

Capacity Building cum Need Assessment Sensitization on Water Sensitive Urban Design and Planning

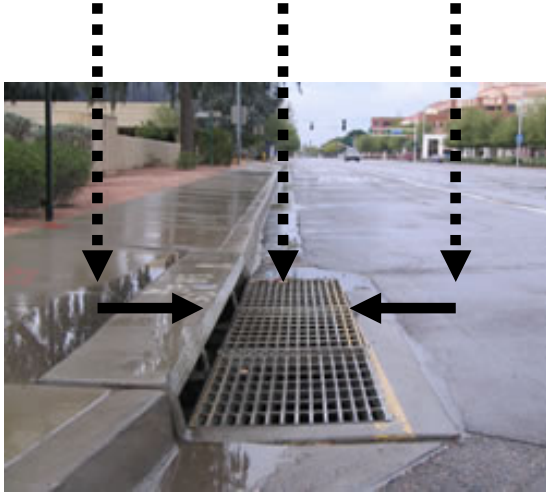
Options and Techniques for RWH in Parks

**Online workshop
18-19, July, 2020**

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Center for Science & Environment, New Delhi**



Precipitation: Rainfall



Rapid conveyance of water & pollutants

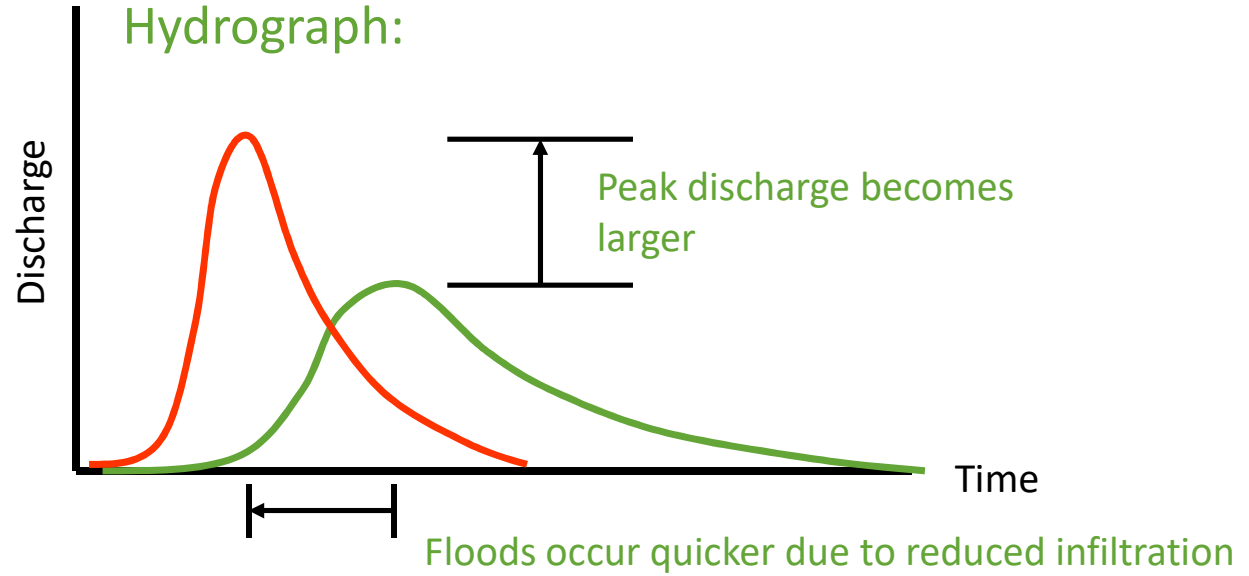


watercourses



Conventional Drainage

Hydrograph:



Public open spaces:

- Attenuate flow
- Promote infiltration & groundwater recharge

Application of RWH/Stormwater harvesting measures

Sustainable Urban Drainage systems (SUDS) manage the flooding and pollution aspects of drainage and ensure that the community and ecology are considered in SUDS design.

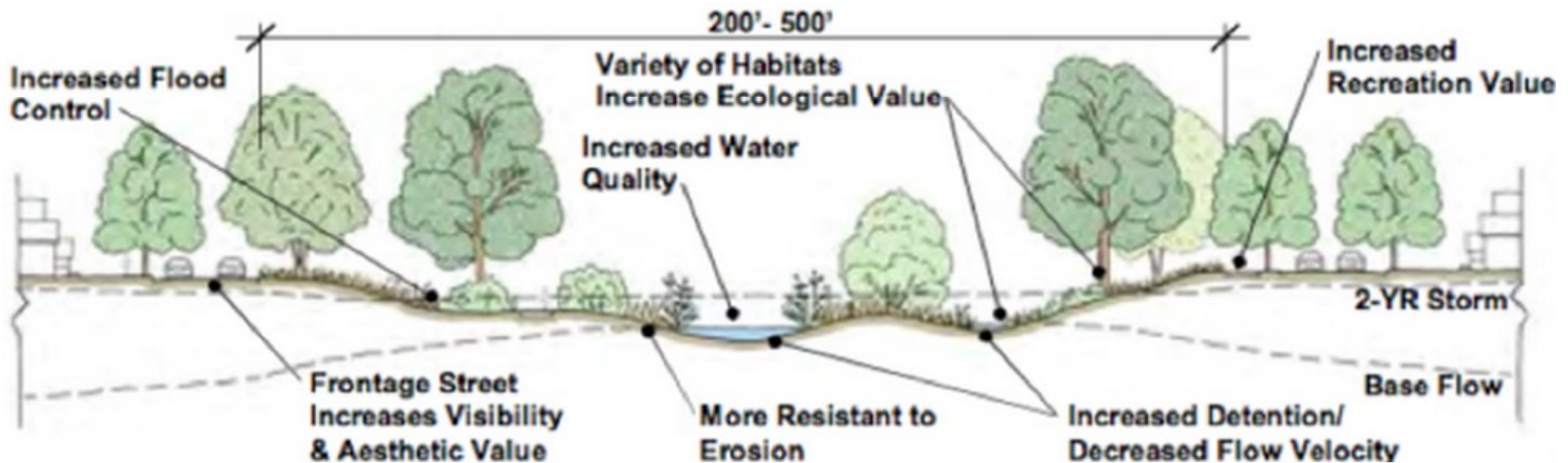
SUDS deliver efficiently and effectively across four key criteria: —

Quantity

Quality

Amenity

Biodiversity



Suggestive trail in context of parks of cities in Odisha:
Swale/trench > bio-retention > recharge pit

Recommended methods 1)

Swales/ infiltration trenches

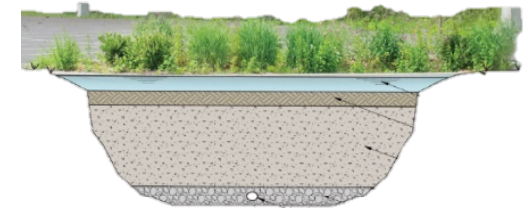
Alternative of the conventional concrete gullies and drainage systems



Recommended methods 2)

Bio-retention areas/ Rain garden

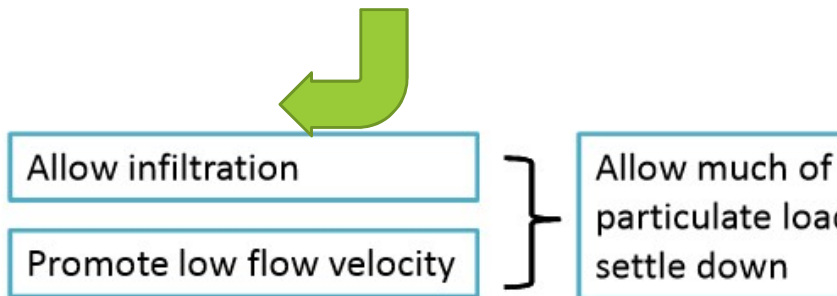
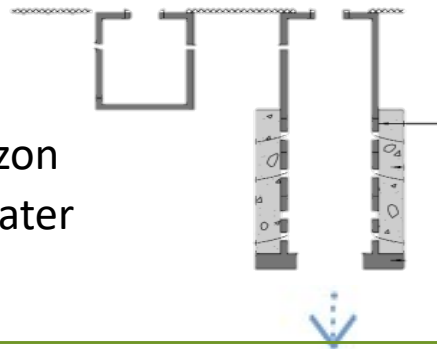
Planted areas that are designed to provide a drainage function as well as contribute to the soft landscape



Recommended methods 3)

Recharge pits with recharge wells

An artificial recharge structure that penetrates the overlying impervious horizon and provides effective access to surface water to recharge the aquifer



Application of RWH/Stormwater harvesting measures on various scales

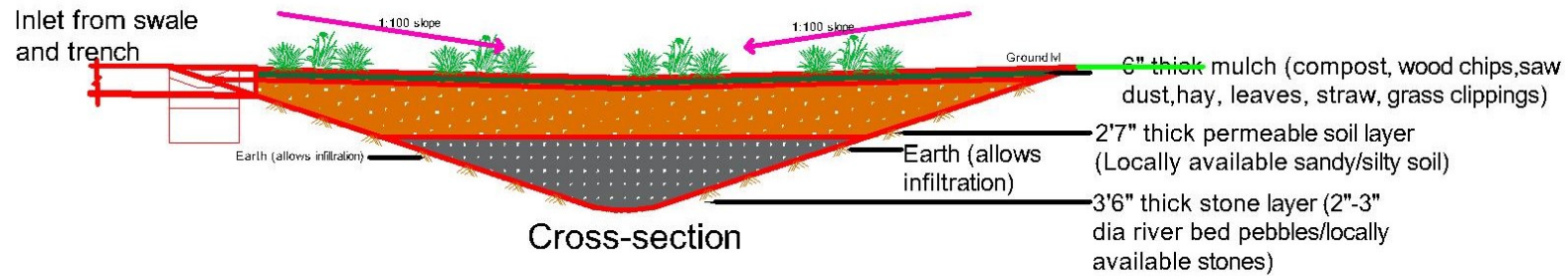
SDP measures		Single detached dwellings	Commercial and industrial development	Medium- and high-density residential development	Public open space	Transport infrastructure	Waterbodies and surroundings
Storm-water management	Filter strips	✓	✓	✓	✓	✓	
	Swales		✓	✓	✓	✓	✓
	Bio-retention areas and rain gardens		✓	✓	✓	✓	✓
	Filter drains and trenches	✓	✓	✓	✓	✓	
	Permeable pavements	✓	✓	✓	✓	✓	
	Detention basins		✓	✓	✓	✓	
	Infiltration basins		✓	✓	✓	✓	
	Ponds		✓	✓	✓		✓

Source: WBM, B. (2009). Evaluating options for water sensitive urban design—a national guide. Joint Steering Committee for Water Sensitive Cities (JSCWSC)

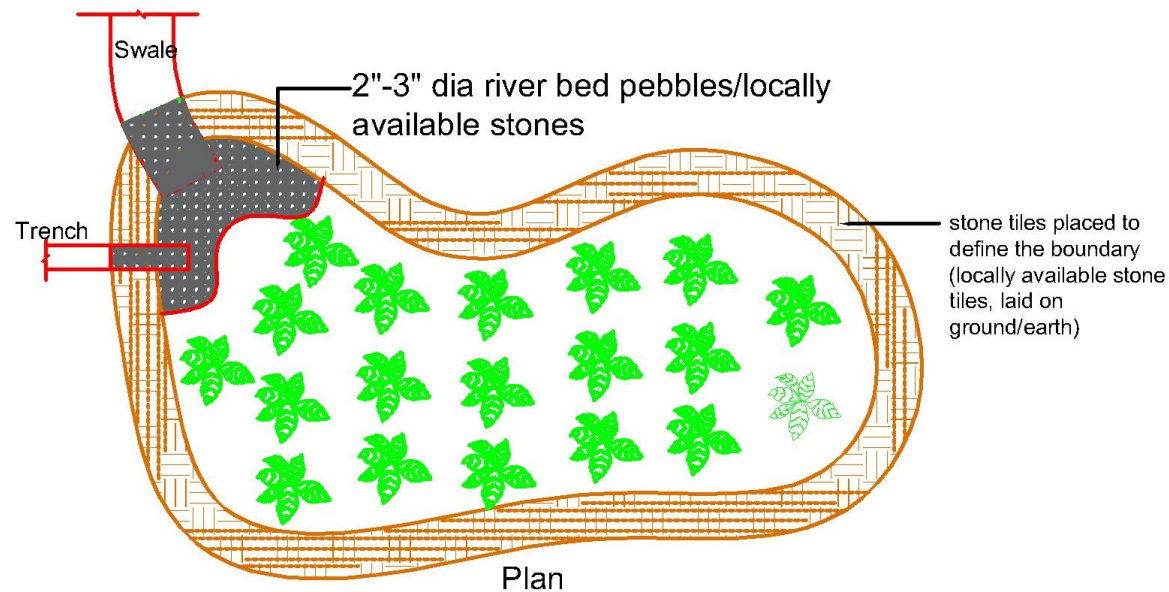
Refer: Pg 53to 54 of WSUDP: A Practitioner's Guide, Implementation of WSUDP

Combination I

in context to parks in cities in Odisha

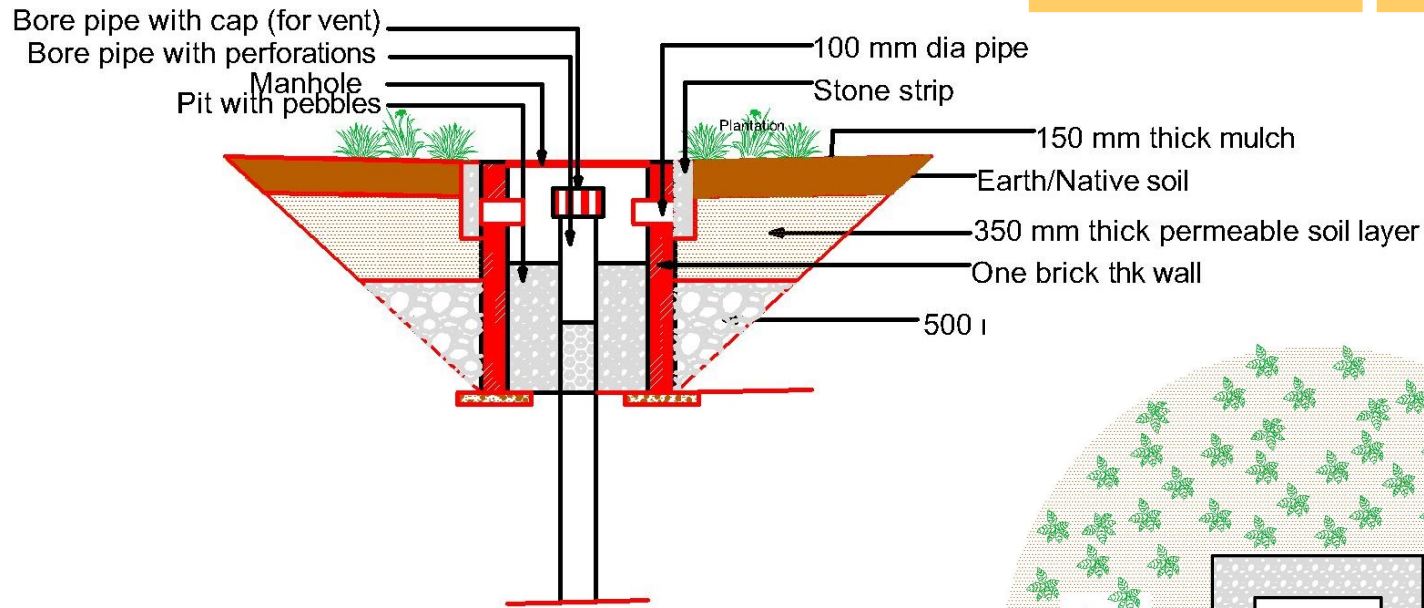


**Swale +
bioretention/rain
garden in parks**

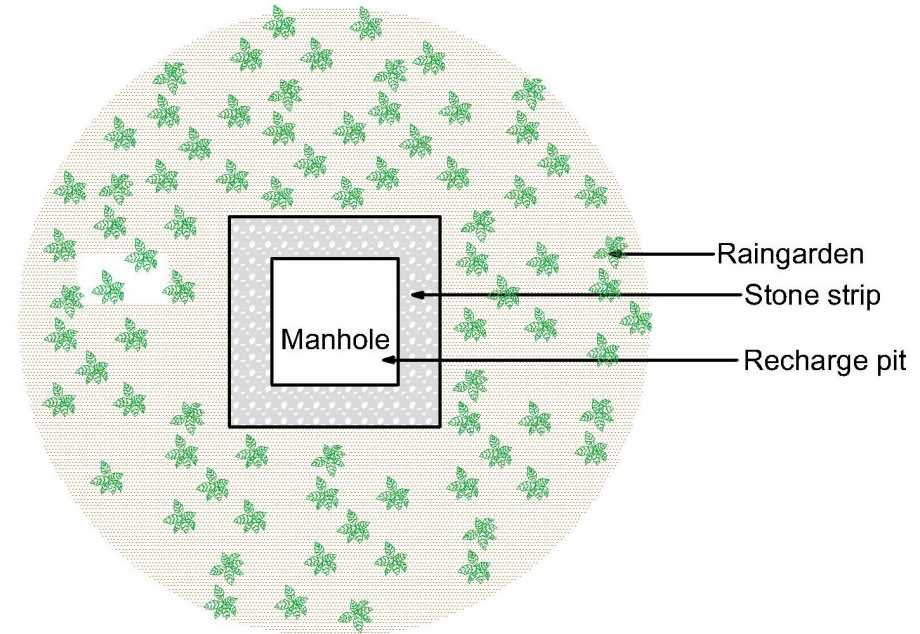


Combination II

in context to parks in cities in Odisha



Cross- section

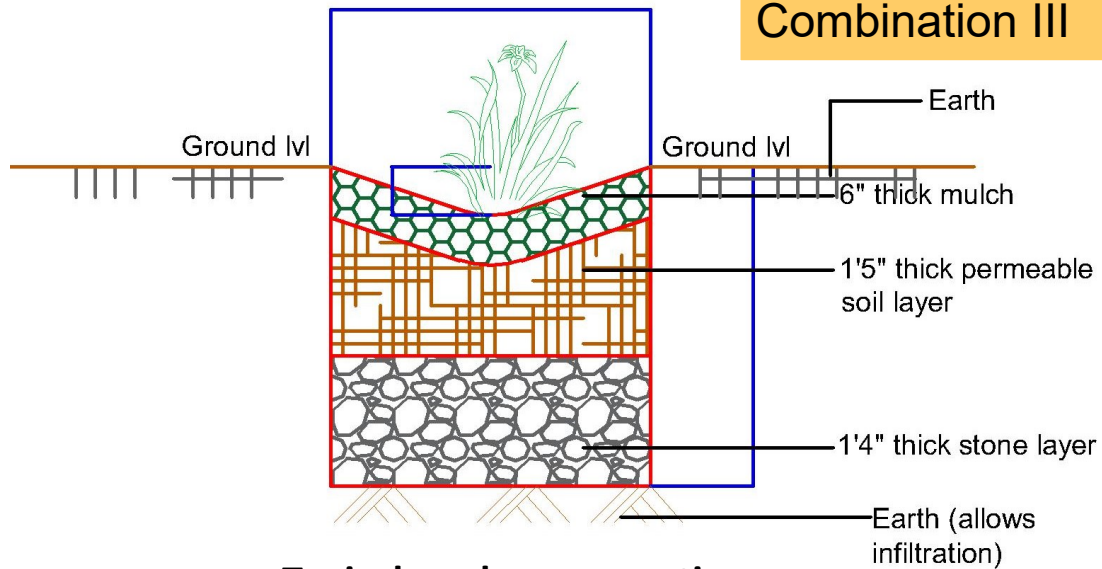


Plan

Raingarden +
recharge pit

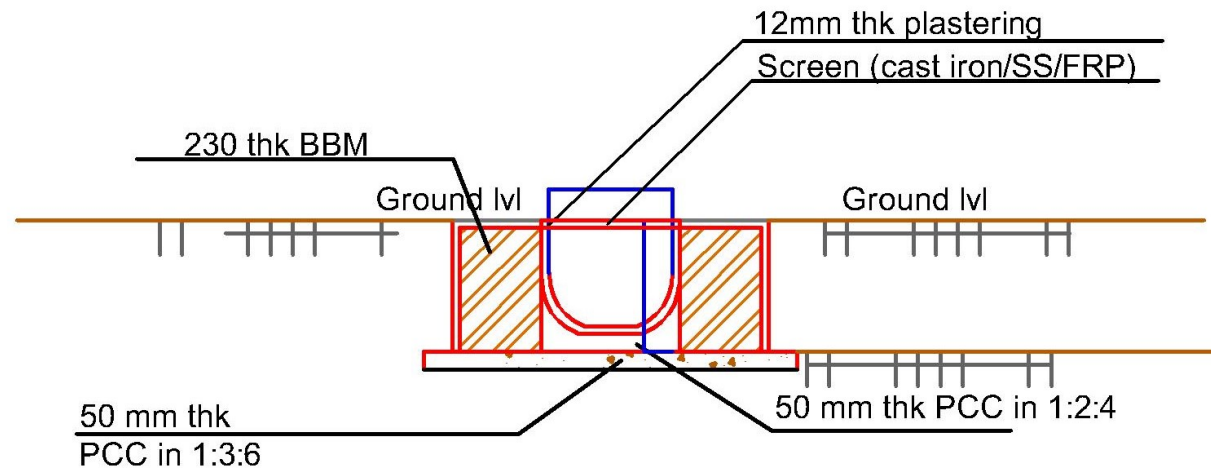
Combination III

in context to parks cities in Odisha



Typical swale cross-section

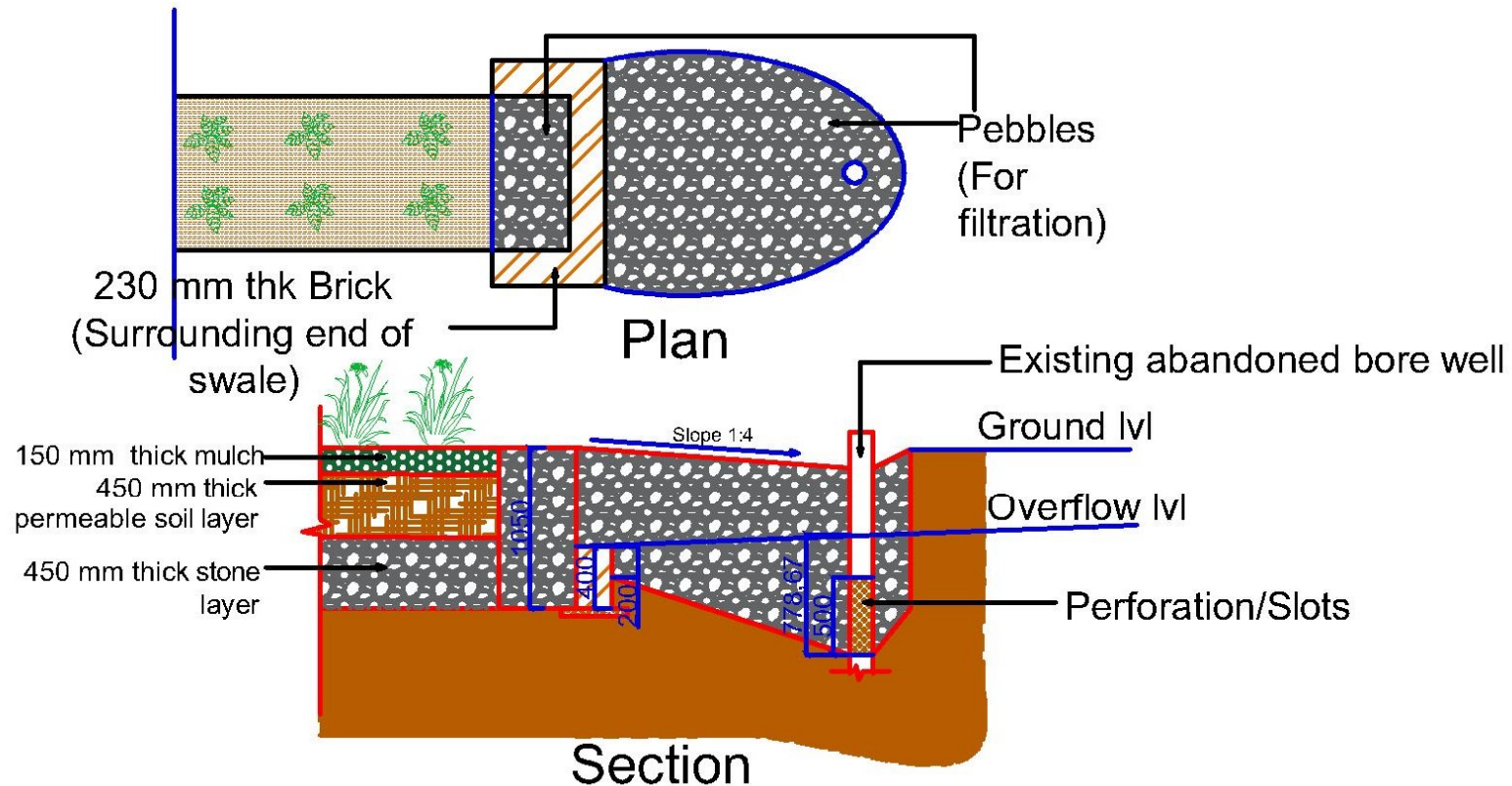
Swales with
trenches (only
for conveyance)



Typical trench/channel cross section

Combination IV

in context to parks in cities in Odisha



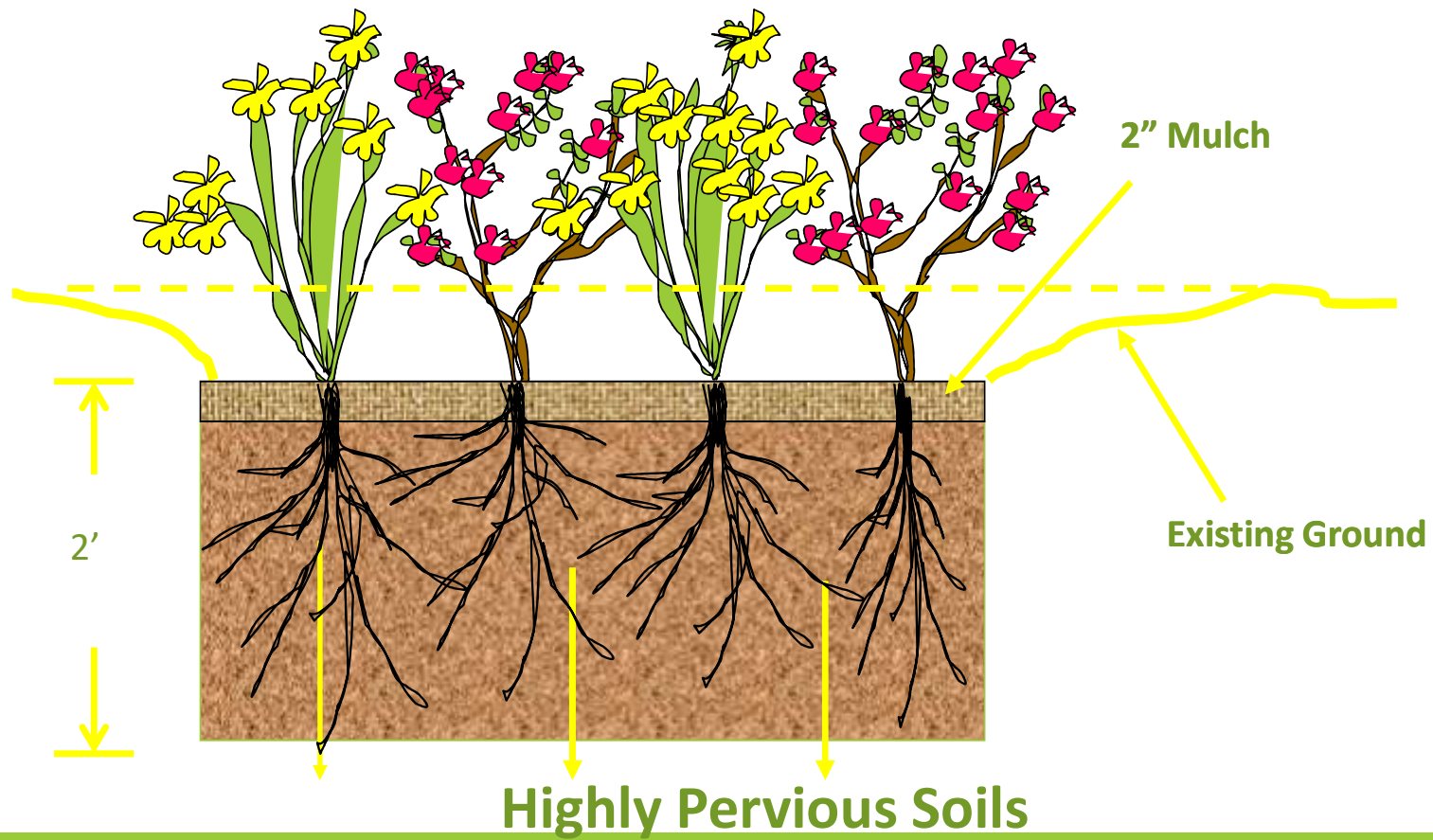
Swales > leading to
raingarden > to RWH pit

Native plant species from Rourkela city

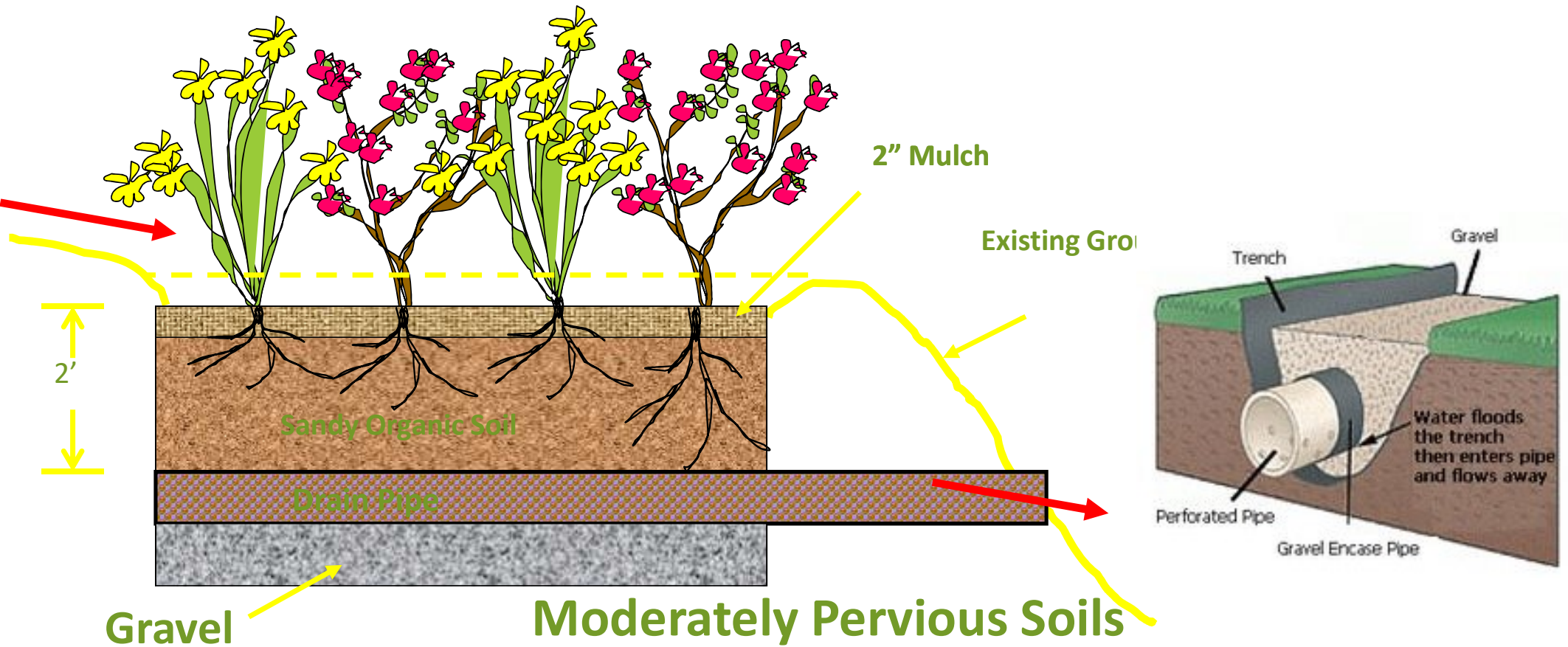


1. Flowers and fruits of *Melia azadirachta* L.,
2. Fruit of *Annona reticulata* L.,
3. Fruits of *Passiflora foetida* L.,
4. Fruits of *Terminalia bellirica* (Gaertn.) Roxb., 5) Flowers of *Leonotis nepetifolia* (L.) R.Br.,
5. Fruits and leaves of *Saraca asoca* (Roxb.) Willd.,
6. Seeds of *Abrus precatorius* L.,
7. Flower of *Passiflora foetida* L.,
8. *Triumfetta pentandra* A. Rich.

Infiltration Systems



Combination Filtration / Infiltration in case of high water table



Data / information requirements

Following are the basic details/ information that are required to be considered in the preliminary action plans before designing and implementation of any of the recommended structures.

No. of Parks ✓

The Locational details (along the geo- coordinates, if possible) ✓

Size of the Parks (in Sq. Mts.) ✓

Topography- General gradient/ slope and orientation of the park ✓

The soil condition (information on the soil profile) ✓

The storm water drains existing in or near the parks ✓

RWH structures existing in or near the parks ✓

Rainfall data of the locality ✓

Data on Aquifers: Type of Aquifer, Depth ✓

Data on Groundwater Table, Groundwater Quality ✓

Nature and type of green cover inside the park ✓

Nature and extent of land covered by the water bodies, if any, inside the park ✓

Utilities commissioned inside the parks and open spaces ✓

Information on drinking water demand and Supply ✓

Mining activities, if any in Urban Areas ✓

Thank you