

# Planter Boxes

Scripps Institution of Oceanography

## Background

Planter boxes are above ground containers that use a combination of plants and soils to temporarily store and filter storm water runoff from roof downspouts. An engineered soil mix within the planter box acts as both a support for native plants and as a filter to capture pollutants found in the runoff. Additionally, naturally occurring microbes within the soil can further break down any captured pollutants. Planter boxes are completely contained systems that require an underdrain connection to disperse flows.



Planter boxes are effective for removing:

- Total Suspended Solids (TSS)
- Sediment
- Trash
- Heavy metals
- Bacteria
- Oil and grease
- Organics

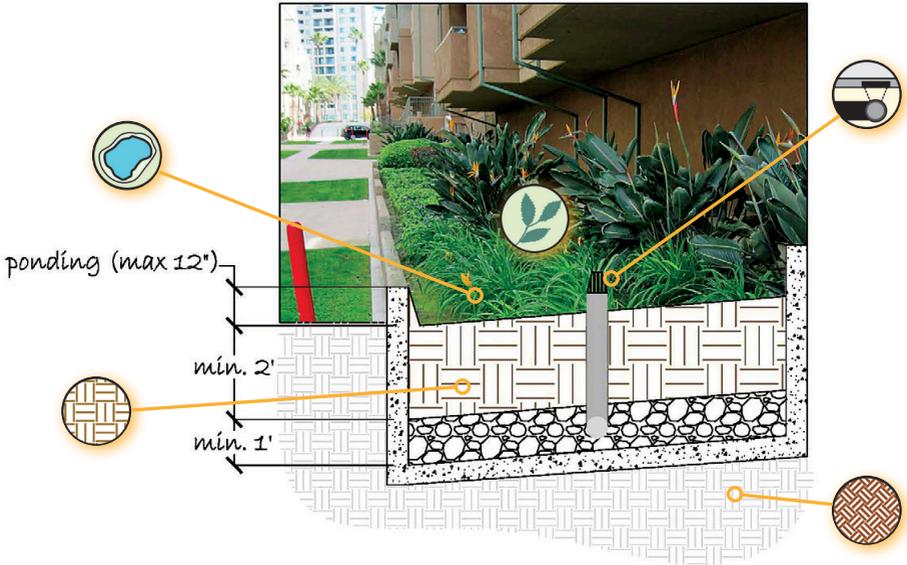
## Site Assessment

Planter boxes require relatively little space and can be easily adapted for urban retrofits to capture building and rooftop runoff or for new street and sidewalk designs. Proper plant and soil selection are important to ensure healthy vegetation in the planter box. Plants must be able to survive fluctuations in soil saturation while soils should be highly permeable while supporting plant growth. Planter boxes should be designed to control peak flow and must drain an area less than a .35 acres to avoid overflow.

Drainage area	Soil infiltration rate	Water table separation	Depth to bedrock	Facility slope	Inflow rate
<0.35 acres	N/A	N/A	N/A	N/A	Mulch: 1 cfs, Grass: 3 cfs

Pollutant Removal	Sediments: High	Nutrients: Medium	Runoff volume reduction	Groundwater recharge
	Trash: High	Metals: High		
	Bacteria: High	Oil and Grease: High	Low	N/A
	Organics: High			

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**Vegetation:** Vegetation is crucial to both the function and appearance. Consider native plants resilient to variable flow and climate conditions. Plants must be tolerant of drought, ponding fluctuations, and saturated soil conditions. Mimic nature with a high diversity of plant types.



**Shallow ponding area:** Designed to control peak flow velocities and enhance sedimentation. Ponded water must completely drain into the soil within 24 hours, with 12 hours preferred as a safety factor.



**Soil Type:** Soils within the drainage area must be stabilized. If planter boxes are fully contained, local soils must provide structural support.



**Media layers:** The top organic mulch layer is designed to filter and bond finer particles. The soil in the middle layer provides nutrients and water for the vegetation and adequate water storage for the design volume. The lower sand bed filter is suggested for regions susceptible to runoff of finer particles.



**Overflow system:** During high-volume storm events, the overflow or bypass system conveys overflow to in-line catchments, including storm drain system, drain ditches, or additional ponding areas.



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