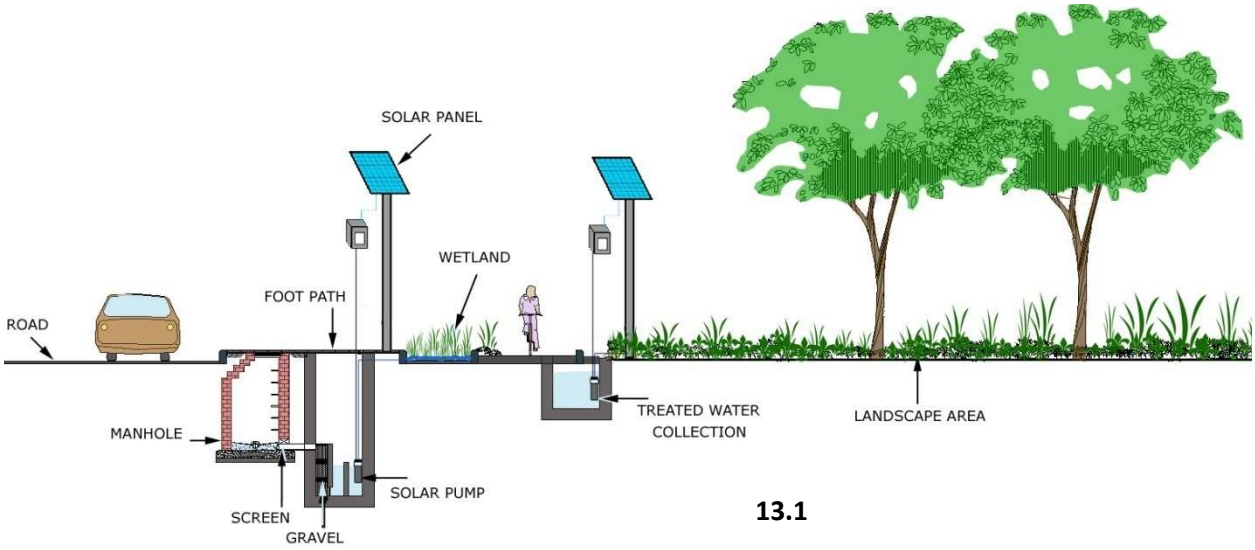
13. Root zone sewage treatment system

REED BED SYSTEM/ CONSTRUCTED WETLAND

Reed bed systems are in use as a secondary treatment method in wastewater treatment systems. The output from septic tank or imhoff tank is treated in the reed bed system. The working principle of the system is filtration through sand, gravel and biological degradation of wastes by aquatic plants.



13.1

The system consists of 100mm top mud layer where plants are grown, below which 100mm sand layer is provided and below the sand layer, 300mm of gravel layer is provided for filtration. The water percolates through the top layer, gets absorbed by the roots and gets treated as roots absorb the pollutants present in it and again the percolated water gets filtered as it passes through the sand gravel layer. After the gravel layer, 100mm RCC slab is provided to prevent the infiltration of the treated water. The treated water can be used to water the green landscapes. The beds can serve flows ranging from $1m^3$/day to more. The constructed wetlands require sizeable land area - 2 to 5 m^2/person.

Aquatic plant species: the selected species should preferably have a rapid growth rate, be tolerant to nutrient rich feeds and be able to withstand wetland conditions. In India, the Phragmites species (available locally) have been reported to be successfully used. About 3-5 Phragmites plant saplings are planted per square meter. At full growth, the plants may be 3-4m tall and 100-150 reeds may exist per square meter.
The quality of the wastewater in terms of BOD (mg/L), volume of discharge and the area available are the deciding factors while planning for a wetland system. Since the construction of wetland system and maintenance involves minimum cost, it is a user friendly system for wastewater handling.

13.2