5.0 SHORELINE & STREAMBANK ALTERATIONS

5.1 Policy. It is the policy of the District to:

5.1.1 Limit alteration of a shoreline or streambank to instances where erosion of the shoreline or streambank is occurring or likely to occur.

5.1.2 Assure that improvements or alterations of shoreline and streambank areas comply with accepted engineering principles to prevent erosion; and

5.1.3 Preserve and, wherever feasible, enhance the ecological integrity and natural appearance of shoreline and streambank areas.

5.2 Regulation. No person shall disturb the natural shoreline or streambank partially or wholly below the ordinary high-water mark of a waterbody, without first securing a permit from the District and posting a surety. A permit will be issued only if it is demonstrated that erosion is occurring or likely to occur.

5.3 Criteria for Bioengineering. Bioengineering shall be used for shoreline and streambank restoration unless it is determined by the District that it is infeasible to repair the erosion problem using bioengineering techniques. The following criteria apply to bioengineering projects:

5.3.1 The resultant project shall be structurally stable. Special emphasis shall be given to the stability of the toe of slope where traditional engineering techniques may be more appropriate.

5.3.2 Native vegetation shall be used in all cases. Preferable species include those that form dense root systems or can be planted from cuttings.

5.3.3 A long-term maintenance plan is included to ensure that small erosion spots are corrected, and native plant materials are successful.

5.3.4 Bioengineering design shall comply with all District shoreline guidance and applicable details.

5.4 Criteria for Riprap Placement. Riprap placement is allowed only when bioengineering is determined by the District to be infeasible. Riprap placement shall comply with the following criteria:

5.4.1 Riprap material should be durable, natural stone common to the setting and of a gradation that will result in a stable shoreline embankment able to withstand ice and wave action.

5.4.2 Typical finished slope should not be steeper than a ratio of 3:1 (horizontal: vertical) under normal conditions. A riprap/boulder stabilization project with a proposed finished slope steeper than 2:1 (horizontal: vertical) shall be evaluated in accordance with the criteria for retaining walls.

5.4.3 No riprap or filter materials shall be placed more than 6 feet waterward of the shoreline measured from the ordinary high-water level (OHWL) elevation.

5.4.4 A transitional layer consisting of graded gravel, at least 6 inches deep, and an appropriate geotextile filter fabric shall be placed between the soil material of the existing shoreline and the riprap to prevent erosion of the embankment and to prevent settlement.

5.4.5 Riprap placement shall not be attempted when underlying soils are not capable of supporting resulting loads. In these cases, a professional engineer registered in Minnesota should be consulted.

5.4.6 The thickness of the riprap layers shall be at least 1.25 times the maximum stone diameter, exclusive of toe boulders at least 50 percent buried.

5.4.7 The riprap shall conform to the natural alignment of the shoreline (i.e., maintaining an undulating or meandering shoreline).

5.4.8 The design must reflect the engineering properties of the underlying soils and any soil corrections or reinforcements. For a shoreline, the design must conform to engineering principles for wave energy dispersion and resistance to deformation from ice pressure and movement. For a streambank, the design shall conform to engineering principles for the hydraulic behavior of open channel flow and shall consider upstream and downstream impacts.

5.4.9 Riprap placement projects shall contain a native vegetation planting element equal to at least five percent of the overall cost of the project.

5.4.10 Represent the "minimal impact" solution to a specific need with respect to all other reasonable alternatives.

5.5 Criteria for Retaining Walls. Retaining walls are allowed only when bioengineering and riprap are demonstrated to be infeasible. In addition to the criteria for riprap, retaining wall installation shall comply with the following criteria:

5.5.1 Whether new or repair/reconstruction, the retaining wall shall not increase floodplain encroachment beyond that required by technically sound and accepted repair/reconstruction methods.

5.5.2 The retaining wall shall not be located within the applicable resource buffer zone width specified in Rule 4.0, regardless of whether the project is regulated by Rule 4.0.

5.5.3 The applicant must file with the District a certificate of survey prepared by a registered land surveyor locating the finished wall.

5.6 Required Exhibits. In addition to the District's standard application form, fees and sureties, the following exhibits shall accompany a permit application (one full-size; one set-reduced to maximum size of 11" x 17"):

5.6.1 A bioengineering application must include:

(a) Site plan and project plans that detail the project setting in relation to adjacent water body;

(b) Information sufficient to demonstrate ability of installation to withstand wind fetch-induced waves and current, including orientation of installation relative to fetch distance and current;

(c) Planting plan, planting list with species and planting density, and specifications;

(d) Project timeframe and schedule, including any work contingencies or restrictions due to high water;

(e) Inspection and maintenance schedule to ensure project success; and

(f) A plan for long-term maintenance.

5.6.2 A riprap application must include:

(a) An analysis of alternative solutions demonstrating infeasibility of bioengineering;

(b) Site plan showing property lines, delineation of lands under ownership of the applicant; delineation of the existing shoreline; delineation of wetland within the project area; existing contour elevations (if available); and locations and lineal footage of the proposed riprap treatment;

(c) Cross-section detailing the proposed riprap, drawn to scale, with the horizontal and vertical scales noted on the drawing. The detail should show the finished riprap slope, transitional layer design and placement, distance lakeward of the riprap placement, ordinary high water level elevation and material specifications;

(d) Description of the underlying soil materials that will support the riprap and, if the underlying soils will not support the riprap, the recommendations of a professional engineer registered in the State of Minnesota;

(e) Gradation, average diameter, quality, and type of riprap material to be used (need must be demonstrated for use of rock larger than a Class III gradation, other than for buried toe boulders);

(f) Gradation, quality, and type of filter blanket material to be used (normally, Type I gradation is sufficient);

(g) Manufacturer's material specifications for proposed geotextile fabric(s);

(h) Verification that materials used shall be non-polluting;

(i) Detailed planting plan for native vegetation planting element of the project; and

(j) A plan for long-term maintenance.

5.6.3 In additional to the required exhibits for a riprap application, a retaining wall application must include:

(a) An analysis of alternative solutions demonstrating infeasibility of riprap;

(b) A structural/geotechnical analysis prepared by a professional engineer, practicing in civil engineering, and registered in the State of Minnesota, showing that the design conforms to accepted engineering principles and will withstand expected ice and wave action and earth pressures; and

(c) A certificate of survey prepared by a registered land surveyor locating the proposed wall.

5.6.4 In addition to the above required exhibits, an application for restoration of a streambank must contain the following:

(a) Site plan prepared by a qualified professional registered in the State of Minnesota showing property lines; the ordinary high-water level (OHWL) elevation and 100-year floodplain elevation; and existing streambank and contour elevations up to the 100-year elevation, for at least 50 feet upstream and downstream of the project location or for the reach for which the project will affect flow conditions, whichever greater, or as otherwise required by District staff;

(b) Cross-section of proposed project including slope dimensions (length, width, height) and distance waterward;

(c) Material specifications including plant species and whether species are rooted, seed or cuttings; and

(d) Design calculations and documentation of structural stability, accounting for physical and flow characteristics of the watercourse, by a professional engineer registered in the State of Minnesota.

5.7 Exceptions. A permit is not required under this rule for the following activities if the stated conditions are met.

5.7.1 Removal of an ice ridge resulting from ice action within the last year if:

(a) No more than 200 feet of shoreline is affected;

(b) All ice ridge material that is composed of muck, clay or organic sediment is deposited and stabilized at an upland site above the OHWL;

(c) All ice ridge material that is composed of sand or gravel is removed as provided above or graded to conform to the original cross-section and alignment of the lakebed, with a finished surface at or below the OHWL;

(d) No additional excavation or replacement fill material occurs onsite;

(e) All exposed areas are immediately stabilized as needed to prevent erosion and sedimentation; and

(f) The District is given at least 7 days prior notice.

5.7.2 Laying sand blankets along shorelines if:

(a) The sand blanket is not along the bank of a stream, creek, or river.

(b) The sand does not cover emergent vegetation, unless already authorized by an MNDNR Aquatic Plant Management permit from the Department's Division of Fisheries.

(c) The sand must be free of toxins or heavy metals, as defined by the Minnesota Pollution Control Agency (MPCA), and must contain no weed infestations such as, but not limited to, purple loosestrife, glossy buckthorn, reed canary grass and Eurasian watermilfoil, or animal life infestations such as, but not limited to, zebra mussels or their larva.

(d) The sand layer must not exceed six inches in thickness, 50 feet in width along the shoreline, or one-half the width of the lot, whichever is less, and may not extend more than ten (10) feet waterward of the ordinary high-water mark.

(e) Sand installation may only be repeated once at same location, not exceeding same amount and dimensions of the original sand blanket.

(f) Beaches that are operated by governmental entities, and available to the public, shall be exempted from the width restriction.

(g) A natural zone of native shoreline plants of the same depth and equal to 20 percent of the width of the sand blanket shall be maintained adjacent to the sand blanket.

(h) The District is given at least 7 days prior notice.