

## Revegetation of Drainageways

### **Description**

Establishing a robust vegetation cover is critical to the proper functioning of engineered drainage structures such as grass-lined channels, detention basins, retention ponds and wetlands. Vegetation serves multiple purposes, including stabilizing structures to prevent excessive erosion and removing pollutants from stormwater. Because of the semi-arid nature of Colorado’s climate, prevalence of introduced weeds and variety of soil types, prompt implementation of a revegetation plan is critical if revegetation is to be successful.

BMP Type			
Design			X
Installation			X
Maintenance/Operation			X
Green Industry Relevance			
ASLA	X	GCC	
ALCC	X	ISA	X
CALCP	X	RMSGGA	X
CGGA		WFC	
CNA			

*This BMP has been adapted directly from the Urban Drainage and Flood Control District’s Storm Drainage Criteria Manual, Volume 2, “Chapter 12 Revegetation” (UDFCD 2001).*

### **Basic Practice Guidelines**

When landscaping engineered drainage facilities, Green Industry professionals should work closely with the engineer responsible for the facility design. A planting plan should be developed and followed that addresses soil bed preparation; plant species, types and sizes to be used; planting methods; mulching and fertilization; and a planting schedule. The basic practice guidelines below are categorized according to plant selection, site preparation, seeding and planting and maintenance.

### **Plant Selection**

1. The form(s) of vegetation and species used should be adapted to the soil and moisture conditions and use of the area (e.g., conveyance of flow, side slopes, etc.). The bottom, side slopes and areas immediately adjacent to a facility have differing moisture regimes that should be taken into consideration. Different plant forms (e.g., grasses, shrubs and trees) may also be limited to specific areas to enable proper functioning of the facility. For example, planting trees and shrubs along the bottom of a channel can reduce the hydraulic capacity of the channel, increase maintenance requirements and cause the plugging of downstream bridges and culverts when uprooted by higher flows.
2. Native, perennial species should be used to the extent possible.
3. Use of plant species requiring irrigation and high maintenance should be avoided except along maintained park settings or where other uses dictate such maintenance.
4. Sod-forming grasses are preferred over bunch grasses.
5. Use containerized nursery stock for wetland, tree and shrub plantings to the extent feasible.

6. The Urban Drainage and Flood Control District recommends that wetland plantings should not include cattails because they tend to proliferate and out-compete other wetland species. If plants are to be purchased, it is more desirable to select a variety of wetland species that will flourish such as sedges, rushes, etc., if cattails are not initially introduced. (Note: other resource agencies may have different recommendations regarding cattails.)
7. Maintenance requirements should be considered in plant selection (e.g., tall grasses should not be used in urban areas unless regular mowing will occur).
8. Live stakes, willow bundles and cottonwood poles should be obtained from local, on-site sources, whenever possible.

### **Site Preparation**

9. All areas to be planted should have at least 6 inches of topsoil suitable to support plant growth. Native topsoil should be stripped and saved for this purpose whenever a site is graded.
10. The upper 3 inches of the soils in areas to be seeded should not be heavily compacted and should be in a friable condition. An 85 percent standard proctor density is acceptable.
11. When necessary, soil amendments should be added to correct topsoil deficiencies (e.g., soil texture, pH or percent organic matter). (If topsoil and native seed mixes are used, fertilizer is often not needed.)
12. Fertilizer and other amendments should be used if specified by a soil analysis. Slow-release (controlled-release) type fertilizers should be used to reduce weed growth and protect water quality. Fertilizer should be worked into soil during seedbed preparation.

### **Seeding and Planting**

13. Seed mixtures should be sown at the proper time of year specified for the mixture.
14. Seed should be drill seeded, whenever possible. Broadcast seeding or hydro-seeding may be substituted on slopes steeper than 3(H):1(V) or on other areas not practical to drill seed.
15. Seeding rates should be doubled for broadcast seeding or increased by 50 percent if using a Brillion drill or hydro-seeding.
16. Broadcast seed should be lightly hand-raked into the soil.
17. Seed depth should be  $\frac{1}{4}$  to  $\frac{1}{2}$  inch for most mixtures.
18. All seeded areas should be mulched and the mulch should be adequately secured.
19. If hydro-seeding is conducted, mulching should be conducted as a separate, second operation.

20. All containerized nursery stock should be kept in a live and healthy condition prior to installation.
21. Containerized trees and shrubs should be installed properly to ensure success.
22. Live stakes, poles and willow bundles should be installed when dormant (late winter and early spring) according to the planting details provided by the UDFCD (2001).
23. Beaver protection should be provided for trees and shrubs for species known to be attractive to beavers if beavers are known to be in the area.

### **Maintenance**

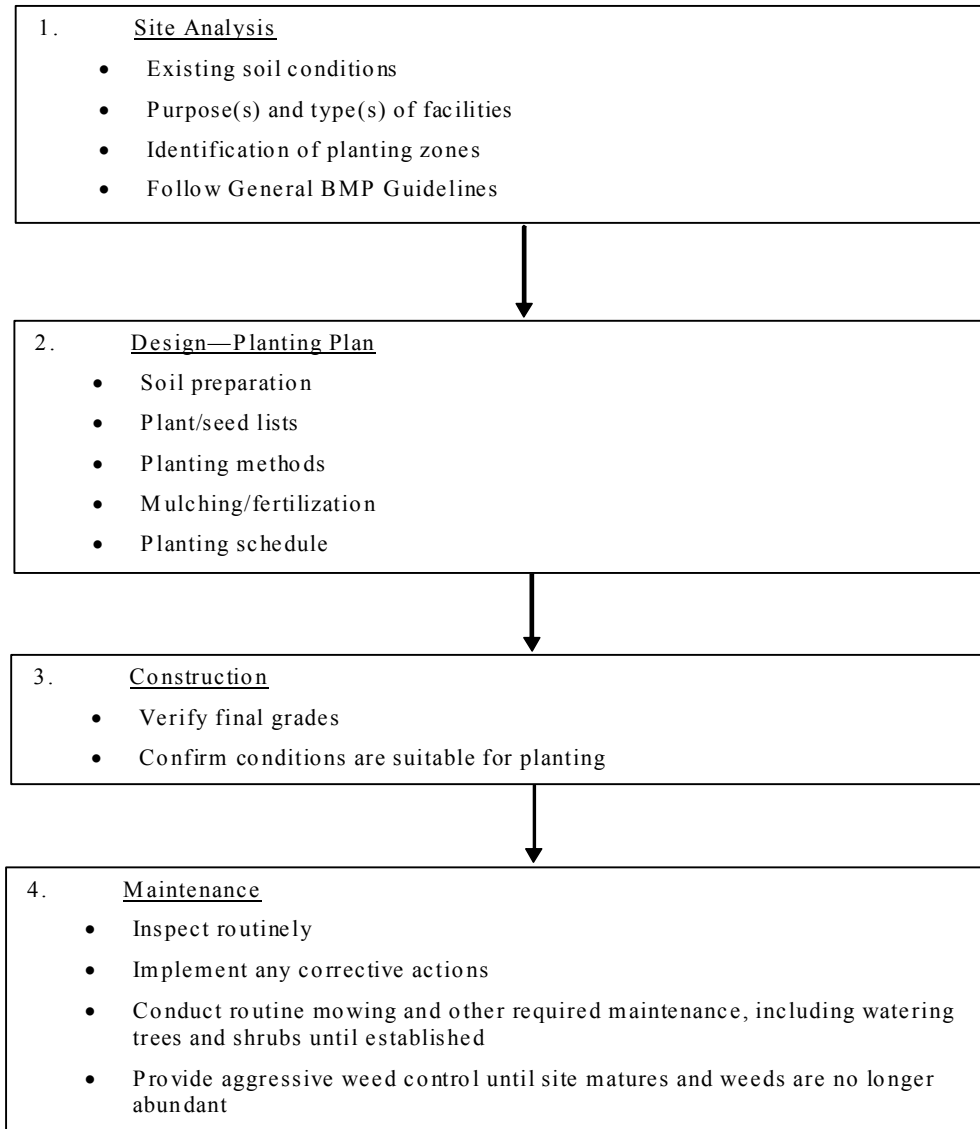
24. Sites should be routinely inspected following planting to implement follow-up measures to increase success. Immediate attention to a problem (e.g., weed infestation, failure of seed to germinate) can prevent total failure later.
25. Access to and grazing on recently revegetated areas should be limited with temporary fencing and signage while plants are becoming established (normally the first year).
26. Weed infestations should be managed using appropriate physical, chemical or biological methods as soon as possible.
27. Stakes and guy wires for trees should be maintained. Dead or damaged growth should be pruned.
28. Beaver protection cages should be used around tree plantings.
29. Mulch should be maintained by adding additional and redistributing mulch, as necessary.
30. Areas of excessive erosion should be repaired and stabilized.
31. Planted trees and shrubs should be watered as needed from April through September until established.

### ***Regional or Industry Considerations/Adaptations***

1. See local Colorado State University Cooperative Extension office, the Natural Resources Conservation Service or other local government recommendations for seed mixes and revegetation species.

## Revegetation Process Flow Chart

(Adapted from UDFCD 2001)



**Key References**

Don Godi and Associates. 1984. *Guidelines for Development and Maintenance of Natural Vegetation*. Denver, CO: Urban Drainage and Flood Control District.

Don Godi and Associates. 1993. *Design Workbook for Establishment of Natural Vegetation*. Denver, CO: Urban Drainage and Flood Control District.

Urban Drainage and Flood Control District. 2001. *Urban Storm Drainage Criteria Manual, Volume 2*. Denver, CO: UDFCD.