



GRIHA

VOLUME-4

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CONTENT

- Water and waste management
- Sustainable building materials
- Health and well-being of building occupants
- Building operation and maintenance

REDUCE WATER USE IN THE BUILDINGS

Conservation and efficient utilization of resources

- **Water efficient fixtures:**

Gravity tank WC



Low flow shower heads



Flush valve operator



Kitchen and
lavatory faucets



Efficient use of water during construction

- Membrane curing with plastic sheets



- Use of gunny bags for curing



- Ponding for curing



- Advantages of it using in Cellular light weight concrete blocks[CLC]:

- 1) Better strength-to-weight ratio

- 2) Reduction of dead resulting in saving of steel and cement

- 3) Reduction in foundation size

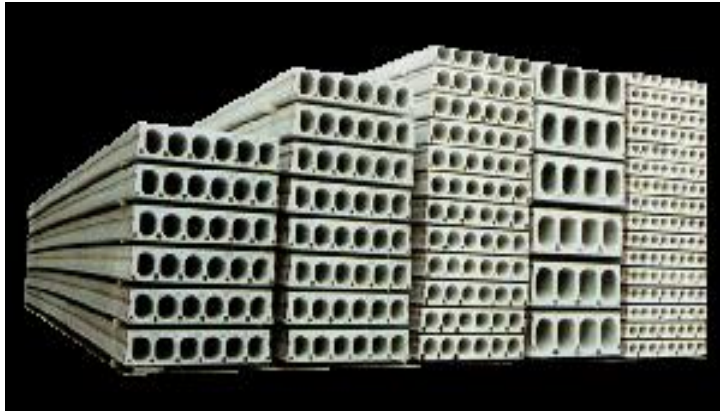
- 4) Better acoustic and thermal insulation

- 5) Saving in consumption of mortar

- 6) Chemically inert and stable (high fire safety rating)

Adopting efficient technologies and materials

Pre-stressed slab elements



Micro concrete roofing



Perforated brick masonry



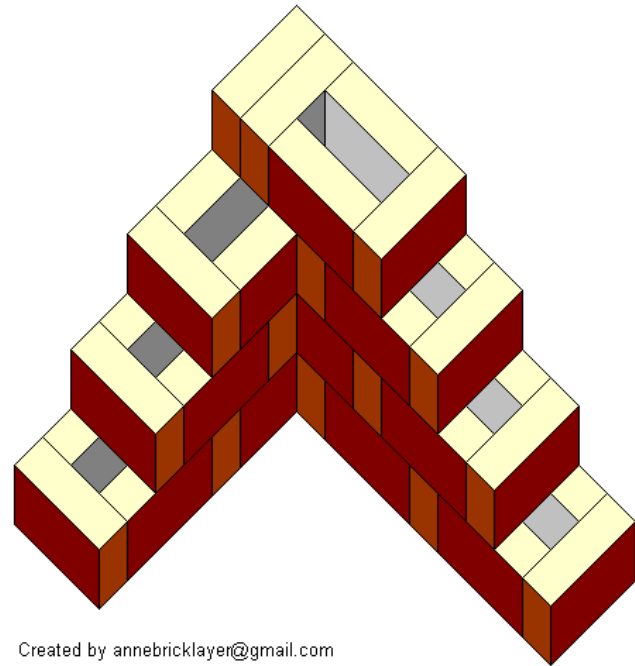
Stabilized compressed earth blocks



Pre cast stone block



Rat-trap bond



Created by annebricklayer@gmail.com

USE LOW-ENERGY MATERIAL IN INTERIORS

- Characteristics :

1)Raw materials should be renewable .

2)Raw materials should have non-toxic nature.

3)Durable and requires low maintenance .

4)Should generate minimum waste during manufacturing .

- Terrazzo flooring



Re-used wood products

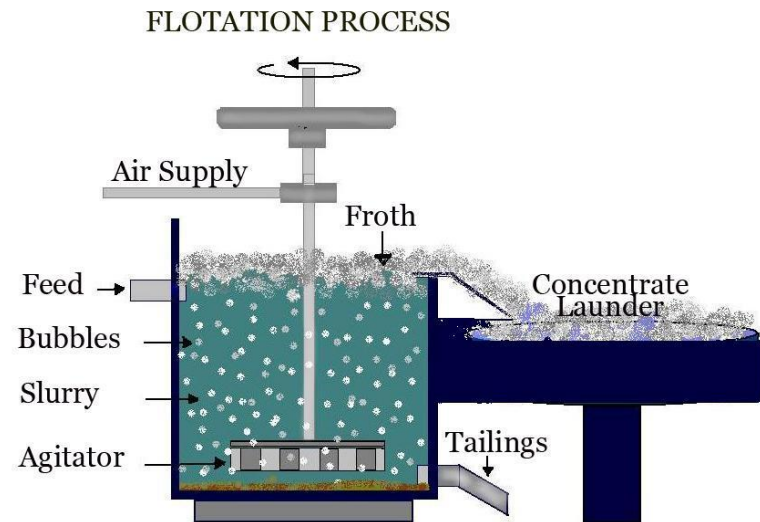
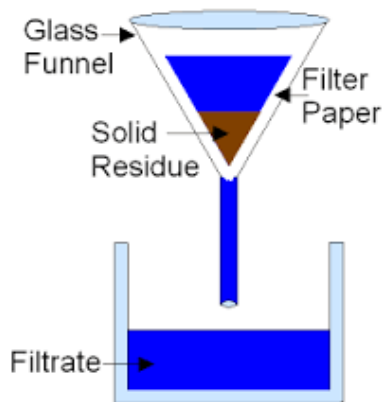
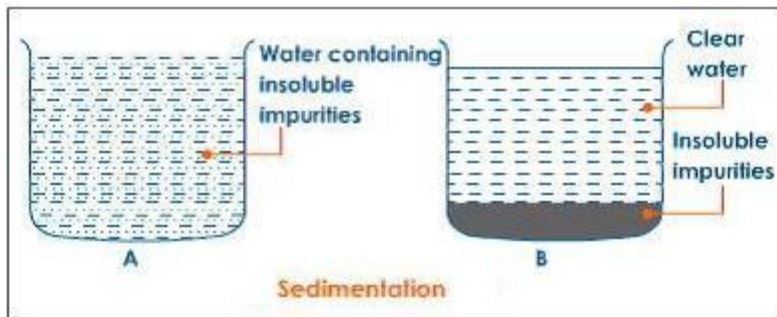


Re-cycled material products

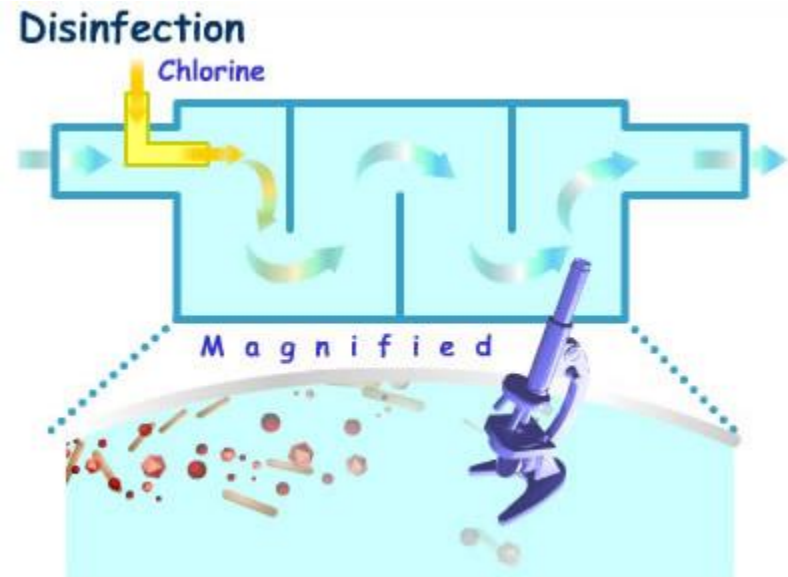
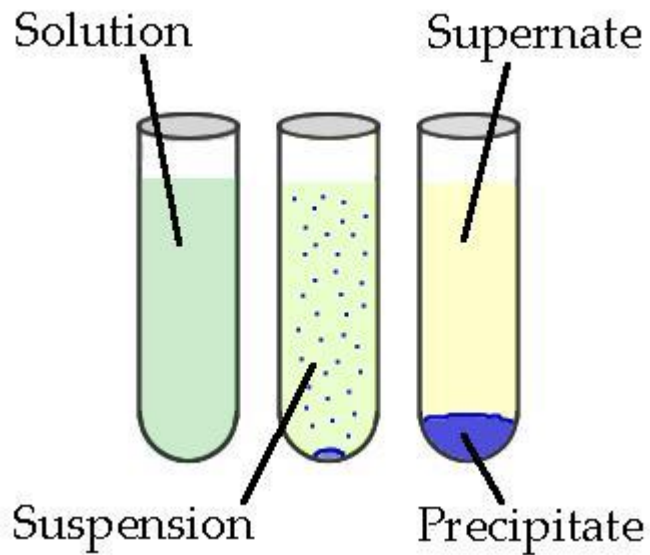


WASTE WATER TREATMENT

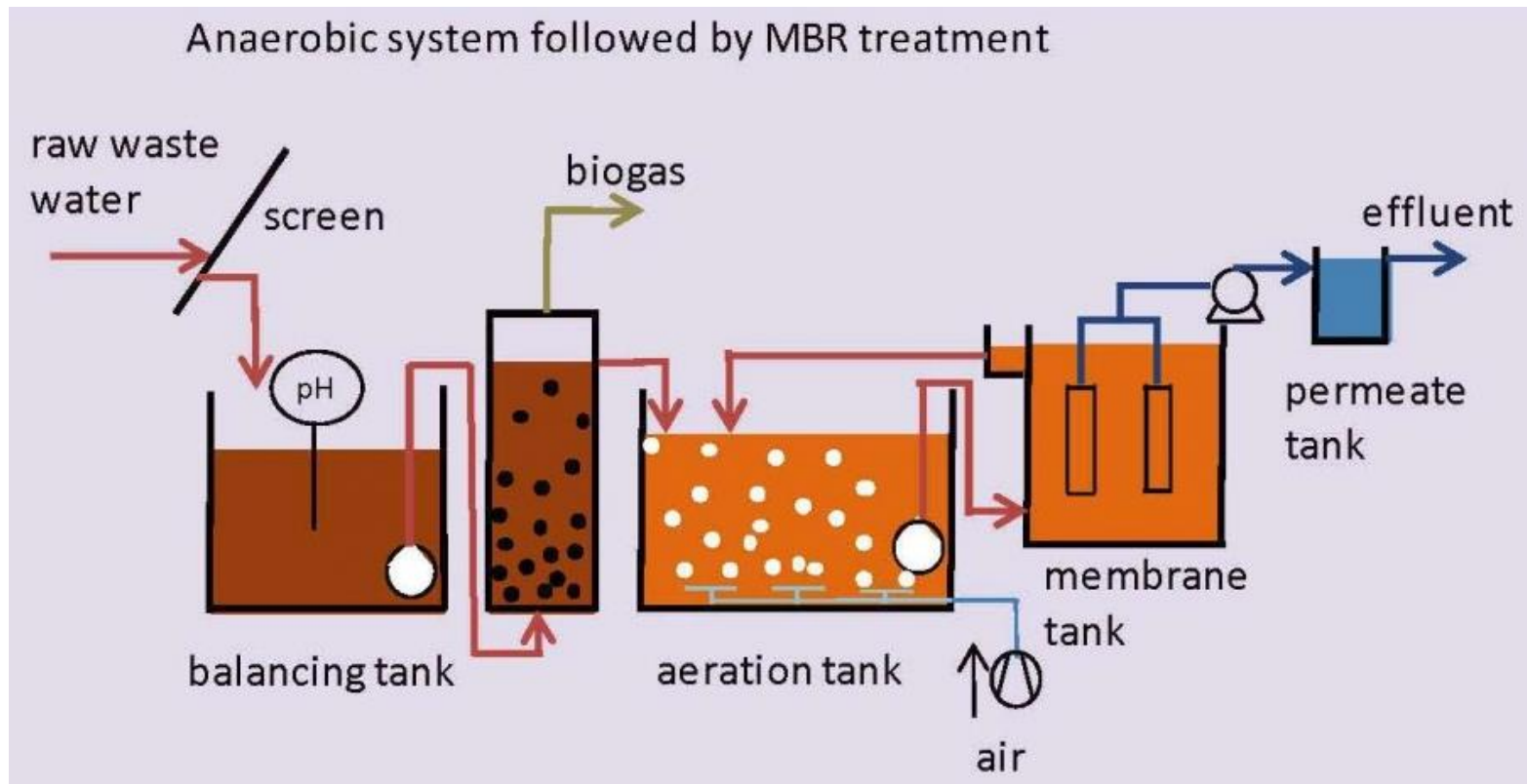
- Physical unit operations:

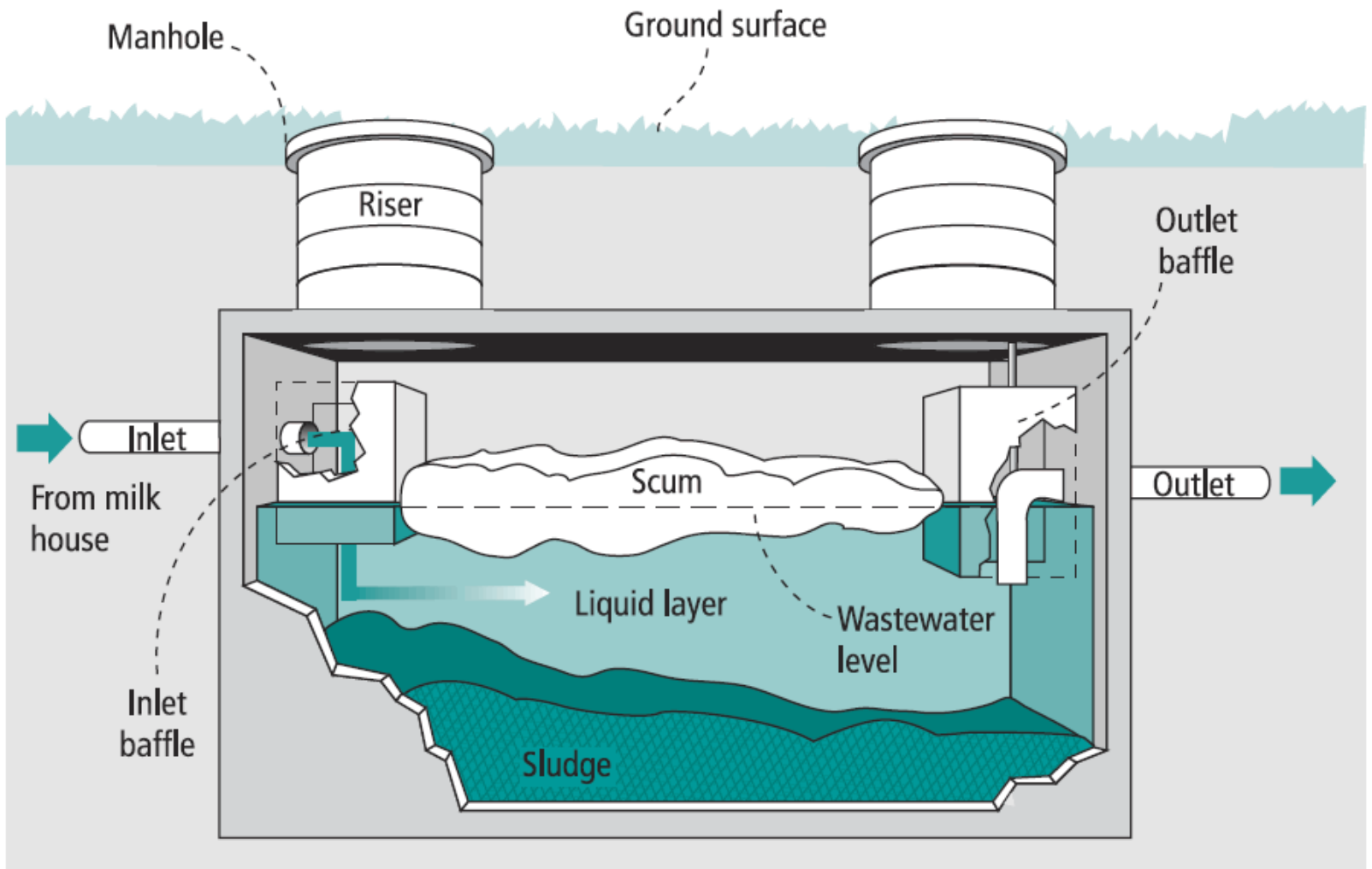


- Chemical unit operations:



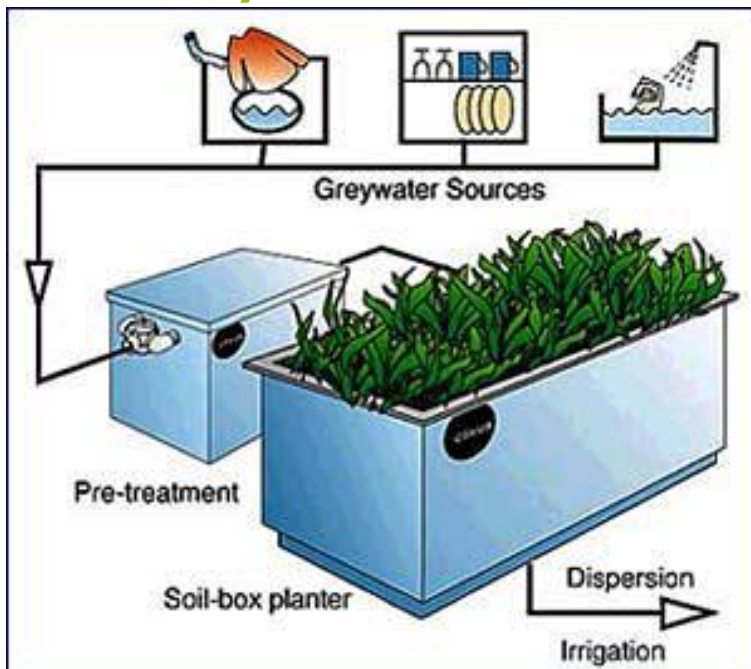
- Biological unit operations:



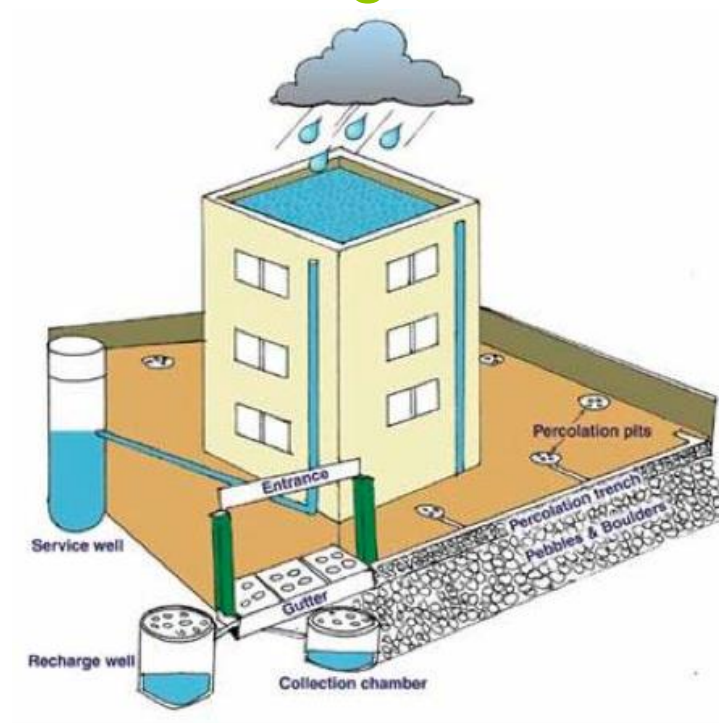


WATER RE-CYCLE AND RE-USE

Dual plumbing system



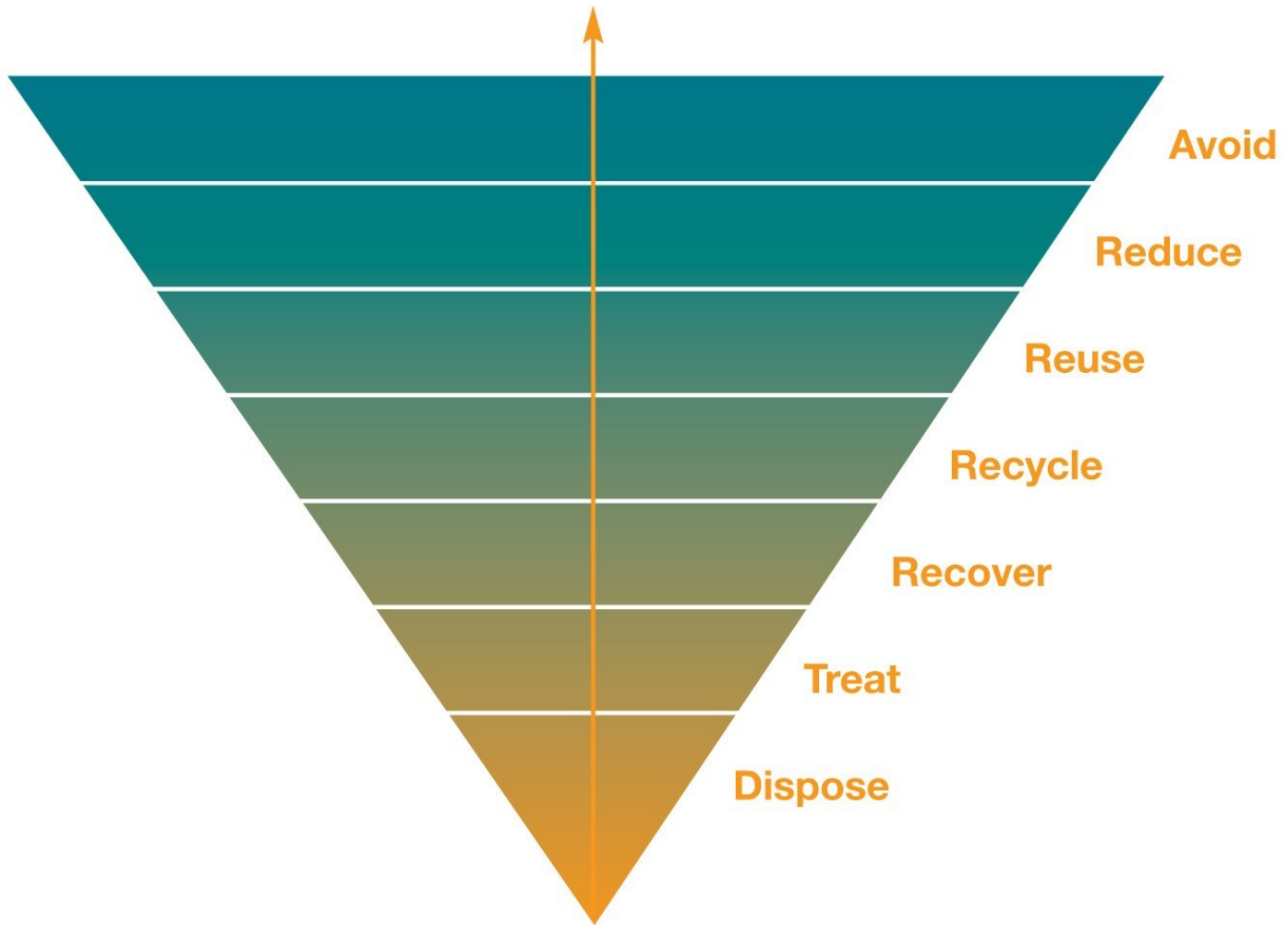
Rain water harvesting



REDUCTION IN WASTE DURING CONSTRUCTION

- Avoid over specification of material quantities for beams and columns
- Avoid designs that restrict use of re-cycled materials.
- Avoid sizing of members which involve lots of wastage from cuts.

Most Preferable



Least Preferable

EFFICIENT WASTE SEGREGATION

- Commercial buildings:
 - Wastes like by-products and materials during business activities and management.

- Hotels and restaurants :

Should have in-house arrangements for treating biodegradable waste.

Offices should only give their e-waste to registered e-waste handling agencies

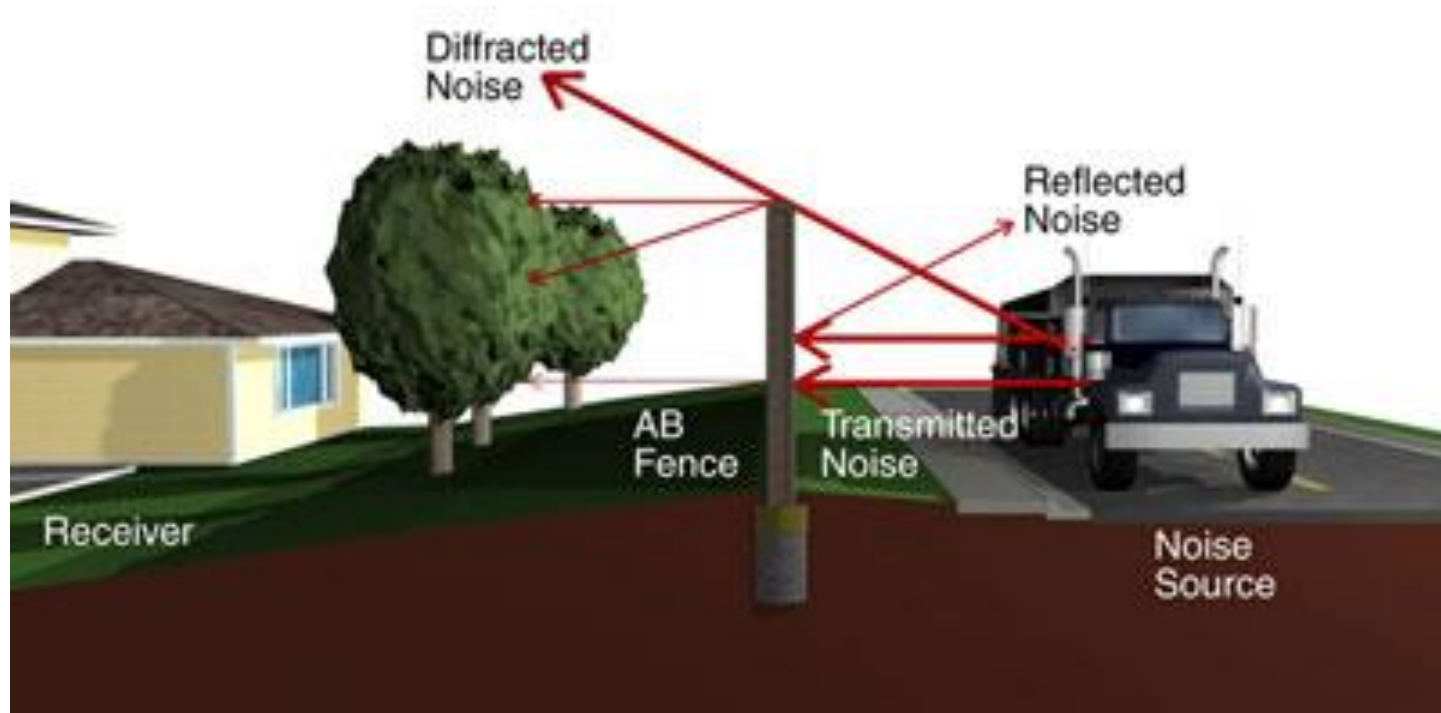
STORAGE AND DISPOSAL OF WASTE

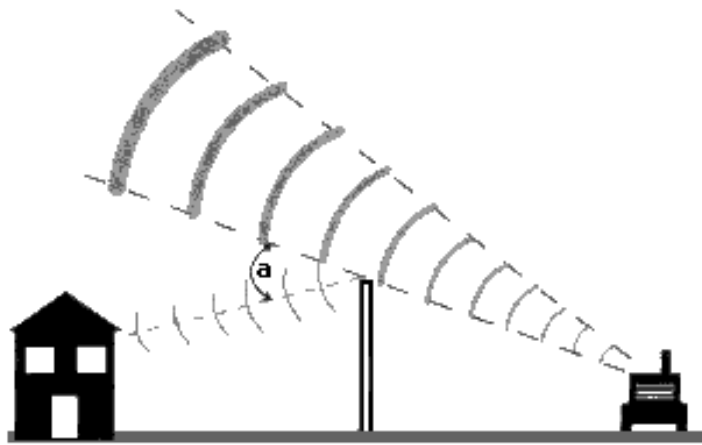
- Before going to dump site the waste has to be stored
- The storage facility should not create any unhygienic conditions
- Capacity should be large
- Double-shoot system for organic and inorganic waste disposal and collection

RESOURCE RECOVERY FROM WASTE

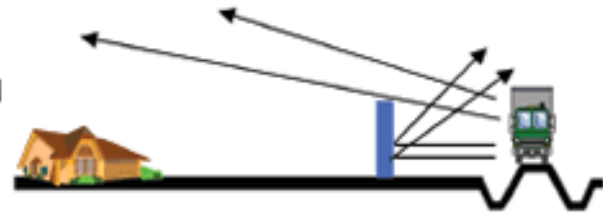
- Waste paper is converted into the recycled paper and can be sold to news paper agencies
- Glass and plastics can be converted into various household goods.
- Horticulture wastes like ,leaves ,vegetable wastes, can be composted in pits or heaps

OUTDOOR AND INDOOR NOISE LEVELS

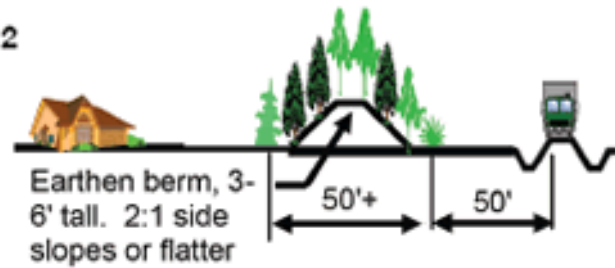




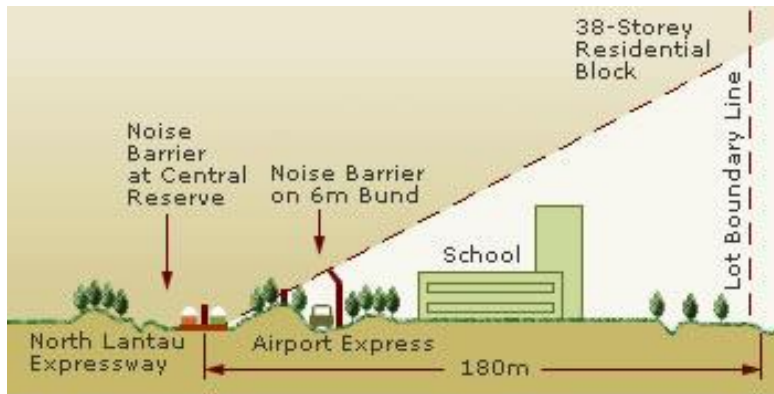
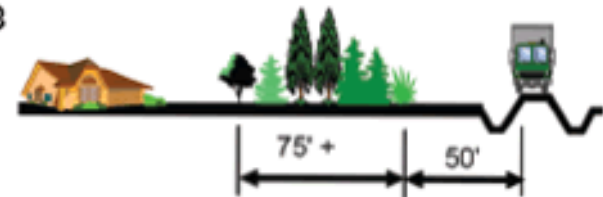
example 1



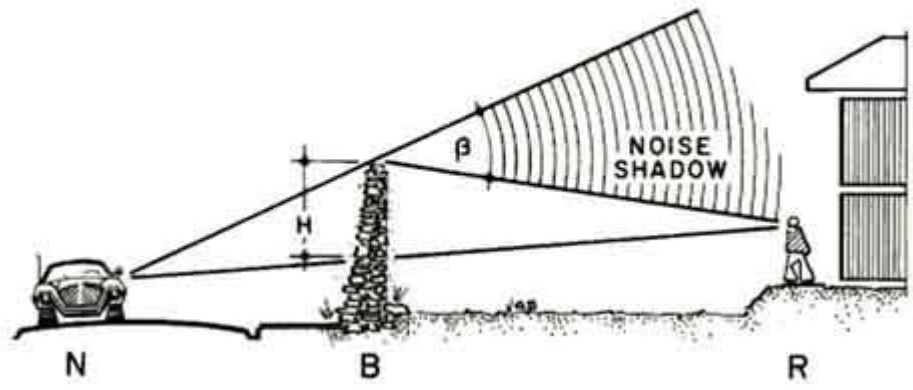
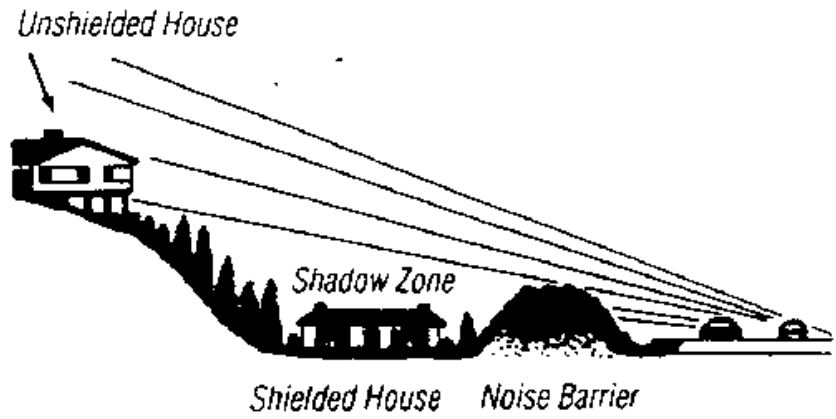
example 2



example 3

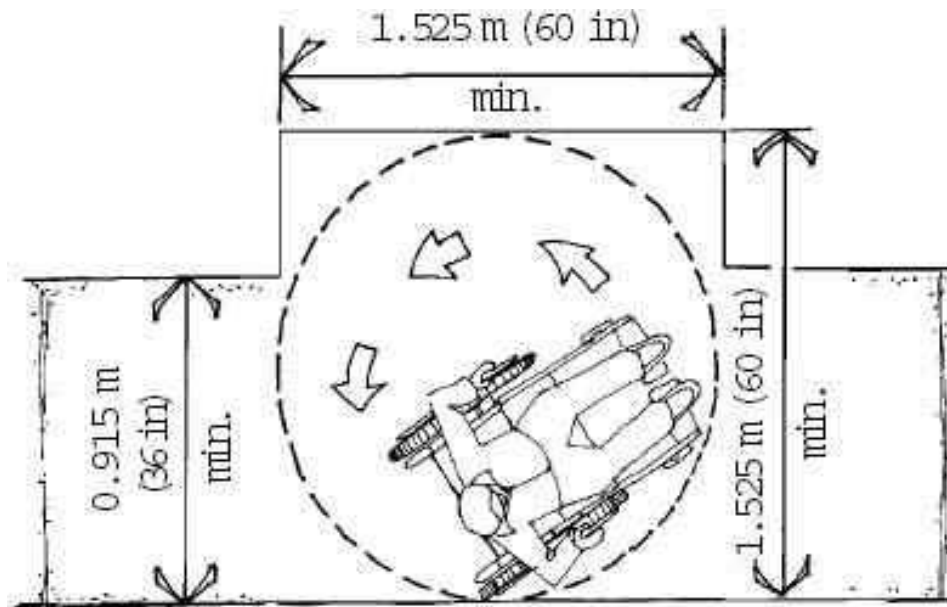


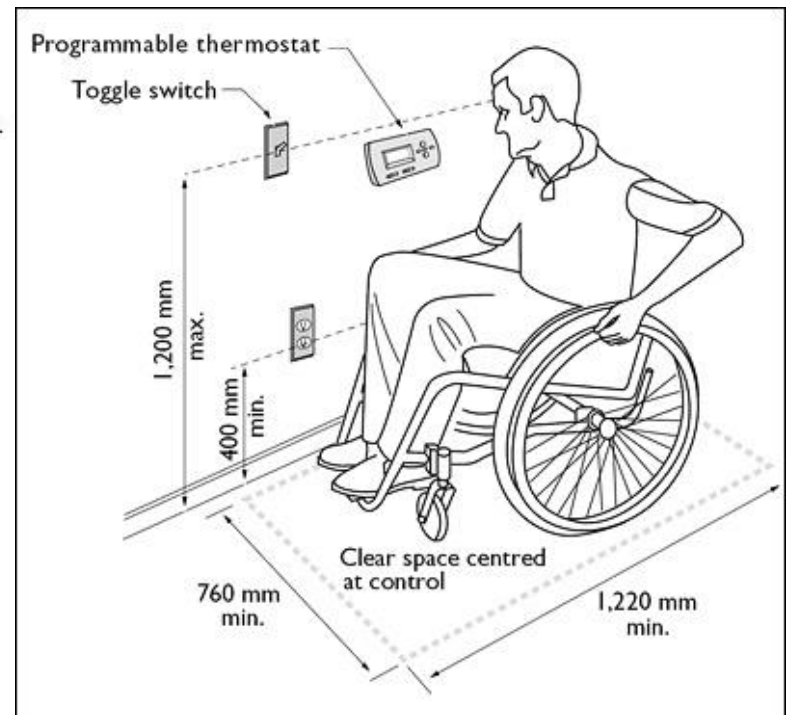
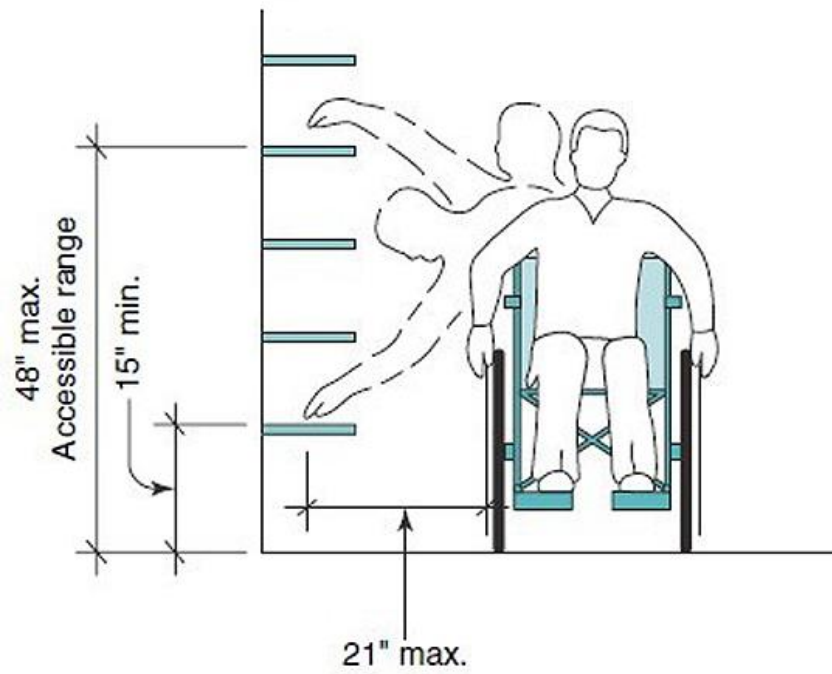
Noise barriers deflect sound and protect residents from road and rail noise.

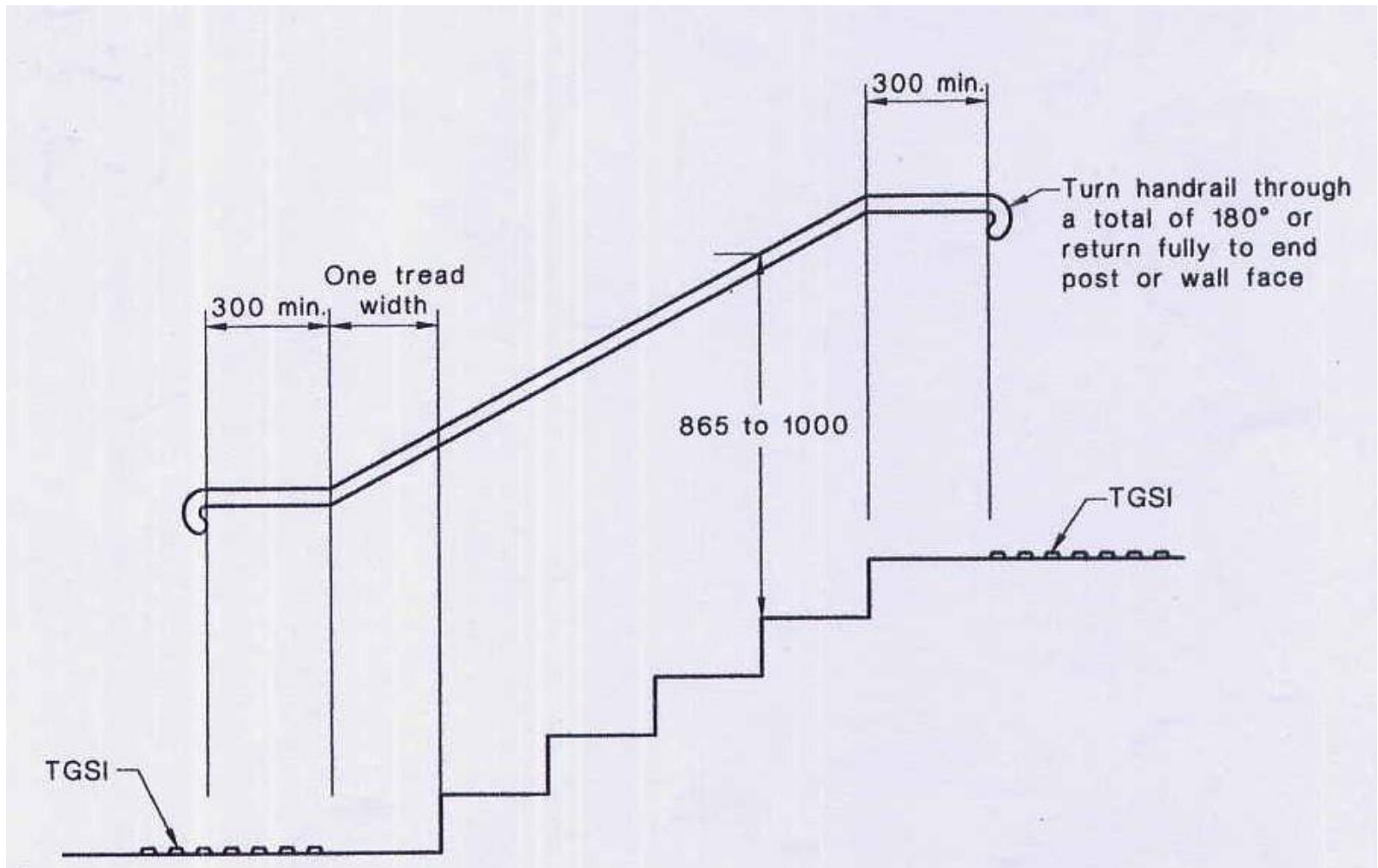


HEALTH AND WELL-BEING OF BUILDING OCUPANTS

- Maneuvering space needed for wheelchair users

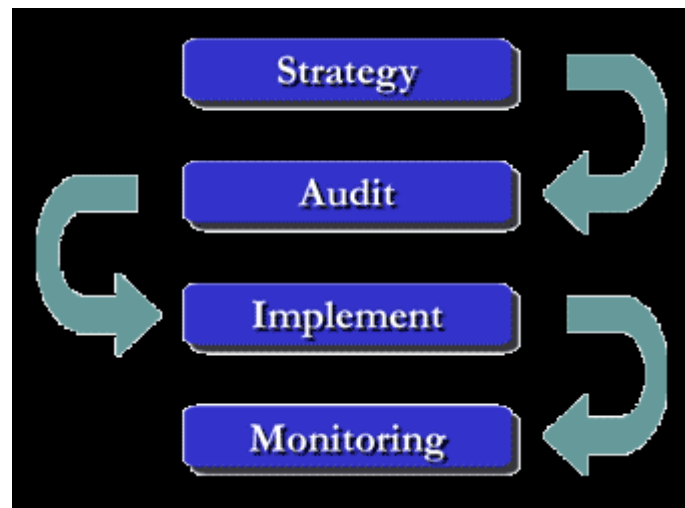






AUDIT AND VALIDATION

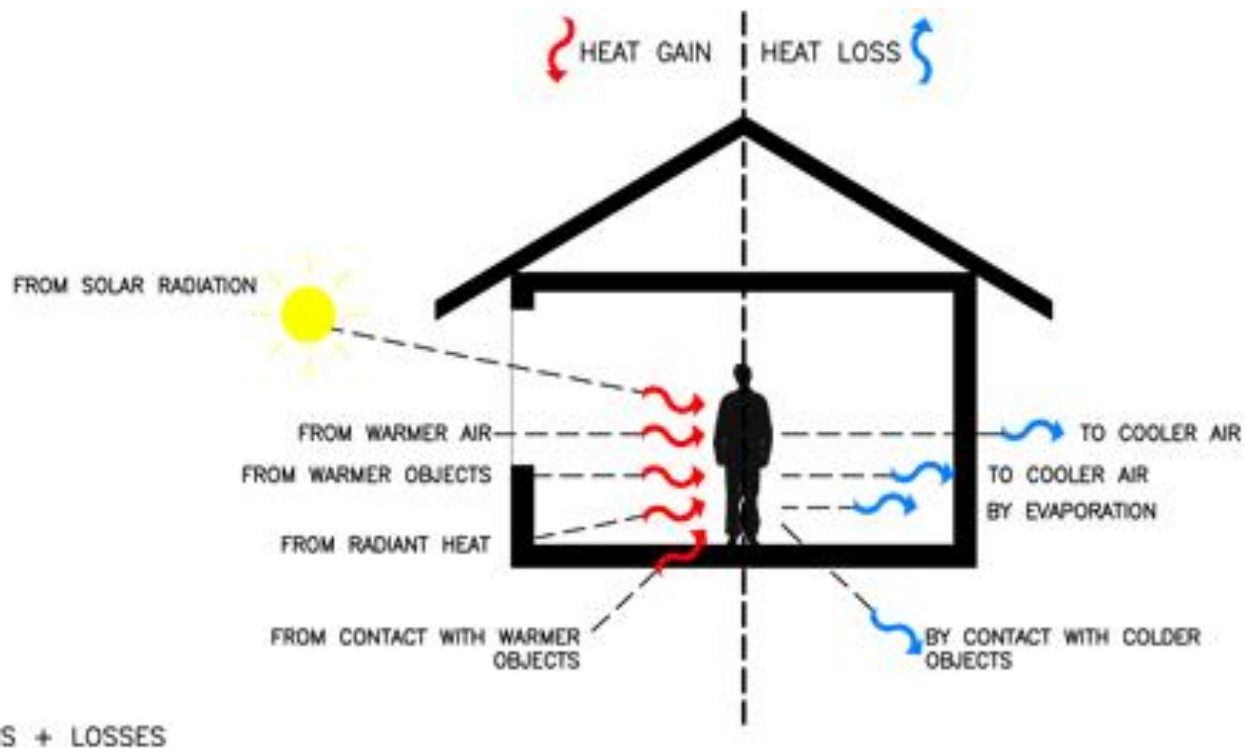
- First step towards ensuring that the building systems are performing as designed.



1) Energy Audit:

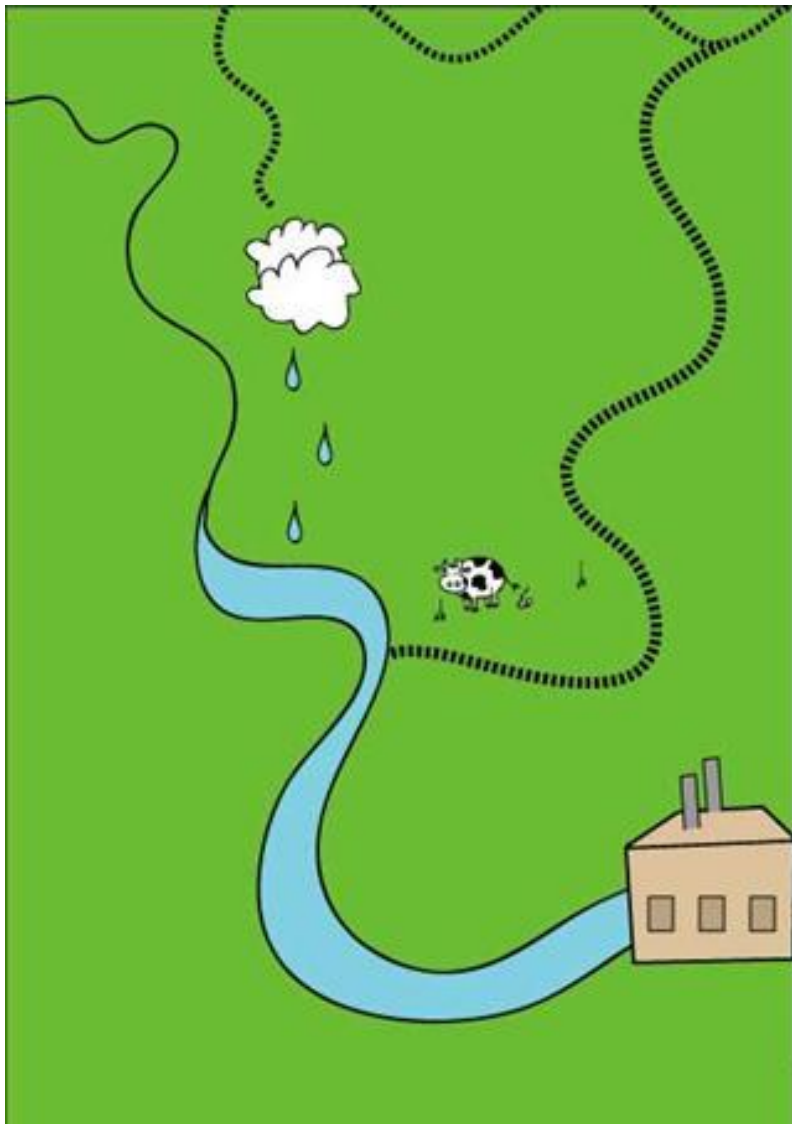


2) Comfort Audit:



3) Water and Waste Audit:

- Water audits are performed to understand water supply, consumption and discharge patterns in buildings.



water auditing

what is your water being used for and how much are you using?

An infographic on a blue background with circular icons and dotted lines. The statistics are: - 1 flush = at least 12 litres (toilet icon), - 5 minutes = 75 litres (shower icon), - 1 hour = 1000 litres (fountain icon), - 1 minute = 5 litres (drinking water icon).



- Waste auditing is conducted to quantify the amount and types of waste generated in a building.
- It will evaluate the existing waste management system including the segregation, storage and disposal.
- Its purpose is to assess the effectiveness of the solid waste management system and identify for any opportunities of improvement.

OPERATION AND MAINTENANCE

- Comprises of:
 - Regularly performance monitoring
 - Correct operation of equipments
 - Repair and upgradation of building system
 - Adjustment of mechanical and electrical systems

- Aim of an O and M protocol:
 - To ensure that all building systems performed efficiently through the lifetime of building as per the intent of the design team
 - Prevent any disruptive failures in the building's electrical and mechanical system

- Maintain required standard of the indoor environment and enhanced user's productivity
- Prolong the life of the equipments and systems



THANKYOU
