Appendix F
Guidance on Selection of Temporary Slope Stabilization Techniques

Temporary stabilization is an important step in protecting a construction site; by providing effective erosion control through stabilization, generated sediment can be significantly reduced.

Selecting Temporary Stabilization Measures

Stabilization measures can vary significantly in cost, effectiveness, means and ease of installation, and longevity. Each construction site has unique site factors and faces a unique set of challenges. Site factors should be compared to the relative costs and functionality of the various stabilization methods to select the most appropriate methods for the area to be stabilized. Temporary stabilization measures should be selected by the Qualified SWPPP Developer (QSD) prior to implementation, with the site erosion and sediment control strategy evaluated and optimized throughout construction. The following Best Management Practice (BMP) characteristics are presented to assist in selection of stabilization methods. These factors include:

- Functional Longevity of the BMP
- Seasonality (Project Timing) and Climate
- Site accessibility
- Material availability
- Slope inclination
- Soil Type and Condition
- Estimated BMP effectiveness
- Cost effectiveness

Functional Longevity of the BMP

As shown in the TableF-1, each temporary stabilization technique has an estimated period of relative effectiveness. Estimating the required longevity of the temporary stabilization method is the first step in selecting a technique. The length of time required to (1) establish adequate temporary vegetation density or (2) protect the soil until redisturbance should be considered. Estimating time to vegetation establishment should include a factor of safety for unknown weather conditions (drought) that may lengthen the actual time to achieve vegetative stabilization. Once the required longevity is known, and the BMPs have been screened for that specific time frame, all other factors in this section should be considered prior to making a decision regarding temporary stabilization. The Table F-1 provides a guideline for initial consideration of temporary stabilization techniques. The table is structured so that the shortest lasting techniques are presented at the top, with increasing longevity as you move down. It should be noted that any technique from a higher longevity category can be utilized for a lower category; however, might not be as cost effective or easy to install. This table is not inclusive of all temporary stabilization methods available; additional temporary stabilization methods, including proprietary products, should be selected based on manufacturer's recommendations of longevity.

Table F-1 Guidelines for Temporary Stabilization Techniques

Required Longevity	Temporary Stabilization Method	Associated Fact Sheet
< 6 months	Hydraulic Mulching (Paper/Cellulose Fiber, Wood Fiber without tackifier)	EC-3
	Soil Binders – Short Lived Plant Based	EC-5
	Straw Mulch	EC-6
	Compost Blanket – (depth 1-inch or less)	EC-14
6 - 12 months	Hydraulic Mulch (wood fiber with tackifier)	EC-3
	Bonded/Stabilized Fiber Matrices	
	Straw Blanket	EC-7
	Wood Fiber Blanket	
	Compost Blanket – (depth 2-inch)	EC-14
	Soil Binders – Long Lived Plant Based and Cementitous	EC-5
12 – 18 months	Soil Binders - Polymeric Emulsion Blends	EC-5
	Jute Blanket	EC-7
	Compost Blanket – (depth 3-inch or greater)	EC-14
>18 months	Straw/Coconut Blanket	EC-7
	Coconut Blanket	
	Synthetic Matting	
	Wood Chips (Flat surfaces only)	EC-8

Seasonality (Project Timing) and Climate

While timing construction to occur during the dry, summer season can be beneficial to preventing erosion due to lack of precipitation, it can have a negative effect on stabilization efforts that include a vegetative component for the same reason. If temporary stabilization efforts include a vegetative component, the time of year when those measures are applied must be considered when choosing the longevity of the BMP (and may require an irrigation component). Very hot and dry climates can also decrease the standard longevity of stabilization BMPs as presented; if specifying stabilization measures in extremely hot climates, factor this into the selection criteria. If temporary stabilization measures are applied in the rainy, winter season, it is important to consider drying time and soil moisture requirements/limitations when selecting soil stabilization methods.

Site Accessibility

Projects that are generally close to roads capable of supporting trucks are generally not limited in their selection of temporary stabilization BMPs. As the distance of the area requiring stabilization increases from a roadway, the choices for stabilization become more limited. For instance, blown-straw mulching and hydraulic applications from a mounted sprayer are typically feasible within approximately 150 feet of a roadway or alternate safe truck access way; and pneumatically applied compost is typically feasible within approximately 300 feet of a roadway or access way. Hand application of straw and compost, or running very long hose runs (which are capable of reaching distances of up to 1000 feet) from a hydraulic mulcher can be much more costly due to required increase in labor.

Material Availability

Depending on site location and the timing of application, specific stabilization products may not be locally available, may have significant cost constraints on shipping to a project location, or, required application equipment or contractors may not be available for use or hire in the timeframe required (especially prior to the rainy season or predicted storm events). For this reason, it is important to assess product and contractor availability prior to the immediate need for temporary stabilization. If possible, temporary stabilization BMP materials should be acquired during the initial stages of construction and should be maintained (under cover or in storage) until their use is required. Materials should not be stored outside as exposure to sun and rain can decrease their functional longevity once installed.

Slope Inclination

Temporary stabilization techniques will vary based upon the slope of the area requiring stabilization. Most temporary stabilization methods presented in the fact sheets can be considered for slopes gentler than 2:1 (H:V), with the exception of wood mulch stabilization (which can be highly transportable even on relatively flat slopes). For slopes 2:1 (H:V) or greater, stabilization can be achieved using high-durability erosion control blankets (Straw/Coconut or Coconut Fiber – See EC-7) or chemically or mechanically bonded hydraulic applications (BFM, SFM, MBFM – See EC-3). Slopes steeper than 1:1 (H:V) or steep rocky slopes may require stabilization methods not presented in this manual, including anchored wire mesh, shotcrete, or other structural solutions (such as retaining walls) and should be designed and specified by a licensed engineer.

Soil Type and Condition

Soil type and condition should be determined prior to selecting any hydraulic application, including the use of Soil Binders (EC-5) for temporary stabilization. Soil binders can be soil-type specific, so it is important to characterize your site soils prior to selection. For instance, polyacrylamides (PAMs) do not function well in sandy soils; therefore stand-alone PAM or using a hydraulic mulch with a PAM tackifier is not appropriate under these conditions. In addition to soil type, the condition of the soil can also play a significant role in selection of a specific soil stabilization technique. Soils that are wet or saturated may prohibit the use of certain hydraulic applications that require a specific drying time and soils that are too dry may require wetting or conditioning prior to application. Soil type does not generally affect erosion control blanket or mat (EC-7) installations; however, uneven or rocky slopes can prevent their proper application. Soils must have uniform contact with erosion control blankets and mats for them to be effective.

Estimated BMP Effectiveness

While the majority of temporary stabilization techniques presented are effective at preventing erosion when properly applied, there are some that perform better than others. For instance, hydraulic mulch applied without tackifier (such as guar) is estimated to be only 50-60% effective as a stand-alone measure; however, with a tackifier included, effectiveness estimates increase to 65-99%. It is generally good practice to combine sediment control techniques (e.g., slope interruption, barriers at the top and bottom of slope) with temporary stabilization techniques; however, it is essential when utilizing a technique that does not have 90-99% estimated effectiveness. Multiple measures (temporary stabilization combined with sediment control) should also be utilized when erosion could cause potential property damage or direct impacts to receiving waters down slope.

Cost Effectiveness

While the primary driver behind selecting temporary stabilization should be prevention of erosion and its associated environmental impacts, it is important to maintain cost-effectiveness while implementing these measures. Once all other factors have been considered and a list of potential BMPs has been developed, the relative cost of those BMPs should be considered when making a final decision. Proper stabilization of difficult terrain or complex areas should not be compromised based on cost decisions; proper stabilization techniques and their potential cost should be considered prior to initiating construction in difficult or steep terrain. Estimated costs for temporary stabilization techniques are provided in the individual fact sheets and in the table below; however, can vary greatly by region and season and should be assessed for each individual project.

Table F-2 Temporary Stabilization Comparison Table

Surface Mulch Category	Unit Cost Installed	Estimated Relative Erosion Control Effectiveness	Standard Application Rate	Ease of Installation
Hydraulic Mulching Types: Wood, paper, cellulose fiber	$900–1,200/ac	50 – 60%	2,000 lbs per acre	2
Compost Application	$1,500-$5,000/ac $5,000-15,000/ac $10,000-20,000/ac	40 – 50% 95 - 99% 95 - 99%	(1" blanket application) (2" blanket application) (3" blanket application)	3 3 3
Straw Mulching Types: Rice and wheat	$1,800–2,100/ac	90 – 95%	2 tons per acre	3
Wood Chip Types: Blanket	$900–1,200/ac	Unknown		3
Hydraulic Matrices Types: Wood mulch + Granular or liquid binder Paper mulch + Granular or liquid binder Cellulose mulch + binder	$1,000-2,000/ac	65 - 99%	2,000 lbs/ac mulch + 10% tackifier	2 2 2
Bonded Fiber Matrices	$5,000–6,500/ac	90 – 99%	3,500 – 4,000 lbs/ac	3
Rolled Erosion Control Products				
Types: Biodegradable				
Jute	$6,000–7,000/ac	65 – 70%	N/A	4
Curled Wood Fiber	$8,000–10,500/ac	90 – 99%	N/A	4
Straw	$8,000–10,500/ac	90 – 99%	N/A	4
Wood Fiber	$8,000–10,500/ac	90 – 99%	N/A	4
Coconut Fiber	$13,000–14,000/ac	90 – 99%	N/A	4
Coconut Fiber Net	$30,000–33,000/ac	90 – 99%	N/A	4
Straw Coconut	$10,000–12,000/ac	90 – 99%	N/A	4
Non-Biodegradable				
Plastic Netting	$2,000–2,200/ac	< 50%	N/A	4
Plastic Mesh	$3,000–3,500/ac	75 – 80%	N/A	4
Synthetic Fiber w/Netting	$34,000–40,000/ac	90 – 99%	N/A	4
Bonded Synthetic Fibers	$45,000–55,000/ac	90 – 99%	N/A	5
Combination Synthetic and Biodegradable Fibers	$30,000–36,000/ac	85 – 99%	N/A	5