

## 7.1 Minimized Phased Disturbance

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### Description

Phased disturbance limits the total amount of grading at any one time and sequences operations so that at least half the site is either left as undisturbed vegetation or re-stabilized prior to additional grading operations. This approach actively monitors and manages exposed areas, so that erosion is minimized and sediment controls can be more effective in protecting aquatic resources and downstream landowners.

### Condition Where Practice Applies

This practice can be applied anywhere development occurs and is well suited to protect critical areas on and off site, such as wetlands, streams, ponds and highly erodible areas subject to high erosion rates. The practice is applicable where natural vegetation can act as a soil stabilizer during development and perhaps as a water quality feature after construction.

### Planning Considerations

Two planning principles should be applied for phased disturbance. First, developments should be fit around the natural site conditions (e.g. topography, drainage, vegetation and setting) and thus involve less grading and fewer offsite impacts than conventional development patterns. Practically this means retaining undisturbed green space around water resources and on critical areas like steep slopes.

The second planning principle is focused on managing active construction, so that at least 50% of the land area is maintained in vegetation. By anticipating the timing and extent each grading and construction operation, along with erosion and sediment controls, exposed ground does not sit idle. This management principle is applied by developing phases of a project that can be brought to completion quicker than the entire parcel; and by utilizing

an effective construction sequence to assist project managers to anticipate the next step towards stabilization and completion.

Ideally with phasing and effective sequencing, a parcel is divided between vegetated inactive areas and active areas where work is continuous from clearing operations, through grading, drainage and construction until final re-stabilization with vegetation. A realistic construction sequence is an essential planning tool for this practice with the goal that only areas under active construction have exposed soils.

Construction Operation	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	
<b>PHASE 1: Roadway, Storm &amp; Utilities</b>	←—————→																			
Install construction site entrance	•																			
Fence natural & tree protection area	•																			
Install SW/sed basin, diversion and silt F.		•																		
Seed SW/Sed basin areas		•																		
Clear ROW		•																		
Grading, install storm, San. and utilities		•	•																	
Place inlet protection on storm sewers			•																	
Grade road swales and stabilize			•	•																
Road construction				•	•															
Seed/mulch graded areas					•	•														
<b>PHASE 1: Home Construction</b>				←—————→																
Clear home sites				•	•	•														
Install silt fence & filter berms				•																
Basement excavation & rough grading				•	•	•	•													
Temporary seeding on lots					•	•	•	•												
Final yard grading							•	•	•											
Permanent seed and mulch							•	•	•											
<b>PHASE 2: Roadway, Storm &amp; Utilities</b>							←—————→													
Install sediment trap, silt F. and filter B.							•													
Seed sediment trap							•													
Grading, install storm, San. and utilities								•	•											
Place inlet protection on storm inlets									•											
Erosion control matting on swales									•											
Road construction										•										
Winterization- Seed/mulch graded areas										•	•									
<b>PHASE 2: Home Construction</b>											←—————→									
Clear home sites											•	•								
Install filter berms												•								
Basement excavation													•	•						
Temporary seeding on lots														•	•	•				
Final yard grading																•	•			
Permanent seeding and mulching																	•	•		
Remove temp riser, clean out SW pond																				•
Adapt SW pond outlet for permanent configuration																				•

Figure 7.1.1 Sample Sequence of Construction Operations

## **Design Criteria**

Specify all major construction operations including erosion and sediment controls with the estimated time for completion in a sequence of operations (see Figure 7.1.1). The sequence of operations shall be noted on construction drawings. Changes should be made to the construction sequence as work is completed or delayed.

Divide site work into major phases so that no more than 50% of the site is exposed at any one time. Within each phase, operations such as clearing can also be divided to keep from removing all the vegetation at once. For example, clearing for a roadway and infrastructure can be effectively separated from clearing operations required for homebuilding rather than removing all vegetation at once.

All areas that are disturbed shall be provided with appropriate controls such as sediment basins, traps or barriers to prevent sediment from impacting water resources or offsite areas. Disturbed areas that are expected to be inactive (idle) for 21 days or longer will be temporarily stabilized until the subsequent construction operations begin or permanent seeding and mulching can be completed.

## **Maintenance**

Monitoring is essential to ensure that phasing and sequencing occur properly. This includes making sure only the areas that need to be exposed are exposed, and all other BMP practices are in good working order.

Routinely verify that work is progressing in accordance with the project's construction sequence. If progress deviates, take corrective actions.

When changes to the project schedule are unavoidable, amend the construction sequence schedule on drawings and plans well in advance to anticipate potential problems and maintain control.

## **Common Problems/Concerns**

Proper planning not conducted – more than 50% of the site is bare at any one time. Areas may be too large and may need to be managed in smaller increments.

Active disturbance of the entire site does not allow portions to reach stages of completion so that temporary or permanent seeding and mulching can be employed. A failure to limit work areas to phases will result in erosion and sediment control being less effective.

Failure to anticipate completion dates for final or temporary grading stages can leave disturbed areas unprotected during winter months.

Failure to follow the construction sequence or maintain may result in erosion and sediment control items being delayed.

Temporary seeding and revegetation of graded areas is delayed as other work slows. Some areas such as slopes should proceed with seedings even though delays in other operations are occurring.