WATER QUALITY ANALYSIS OF AIR CONDITIONED WATER

Faizuneesa.A[1], Aadithyan.R[2], Jaikumar.V[3], Madhankumar.S[4], Alexpandiyan. V[5]

[1]Asst professor, Civil Engineering, Prathyusha Engineering College, India
[2]Student, Civil Engineering, Prathyusha Engineering College, India
[3]Student, Civil EngineeringPrathyusha Engineering College, India
[4]Student, Civil Engineering Prathyusha Engineering College, India
[5]Student, Civil Engineering Prathyusha Engineering College, India

Abstract: Human life, as with all animal and plant life on the planet, is dependent upon water. Not only do we need water to grow our food, generate our power and run our industries, but we need it as a basic part of our daily lives - our bodies need to ingest water every day to continue functioning .so water is making the important role in human life. By this project we want to convey that extracted water from air conditioner is not waste water, we can use that also for the other domestic purposes. In this project we are extracted air conditioner water and tested the sample. The following water qualities parameters like pH, dissolved oxygen, total dissolved solids, hardness, acidity, alkalinity, chloride, colour, odour, Electrical conductivity, sodium, sulphate, copper, zinc, phosphate, magnesium, detergent, Aluminium, Escherichia coli, total coliform, fluoride, Iron, carbonate Hardness, Non-carbonate Hardness, ammonium nitrogen, calcium Hardness, magnesium Hardness are compared and represented. Through which we should beware of such activities i. e, air conditioner water can be used for domestic purpose also

Index Terms –Important of water, Extraction of AC water, AC water as a drinking water

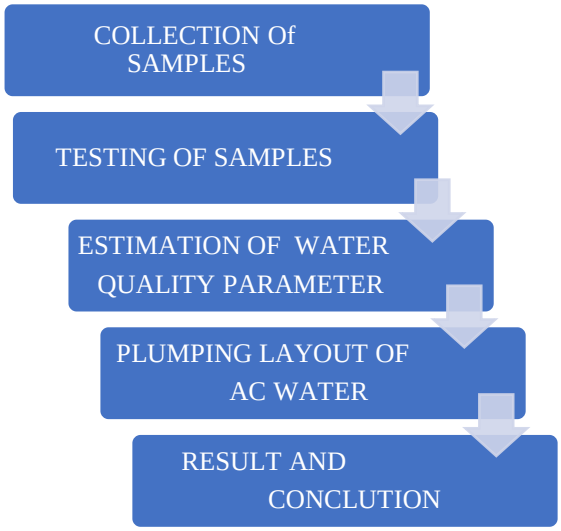
I. INTRODUCTION

Groundwater is used for drinking water by more than 50 percent of the people in the India, including almost everyone who lives in rural areas. The largest use for groundwater is to irrigate crops Groundwater supplies are replenished, or recharged, by rain and snow melt that seeps down into the cracks and crevices beneath the land's surface. In some areas of the world, people face serious water shortages because groundwater is used faster than it is naturally replenished. In other areas groundwater is polluted by human activities.The possibility of extracting water from air is an activity that has been studied recently, especially with the purpose of producing it for emergencies or exceptional events, when drinking water is not temporarily available. Water extraction can be done with different technologies, one of which is represented by cooling water below the dew point, to cause condensation of the vapour content of the air. An interesting solution may be an equipment for water extraction that contemporarily uses the cooled air for refrigeration, which consists in a combined HVAC system for the dual purpose of water production and air-conditioning

II.TESTING OF PAREMETERS:

1. pH value
2. Hardness
3. Dissolved oxygen
4. Chlorides
5. Acidity
6. Total Alkalinity
7. Colour
8. Magnesium
9. Sulphates
10. Iron
11. Copper
12. Zinc
13. E-coli
14. Sodium
15. Phosphate
16. Fluorides
17. Aluminium
18. Detergent
19. Electrical conductivity
20. Carbonate hardness
21. Ammonium nitrogen
22. Total coliform
23. Non carbonate hardness
24. Calcium hardness
25. Magnesium hardness
26. Calcium
27. Phenolphthalein alkalinity
28. Odour

III.METHODOLOGY:



IV.OBJECTIVES:

- To determine the quality standards of the air conditioned water
- To analysis whether air conditioned water is suitable for drinking purpose
- To determine how to harvest air conditioned water from the air conditioner
- Through pipe
- To estimate the amount of water to be collected for the provided building per day
- To reduce the consumption of ground water usage
- To design the plumping layout for the collection of air conditioned water

SCOPE:

- The air conditioned water can be used as a drinking water.
- It is used for gardening, washing, and other domestic purposes.
- It is also used as a distilled water for chemical reaction. which has been proved by this project.

V.PROCESS OF AIRCONDITINOR

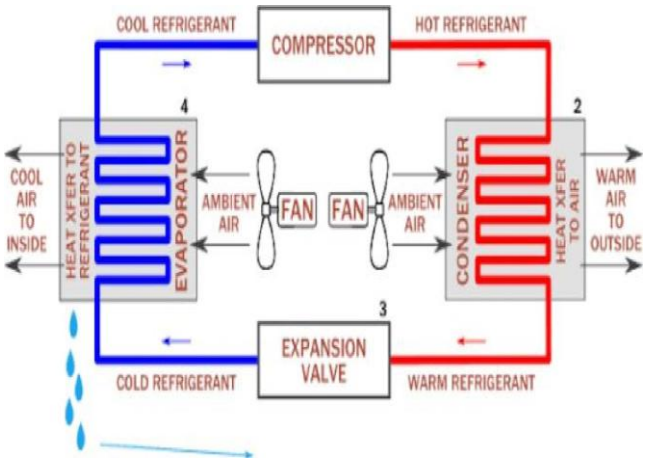


fig no. 1

no. 4

VI.CONDENSATION OF AC WATER:

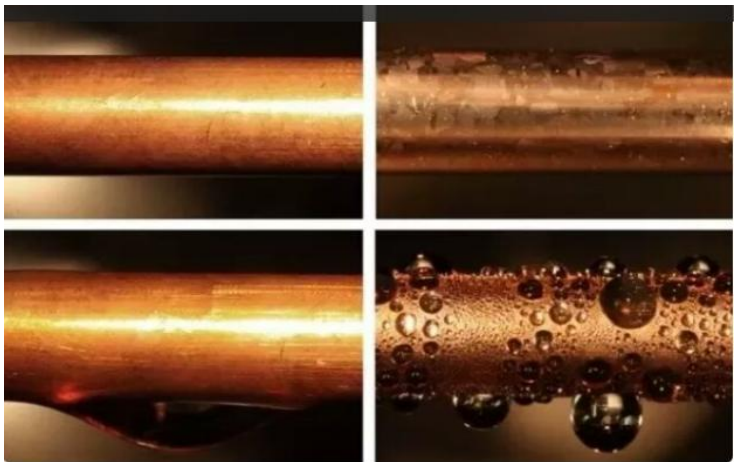


fig no 2

VIII.TEST DONE FOR AIR CONDITIONED WATER

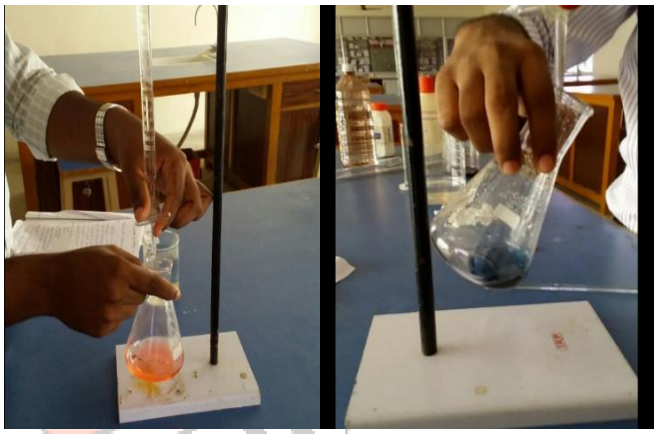
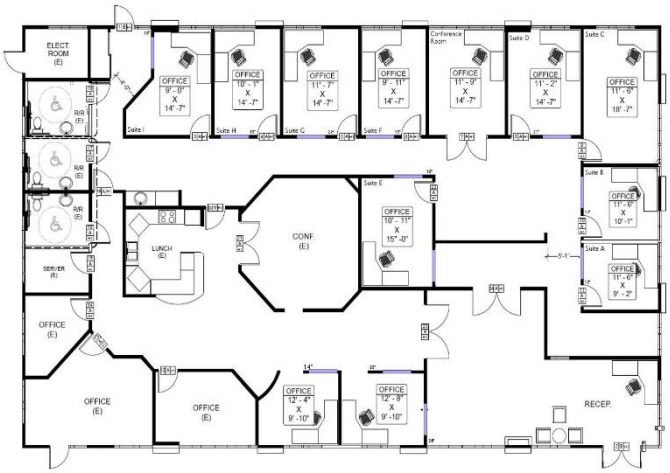


fig no. 3

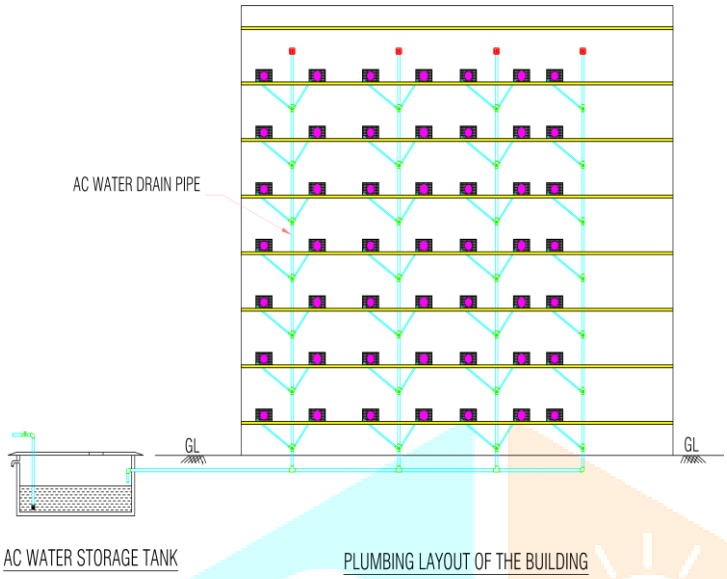
IX.ESTIMATIONBUILDING PLAN



fig

X. PLUMBING LAYOUT FOR COLLECTION SYSTEM

fig no. 5



S:NO	DISCRIBTION	NOS	UNITS	RATE/NO	COST
1	1INCH PIPE REQUIRED	38	NOS	450	17100
2	1.5 INCH PIPE REQUIRED	29	NOS	600	17400
3	2.5 INCH PIPE REQUIRED	13	NOS	800	10400
4	1 INCH BENDS REQUIRED	112	NOS	45	5040
5	1.5-2.5 REDUCER	9	NOS	50	450
6	TEE	9	NOS	75	675
7	Y WAY CONNECTION	14	NOS	120	1680
8	4 WAY Y CONNECTION	49	NOS	200	9800
9	1 INCH GATE VALVE	1	NOS	100	100
10	COWL(VENTILATION)	9	NOS	50	450
11	2.5 INCH BENDS REQUIRED	4	NOS	85	340
12	LABOUR COST	4	NOS	500/day	15000
				TOTAL	78435

XI. ESTIMATION COST FOR PLUMPING

Table no 1

RESULT:

TABLE NO:2

AIR CONDITIONED WATER DRINKING STANDARDS (AS PER IS)

S.NO	PARAMETER	PERMISIBLE LIMIT	RESULT	PROTOCAL
1	pH@25˚C	6.5-8.5	7.41	IS:3025:part:11-1983(reaff:2012)
2	Colour	5-50 Hazen	5 Hazen	IS:3025:part:4-1983(reaff:2012)
3	Odour	Agreeable	Agreeable	IS:3025:part:5-1983(reaff:2012)
4	Electrical conductivity@25˚c	0.4-0.85 m moles/ cm	70.3µmhos/cm	IS:3025:part:14-2013
5	Total hardness as $caco_3$	300-600mg/l	BDL(DL:1.0mg/l)	IS:3025:part:21-2009(ref 2014)
6	Calcium hardness as $CaCO_3$	100-400 mg/l	BDL(DL:1.0mg/l)	IS:3025:part:21-2009(ref 2014)
7	Magnesium hardness as $caco_3$		BDL(DL:1.0mg/l)	IS:3025:part:21-2009(ref 2014)
8	Total alkalinity as $CaCO_3$	80-120 mg/l	23mg/l	IS:3025:part:23-1986(ref 2014)
9	Phenolphthalein alkalinity $CaCO_3$	Depend upon co_2	Nil	IS:3025:part:23-1986(ref 2014)
10	Chloride as cl	250-1000 mg/l	3.9mg/l	IS:3025:part:32-1988(ref 2014)
11	Sulphate as SO_4	150-200 mg/l	BDL(DL:1.0mg/l)	IS:3025:part:24-1986(ref 2014)
12	Acidity		6.9mg/l	IS:3025:part:22-1986(ref 2014)

13	Dissolved oxygen	500 mg/l	6.4mg/l	IS:3025:part:38-1989(ref 2014)
14	Iron as Fe	0.3-1 mg/l	BDL(DL:0.01mg/l)	IS:3025:part:53-2003(ref 2014)
15	Fluoride as F	0.6-1.2 mg/l	BDL(DL:0.1mg/l)	APHA-22nd Edn 2012-4500F,D
16	Phosphate as P	0.03-0.2 mg/l	BDL(DL:0.01mg/l)	IS:3025:part:31-1988 (ref 2014)
17	Ammonium nitrogen as N		BDL(DL:1mg/l)	IS:3025:part:34-1988 (ref 2014)
18	Calcium as Ca	75-200 mg/l	BDL(DL:1mg/l)	IS:3025:part:40-1991 (ref 2014)
19	Magnesium as Mg	30-100 mg/l	BDL(DL:1mg/l)	IS:3025:part:46-1994 (ref 2014)
20	Anionic surface active agent as (MBAS)	0.2-1 mg/l	BDL(DL:0.01mg/l)	IS:13428-2005(reaff:2014) (Annexk)
21	Non carbonate hardness as $CaCO_3$		Nil	IS:3025:part:21-2009 (ref 2014)
22	carbonate hardness as $CaCO_3$		Nil	IS:3025:part:21-2009 (ref 2014)
23	Sodium as Na	< 100 mg/l	BDL(DL:0.5mg/l)	IS:3025:part:45-1993 (ref 2014)
24	Copper as Cu	0.05-1.5 mg/l	BDL(DL:0.02mg/l)	IS:3025:part 65:2014
25	Zinc as Zn	5-10 mg/l	BDL(DL:0.05mg/l)	IS:3025:part 65:2014
26	Aluminium as Al	0.05-0.2 mg/l	BDL(DL:0.02mg/l)	IS:3025:part 65:2014
27	Escherichia coli	Not acceptable	Absent/100ml	IS:1622: 1981(reaff:2009)
28	Total coliform	Not acceptable	Absent/100ml	IS:1622: 1981(reaff:2009)

Note: BDL: Below Detection limit DL: Detection limit

XII.CONCLUSION:

Water, being the fundamental need for life is now facing a crisis regarding its availability and quality. Our project aims to explore new avenues for water availability in particular from Air conditioning units. The water obtained has been tested and adheres to the norms stipulated in India for parameters of potable water. We have estimated the total cost of one office building and designed the layout for the collection system. If the project is implemented, it would help alleviate problems relating to water availability to some extent.

XIII.REFERENCES:

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