

# Amendment No. 1 Engineering Design Standards – July 2008 City of Ventura

Approved by:   
Rick Raives, Public Works Director

10-16-14  
Date

The Engineering Design Standards – July 2008 is hereby amended as follows:

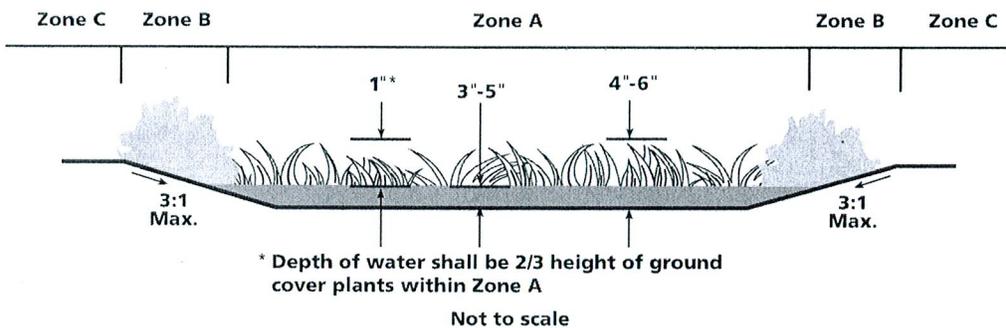
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Add Section 8-7, Vegetated Swale Planting Requirements

## 8-7 Vegetated Swale Planting Requirements

Whenever a vegetated swale is installed in the Public Right-of-Way or on private property for the purpose of complying with MS4 or State General Permit for Stormwater Compliance, the swale dimensions and plantings must meet these requirements.

### TYPICAL SECTION



### ZONE DESIGNATIONS

**Zone A:** Swale basin (is fully submerged during rain events)

**Zone B:** Swale side slopes (is partially submerged during rain events)

**Zone C:** Areas immediately outside of swale slopes

## **ZONE VEGETATION**

Swales must be vegetated in order to provide adequate treatment of runoff via filtration. Vegetation, when chosen and maintained appropriately, also improves the aesthetics of a site. It is important to maximize stormwater contact with vegetation. Vegetation must be selected appropriately based on irrigation requirements and exposure (shady versus sunny areas).

- Vegetated swales provide pollutant removal through filtration and settling in the vegetation (usually grasses) lining the channels. An effective vegetated swale achieves uniform sheet flow through a densely vegetated area for a period of several minutes (Minimum 7 minutes). A thick vegetative cover is required for vegetated swales to function properly.
- Refer to the Ventura County Technical Guidance Manual for Stormwater Quality Control Measures (TGM) page 6-139 and following for design criteria and page 6-141 for Table 6-20: Vegetated Swale Filter Design Criteria, for a summary of minimum requirements.
- Trees or shrubs may be used in the surrounding landscape as long as they do not over-shade the swale and plant material or drop leaves/needles that will affect plant materials vegetative growth or effectiveness of swale.

### **Zone A:**

Function: Slows and filters stormwater flow and nuisance water through dense vegetation. This helps to physically screen out gross pollutants such as litter, other pollutants (nutrients, metals, oxygen demand and toxic organics) to a lesser degree and slows water to allow sediments to settle out. Slowing the flow also reduces erosive effects and encourages infiltration in the swale. Plants also take up nutrients and can bind other substances.

### **Minimum Plant Performance Standards**

Any plants proposed for vegetated swales not found in the examples list shall require submittal of color photos with a detailed description of the plant anatomy, habitat, and culture to Land development. Vegetative cover is to be established prior to October 1<sup>st</sup>. If not in place by October 1<sup>st</sup>, alternative means of pollutant removal shall be employed as approved by the City Engineer.

- Requires no supplemental irrigation after a 6-8 month establishment period (supplemental irrigation by above ground drip or hand watering only during establishment)
- Dense growth herbaceous annual with no woody stems
- Growth height of 4" to 6" – excluding reproductive stems (flower stalks) that may grow higher. Prefer plants that do not need mowing, but minimal mowing to maintain height is acceptable if necessary.

- Complete vegetative coverage of planting area to achieve pollutant removal.
- California native plants preferred, but not required.
- Not an invasive plant (list at [www.cal-ipc.org/ip/inventory](http://www.cal-ipc.org/ip/inventory)).

Plants Examples (all California Native plants unless noted)

- Biofiltration Sod Mix™ (Trademarked CA native sod mix sold locally by Delta Bluegrass Co. based in Carpenteria; [www.ssseeds.com](http://www.ssseeds.com); (805)684-2798)
- Biofiltration Seed Mix available from S&S seeds in Carpenteria (to be developed), ie. Native Biofiltration Sod and Basic Native Erosion Control Mix.
- Blue Grama, *Bouteloua gracilis*; long-lived warm season perennial grass; no mowing necessary.
- Rusty Sedge, *Carex subfusca*; perennial sedge, minimal mowing.
- California Meadow Sedge, *Carex pansa*; perennial sedge, minimal mowing, prefers sandy soil.
- Creeping Rye Grass, *Leymus triticoides*; perennial herb, minimal mowing

**Zone B:**

Function: Mostly soil binding and erosion control on swale side slopes.

Core Plant Standards

- Requires no supplemental irrigation after a 6-8 month establishment period (supplemental irrigation by above ground drip or hand watering only during establishment – no underground irrigation to be installed)
- Does not exceed 18" height – excluding reproductive stems (flower stalks) that may grow higher.
- Easy to maintain – does not need mowing

Plants Examples (all California Native plants unless noted)

- Any of the plants listed for Zone A
- Yarrow, *Achillea millefolium*; perennial herb, minimal mowing
- Silver Carpet, *Dymodia margaretae* (African origin) ; perennial, no mowing
- Creeping Lippia, *Phyla nodiflora*; perennial herb, no mowing
- Santa Barbara Sedge, *Carex barbarae*; perennial sedge, 12" height
- Berkeley Sedge, Grey Sedge, *Carex divulsa* (Eurasian origin); perennial sedge, 12" – 18" height
- Molate Red Fescue *Festuca rubra* 'Molate'; perennial grass, 10" height
- Alpine Strawberry, *Fragaria vesca californica*; perennial, 12" height
- Myoporum, *Myoporum parvifolium* (Australian origin); shrub, 9" height

## **Zone C:**

Function: Mostly soil binding and erosion control on landscaped areas immediately adjacent to vegetated swales. If slopes are steeper than 5:1, then a bio-degradable erosion control matting as approved by the City Engineer shall be used in this zone.

### Core Plant Standards

- Requires no supplemental irrigation after a 6-8 month establishment period (supplemental irrigation by above ground drip or hand watering only during establishment – no underground irrigation to be installed)
- Easy to maintain
- Up to 4' height, taller trees OK if from approved tree list

### Plants Examples (all California Native plants unless noted)

- Any of the plants listed for Zones A and B
- Native Buckwheats, genus *Eriogonum*; shrub, 3'-4' height
- Native Sages, genus *Salvia*; shrub, 3'-4' height
- Soft Rush, *Juncus effuses*; perennial, 1'-2' height
- California Gray Rush, *Juncus patens*; perennial, 2'-3' height
- Canyon Prince Wild Rye, *Leymus condensatus*; perennial grass, 1'-2' height

## **SCHEDULING**

Vegetated Swale's plants must be established and operational by October 1. To meet the October 1 deadline, the following schedule must be met:

1. Sufficient vegetation must be established prior to issuance of certificate of occupancy unless as approved by the City Engineer. Irrigation may be required.
2. Within 30 days of seeding, or by September 30, whichever is earlier, the site shall be inspected by the Developer's landscape architect to determine adequacy of vegetation growth, and to determine if erosion or damage has occurred. Areas of damage shall be repaired and seeded immediately.
3. If vegetation growth is insufficient, or excessive damage or erosion has occurred, the site must be further stabilized by utilizing bio-degradable erosion control matting as approved by the City Engineer. If the site cannot be adequately stabilized prior to October 1, temporary measures must be installed to divert storm flows around the swale until adequate vegetation and stabilization occurs.
4. Prior to issuance of the certificate of occupancy, the Engineer of Record and the Landscape Architect shall submit the certificate of compliance with MS4 permit requirements to Land Development.

## **MAINTENANCE REQUIREMENTS**

To provide optimum treatment, Vegetated Swale's plants must be regularly maintained to ensure a height of 4 to 6 inches (excluding the seed pod) in Zone A, a dense vegetation growth, and to prevent erosion of the underlying soils.

## **SOURCES FOR PLANT LISTS**

- Central Coast Low Impact Development Initiative ([www.centralcoastlidi.org](http://www.centralcoastlidi.org))
- Channel Islands California Native Plant Society regional plant checklists
- Channel Islands California Native Plant Society "Native Plants for Santa Barbara and Ventura County Gardens"
- Ventura County Water Wise Project ([www.ventura.watersavingplants.com](http://www.ventura.watersavingplants.com))
- City of Santa Barbara "Water Wise Lawn Alternatives" ([www.savewaterSB.org](http://www.savewaterSB.org))