



7-11 Environmental Resources Management



**Innovation through
Improvisation**

**ENVIRONMENT,
WATER & ENERGY
CONSERVATION
&
MANAGEMENT**

Environmental Management Products & Services

Water Management :

- **Rain Water Harvesting** Systems along with Bore / Ring well.
- **Waste Water Treatment Plant :**
 - Sewage / Effluent Treatment Plant.
 - Grey Water Treatment Plant.
 - Pool Water Recycling Plant.
 - Ultra Fine Filtration Plant.
- **Water Treatment Plant :**
 - Water Filtration Plant.
 - Water Softening Plant.
 - Reverse Osmosis Plant.
- Water Management thought **internal Water Audit.**

Waste Management

- **Organic Waste Management**
 - Composting Solution,
 - Organic Waste Crusher,
 - Auto / Semi Composter.

Environmental Management Products & Services

Air Management – through Professionals under consultancy.

- HVAC Systems : Water & Energy.
- Indoor Air Quality Test & Feasibility.

Other Facility Management

- Swimming Pool projects along with Water Recycling for Secondary purpose.
- Landscaping to reduce land heat, avoid soil erosion & utilization.
- Green Building Material.

Go Green! What is that ?



Incorporating excellent practices that result in environment protection, water conservation, energy efficiency, usage of recycled products and renewable energy, is termed as going **Green.**

Buildings have always been most secure investments, but did you know buildings could be made profitable?

Yes, healthy places to live and work too. All you need to do is
GO GREEN.

Existing Buildings – at a glance

Some facts :-

- Buildings use 40% of the world total energy.
- 23% of harvested wood
- 16% of fresh water.
- People spend 90% of their time indoors.
- Air quality is 2 – 5 times worse than that outside.

Water Efficiency :-

- 25 – 30 % Reductions in Usage Of Potable Water.
- 100% Recycling of Waste Water.
- Water Efficient Landscaping & Gardening.
- Rainwater Harvesting.
- Arrest Water Leakage.

Existing Buildings – at a glance

Energy And Atmosphere

- Use Of World Class Energy Efficient Practices
- 30% Reduction In Energy over Normal Buildings
- Use Of On- Site Renewable Energy Like Solar.
- Landscape To Reduce Heat Island.

Materials And Resources & Waste Management

- Composting, Organic Waste Crusher & Composter for Solid Waste.
- Storage and Collection of Recyclables
- Reuse Of Building Materials

Indoor Environment Control

- System Controls To Maintain IAQ
- HVAC System through Professionals

Save Water
Grow Trees



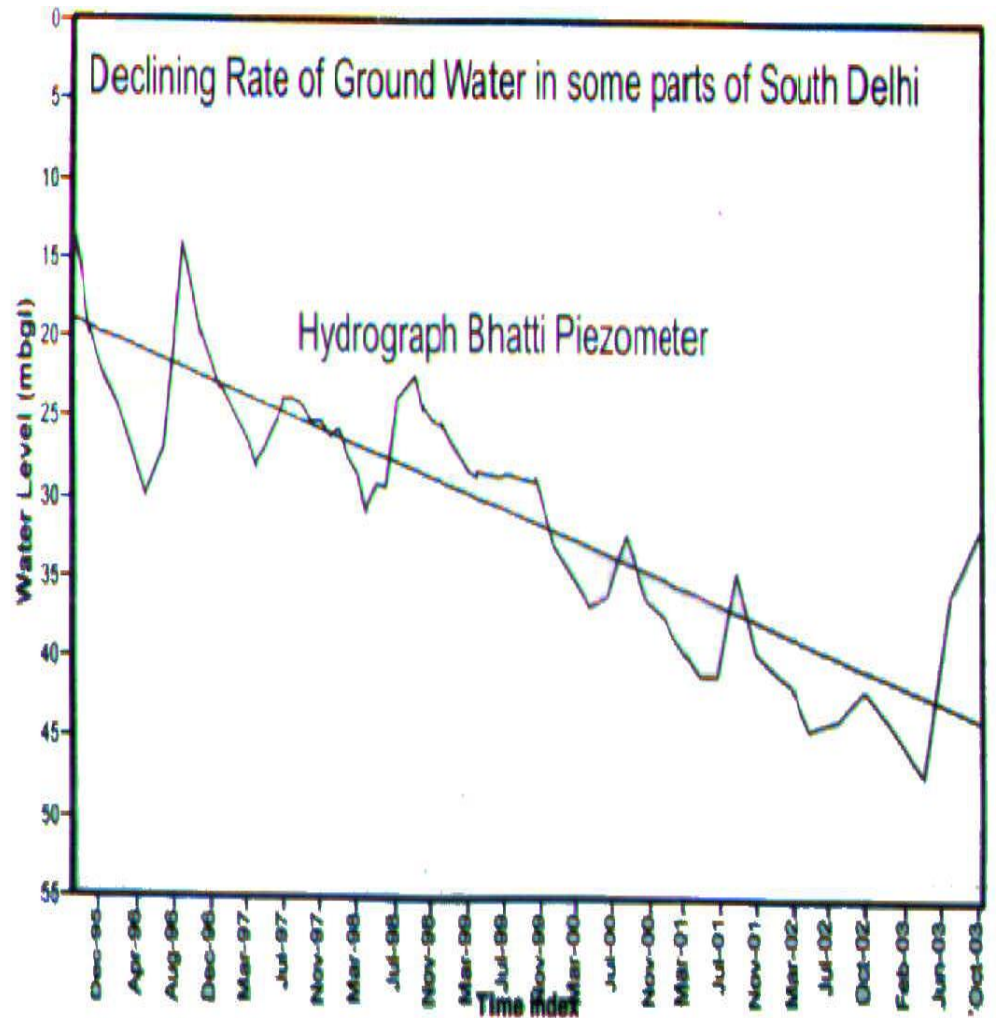
Save Life

Save the World

Water Management

Ground water is forever...!

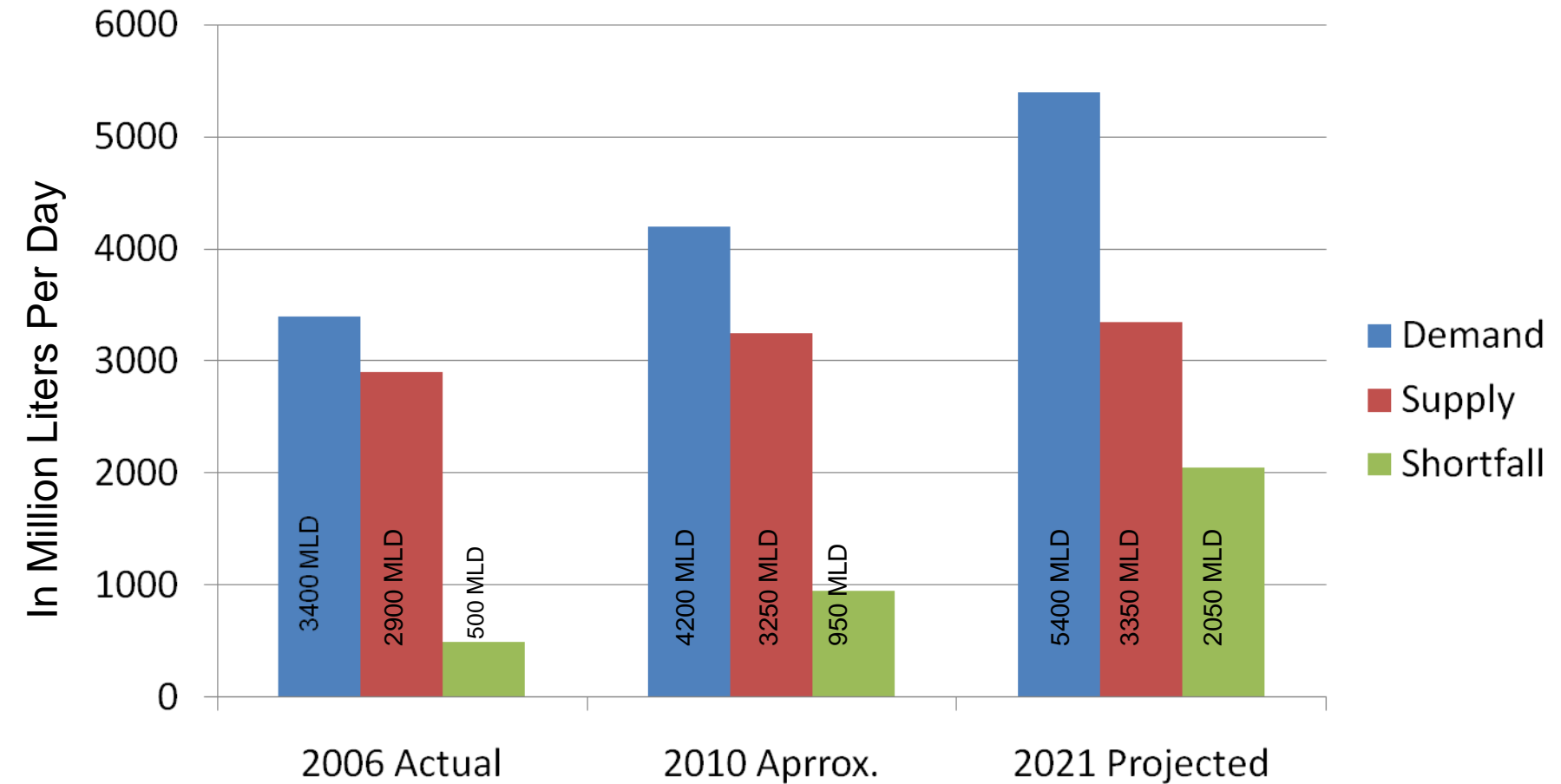
- A beautiful Day Dream...!
- Ground Realty is ...
Ground water is receding By every passing year.
- Declining Rate of Ground Water in some Parts of Mumbai as monitored by Piezometer.



An Alarming Negative Trend

- In 1985 Water Table was 50 ft.
- In 2004 water Table in same area is Nearly 225 ft.
- A drastic decline on Average of 9 Ft. per year.

Demand Supply Gap - Water Stress



How Much water do we use ?

ACTIVITY (Residential)	QTY [LTRS]	
Drinking	3	4 %
Cooking	4	
Washing Utensils / Kitchen	10	51 %
Washing Clothes	18	
Bathing (GWTP ¹)	40	
Flushing (GWTP ¹)	40	45 %
Gardening / Cleaning	15	
Safety	5	
	Total*	135
	Commercial*	50 LPCD
	Commercial with Hotel*	90 LPCD
	(as per BIS, 1993, Rev. 2007)Hotels*	180 LPCD

How we misuse our water

- BMC has extensive network for water supply but.....
Mumbai Supplies the Treated quality water as per world standards to its Citizens, which is utilized for all purposes including flushing, gardening, Cars & Compound washing etc.
- Only 40% of the water is used for drinking, cooking and bathing
- Over 60% is used for, washing and flushing down the toilet

LITERALLY WATER DOWN THE DRAIN

60% POTABLE WATER ENDS UP AS WASTE WATER

Efficient Water Management

1] Responsible Usage – Generic Points

- Do not keep the taps continuously opened, open them $\frac{1}{2}$ or $\frac{3}{4}$, or use bucket.
- Repair Leaking Taps immediately.
- Clean Vehicles just by cloth and bucket of water or use Controlled Jet Water with least output.
- Balconies and floors can just be swabbed instead of pouring lot of water while deep cleaning. Basement cleaning shall be with Jet water with least output.
- Do not throw away water filled yesterday, the water does not become stale if stored properly.

*Once we start thinking, many more thoughts will come in our mind.
Water conservation is saving water for our future and not for
anybody else.*

Statistics in general

- When a Tap is open for one minute, we waste 10 Ltrs of water.
- When we throw stored water (say even 2 buckets) we waste 40 Ltrs of water.
- When we wash our hands with Tap open, we waste 5 Ltrs of water every time.
- When we brush for 5 minutes with Tap open, we waste 50 Ltrs of Water.
- When we shave with Tap open for 10 Minutes, we waste 100 Ltrs of Waters.
- When we wash car with flowing pipe water, we waste 100 Ltrs of water.
- When we bath for 15 minutes with cont. shower on, we use 80 Ltrs of water.
- When we bath using a bath tub, we waste 200 Ltrs of water.
- Thousands of Liters of water is wasted through overflowing tanks of buildings.
- *Chillers Cooling Tower per tons capacity consumes average 40-50 Ltrs in Winter & 50-60 Ltrs in Summer.*

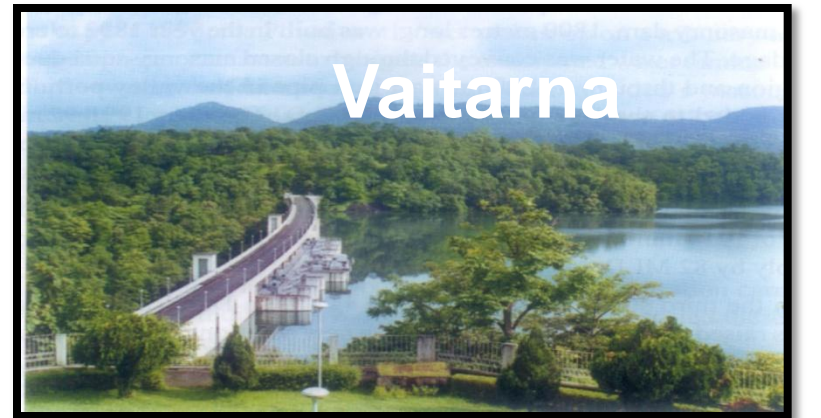
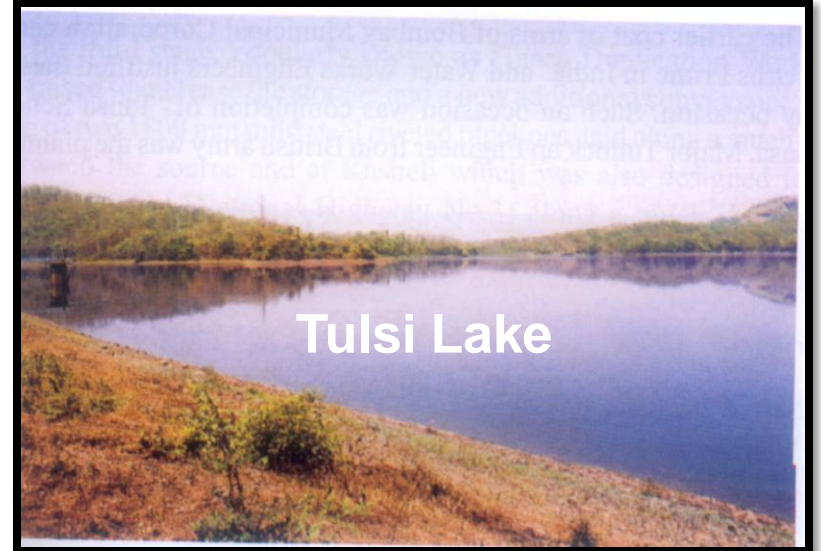
Note : Several other factors are there which has hidden factors & valuable; if considered. The way to outcome from crisis is Water Audit & Management.

Basic Concern of Mumbaikar..

- Reclaimed Land and threat of salinity, quality of water – of both Municipal supply and Tankers.
- Unequal Distribution.
- Wasteful consumption pattern – leading to over withdrawal from sources – heading for urban – rural conflict ?

Therefore Overall Water Management Is The Order Of The Day – With RWH & Waste Water Management as a Key Component.

Water Sources ...



Alternative Water Sources ...

a) Use of Ground water :- This results in lowering of ground water table, requiring more and more energy to lift the water. Natural reserve of water is dried off causing ecological imbalances.

b) Desalination :- Treatment plant is setup at one location and treated water is distributed through a network of pipelines. Technical limitation like efficiency of plant, treatment cost and setting up a new network for distribution.

c) Recycling :- Requires a system of facilitating further use of treated water. Locally based plants, unless there is a large requirement for garden, it becomes essential to set up a completely separate flushing network (separate tanks, supply lines etc.). The system requires regular maintenance from a skilled person.



**RAIN WATER
HARVESTING
SYSTEM
&
MANAGEMENT**

Alternative Water Sources ...

d) Rain water Harvesting :- It is the simplest, indigenous technology being practiced in India for centuries. The concept involves collection of rain water by individual plot owner, either in artificial tanks and / or in natural reservoir.

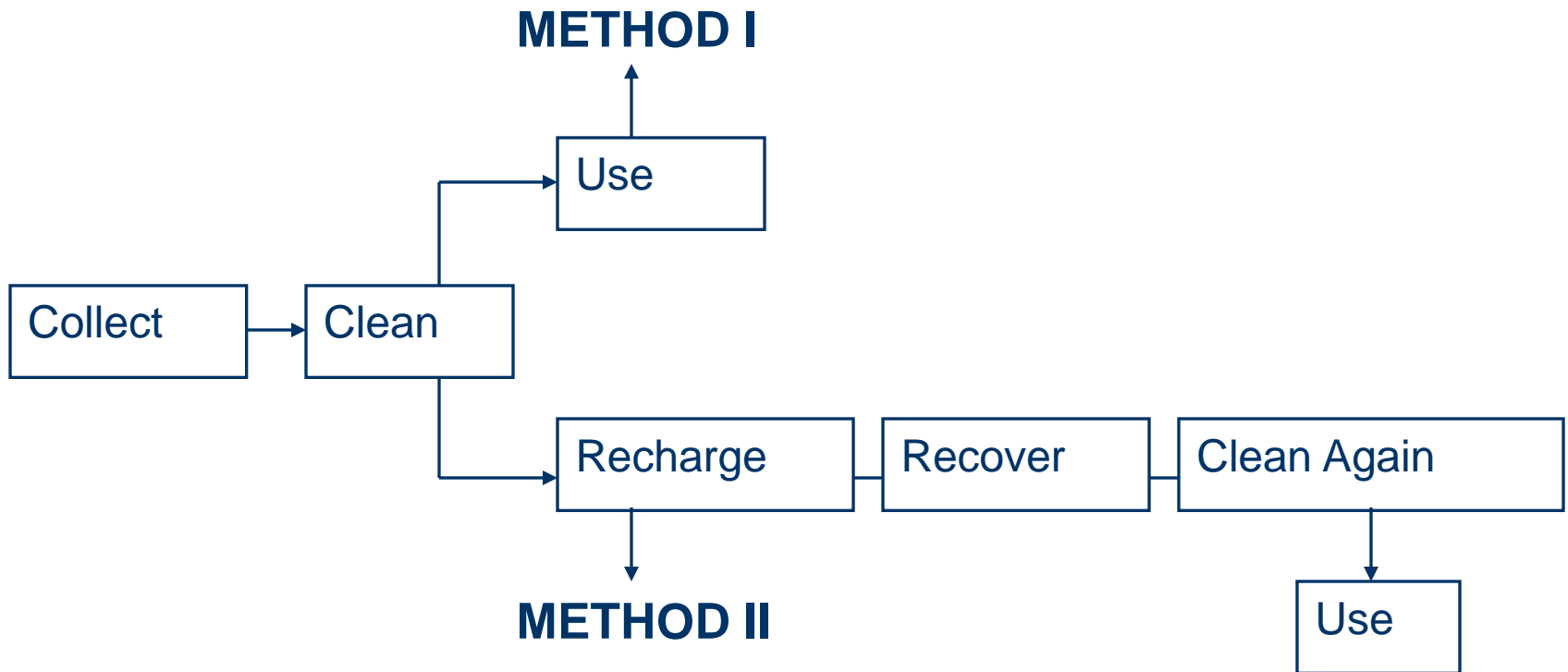
- * It helps self sufficiency.
- * Raises Ground water table.
- * Improves quality of ground water.
- * Reduces soil Erosion.
- * Prevents Sea water ingression.
- * It is less expensive.
- Easy to maintain & Operate.
- No re-occurring cost.

Efficient Water Management

Rainwater Harvesting

- Provides self-sufficiency to your water supply.
- Reduces the cost of pumping of ground water.
- Provides high quality water, soft and low in minerals.
- Improves the quality of ground water through dilution when recharged to ground water.
- Reduces soil erosion in urban areas.
- In saline or coastal areas, rain water provides good quality water and when recharged to ground water it reduces salinity and also helps in maintaining balance between the fresh-saline water interface.
- In Islands, due to limited extent of fresh water aquifers, rain water harvesting is the most preferred source of water for domestic use.

RAINWATER HARVESTING HOW IT WORKS

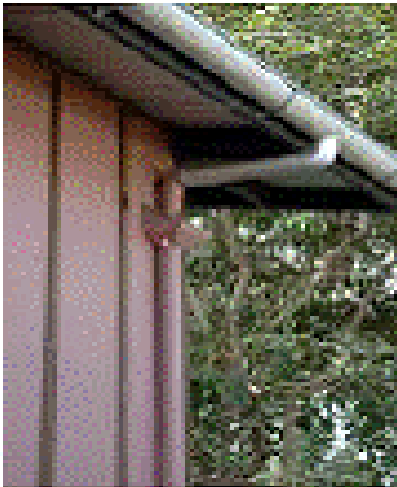


**An Ideal RWH System should incorporate both methods
Use a Lot, Save the Rest.**

RAINWATER HARVESTING HOW TO COLLECT METHOD - II

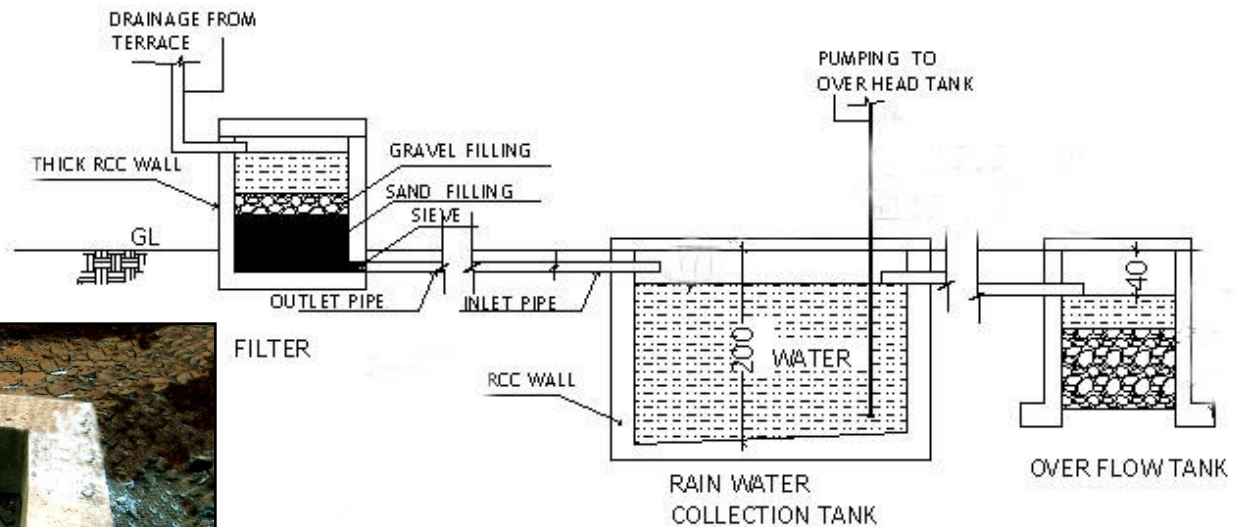
For collection Of Rainwater; we need to divert all storm water drains to one designated location.

- **Half Round Pipes for sloped roofs.**
- **Interconnecting vertical down takes from terraces.**
- **Diverting Storm Water gutters**



RAINWATER HARVESTING HOW TO CLEAN

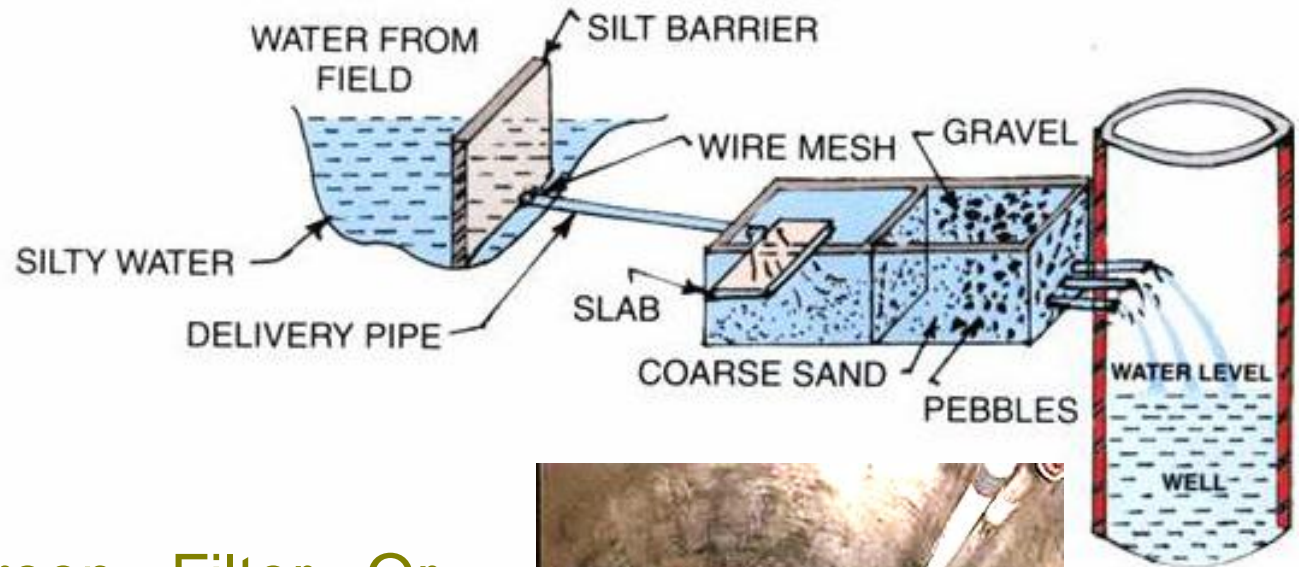
Probably The most Important Component of any RWH System is the Receiving Tank or Settling Tank



IN Small Capacity RWH This Cleaning Function Is Done By Screen Filters.

RAINWATER HARVESTING METHOD I

Direct Use Method



After Basic Screen Filter Or Gravel Filter Rainwater is ready to be discharged directly in to flush tank or open well.



RAINWATER HARVESTING METHOD II

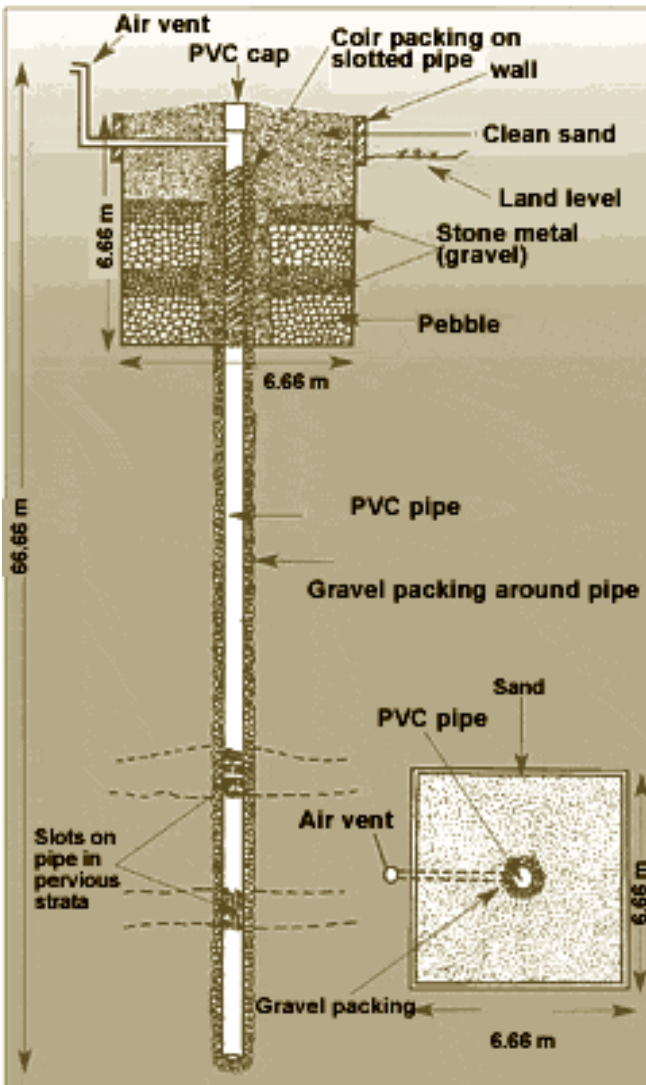
Percolation Pits are used to injects water slowly at sub soil level



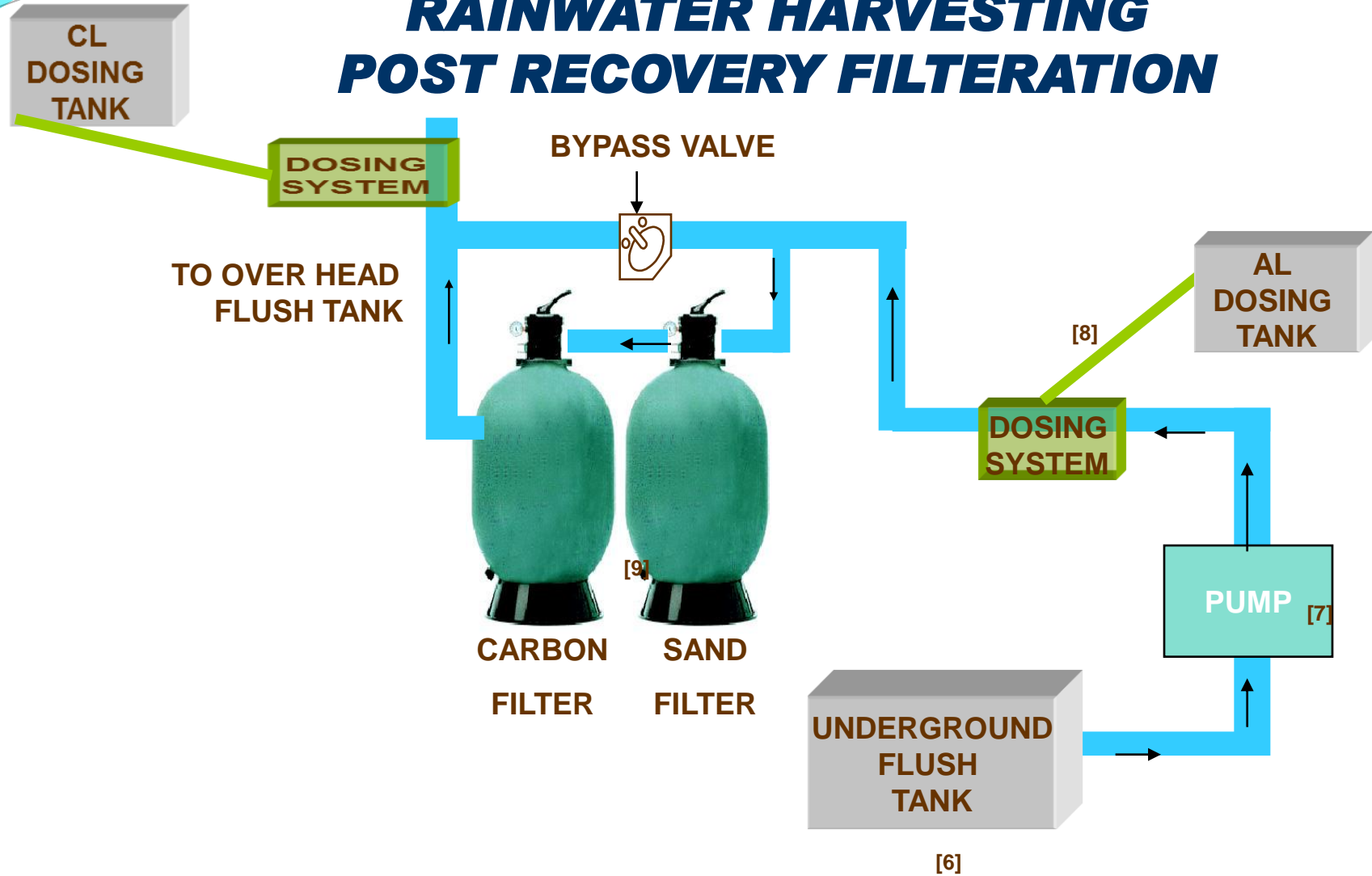
RAINWATER HARVESTING METHOD II

Bore Recharging System for high Capacity of water and fast rate of percolation required.

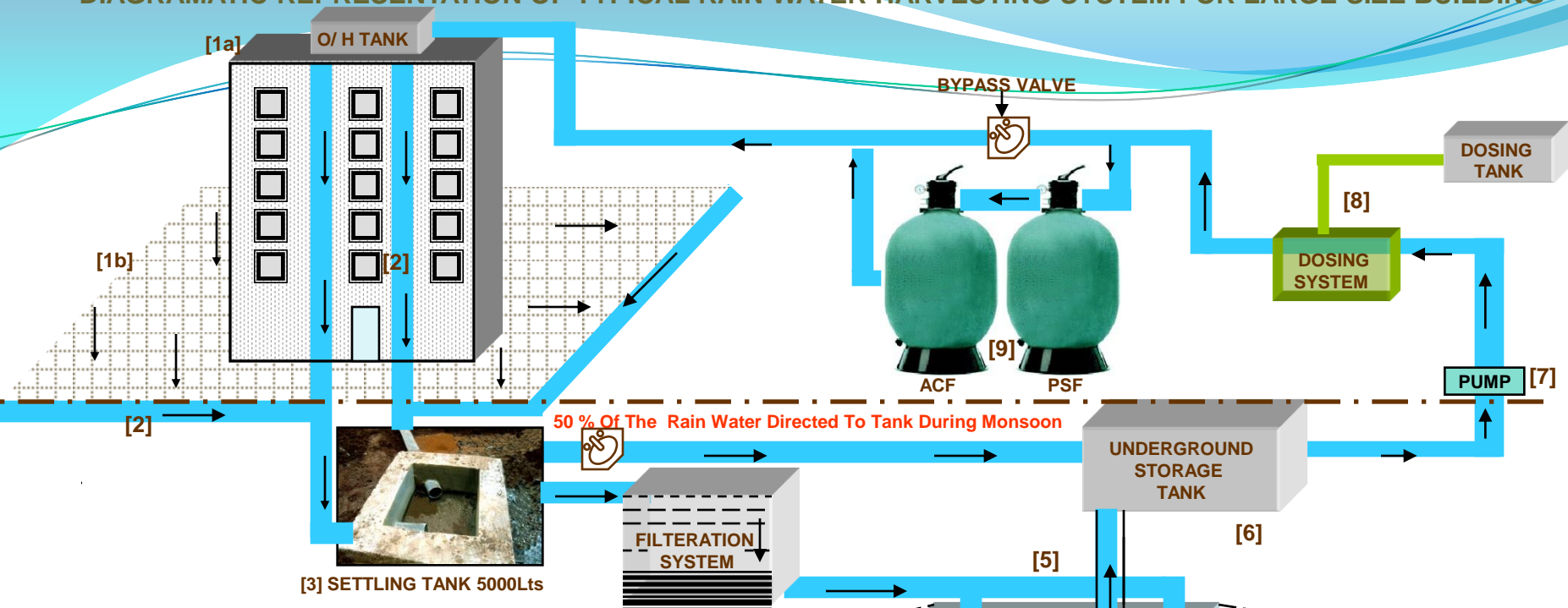
These set of feed-well can be used to recharge deep aquifers and one pump can be used to draw water.



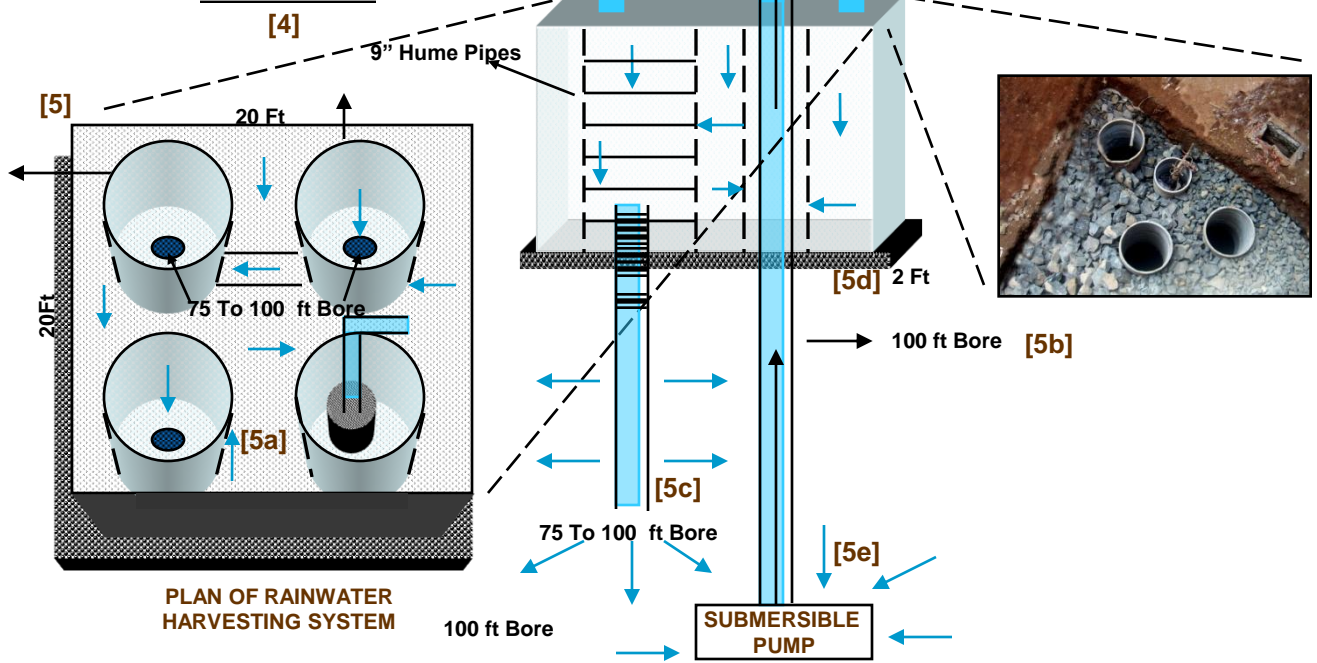
RAINWATER HARVESTING POST RECOVERY FILTERATION



DIAGRAMATIC REPRESENTATION OF TYPICAL RAIN WATER HARVESTING SYSTEM FOR LARGE SIZE BUILDING

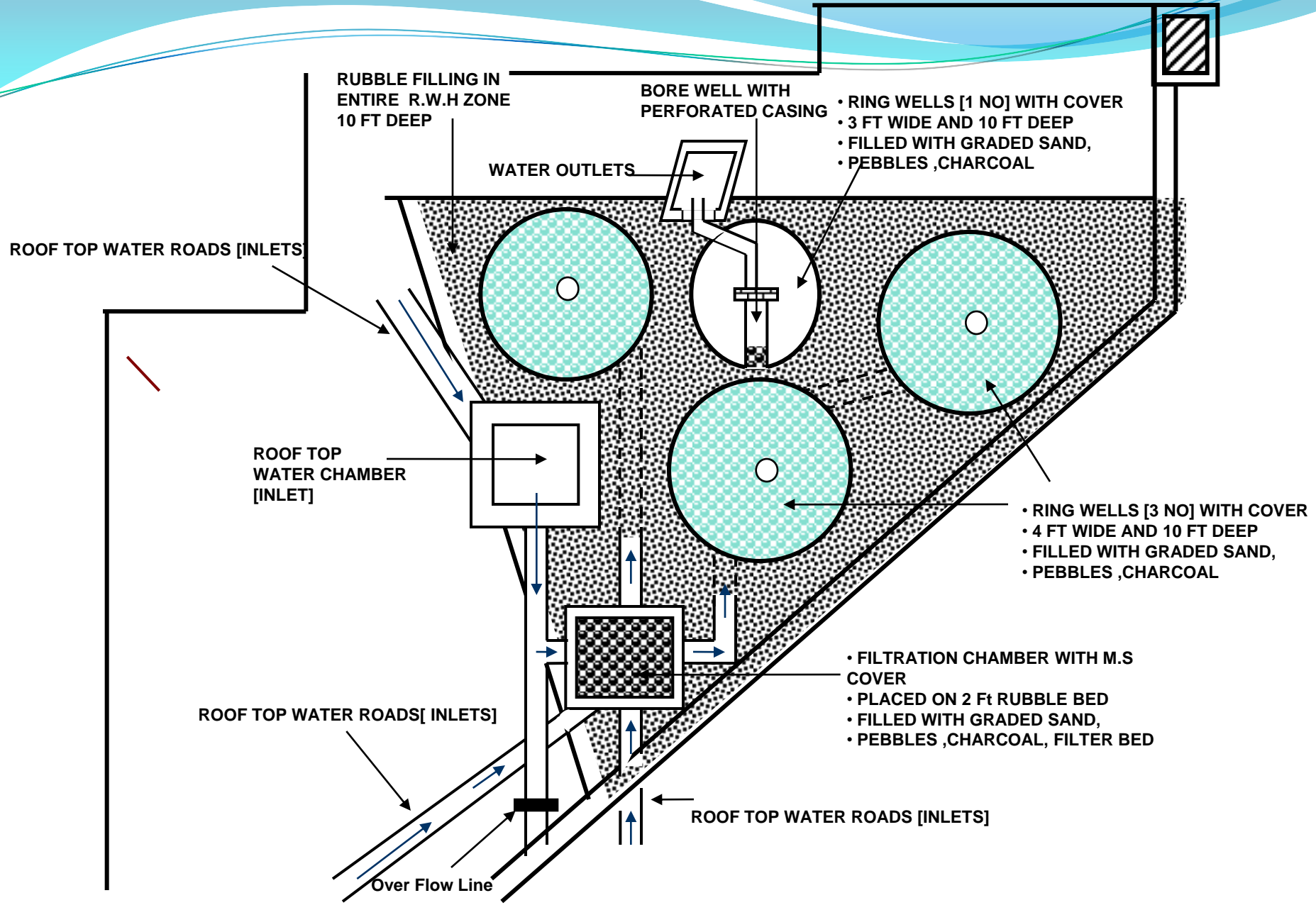


- [1] a: ROOFTOP OF BUILDING and b: PAVEMENT
- [2] WATER ROADS AND STORM DRAINS:
- [3] SETTLING TANK : 5000 LITRES.
- [4] FILTRATION SYSTEM : 2M x 2M x 0.6M [H]:
- [5] RAINWATER HARVESTING SYSTEM:
 - Open Well 20Ft x 20 Ft x 15Ft [Deep]
 - [5a] RING WELL: 10 Ft Deep.
 - [5b] BORE WELL: 100 Ft – 1 No
 - [5c] BORE WELLS: 75 To 100 Ft – 3 No
 - [5d] RUBBLE BED: 2 Ft
 - [5e] SUBMERSIBLE PUMP + PANEL- 1 No
- [6] PRIMARY STORAGE TANK: 25,000 Lts
- [7] DELIVERY PUMP: 400/440 V, 3 Phase,
- [8] CHLORINE DOSING SYSTEM
- [9] DUAL MEDIA FILTER 10,000 Lph, Sand Filter + Activated Carbon



PLAN OF RAINWATER HARVESTING SYSTEM

DIAGRAMATIC REPRESENTATION OF RAIN WATER HARVESTING SYSTEM IMPLEMENTED A



Pipes take water
to treatment
center

Screening
stage

Primary
treatment stage

Secondary
treatment stage

Final
treatment stage

Filtered
into river

WASTE WATER MANAGEMENT:

SEWAGE

TREATMENT PLANT



Wastewater Treatment Considerations

Objective: to improve the quality of waste water for recycling to reduce potable water consumption.

- Treatment stages are:-
 - ❖ Pre-treatment.
 - ❖ Preliminary treatment.
 - ❖ Primary treatment.
 - ❖ Secondary treatment.
 - ❖ Tertiary Treatment .
 - ❖ Sludge (bio-solids) disposal.

Sewage Treatment

In ancient time, the process started with Septic and enhanced with Anaerobic. The further upgradation occurred in *Japan* and started with Aerobic Treatment, considering attached growth.

Aerobic Vs Anaerobic Treatment

- Aerobic, as the title suggests, means in the presence of air (oxygen).
- Anaerobic means in the absence of air (oxygen).

Aerobic Treatment

Activated Sludge Process & Attached Growth

Activated sludge processes (suspended-growth system or aerobic digestion), the waste flows around and through the free-floating microorganisms, gathering into biological flocs that settle out of the wastewater. The settled flocs retain the microorganisms, means they can be recycled for further treatment.

Attached-growth systems use a medium to retain and grow microorganisms. Rotating biological contactors (RBCs) & Trickling filters are two common types.

- RBCs consist of a series of circular disks rotating through the wastewater flow, partially submerged. These disks, usually plastic, are the media on which the bio-film develops and eventually sloughs off.
- The trickling bio filter consists of a fixed bed of gravel, peat moss, ceramic, plastic, or textile media — to name just a few — over which sewage passes and creates a bio-film that becomes thick and falls off (called “sloughing”).

Wastewater Treatment Flow Diagram

WHAT IS ETP?

ETP OR **EFFLUENT TREATMENT PLANT** IS USED TO TREAT THE INDUSTRIAL WASTE WATER.

INFLUENT: UNTREATED INDUSTRIAL WASTE WATER.

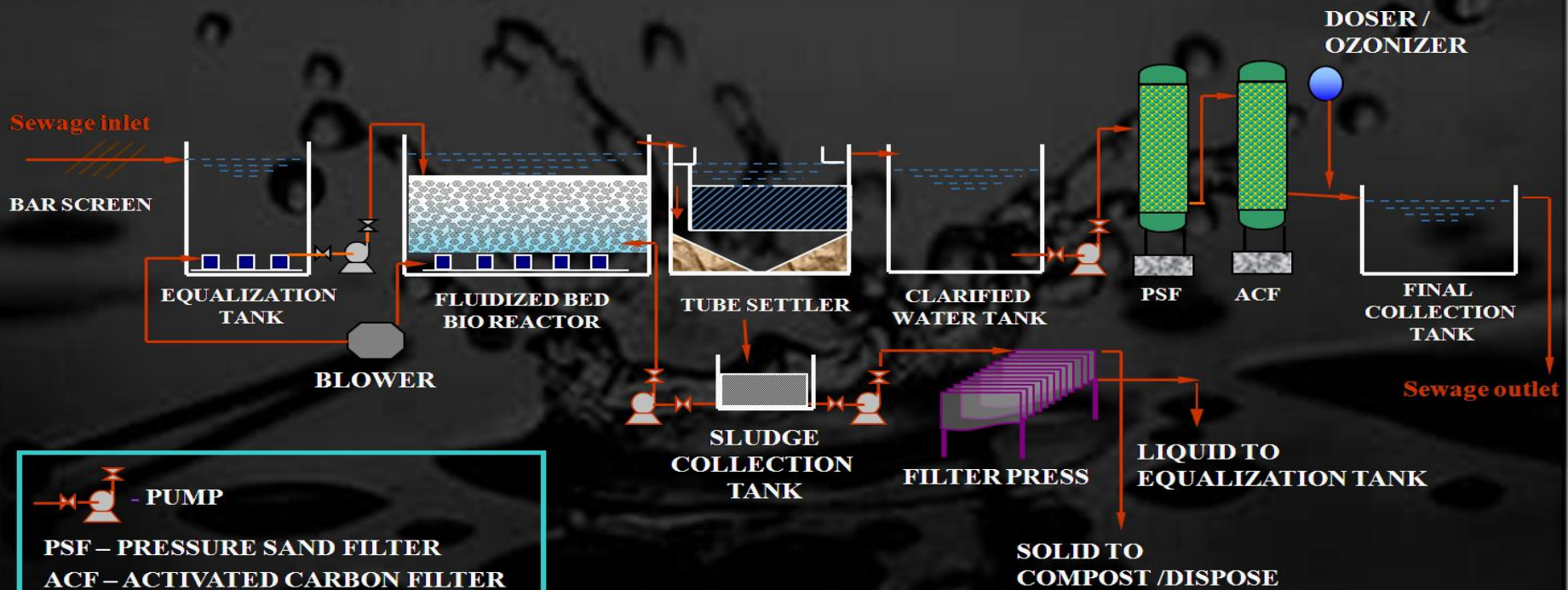
EFFLUENT: TREATED INDUSTRIAL WASTE WATER.

SLUDGE: SOLID PART SEPARATED FROM WASTE WATER BY ETP.



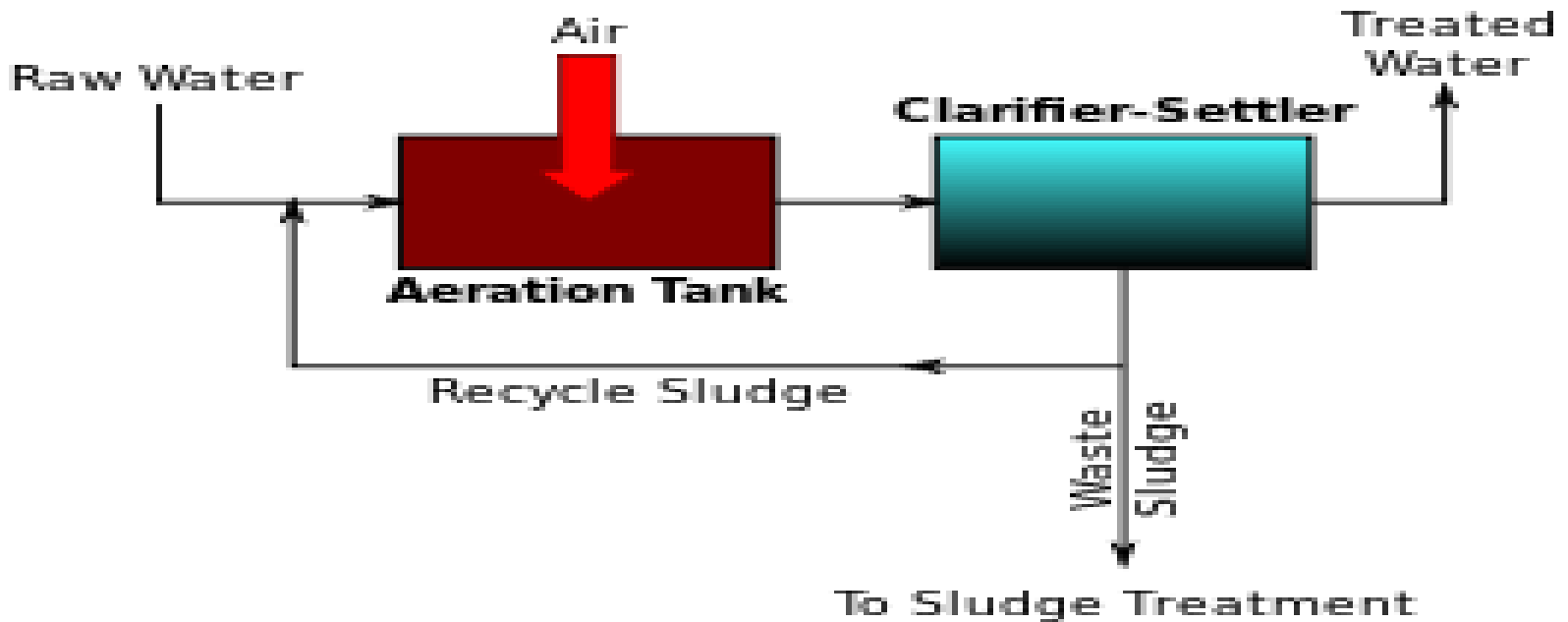
Wastewater Treatment Flow Diagram

FLOWSHEET for STP with FBBR



Aerobic : Activated Sludge Process (ASP)

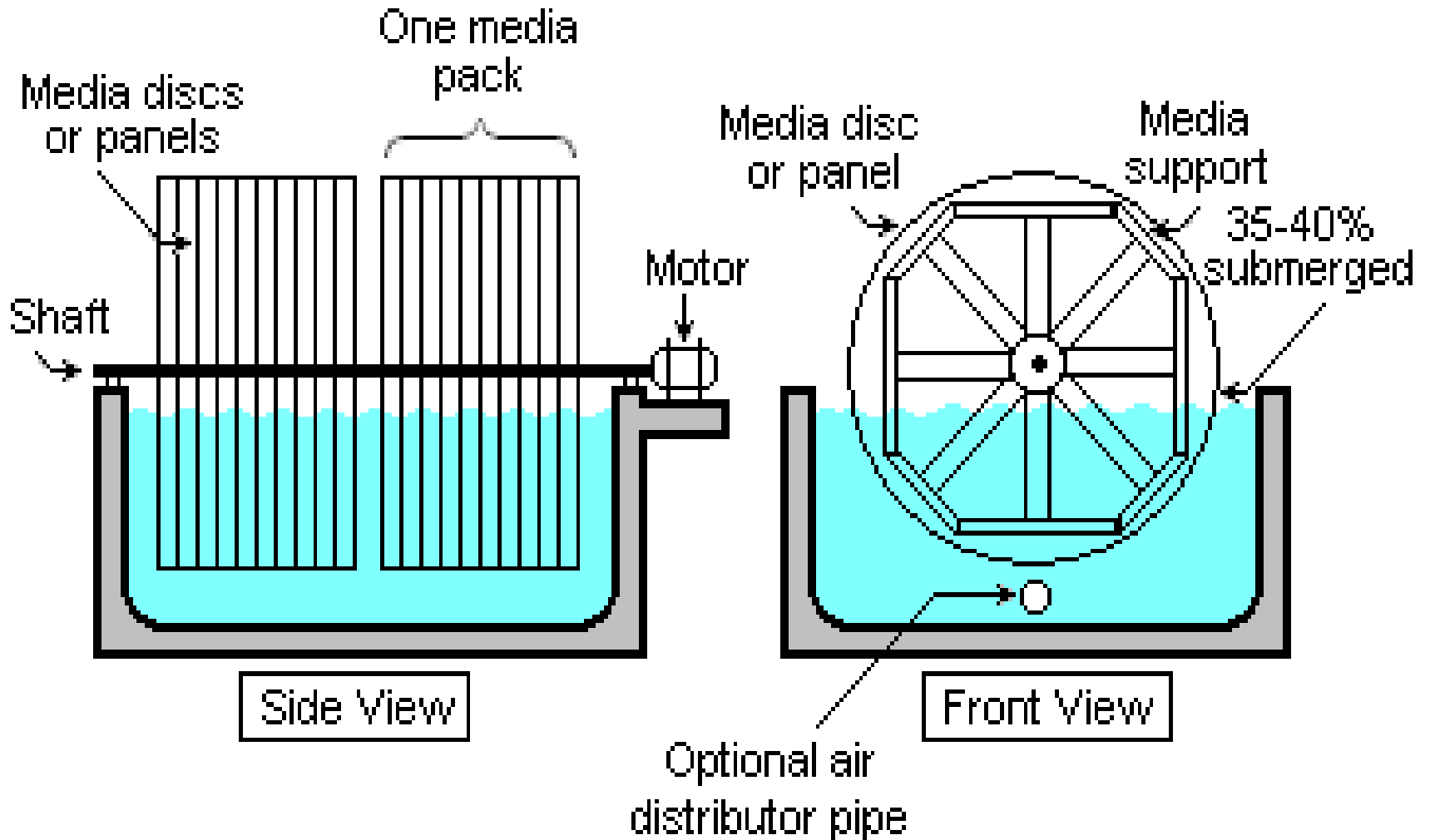
- **Activated Sludge Process (ASP)** : The **activated sludge process** is a process by using **forced air** and biologically compositing of bacteria.



Aerobic : Attached Growth - RBC

- **Attached Growth under Rotating Biological Contactor (RBC)** by *natural aeration* and biologically compositing of bacteria.
- The rotating packs of disks (known as the media) are contained in a tank or trough and rotate at between 2 and 5 revolutions per minute. Commonly used plastics for the media are polythene, PVC and expanded polystyrene. The shaft is aligned with the flow of wastewater so that the discs rotate at right angles to the flow with several packs usually combined to make up a treatment train.
- About 40% of the disc area is immersed in the wastewater & 60% in contact of air.

Aerobic Treatment : Attached Growth



Type of Plant under A.S.P. & Attached Growth

There are mainly four types under Activated Sludge Processes (ASP) and two types are under Attached Growth as under mentioned :-

A.S.P.

- **MBBR.**
- FBBR.
- FABR.
- SAF.
- FMR

Attached Growth.

- **RMBR.**
- Trickling Filter.
- RBC.

Plant Type

A.S.P. & Attached Growth

A.S.P.

- MBBR : Moving Bed Bio-film Reactor.
- FABR/FBBR : Fluidized Aerobic / Bed Bio Reactor.
- SBR/AR : Submerged Bio Reactor Aerated Filter.
- MBR : Membrane Bio Reactor.

Attached Growth.

- RBC : Rotating Biological Contactors.
- RMBR : Rotating Membrane Bio Reactor.
- Trickling Filter : Fixed bed of rocks or plastic media over which sewage flows downward.

Plant Design *INPUT & OUTPUT*

INPUT from Client

- Ph : 6.5 to 8.5.
- BOD : 50 - 100 Mg / Ltr.
- COD : 200 - 400 Mg / Ltr.
- SS : 200 Mg / Ltr.

- Temp. : 50 °C.
- Average Temp : 30-40°C.
- Type of Building :
- No. of People :
- Final Uses :

OUTPUT to be given

- Ph : 6.5 to 8.5.
- BOD : 5-10 Mg / Ltr.
(5 Day at 20°C or 2.5 Day@37°C).
- COD : < 50 Mg / Ltr (2 Hrs).
- SS : < 20 Mg / Ltr.
- TSS : < 10 Mg / Ltr.
- DO : \leq 4 Mg / Ltr.
- Bacteria : 5 Hazen Units.
- E Coli : **ZERO** / 100 MI.
- Facial Coliform : 1000MPN/100MI
for Irrigation. Urban– NO F.C. accepted
- Phosphorus : <1Mg/Ltr.
- M Alkalinity : < 50 Mg / Ltr.

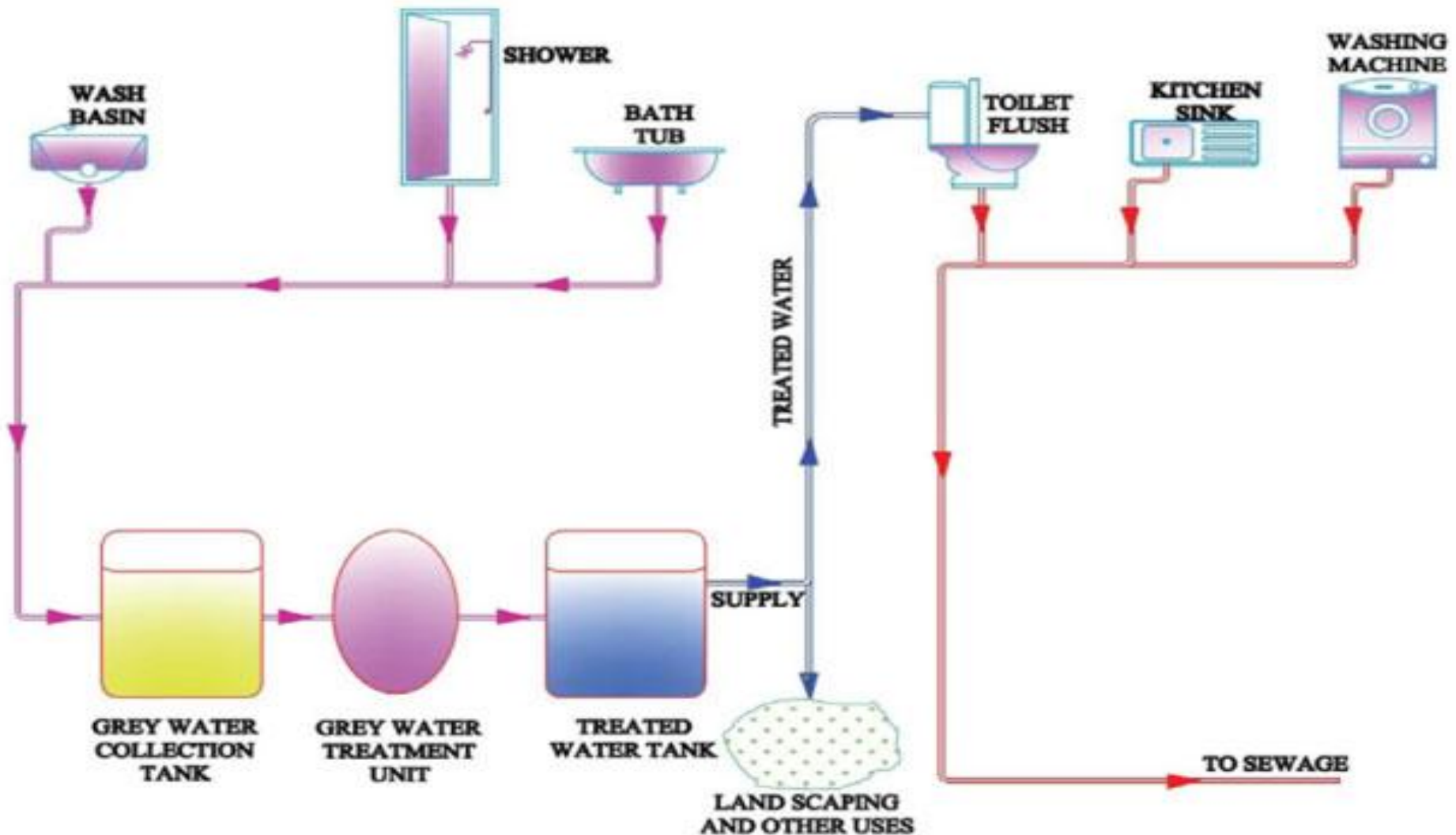
STP Project – during Works





**Other
Waste Water
Treatment
Plant**

TYPICAL LAYOUT OF GRAY WATER PLANT INSTALLATION





**Water
Filtration,
Softener &
Reverse Osmosis
Plant**

Water Filtration Plant



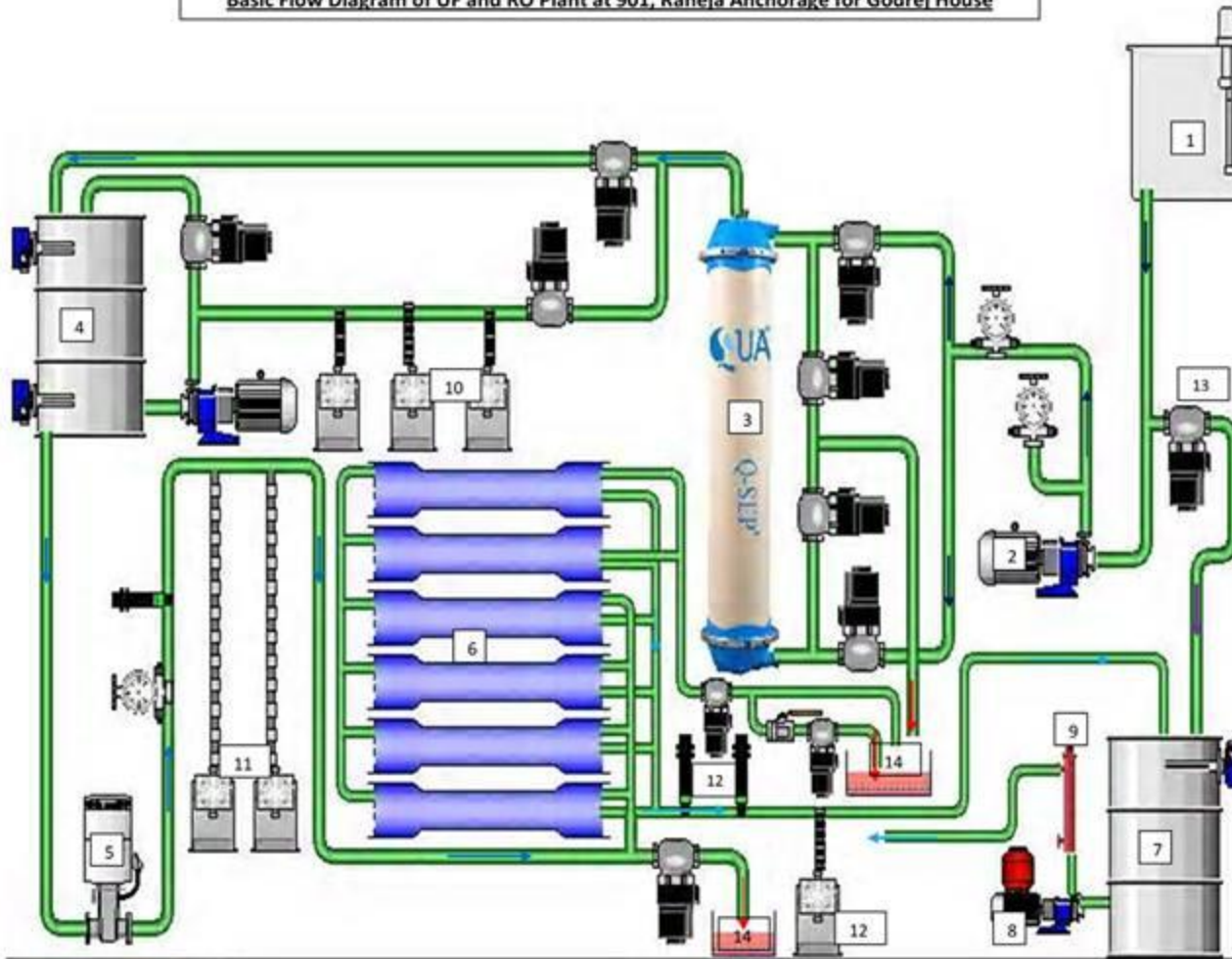
Water Softening Plant



Reverse Osmosis Plant

Basic Flow Diagram of UF and RO Plant at 901, Raheja Anchorage for Godrej House

* Simplified drawing for understanding



Pt	Description	Function
1	Raw Water Inlet- OHT	Inlet taken from BMC Tank for UF Plant Feed
2	UF Pump	Feeds Raw water to UF Plant. 2 Cum @ 1.5 Bar.
3	UF Plant with Membrane	T.S.S. removed. S.D.I. is maintained < 3. Bacteria removed from raw water.
4	UF Treated Water Tank	For handling of UF Permeate water & utilized for feed water to RO Plant
5	HP Pump of RO Plant Feed	High Pressure water injected to RO Membrane for process.
6	RO Plant Membrane	T.D.S gets removed from UF Treated Water. Removes Bacteria.
7	RO Treated Water Storage Tank	RO Treated water Storage for fed to Hydro Pneumatic Pump for Utility purpose.
8	HPn Pump	HPn Pump feeds water to entire utility service @ 4 Bar pre
9	UV Unit (post RO Storage)	UF & RO Treated water gets finally disinfected with UV Process & fed to consumer for drinking purpose
10	UF Dozing	Auto dozing to UF treated water
11	RO Dozing	Auto dozing to RO Inlet water
12	pH Pp & other	pH maintainer, ORP & TDS Indicator
13	Plant By Pass Valve	Emergency By-Pass Service Valve in case of failure of Plant.
14	Reject System flow line	Auto Backwash & Reject water from UF & RO

Note : Detailed flow diagram, P & ID, Process with complete technical, operational, Maintenance and SOP will be submitted in a Booklet includes warranty documents.

Drg No. : Nil. Reference drawing only.
 Designed : System Engineer.
 Checked : System Creator.
 Verified : Unverified / Non-standard.
 7-11 ERM - Non Standard Ref. Drawing.



B-302, Sai Srishthi Complex, Near Jangid Estate, Mira Road, Thane - 401 107

UF & RO(#1); 800X480

WATER AUDIT

to

REDUCE – potable water consumption,

RECHARGE - Aquifer,

&

RECYCLE – waste water for reuse.



Why water audit?.

- Reduce our water footprint.
- No one seems to be focused on water wastage.
- Direct relation to our deferred maintenance list.
- Maximize Productivity and Minimize Cost.
- Prepare and Access Records.
- List Expectations.
- REDUCE, REUSE, RECHARGE, RECYCLE.

Water Audit Activity Plan

Activities for Audit are :

- 1. I.P.O. Cycle of Water :- Commencing from Water Inlet to User end.**
- 2. WTP : Technical, O&M.**
- 3. STP : Technical, O&M.**
- 4. HVAC : CT, CW, AHU w.r.t. Input water.**
- 5. Plumbing Network : Inspection of existing system.**
- 6. Lab Test of various Water for analysis.**
- 7. Fault finding, diagnosis, corrective measures & recommendation for Implementations.**
- 8. Conservation Process Action Plan & benefits.**
- 9. Geological Survey to find Aquifer, Water Road, RWH for existing building.**



ENERGY MANAGEMENT

Energy Management

❖ Objective:

To manage from the available natural energy resources to cater current demand of Electricity on earth.

Existing Buildings

Energy And Atmosphere :

- Use Of World Class Energy Efficient Practices.
- 20% Reduction In Energy Over Normal Buildings.
- Use Of On- Site Renewable Energy Like Solar & Water Recycling.
- Landscape To Reduce Heat Island.

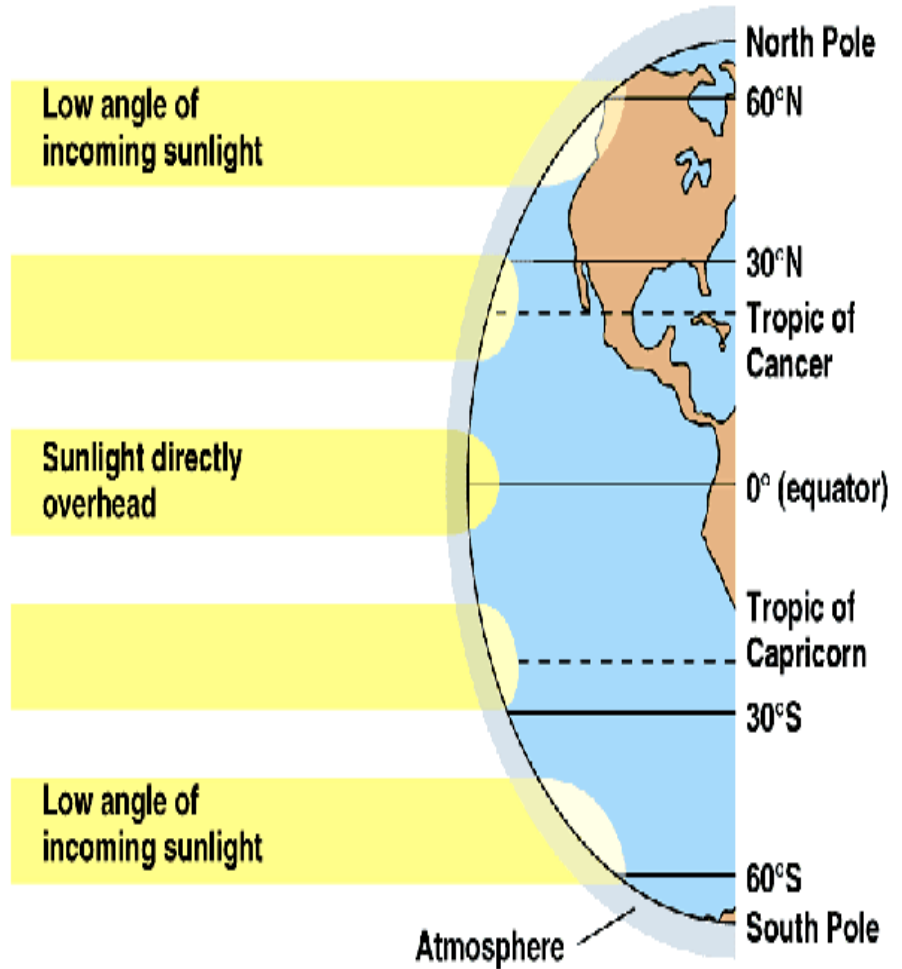
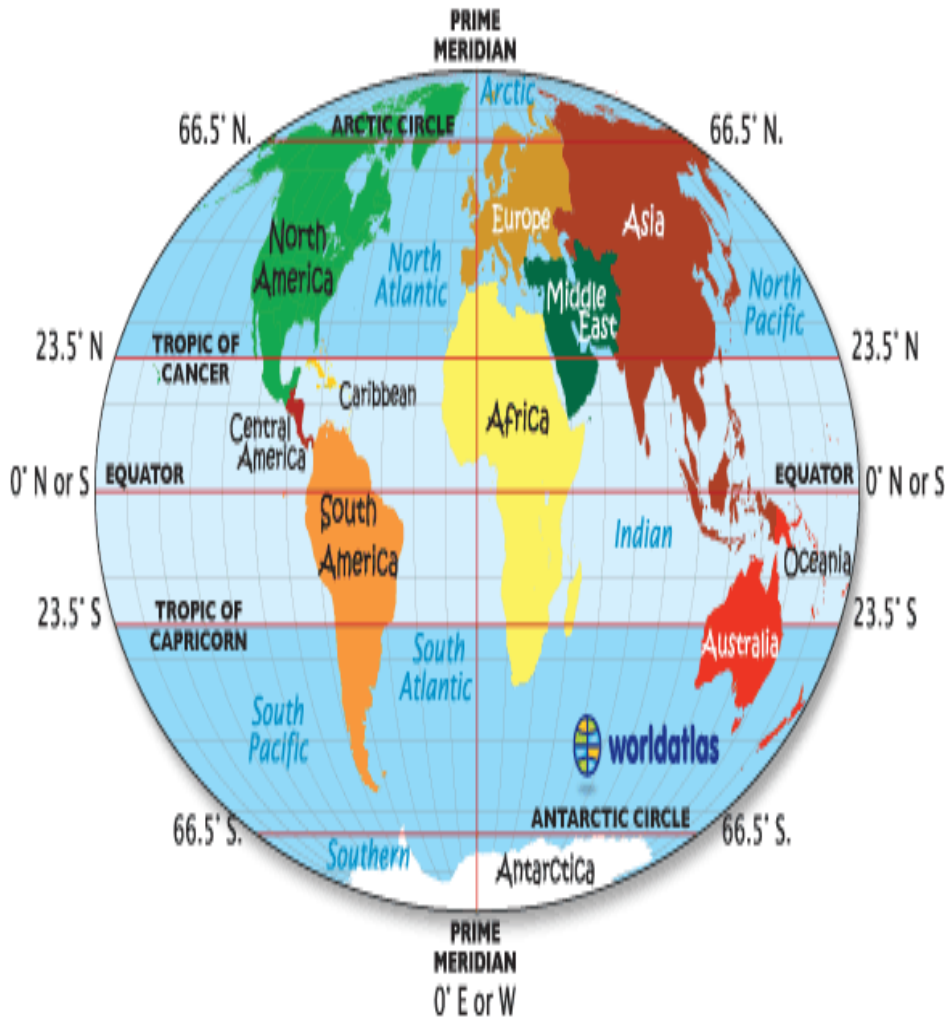
Energy Efficient Systems

- Use of Energy Efficient equipment BEE Star (*) rating like A/C and Refrigerators heaters etc which consume maximum Electricity.
- Replace old Light fixtures with new LED lights phase wise
- Don't waste electricity .. Switch off when not necessary

These systems cost a little more initially but saves huge money in long term and saves universe.

The Source used is Sunlight to meet increased need of the society, which is Free of Cost & we do not have to pay for it to the Generator. It's you, the Creator Let's do it

India - Geographical



Geographical Facts of India

- Geographically, India is lucky to receive Solar Energy for greater part of the Year. It is estimated **that during a year, India receives Energy Equivalent to more than 5000 Trillion/kWH. The Daily average 4 to 7 kWh/M².**
- The earth's atmosphere exposed perpendicularly to the rays of the sun at the **average distance between the Sun & Earth is known as Solar Constant & estimated Energy is 1.4kW/M². The capacity of solar measured in kWp.**
- The most sunshine in a Tropical country like India is received from the South direction. **The peak sunshine in India is received from 11:00AM-04:00PM.**

Solar Energy

Basic Principle

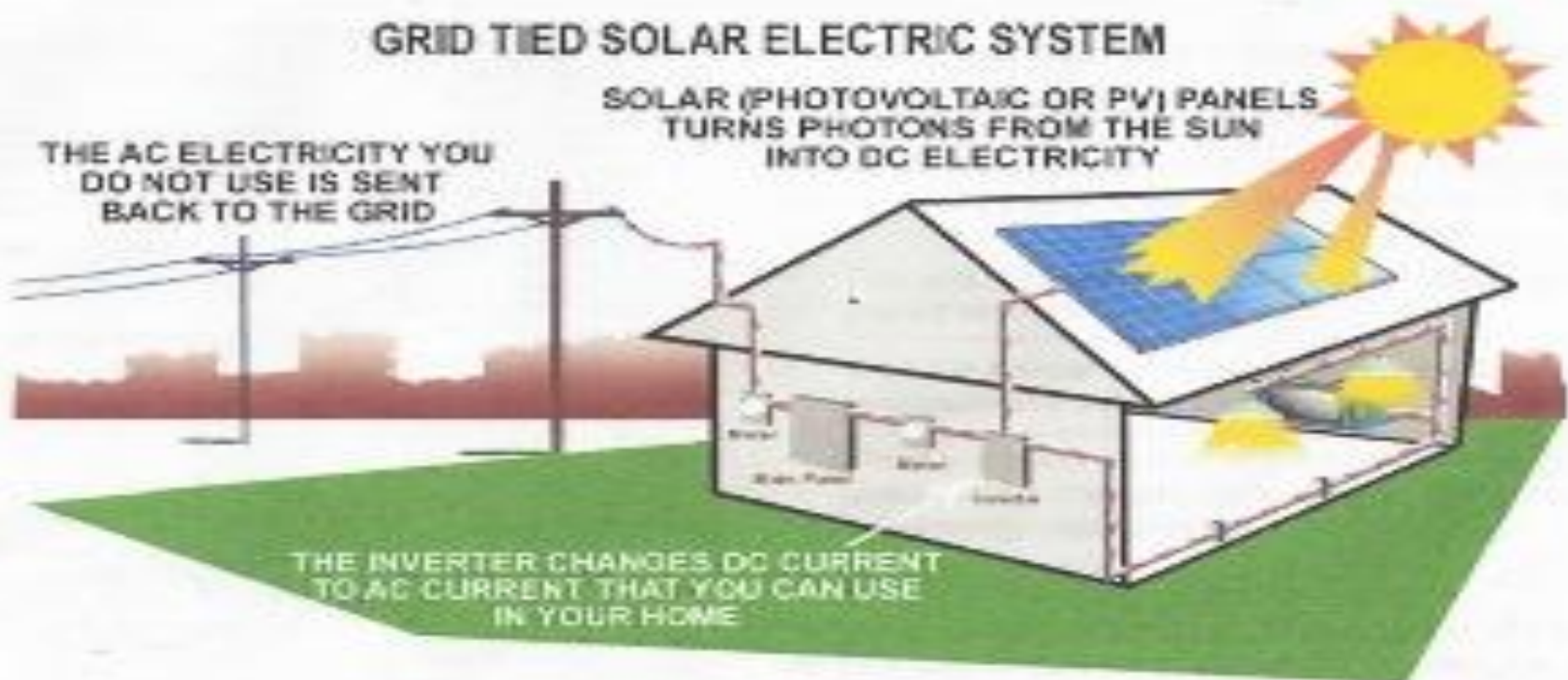
To absorb solar energy and convert it into heat energy or electricity by absorbing it through Thermal or Photovoltaic systems respectively.

Principle components are :

- Solar thermal collectors (Evacuated Tube Collectors) and Insulated Tanks in case of a Solar Water Heating Solution also known as Solar Thermal System
- Solar Photovoltaic Panels, Inverters and Balance of System Accessories (like batteries in a battery backed-up system, charge controllers, junction boxes etc) also known as Solar PV system

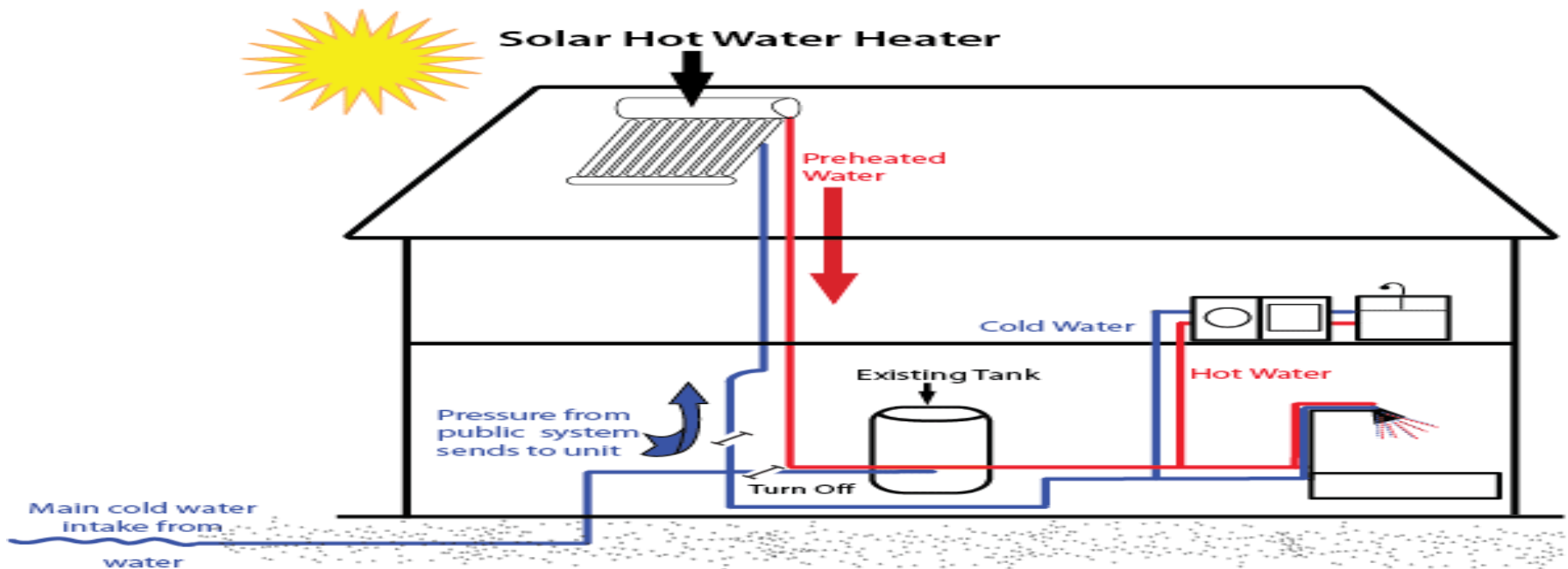
Solar Energy System - SPVS

These are manufactured using superior quality ,basic material and advance technology which ensure the compliance with defined industrial standards . Efficiency of system is related to efficiency of solar collectors.



Solar Water Heating System

- Solar water heaters save electricity and thus money; electricity is becoming more and more expensive and its availability is becoming unreliable;
- Solar water heaters are non-polluting.
- Solar water heaters are safer than electric geysers as they are located on the roof top.
- For every 1000LPD (Litres Per Day) the electricity used is 42units, whereas it can be done for FREE with a Solar Water Heating System.



Consideration – Govt. & Environment

The subsidy at 30% of benchmark cost of Rs 87,000/KW = Rs 26,100/KW after the installation and commissioning.

E.g. for 100 kW system, Rs 26,100 * 100= Rs. 26,10,000.00.

NOTE : IT IS NOT APPLICABLE FOR COMMERCIAL & INDUSTRIAL SECTORS.

And the environmental benefits of the said system are as follows:

- 1) 16750 trees planted on the rooftop
- 2) 1100 cars taken off road each year
- 3) 806250 pounds of CO₂ off settled from the atmosphere annually
- 4) 30 railcars of coal not burnt each year
- 5) 80 tanker trucks of gasoline not burnt each year
- 6) 335 Olympic Size Swimming Pools worth of water saved from electricity production.



***ORGANIC
WASTE
MANAGEMENT***

ZERO WASTE SYSTEM



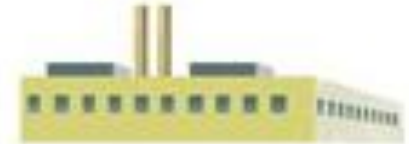
CHANGING THE RULES



SHIFTING SUBSIDIES



DESIGN FOR THE ENVIRONMENT



CLEAN PRODUCTION



DISTRIBUTION



EMPOWERED CONSUMER



RESOURCE RECOVERY CENTERS



PRODUCER RESPONSIBILITY



JOBS FOR THE ENVIRONMENT

Waste Management



Waste, Waste everywhere ..

- *Waterwise Systems, A Roman Group Co. offers you,*
 - ***composter***
 - ***Organic Waste Crusher (OWC) with Fiber Pit***
 - ***Organic Composter***
- for*
- RESIDENTIAL,
 - COMMERCIAL,
 - INDUSTRIAL ESTABLISHMENTS,
 - CONSTRUCTION,
 - CAMPS, CAMPUSES AND
 - HOTELS

Organic Waste Crusher

- It lowers environmental impact. The compost provides benefits to soil it's used in, improving moisture absorption and drainage.
- Carbon re-absorption and reduction of carbon dioxide-potential for carbon trading. 1 ton of waste converted per day helps reduce **327 tones** of carbon going into the atmosphere.
- There is reduction in runoff that results from its use makes existing fertilizers (both natural and chemical) a lot more effective. Fertilizer contamination of water is also significantly reduced.
- The environmental benefits of using compost are significant. Making use of this material can help clean up contaminated soil, reducing runoff of toxic materials and binding some toxins.

Organic Waste Crusher



OWC & Composter - Can do !

ALL THE BELOW MATERIAL
CAN BE COMPOSTED



RESTRICTED ITEMS
(feed in limited quantity)

Paper – not to exceed 5% of garbage



Carpentry waste (wood only)-- not to exceed 5% of weight of garbage



Cardboard packaging waste (no plastics)-- not to exceed 5% of weight of garbage



Total of these items -- not to exceed 10 % of weight of garbage

Store and distribute feed over a few days

PACKAGED GARBAGE COMPOSTER

Features

- Extremely compact, prefabricated, containerized and elegant system
- *UNSIGHTLY MATURATION TRAYS ARE ELIMINATED AND THE ENTIRE REACTION OCCURS IN THE REACTOR ITSELF.*
- No need to touch garbage. Once it is charged to the shredder, the rest of the process happens without much human intervention. Compost is automatically ejected from the composter through sieves on rotation of the composter drum.
- Robust shredder – easy to operate. Can easily handle hard and large material.
- Composting process completed in 8-10 days with bio-culture
- Minimal civil works required (only a foundation pad). Low Sound , clean operation
- Easily expandable. Good odor management
- Excellent quality of compost. Built-in sieve for uniformly graded compost
- Negligible energy consumption. Negligible maintenance
- Option of Solar Power operation. User friendly interface
- E-connectivity of ECOBIOCOMPACT installation for on-line observation & support.

Composter-Caution! Can't be done!

NON COMPOSTABLE STUFF

ALL THE BELOW MATERIAL CANNOT BE COMPOSTED



THERMOCOL &
PACKING MATERIAL



PLASTICS



PLASTIC AND METAL
BOTTLES, AND CONTAINERS



CONSTRUCTION DEBRIS



LEATHER, REXINE



BATTERY
CELLS



SANITARY NAPKINS



PVC Etc.



CLOTH



LIQUIDS



STEEL ITEMS

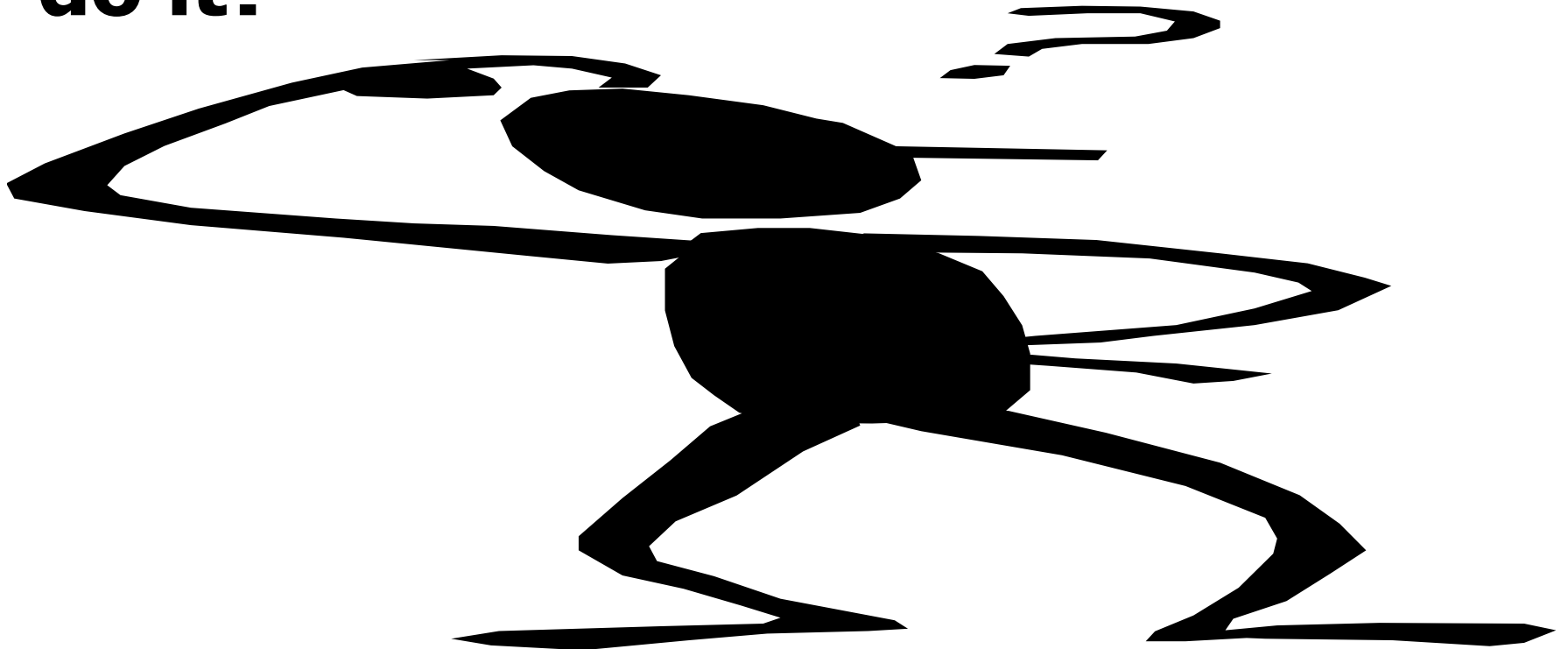


HARDWARES

IN SHORT, ANYTHING THAT IS NOT OF NATURAL ORIGIN CANNOT BE COMPOSTED

5S BASIC

What is 5S and why do we want to do it?



5S - ?

1. Sort -

2. Set

3. Shine

4. Standardize

5. Sustain

What is 5S and why do we want to do it?

- 5S is short for: Sort, Set in Order, Shine, Standardize and Sustain.
- **5S** represents 5 disciplines for maintaining a visual workplace (visual controls and information systems).
- These are foundational to Kaizen (continuous improvement) and a manufacturing strategy based "Lean Manufacturing" (waste removing) concepts.
- 5S is one of the activities that will help ensure our company's survival.

5S

- 1. Sort** - All unneeded tools, parts and supplies are removed from the area
- 2. Set in Order** - A place for everything and everything is in its place
- 3. Shine** - The area is cleaned as the work is performed
- 4. Standardize** - Cleaning and identification methods are consistently applied
- 5. Sustain** - 5S is a habit and is continually improved

Also - Work areas are safe and free of hazardous or dangerous conditions.

5S Examples - Sort, Set in Order



BEFORE See the difference? AFTER

- 1. Sort** - All unneeded tools, parts and supplies are removed from the area
- 2. Set in Order** - A place for everything and everything is in its place.

5S Examples - Shine



3. Shine - The area is cleaned as the work is performed (best) and/or there is a routine to keep the work area clean.

5S Examples - Standardize

4. Standardize - Cleaning and identification methods are consistently applied.

Departments have **weekly 5S tours**

Every job has duties that use **Sort, Set in Order and Shine.**

We all have common duties to do our part to **keep all areas of the plant in ship shape - breakroom, restrooms, locker area, parking lot, offices, etc**

5S Examples - Sustain

5. Sustain - 5S is a habit and is continually improved

5S is a simple concept with powerful results.

You will have more interest about 5S when become used to with 5S mindset so that you will be well equipped.

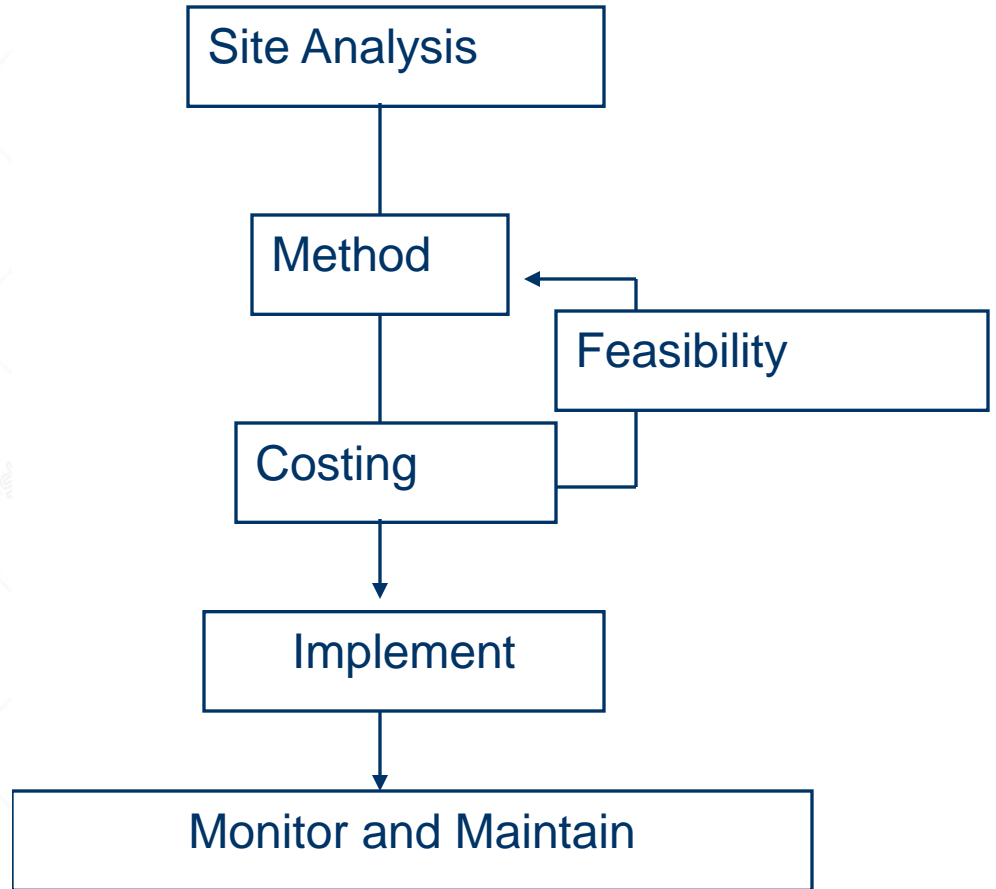
Our experience is that the more we do 5S the better the work environment becomes: cleaner, safer, more organized, the work is easier, less confusion and less stress.

Use the 5S (work\home\play) - The more you use it the easier it becomes and life just gets better and better.

BABY STEPS TO GOING GREEN



Green House



Its Time to do our bit





Thank you!!!

***Seven Eleven
Environmental Resources Management***