Impacts of Plants on Earthen Dams

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GLOSSARY

This glossary provides the definitions of some of the basic terms used in this course and is not intended to be a comprehensive glossary of terms associated with dam safety. A more extensive resource of dam safety terms and definitions is available through the many references provided at the end of each chapter of the ***Course***.

Absorption - the process of being taken into a mass or body, as water being taken in by plant roots.

Abutments - the interface between the sides of a valley containing a dam and the dam embankment. Right and left abutments are referenced by viewing the dam while facing downstream.

Adsorption – the adhesion of an extremely thin layer of molecules to the surface of solid bodies or liquids with which they are in contact.

Appurtenances – structures associated with dams such as spillways, gates, outlet works, ramps, docks, etc. that are built to allow proper operation of dams.

Berm – a horizontal step or bench in the embankment slope of an earthen dam.

Biological Barrier – an herbicidal releasing system, device, or material designed to exclude root growth and/or penetration of plants into a protected underground zone (such as a dam embankment).

Boil – a typically circular feature created by the upward movement of soil particles by seepage flowing under a pressure slightly greater than the submerged unit weight of the soil through which seepage is occurring.

Breach – a break, gap, or opening in a dam that typically allows uncontrolled release of impounded water.

Capillary Rise – the rise of water in the voids of a soil mass as a result of the surface tension forces of water.

Clearing – the removal of trees and woody vegetation by cutting without removal of stumps, rootballs, and root systems.

Crest – the near horizontal top surface of an earthen dam, or the control elevation of a spillway system.

Diameter at Breast Height (dbh) – the diameter of a tree measured at about four feet (breast height of average person) above the ground surface.

Drainage System – graded and/or protected pervious aggregates in a dam designed to collect, filter, and discharge seepage through the embankment, abutments, or foundation.

Earthen Dam – a dam constructed of compacted natural soil fill materials selected to minimize embankment seepage while maximizing workability and performance.

Embankment – an earthen or rockfilled structure having sloping sides constructed of select compacted fill materials.

Failure – a (dam) incident that results in the uncontrolled release of water from the impoundment of a dam.

Freeboard – the vertical distance from the normal operating water level of an impoundment to the crest (top) of the dam.

Grubbing – the removal of stumps, rootballs, and lateral root system of trees and woody vegetation. A construction operation that is typically done following the clearing operation.

Herbicide – a chemical substance or mixture designed to kill or maintain undesirable Plants that may include herbaceous plants, vines, brush, and trees.

Hydraulic Height (of a Dam) – the vertical distance from the normal operating water level of the impoundment to the invert of the outlet works or downstream outlet channel.

Hydro-seeding – the technique of applying grass seeds, fertilizer, agricultural lime, and seedbed mulch to seeded area in a pressurized aqueous mixture.

Lateral Root System – roots of trees and woody plants that extend laterally from the tap root and/or rootball to provide lateral support and nutrient uptake for the plant.

Line of Saturation – the leading boundary of the progression of saturation of soil in an embankment exposed to an increasing head (source) of water (impoundment).

Line of Wetting – the leading boundary of the progression of wetting (partial saturation) of soil in an embankment exposed to an increasing head (source) of water (impoundment).

Maintenance – routine upkeep necessary for efficient inspection, and safe operation and performance of dam and their appurtenances. Labor and materials are required; however, maintenance should never be considered to comprise dam remediation.

Mowing – the cutting of grass, weeds, and small-diameter woody vegetation by mechanical devices such as mowers, bush hogs, and other vegetation cutting machinery.

Mulching – the application of protective material such as straw, fiber matting, and shredded paper to newly seeded areas.

Operation (of a dam) – activity by a dam owner for the necessary and safe use and performance of a dam, the appurtenances of a dam, and the impoundment.

Owner – any person or organization that owns, leases, controls, operates, maintains, or manages a dam and/or impoundment.

Phreatic Surface – the upper boundary (surface) of seepage (water flow) zone in an embankment.

Piping – the progressive downstream to upstream development of internal erosion of soil as a result of excessive seepage that is typically observed downstream as a hole, or boil, that discharges water containing soil particles.

Remediation – restoration of a dam to a safe and intended design condition.

Revegetation – restoration of desirable ground cover vegetation (i.e. grasses) to disturbed areas designed to prevent embankment surface erosion.

Rootball – the root and soil mass portion of a tree or woody plant that is located directly beneath the trunk or body of the tree that provides the primary vertical support for the tree or woody plant.

Root Penetration – intrusion of plant roots into a dam embankment so as to interfere with the safe hydraulic or structural operation of the dam.

Root System – roots contained in the rootball and the lateral root system collectively comprise the root system of trees and woody plans and provide both lateral and vertical support for the plant as well as providing water and nutrient uptake for the plant.

Seeding – application of a seeding mixture to a prepared seedbed or disturbed area.

Seepage – the flow of water from an impoundment through the embankment, abutments, or foundation of a dam.

Seepage Line – the uppermost boundary of a flow net, or the upper surface (boundary) of water flow through an embankment (see Phreatic Surface).

Slump – a portion of soil mass on an earthen dam that has or is moved downslope, sometimes suddenly, often characterized by a head scarp and tension cracks on the crest and embankment slope.

Spillway Systems – control structures over or through which flows are discharged from the impoundment. Spillway systems include Primary or Principal Spillways through which normal flows and small storm water flows are discharged and Auxiliary or Emergency Spillways through which storm water flows (floods) are discharged.

Stripping – the removal of topsoil, organic laden materials, and shallow root systems by excavating the ground surface (surficial soil stratum) after grubbing an area.

Structural Height (of a Dam) – the vertical distance from the crest (top) of the dam to the lowest point at the toe of the downstream embankment slope, or downstream toe outlet channel.

Stump – that portion of the trunk or body of a tree or woody plant left after removal by cutting during timber harvesting and/or clearing of trees and woody plants.

Stump Diameter – the diameter of a tree or woody plant at the ground surface.

Tap Root – the primary vertical root in the rootball that is the origin of development for the rootball and lateral root system growth.

Purchase this course to see the remainder of the technical materials.