



Dear Reader,

We are happy to bring out the first edition of **Reflection iA**, a quarterly newsletter of iA on the occasion of company's second anniversary. This four-page newsletter is a reflection of iA comprising of Vani, Karma, Athithi, and Bimba intended to unfold the outlook of iA and our work.



iA (Powered by unseen waste energies), Intellectual Associates is established in 2003 by a group of young individuals.

iAes, a division of iA is specialized in,

- Heating, Ventilation and Air-Conditioning
- Public Health Engineering
- Fire Suppression
- Renewable Energy Systems
- Environmental engineering
- Climatic design

Years gone past has given us opportunity to lay our feet firm on the ground and establish niche for ourselves in the building services area. We have grown in ways that helps us do competitive work through iA's core strength; research oriented techno savvy company.

The goal of an air-conditioner is to provide effective, economical, environmental friendly and health conscious cooling system. Different air-conditioning systems work on different principles. An innovative and experimental three-stage air-cooling system was built which is a blend of direct evaporative, indirect evaporative and chilled water coil. This mixed-mode system provided us an answer, which lessened the initial and operating cost as well as provided 100% fresh air system in one of our works. 'Karma' has the details.

A simple, low-cost and highly effective water filter is what is needed for a common man. A construction of such a water filter through easily available articles is described in our Athithi. Recreating the legacy of the past in this new techno centric world has become a recent trend. This water filter makes much sense for those who are looking for better interior looks.

Innovation is iA's strength.

Ed.

Company:

iA, intellectual associates is established in 2003 by a group of young individuals. As the name indicates the idea is to bring in intellect individuals together who are cut out for the task of innovation.

iAes, a division of iA, is a engineering consultancy company, which specializes in the design of low energy, high quality, environmentally responsive buildings. We provide consultancy on Heating, ventilation and air conditioning, Public health engineering, Fire suppression and renewable energy systems.

Employee strength: 8

Projects:

Some of the projects which we have worked on,

Sahara Ganj – for Sahara India Pvt Ltd, Air condition of mall project at Lucknow

E2 solutions – For E2 solution Pvt Ltd, Air condition of software firm at Bangalore

TVSe- Air condition project at Bangalore

T-zed – Apartment project at Bangalore – Air conditioning and PHE works

Prince Aly khan Hospital – Mumbai, Air condition

Pride Hotel – 3 star hotel project at Bangalore, PHE, Fire suppression and Air condition system

Brindavan college- PHE works

Karle International – Air condition project at Bangalore

J P residency – an Apartment project Bangalore- PHE works

Hoysala Vijay Enclave – An Apartment project Bangalore – PHE Works

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An energy saving mixed mode air cooling system

designed and installed in *Sankey west view* – a bungalow project



Sankey west view system

The cooling system installed in sankey west view is *mixed mode cooling system*. The air comes from the mixed mode system (indirect, direct and chilled water coil) is supplied to all the bed rooms thru ducts and diffusers. The occupant can select the mode according to the wished comfort level. This is once thru 100% fresh air system and the air will not be re-circulated instead it is exhausted out.

System mode

Summer	Indirect + Direct
Winter	Indirect + Direct
Monsoon	Indirect + Chiller or 100% fresh air system

System Details:

AC area	2000 sqft
Calculated load	10 TR
System installed	3 stage mixed mode cooling system
Exhaust system	Ducted centrifugal fans

Benefits:

1. Cost of two stages is same as the cost of regular AC
2. Cost of three stage (sankey west view system) is 1.5 times the cost of regular AC
3. Operating cost / year
 - a. Tow stage system is 80% less than regular split AC
 - b. Three stage system is 60% less than regular split AC
4. 100% fresh Air system – the same air is not re circulated as we do in regular AC

Project info:

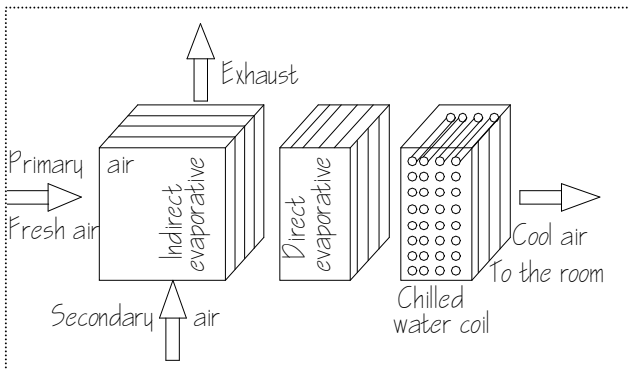
Client: Mr. V K Surendra

Interior Architects:

Ananad & Associates

History of Air cooling

Evaporative cooling has made summers more bearable for thousands of years and with 21st century technology provides



1st stage - indirect

The air from the atmosphere is sucked in thru 20 micron dust filters and is forced across a heat recuperator consisting of a cross flow wet plate heat exchanger.

The air that flows thru the heat exchanger is never in direct contact with water. The wet side of the heat exchanger is covered with a hydrophilic material which maintains a thin

effective, economical, environmentally friendly, and healthy cooling. Evaporative cooling comes in three flavours: direct, indirect, and indirect/direct. Evaporative cooling is responsible for the chill you feel when a breeze strikes your skin the air evaporates the water on your skin, with your body heat providing the energy. The ancient Egyptians hung wet mats in their doors and windows, and wind blowing through the mats cooled the air—the first attempt at air conditioning. This basic idea was refined through the centuries: mechanical fans to provide air movement

film of water which evaporates when the sensible heat is transferred to the wet side. The air comes out from the 1st stage is significantly cooler than the ambient temperature (it cools down from 36 C to 28 C, for Bangalore condition).

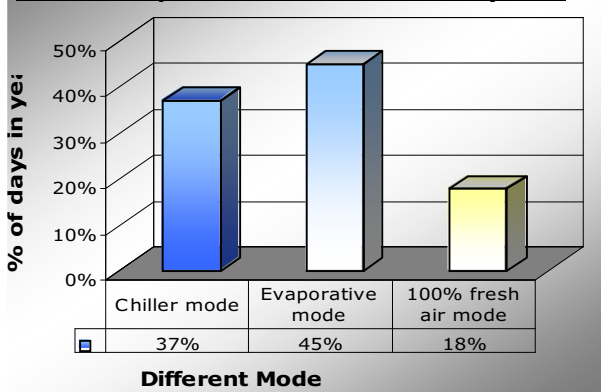
2nd stage - direct

The air comes out from the 1st stage is made to pass thru the direct evaporative cooling system which consists of cellulose media (air cooler, celdek pad) thus brings down the temperature further down (28C to 24C, for Bangalore condition).

3rd stage – chilled water indirect

The cooled and humid air comes out from the two stage system is sufficient enough to keep the space comfort. This can maintain an indoor temperature of 28 ± 1. Cooling further from 28C to below temperature is possible thru by attaching small chiller with the chilled water coil to the unit.

Year round cooling system- mixed mode: chiller+evaporative+100% fresh air system



in the 16th century, cooling towers with fans that blew water-cooled air inside factories in the early 19th century, swamp coolers in the 20th century.

How mixed mode cooling system works?

Common man's water filter

Here is a simple technique for converting unpotable water to potable drinking water by successfully removing **Coli Form¹** and **arsenic²**. Further, it strengthens the water with natural elements known to increase immunity, is made from commonly available materials and costs no more than Rs 600.

The water filter comprises four Copper Vessels/Containers, placed one on top of the other, with a single 1.5 mm hole made at the bottom of each container. The base of the lowermost container is left unpunctured, so as to contain the filtered water. Alternatively, **instead of copper vessels, Bamboo shoots can also be used which offer other unique advantages along with further economy.**

VESSEL 1

FILLER: COCONUT CHARCOAL

Charcoal, well known to all, is a commonly available, generally residual by-product. It is an excellent adsorbent for organic compounds and also adsorbs arsenic species. Here, charcoal obtained by burning coconut shells, which is the best form of charcoal and also an excellent filter, is used.

VESSEL 2

FILLER: MARBLE CHIPS

A careful introspection into the religious places all over the world reveals how man exploited the cleansing properties of limestone. Holy waters of rivers like Ganga, Jamuna and Nile, and 'sacred' hot water springs in West Indies, New Zealand as well as in the Indian subcontinent such as found in the pilgrimages of Amarnath, Champaner and many more are regarded for their medicinal properties. The common underlying ingredient in all these water sources is Calcium Carbonate. The abundant presence of stratified Calcium

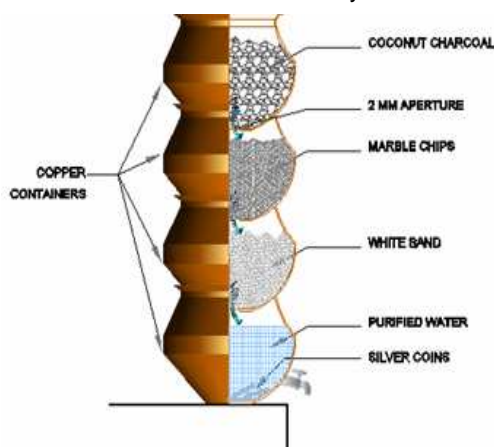
¹ Laboratory reports attached/available

² Water with 200 ppb arsenic was tested and found to have reduced to 20 ppb in a single run.

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Carbonate rocks surrounding the water is what makes these holy



waters 'magical'. *Lime inhibits pathogens by controlling the environment required for bacterial growth. Moreover, Lime facilitates the removal of carbonate hardness and facilitates in removing arsenic from water³.*

Hence, the second vessel is filled with small marble chips, which is basically a highly compressed form of limestone. The water slowly seeps through the air gaps and percolates to the next vessel. Due to the high pH of 10.5-11.0 maintained by lime, the stripping of nitrogen, another nutrient is facilitated. Thus, the removal of phosphorus and nitrogen helps prevent eutrophication (algae build-up).

VESSEL 3

FILLER: WHITE SAND

Taking clues from a common pragmatic approach, wherein drilling is done until white sand is uncovered, (which signifies purity), the third container is filled with local fine white sand.

VESSEL 4

FILTERED WATER

Purified water can be collected in the bottom most container, equipped with a small tap for easy access.

As shown in the diagram, silver coins are left at the bottom of the container. Recent research compared silver-copper ionization with the use of high temperatures to destroy bacteria. Contaminated cold water re

³ National Lime Association, U.S.

infected the hot water system even when temperatures in hot water heaters reached as high as 60 degrees Centigrade. **But experiments showed that even at lower water temperatures, ionization of soft water with silver and copper ions was effective against the bacteria.** The value of silver in medicine, and as a purifier has been acknowledged for centuries. Egyptians implanted silver plates into skulls with surgery. In Ancient Greece and Rome, people used silver

containers to keep liquids fresh. When settlers moved across the American West, they would purify a container of water by putting a silver dollar in it overnight. Towards the end of the 19th century, other medicinal uses for silver were developed including the use of silver and mercury in filling cavities, and the dropping of a silver filtrate solution into the eyes of newborn babies to prevent blindness due to infection⁴. Thanks to eye-opening research, silver is emerging as a wonder of modern medicine. An antibiotic kills perhaps a half dozen different disease organisms but silver kills some 650. Moreover, silver is virtually non-toxic⁵.

Russian scientists working on water recycling and purification problems for the Soviet space program have decided on silver as the best long-term sanitation agent.

MAINTAINING THE COMMON MAN'S WATER FILTER

- The coconut charcoal should be replaced every four months (which can be dried and used for barbecue or cleaning vessels!)
- All containers and their contents should be washed with alum once a month.

A collection from Sanjay prakash dairy, Sanjay prakash & Associates (Practicing Delhi Architect)

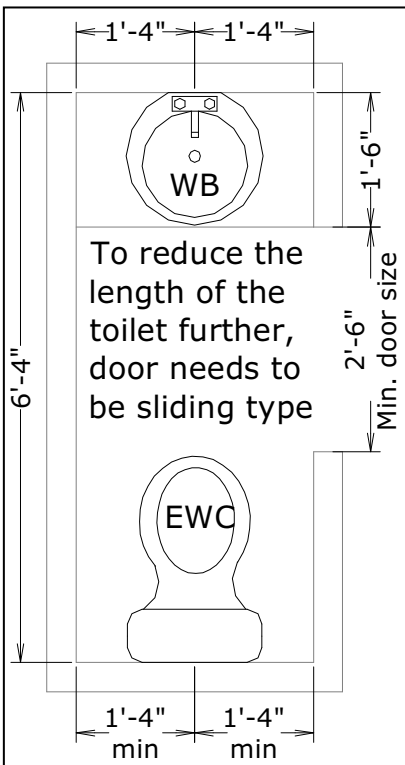
⁴ Dr. Harry Margraf, "The Story of Silver in Medicine"; Gold & Silver Newsletter, September 1974

⁵ Jim Powell, "Our Mightiest Germ Fighter"; Science Digest, March 1978

Peace space general space requirement for the toilets.

A. Bath Room Size

1. Half-Bath (wash basin, EWC/ IWC) minimum size is 18 sq. ft (6'4"x2'8") eg: powder room. Toilet of 4'x4' size can



accommodate EWC and Corner wash basin but it is very tight door needs to be sliding type.

2. Full Bath -shower (wash basin, EWC, and shower) 35 sq. ft. (8'x4'4")

3. Full Bath – bath tub (wash basin, EWC, and bath tub) 40 sq. ft. (8'x5'). If a tub is to be included, one wall must be min. of 5 ft. to accommodate it. It is best to buy the tub before construction begins and have it built in.

4. If the toilet is to be in a separate room, that room must be at least 36in. x 66in.

5. Shower stalls should be at least 32" x 32" but the trend is for large showers and larger the better

6. The suggested minimum width of the door is 30". But as per the norms 32 inch minimum width doors should apply.

B. Clearances b/w fittings

These are minimums. In all cases, more is better.

1. All fixtures must be at least 32 inches apart, center-to-center, and 16 inches from the center to the nearest wall or obstruction.

2. Leave 24 in. in front of a toilet or bidet.

3. Leave 30 in. space beside the full length of the tub.

C. Common heights of bath room fixtures: from the floor level

- >Shower head 6'7"
- >Soap holder 4'
- >Towel bar 4'
- >Tooth brush holder 4'
- >Toilet paper holder 1'6"
- >Tub deck height 1'6"
- >Wash basin 2'8"
- >EWC 1'4"
- >Mirror height 4'

D. Measurements of sanitary fittings

1. Washbasins

- Medium 1'10" x 1'6"
- Semi recessed 2'3" x 1'6"
- Wing 2'5" x 1'6"
- Cloakroom semi recessed 1'8" x 1'3"
- Corner 2' x 1'8"
- Baby 1'6" x 1'
- Inset / vessel 2'8" x 1'8"
- Block 3' x 1'6"

2. Bidet

- Bidet 1'10" x 1'3"

3. Bath tub

- Straight 5' x 2' 6"
- Straight 5'6" x 2'4"
- Straight 5'6" x 2'6"
- Double ended 5'6" x 2'6"
- Double ended 6'10" x 2'10"
- offset corner 5' x 1'4"
- Corner 4'3" x 4'3"

4. Water closet

- Standard incportriat cistern 1'6" x 2'4"
- Standard inc landscape cistern 1'8" x 2'4"
- Corner 1'3" x 2'6"
- Back to wall & WC 1'8" x 2'6"