**GUIDELINES FOR MATERIALS FOR STREAMBANK STABILIZATION**

The following guidelines represent the efforts of a work group composed of Conservation District representatives, natural resource consultants, environmental interests and state and federal regulatory agencies. They are suggested by the Montana Department of Environmental Quality and not necessarily endorsed by all the work group members. These guidelines are only for use in areas where the use of high density, angular rock is not "practicable" (The term practicable means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. 40 CFR 230.3(q)). Sandstone or broken concrete may be acceptable alternatives to high-density angular rock in certain situations, although local regulation may prohibit their use. The use of any river training device/structure may directly or cumulatively alter the ecology of Montana rivers and streams. Cumulative impact considerations may preclude the use of any river training device.

Bank stabilization projects are sometimes authorized under the following jurisdictions: Local Conservation District – Natural Streambed & Land Conservation Act (310); Montana Department of Fish Wildlife and Parks – Stream Protection Act (SPA124); County Floodplain Administrator – Flood plain Permit; U.S. Army Corps of Engineers – Section 404/ 10 Permit; Montana Department of Environmental Quality – 75-5-318, MCA Authorization; Montana Department of Natural Resources and Conservation - Navigable Rivers Land Use License/Easement

The following optional design concepts should be considered in conjunction with the guidelines to minimize environmental/aesthetic concerns:

(Numerous documents with more detailed information are available – contact NRCS or the Department of Natural Resources and Conservation for their Stream Project Manual.)

- Utilize rock only in the lower* portion or toe of the riprap with woody structures/features, biodegradable fabric, etc. in the upper* portions.

* The elevation at which the mean annual flow occurs is the division between "upper" and "lower".

- Incorporate soil in the upper portions of the project with appropriate woody (usually willow) plantings as near average water elevations as possible and herbaceous plantings elsewhere.
- Provide a temporary or permanent buffer strip (streamside area where protection promotes growth and sustenance of woody vegetation) along the project length to provide for vegetation stability where grazing or recreational use may impact plant growth.
- Preferably, plantings should be on slopes of 3:1 or flatter and irrigated, if possible.

In consideration of landowner preferences to utilize materials that are not cost prohibitive in areas of the state where high-density angular rock is not readily available, the following is offered:

SPECIFIC GUIDELINES

Applicants proposing the use of alternative materials must adhere to the following specifications:

a) Materials must be free of grease, oils, paint and other pollutants.

b) Materials must be free of rebar - internal and external (ARM 17.5.503 (6)), iron or other foreign material.

c) Materials must meet gradation guidelines (the lower range of these guidelines are generally more appropriate for lower-energy, smaller streams versus the higher range for larger streams/rivers – the actual size needed will depend on site-specific conditions, the type of structure and the degree of protection desired).

All materials must have a longest dimension not more than 3 times the length of the shortest dimension and should approximate the following gradations:

- 70% of the material by volume between 15-30 inches in length
- 15% of the material by volume less than 15 inches in length
- 15% by volume 30-40 inches in length.
- The thickness of the placed material should be 2-3 times the mean fragment diameter.

d) Sandstone is favored over concrete. If concrete is utilized, the material must be stockpiled to allow for an inspection, if requested by the authorizing agency, before placement and a statement signed by the provider and recipient of the concrete, noting the source, type of concrete, and compliance with these specifications must be provided. (see attached form)

e) The streambank must be adequately sloped prior to application of riprap material. (slopes steeper than two to one are discouraged and flatter slopes recommended).

f) Riprap material must be placed on the bank – not dumped.

g) Largest material must be keyed into the toe and also used in the base of the riprap.

h) Unless naturally occurring material is present at the site, appropriate measures must be taken to ensure retention of fine soil particles beneath the riprap material. Protective measures can include coarse sand and fine gravel or the use of a suitable geotextile material.

i) The sandstone or concrete material must be keyed into the river/stream bank to provide adequate protection against flanking.

j) Any structure that protrudes into the river must be designed by a professional engineer/hydrologist experienced in the design of such structures.

Depending on site conditions and the composition (size/density/hardness) of the alternative materials, there can be a higher risk of failure with the use of these materials. Sandstone is favored over broken concrete. Applicants preparing to apply these guidelines to their projects will be responsible for complying with local, state and federal permitting requirements and providing documentation, if requested, that these guidelines have been adhered to.

## COMPLIANCE CERTIFICATION

Project: (please attach copy of the completed "Joint Application for Proposed Work in Montana's Streams, Wetlands, Floodplains and Other Water Bodies")

Upon completion of project activity, sign this certificate and return it to the following address:

Montana Department of Environmental Quality
Permitting & Compliance Division/Water Protection Bureau
Box 200901
Helena, Mt. 59620-0901

Please answer the following questions:

1. What is the source of the concrete rubble?

2. What is the type of concrete rubble (curb/gutter, foundation, etc.)?

3. What was the cost of the rubble?

(the recipient of the rubble cannot be compensated to accept the rubble; unless they have a landfill license)

I hereby certify that the project work performed is in compliance with all applicable permits and in compliance with the "Guidelines for Materials for Streambank Stabilization"

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Signature of Project Owner Date

I hereby certify that I provided the concrete rubble used in the project, and that I did not compensate the owner for accepting the rubble.

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Signature of Concrete Rubble Provider Date