

Construction Phasing/Sequencing (CPS)



Practice Description

Construction phasing/sequencing is the coordination of the construction schedule with the necessary erosion, sediment, and stormwater BMP installation. The purpose of construction sequencing is to reduce the amount of on-site erosion and off-site sedimentation. The construction sequence is an orderly listing of all major land-disturbing activities together with the necessary erosion- and sedimentation-control measures planned for a project. This type of schedule guides the contractors on work to be done before other work is started so that serious erosion and sedimentation problems can be avoided. Construction sequencing also allows for a potential reduction in the amount of land area disturbed at any one time during construction.

Planning Considerations

Construction sequencing can ultimately lower the cost of construction by retaining sediment on-site. Studies have shown that land disturbances at construction sites can cause soils to be 2 to 40,000 times more erodible (Harbor, 1999). Erosion leads to sedimentation, often times off-site. Additional costs from permit non-compliance or sedimentation of wetlands or other sensitive areas can occur if stormwater controls are not properly installed. Proper construction phasing begins with preservation of natural vegetation. Existing vegetation should be preserved in areas where it is likely to have the most benefit to hydrology. Preserving as much native vegetation as possible can reduce the impacts of land-disturbance activities. Also, protecting nearby vegetated areas with proper erosion and sediment controls will help maintain the adjacent areas' natural hydrology and help prevent off-site erosion and sedimentation.

Design Criteria and Construction

Vegetation Protection

Identify and map areas requiring special protection, i.e., wetlands, buffer zones, filter strips, and trees. Be sure these areas are clearly marked on drawings, maps, and properly flagged on-site.

Access Points

Define areas for construction-site access, construction routes, and equipment parking. Construction-site access pads must be installed prior to land disturbances. See Construction-Exit Pad (CEP) for details.

Sediment Traps

Install sediment traps (basins, fences, outlet protection) after site access has been established. Additional sediment basins or fencing may be required as land grading begins. Installation information can be found in the *Sediment Control* section.

Runoff Controls

Controlling runoff can be accomplished through diversions, dikes, silt fence and outlet protection. These measures should be installed after sediment practices and before land grading. Additional runoff-control measures may be required during the course of construction. Additional information on runoff-control practices is available in the *Runoff Conveyance* section.

Runoff Conveyance Systems

Runoff conveyance can be accomplished through stabilization of stream banks, check dams, diversion, drop structures, channels or swales, inlet and outlet protection, temporary-slope drains, etc. Whenever possible, stabilize stream banks as early as possible. Install runoff conveyance systems with runoff controls and before land grading. Additional runoff conveyance measures may be required during the course of construction. Additional information is available in the *Runoff Conveyance* section.

Land Clearing and Grading

Begin site preparation including cutting, filling, and grading only after sediment and runoff controls are installed. Install additional control measures as needed.

Surface Stabilization

Surface stabilization includes temporary and permanent seeding, mulching, sodding and installing riprap. These items should be installed immediately on all disturbed areas where work has been completed or significantly delayed.

Building Construction

During the construction phase, any additional erosion and sediment controls should be installed as needed.

Landscaping and Final Stabilization

During the last phase of construction, all open areas should be stabilized through topsoiling, planting trees and shrubs, seeding, mulching, sodding, and final riprap placement. At this point, all non-biodegradable, temporary-control measures should be removed.

Common Problems

Consult with a qualified design professional if any of the following occur:

Sensitive areas such as wetlands have not been properly protected and have been impacted by sediment.

The site's erosion- and sediment-control plan does not adequately address stormwater issues on-site. If site limitations require changes to construction plan, be sure the erosion and sediment plan is amended.

Maintenance

Maintenance inspections should be conducted weekly and after rainfall events of ≥ 0.5 inch in a 24-hour period. All maintenance repairs should be made immediately after periods of rainfall. Pre-storm inspections can prevent BMP failures during large rain events.

References

BMPs from Volume 1

Chapter 4

Land Grading (LG)	4-16
Preservation of Vegetation (PV)	4-64

BMPs from Volume 2

Chapter 2

General Planning Concepts for Stormwater Runoff Management and Overview of Low Impact Design and Smart Growth Concepts	2-1
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Chapter 4

Infrastructure Planning	
Protection of Natural Features	