4. Stabilization of Road Slope Surfaces and Spoil Disposal Areas (PRACTICE: 2-4)

a. Objective: To minimize erosion and sediment delivery from exposed cut slopes, fill slopes, and spoil disposal areas.

b. Explanation: This is a preventative practice using mechanical, biological and structural techniques to prevent erosion or minimize its transport. Selection of techniques depends on site specific characters such as soil properties, slope, road surface type, appropriate vegetation, and cost. The techniques, or combination thereof, are applied to cut and fill slopes and spoil disposal areas at risk of erosion, slope instability or sediment transport. Selection of techniques involves the design professional along with input from a soil scientist, geologist, hydrologist, and botanist.

Spoil disposal areas, regardless of location, are candidates for stabilization techniques which may differ from those applied at the original road location.

Mechanical techniques may include erosion nets/mats, blankets, mulch, tackifiers (may include seed), windrowed construction slash at toe of fill slopes, or soil seals. Biological techniques may include planting vegetation such as grass(es), brush, trees, or a combination thereof. Vegetation types are native seed or stock, certified weed-free to prevent transport of non-native invasive plants. If native vegetation is not feasible, non-native species that are non-invasive may be substituted. Vegetation methods, which take effect over time, may be used in combination with other methods to provide for continuous erosion protection. Structural methods may include terraced or roughened cut and fill slope faces, allowing larger rock and boulders to remain in place, if they don't present safety hazards. Riprap placement, mid-slope drainage ditches, retaining walls, or construction of reinforced earth embankment may also be incorporated, within funding availability.

c. Implementation: Beginning with project analysis, through road location selection and design process, the site characteristics are weighed and mitigation measures planned and designed to minimize impacts to water quality and other resources. The designer has the full complement of procedures available to consider for incorporation, and selection is made with respect to effectiveness and funding availability.

Project drawings, and specifications if project work is contracted, include details of methods, materials, locations, quantities of slope stabilization requirements. For contracts, the COR and inspector insure compliance by the contractor. For force account labor, the project manager, designer, geologist, hydrologist, and crew supervisor/leader work together to assure the slope stabilization is constructed as planned. Compliance with operating plans for timber sales, mining operations, or other authorized activity is ensured by the ER, FSR, or permit administrator through inspection and feedback communication. Regardless of implementation method, monitoring for effectiveness provides important information to influence future slope stabilization method selection.

Reference: FP-03 – Section 157 – Soil Erosion Control
FP-03 – Section 204 – Excavation and Embankment
FP-03 – Section 207 – Earthwork Textiles
FP-03 – Division 250 – Slope Reinforcement and Retaining Walls

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Comment [WW1]: To protect water quality, we are really interested in sediment delivery to streams and other water bodies. Erosion is interesting, but not really germane to aquatics and water quality unless it gets into streams.

Comment [WW2]: Again, preventing erosion an unlikely (unobtainable) objective. Minimizing transport is not even that important. It is really about preventing or minimizing the delivery of sediment to a waterbody (stream, lake, etc)

Comment [WW3]: As I read the objective, road surfaces are NOT included here. Thus, I don't see how road surface type affects erosion on cut slopes, fillslopes or spoil disposal areas.

Comment [WW4]: It depends on other factors also, including bedrock (stability), source and amount of run-on (if any), emergent groundwater (springs and seeps), climate (environmental setting), among others.

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Comment [WW5]: Nowhere are **biotechnical** methods specifically discussed, which include the combined benefits of structural control and vegetation protection. There are a whole suite of beneficial treatments methods that are applicable to forest road cut and fill slopes. Biotechnical methods should be included.

Comment [WW6]: Is there a threshold where lack of funds would trigger rejection of a road project because there was not enough money to perform the necessary stabilization work? In other words, how does the "funding availability" figure into the decision process, and which is more important: effectiveness or funding availability? What is the guidance and how is that decision made?

Comment [WW7]: What if work is not contracted? Do you then not need to have drawing s and specifications that describe the necessary details?

Comment [WW8]: So, is a monitoring plan required for a stabilization project, and is post-project monitoring required? Who does it?

FP-03 – Division 600 – Incidental Construction
FP-03 – Division 700 – Material