Physical	Turbidity (Units)	5	2		5
- 3	Smell	None	None		None
	Total dissolved Solids	1140	50		2000
	Carbonate hardness as CaCos	352	10		
	Non- Carbonate hardness as CaCo	0	0		
	Total hardness as CaCo,	352	10		600
	Chloride as Chlorine	128	8	FIRM	1000
	Azomoniacal nitrogen	1000年7月100			Nil
	Albuminoid nitrogen	Carl Section			Nil
	Oxygen absorbed (Tidy's test)	0.48	0.08		
\$	Marate-narogen	2.0	Nil	14-30 AL 200	10.2
1	Attalogy 7 Phenolphthalein	0	0		
afton	as CaCOs Methyl Orange	432	16		600
1	Ruoride as Ruoride	0.1	Nil	and the same of	1.5
okal Examination (in mg/3)	PH	6.9	6.5		6.5-8.5
. 8	Paras fe Youl	0.05	Nil -	A Relative to	1.0
	Ferrous	Nil	Nil		
	Manganese es Mr. Queltocire	Nil	Nii		0.3
	Nitria nitrogen	Trace	Trace		
	Suprate Prospecty	Present	Trace		Trace 400
	Toes MANAGES	Trace	Trace		
	- Exercised conductives (Barriers)		4 4 4 4 5		Trace
AND THE SAME	gestayes bet Ces, at \$24Cl	1630	70		
	Microscopical Examination		ous matter		

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2. RO water collected from RO outlet tap near Hostel (Misc.362)

The sample of water is colourless and clear in physical appearance.

Chemical analysis reveals that it is very soft and less mineralized. Eventhough it is of usable chemical quality for drinking, the total hardness is only 10mg/l. The calcium and magnesium elements are almost removed from this water, which are very essential for healthy living of human beings. Consumption of this type of low content Calcium and Magnesium for a prolonged time would be deleterious to the health of the consumer.

It is of satisfactory biological and bacteriological quality for drinking purposes on this occasion.

It is advised that the firm that installed the R.O. unit should be contacted along with a copy of the analysis report and arrangements may be made to set right the R.O. units in such a way that the outlet water should contain atleast a minimum content of total hardness of 30 mg/l so as to have some amount of calcium and magnesium that are very essential for healthy life.

Copy to: Lab & File

CHIEF WATER ANALYST, Chief Water Analysis Laboratory, Guindy, Chennai – 32.

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Analysis Report of Water Sample 2024



CHENNAI METTEX LAB PRIVATE LIMITED

Jothi Complex, 83, M.K.N. Road, Guindy, Chennai - 600 032, Tamil Nadu, INDIA Phone : +91 44 22323163, 22311034, 42179490, 42179491 | CIN : U74999TN2008PTC069459 Email : test@mettexlab.com | | Web : www.mettexlab.com





TEST REPORT

ISSUED TO : M/s. Meenakshi Sundararajan Engg.College, 363, Arcot Road, Kodambakkam, TAMIL NADU, INDIA.

Customer

Laboratory No

: SRF Dated : 04.06.2024 : 2501054/001

Test Certificate No Test Certificate Date

: CML/24-25/T002271 : 11/06/2024

Date of Receipt : 04/06/2024 Analysis Commenced On 1 04/06/2024 Analysis Completed On : 07/06/2024

Sample Description: Borewell Water - Hostel Inside Room, Date of Sampling: 04.06.2024, Time: 01.55 pm.

	Test Parameters	Test Method	Units	Results	Limit as per IS: 10500:2012 (Realf 2018) With Amendment No: 4 November 2021		
S.No.					Acceptable Limit (Max)	Permissible Limit in the absence of alternate source (Max)	
Disci	pline :Chemical					Group Water	
1	Calcium as Ca	IS: 3025 Part 40:1991 (Reaff: 2019)	mg/1	345	75	200	
2	Chloride as Cl	IS: 3025 Part 32-1988 (Reaff. 2019)	mg/l	1065.5	250	1000	
3	Colour	IS: 3025 Part: 4 -2021	Hazen	5	5.0	15	
4	Odour	IS: 3025 Part: 5-2018		Agreeable	Agreeable	Agreeable	
5	Conductivity @ 25°C	IS:3025 Part 14:2013 (Reaff:2019)	µS/cm	4360			
6	Fluoride as F	APHA-23rd Edn. 2017:4500 F.D	mg/l	1.2	1.0	1.5	
7	Iron as Fe	IS: 3025 Part 53:2003 (Reaff: 2019)	mg/l	0.35	1.0	No Relaxation	
8	Magneslum as Mg	IS: 3025 Part 46:1994 (Reaff 2019)	mg/1	94.8	30	100	
9	Nitrate as NO,	IS: 3025 Part:34-1988(Reaff: 2019)	mg/l	22	45	No Relaxation	
10	pH at 25°C	IS: 3025 Part: 11-1983 (Reaff:		6.73	6.5 - 8.5	No Relaxation	
11	Sulphate as SO ₄	IS: 3025 Part 24-1986 (Reaff: 2019)	mg/l	257.1	200	400	
12	Total Alkalinity as	IS: 3025 Part 23-1986 (Reaff. 2019)	mg/l	597.8	200	600	
13	Total Dissolved Solids	IS: 3025 Part 16-1984 (Reaff. 2017)	mg/l	2616	500	2000	
14	Total Hardness as CoCO	IS: 3025 Part: 21-2009 (Reaff. 2019)	mg/l	1250.0	200	600	
15	Turbidity	IS: 3025 Part: 10-1984 (Reaff: 2017)	NTU	Lessthan 0.5	1.0	5.0	
Disci	pline :Biological					Group :Water	
16	Escherichia coli	IS 15185:2016 Reaff.2021		Absent/100 ml	Shall not be detectable in any 100ml sample	Shall not be detectable in any 100ml sample	

Present/100 ml ition as per IS: 10500:2012(Reaff.2018)



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Jothi Complex, 83, M.K.N. Road, Guindy, Chennai · 600 032, Tamil Nadu, INDIA Phone : +91 44 22323163, 22311034, 42179490, 42179491 I CIN : U74999TN200BPTC069459 Email : test@mettexlab.com I Web : www.mettexlab.com

TEST REPORT

Page:1 of 1

: CML/24-25/T002272

ISSUED TO : M/s. Meenakshi Sundararajan Engg.College, 363, Arcot Road,

Kodambakkam TAMIL NADU, INDIA.

: SRF Dated : 04.06.2024

: 2501054/002

Test Certificate No.

Test Certificate Date

Date of Receipt

: 04/06/2024

Analysis Commenced On Analysis Completed On

: 04/06/2024 : 07/06/2024

: 11/06/2024

Sample Description: RO Water - College, Date of Sampling: 04.06.2024, Time: 01.45 pm

Customer

S.No.	Test Parameters	Test Method	Units	Results	Limit as per IS: 10500:2012 (Reaff.2018) With Amendment No : 4 November 2021	
					Acceptable Limit (Max)	Permissible Limit in the absence of alternate source (Max)
Discip	pline :Chemical					Group : Water
1	Calcium as Ca	IS: 3025 Part 40:1991 (Reaff: 2019)	mg/l	9	75	200
2	Chloride as Cl	IS: 3025 Part 32-1988 (Reaff. 2019)	mg/l	31.3	250	1000
3	Colour	IS: 3025 Part: 4 -2021	Hazen	Lessthan 1	5.0	15
4	Conductivity @ 25°C	IS:3025 Part 14:2013 (Reaff:2019)	μS/cm	240		
5	Fluoride as F	APHA-23rd Edn. 2017:4500 F,D	mg/l	BDL(DL:0.1)	1.0	1.5
6	Iron as Fe	IS: 3025 Part 53:2003 (Reaff: 2019)	mg/l	BDL(DL:0.01)	1.0	No Relaxation
7	Magnesium as Mg	IS: 3025 Part 46:1994 (Reaff: 2019)	mg/l	4.1	30	100
8	Nitrate as NO ₃	IS: 3025 Part:34-1988(Reaff: 2019)	mg/l	4	45	No Relaxation
9	Odour	IS: 3025 Part: 5-2018		Agreeable	Agreeable	Agreeable
10	pH at 25°C	IS: 3025 Part: 11-1983 (Reaff:		6.92	6.5 - 8.5	No Relaxation
11	Sulphate as SO.	IS: 3025 Part 24-1986 (Reaff: 2019)	mg/l	11.1	200	400
12	Total Alkalinity as	IS: 3025 Part 23-1986 (Reaff. 2019)	mg/l	31.4	200	600
13	Total Dissolved Solids	IS: 3025 Part 16-1984 (Reaff. 2017)	mg/l	132	500	2000
14	Total Hardness as CaCO	IS: 3025 Part: 21-2009 (Reaff. 2019)	mg/l	40.0	200	600
15	Turbidity	IS: 3025 Part: 10-1984 (Reaff: 2017)	NTU	Lessthan 0.5	1.0	5.0
Discip	pline :Biological					Group :Water
16	Escherichia coli	IS 15185:2016 Reaff.2021		Absent/100 ml	Shall not be detectable in any 100ml sample	Shall not be detectable in any 100ml sample
17	Total Coliform	15 15185:2016 Ream.2021		Absent/100 ml	Shall not be detectable in any	Shall not be detectable in any

te: The above water sample compiles with Acceptable limits of drinking water specification as per IS: 10500:2012(Reaff.2018) With tenderent No: 4 November 2021 with respect to above parameters tested.

breviation: BDL: Below Detection Limit; DL: Detection Limit, APHA: American Public Health Association.

For Chennal Mettex Lab Private Limited

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TEST REPORT

ISSUED TO : M/s. Meenakshi Sundararajan Engg.College.

363, Arcot Road, Kodambakkam,

TAMIL NADU, INDIA Customer : SRF Dated : 04.06.2024 Laboratory No : 2501054/003

Page: 1 of 1 : CML/24-25/T002273 Test Certificate No

Test Certificate Date : 11/06/2024 : 04/06/2024 Date of Receipt

Analysis Commenced On : 04/06/2024 Analysis Completed On : 07/06/2024

Sample Description: RO Water - Hostel, Date of Sampling: 04.06.2024, Time: 01.50 pm.

Limit as per IS: 10500:2012 (Reaff.2018) With Amendment No: 4 November 2021 S.No. **Test Parameters** Test Method Units Results Permissible Limit Acceptable in the absence of Limit (Max) alternate source (Max) Discipline :Chemical Group : Water Calcium as Ca IS: 3025 Part 40:1991 (Reaff: 2019) mg/l 200 Chloride as Cl IS: 3025 Part 32-1988 (Reaff. 2019) mg/l 34.2 250 1000 Colour IS: 3025 Part: 4 -2021 Hazer Lessthan 1 5.0 15 Conductivity @ 25℃ IS:3025 Part 14:2013 (Reaff:2019) µS/cm 203 Fluoride as F 5 APHA-23rd Edn. 2017:4500 F.D BDL(DL:0.1) mg/l 1.5 Iron as Fe IS: 3025 Part 53:2003 (Reaff: 2019) mg/l BDL(DL:0.01) 1.0 No Relaxation IS: 3025 Part 46:1994 (Reaff: 2019) Magnesium as Mg mg/l 74 30 100 Nitrate as NO₃ IS: 3025 Part:34-1988(Reaff: 2019) mg/l 3 45 No Relaxation IS: 3025 Part: 5-2018 Odour Agreeable Agreeable Agreeable IS: 3025 Part: 11-1983 (Reaff: pH at 25°C 6.98 6.5 - 8.5 No Relaxation Sulphate as SO₄
Total Alkalinity as IS: 3025 Part 24-1986 (Reaff: 2019) mg/l 13.2 200 400 IS: 3025 Part 23-1986 (Reaff. 2019) mg/l 20.6 200 600 Total Dissolved Solids IS: 3025 Part 16-1984 (Reaff. 2017) 13 mg/l 111 500 2000 Total Hardness as CaCO s IS: 3025 Part: 21-2009 (Reaff. 2019) mg/l 25.0 200 600 IS: 3025 Part: 10-1984 (Reaff: 2017) NTU Lessthan 0.5 1.0 5.0 Discipline :Biological Group : Water Shall not be Shall not be detectable in any 16 Escherichia coli above water sample complies with Acceptable limits of drinking water specification as per IS: 10500:2012(Reaff.2018) With 100m: BDL: Below Detection Limit; DL: Detection Limit. APHA: American Public Health Association. Absent/100 ml detectable in any 100ml sample 17 Total Coliform



For Chennal Mettex Lab Private Limited

P. KAVITHA

PRINCIPAL MEENAKSHI SUNDAPADASA SUSINEERING COLLEGE HAKKAM 412011400 024





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Kodambakkam TAMIL NADU, INDIA.

Customer

Reference

Laboratory No.

: Borewell Water - IIET Block Inside, Date of Sampling : 04.06.2024, Time : 02.00 pm.

: 2501054/004

Test Certificate No : CML/24-25/T002274

Test Certificate Date : 11/06/2024 : 04/06/2024 Date of Receipt

Analysis Commenced On : 04/06/2024

Analysis Completed On : 07/06/2024

Sample Description: Borewell Water - HET Block Inside, Date of Sampling: 04.06.2024, Time: 02.00 pm.

S.No.	Test Parameters	Test Method	Units	Results	Limit as per IS: 10500:2012 (Reaff.2018) With Amendment No : 4 November 2021	
					Acceptable Limit (Max)	Permissible Limit in the absence of alternate source (Max)
Discip	pline :Chemical					Group : Water
1	Calcium as Ca	IS: 3025 Part 40:1991 (Reaff: 2019)	mg/l	421	75	200
2	Chloride as Cl	IS: 3025 Part 32-1988 (Reaff. 2019)	mg/l	1224.6	250	1000
3	Colour	IS: 3025 Part: 4 -2021	Hazen	5	5.0	15
4	Conductivity @ 25°C	IS:3025 Part 14:2013 (Reaff:2019)	µS/cm	4660		
5	Fluoride as F	APHA-23rd Edn. 2017:4500 F,D	mg/l	1.19	1.0	1.5
6	Iron as Fe	IS: 3025 Part 53:2003 (Reaff: 2019)	mg/l	0.40	1.0	No Relaxation
7	Magnesium as Mg	IS: 3025 Part 46:1994 (Reaff: 2019)	mg/l	194.4	30	100
8	Nitrate as NO,	IS: 3025 Part:34-1988(Reaff: 2019)	mg/l	25	45	No Relaxation
9	Odour	IS: 3025 Part: 5-2018		Agreeable	Agreeable	Agreeable
10	pH at 25°C	IS: 3025 Part: 11-1983 (Reaff:		6.52	6.5 - 8.5	No Relaxation
11	Sulphate as SO ₄	IS: 3025 Part 24-1986 (Reaff: 2019)	mg/l	287.6	200	400
12	Total Alkalinity as	IS: 3025 Part 23-1986 (Reaff. 2019)	mg/l	597.8	200	600
13	Total Dissolved Solids	IS: 3025 Part 16-1984 (Reaff. 2017)	mg/l	2796	500	2000
14	Total Hardness as CaCO	IS: 3025 Part: 21-2009 (Reaff. 2019)	mg/l	1850.0	200	600
15	Turbidity	IS: 3025 Part: 10-1984 (Reaff: 2017)	NTU	Lessthan 0.5	1.0	5.0
Disci	pline :Biological					Group : Water
16	Escherichia coli	IS 15185:2016 Reaff.2021		Absent/100 ml	Shall not be detectable in any 100ml sample	Shall not be detectable in any 100ml sample
17	Total Coliform			Present/100 ml		
BOST TOWN	And the same of th	the same of the sa	-			1012(P# 2019)

Note: The above water sample does not comply with Acceptable limits of drinking water specification as per IS: 10500:2012(Reaff.2018) With Amendment No: 4 November 2021 with respect to above parameters tested.

Abbreviation: APHA: American Public Health Association. .End of Report.....



For Chennal Mettex Lab Private Limited

P. KAVITHA

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7.1.4(5) DISTRIBUTION SYSTEM:



Fig. 5: LOCATION: CIVIL BLOCK



Fig. 6 :LOCATION: HOSTEL BLOCK

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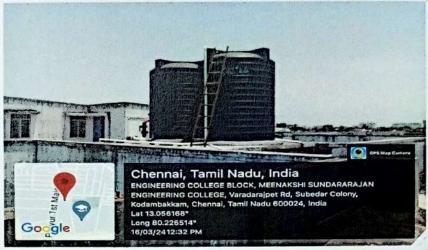


Fig. 7: LOCATION: MECHANICAL BLOCK



Fig. 8: LOCATION: MAIN BLOCK

Prepared by

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