ENVIRONMENTAL
Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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DB-1 2020

Basic Terms of Dam Characteristics

The following is a list of terms and their definitions that are frequently used when discussing the physical characteristics of dams. Illustrations can be found on pages 4-6.

Abutment: The part of the valley side against which the dam is constructed. May also refer to an artificial abutment sometimes constructed as a concrete wall. Right and left abutments are those on respective sides as an observer looks downstream.

Base width: The width of the dam measured along the dam/foundation interface.

Breach: An opening or a breakthrough of a dam sometimes caused by rapid erosion of a section of earth embankment by water.

Conduit: A closed channel to convey the discharge through or under a dam. Usually pipes constructed of concrete or steel.

Core (Impervious Core) (Impervious Zone): A zone of material of low permeability in an embankment dam, hence the terms central core, inclined core, puddle clay core, and rolled clay core.

Crest Length: The developed length of the top of the dam. This includes the length of the spillway, powerhouse, navigation lock, fish pass, etc., where these structures form part of the length of the dam. If detached from the dam, these structures should not be included.

Crest of Dam: This is often used when top of spillway and top of dam should be used for referring to the overflow section and dam proper, respectively.

Cutoff: An impervious construction by means of which seepage is reduced or prevented from passing through foundation material.

Cutoff Wall: A wall of impervious material, e.g., concrete, wood pilings, steel sheet piling, built into the foundation to reduce seepage under the dam.

Drainage Layer or Blanket: A layer of pervious material placed directly over the foundation material or downstream slope to facilitate seepage drainage of the embankment. May also use an upstream blanket placed on the impoundment floor and upstream embankment to prevent seepage entering the dam.

Drawdown: The resultant lowering of water surface level due to release of water from the reservoir.

Embankment: Fill material, usually earth or rock, placed with sloping sides.

Emergency Action Plan: A predetermined plan of action to be taken to reduce the potential for property

damage and loss of lives in an area affected by a dam break.

Face: The external surface that limits the structure, e.g., the face of the wall or dam.

Flashboards: Lengths of timber, concrete, or steel placed on the crest of a spillway to raise the operating water level but that may be quickly removed in the event of a flood either by tripping a supporting device or by designing the flashboard supports to fail under specified conditions.

Foundation of Dam: The natural material on which the dam structure is placed.

Freeboard: The vertical distance from the water surface to the lowest elevation at which water would flow over the dam at a section not designed to be overflowed.

Gate: In general, a device in which a leaf or member is moved across the waterway from an external position to control or stop the flow.

> **Crest Gate (Spillway Gate):** A gate on the crest of a spillway that controls overflow or reservoir water level.
>
> **Flap Gate:** A gate hinged along one edge, usually either the top or bottom edge. Examples of bottom-hinged flap gates are tilting gates and fish belly gates so called from their shape in cross section.
>
> **Outlet Gate:** A gate controlling the outflow of water from a reservoir.
>
> **Radial Gate (Tainter Gate):** A gate with a curved upstream plate and radial arms hinged to piers or other supporting structures.
>
> **Slide Gate (Sluice Gate):** A gate that can be opened or closed by sliding in supporting guides.

Heel of Dam: The junction of the upstream face of a gravity or arch dam with the foundation surface. In the case of an embankment dam the junction is referred to as the upstream toe of the dam.

Intake: Any structure in a reservoir, dam, or river through which water can be drawn into an outlet pipe, flume, etc.

Low Level Outlet (Bottom Outlet): An opening at a low level from the reservoir generally used for emptying the impoundment.

Outlet: An opening through which water can be freely discharged for a particular purpose from a reservoir.

Pervious Zone: A part of the cross section of an embankment dam comprising material of high permeability.

Riprap: A layer of large uncoursed stones, broken rock, or precast blocks placed in random fashion on the upstream slope of an embankment dam, on a reservoir shore, or on the sides of a channel as a protection against wave and ice action.

Seepage Collar: A projecting collar usually of concrete or steel built around the outside of a pipe, tunnel, or conduit, under an embankment dam, to lengthen the seepage path along the outer surface of the conduit.

Spillway: A structure over or through which flood flows are discharged. If the flow is controlled by gates, it is considered a controlled spillway; if the elevation of the spillway crest is the only control, it is considered an uncontrolled spillway.

> **Auxiliary Spillway (Emergency Spillway):** A secondary spillway designed to operate only during exceptionally large floods.

Ogee Spillway (Ogee Section): An overflow spillway, which in cross section the crest, downstream slope, and bucket have an "S" or ogee form of curve. The shape is intended to match the underside of the nappe at its upper extremities.

Spillway Channel (Spillway Tunnel): A channel or tunnel conveying water from the spillway to the river downstream.

Stoplogs: Large logs, timbers or steel beams placed on top of each other with their ends held in guides on each side of a channel or conduit so as to provide a cheaper or more easily handled means of temporary closure than a bulkhead gate.

Structural Height: The vertical distance from the lowest point of natural ground on the downstream side of the dam to the highest part of the dam which would impound water.

Toe of Dam: The junction of the downstream face of a dam with the natural ground surface. This is also referred to as the downstream toe. For an embankment dam the junction of the upstream face with ground surface is called the upstream toe.

Top of Dam: The elevation of the upper most surface of a dam, usually a road or walkway, excluding any parapet wall, railings, etc.

Top Thickness (Top Width): The thickness or width of a dam at the top of the dam. In general, the term thickness is used for gravity and arch dams; width is used for other dams.

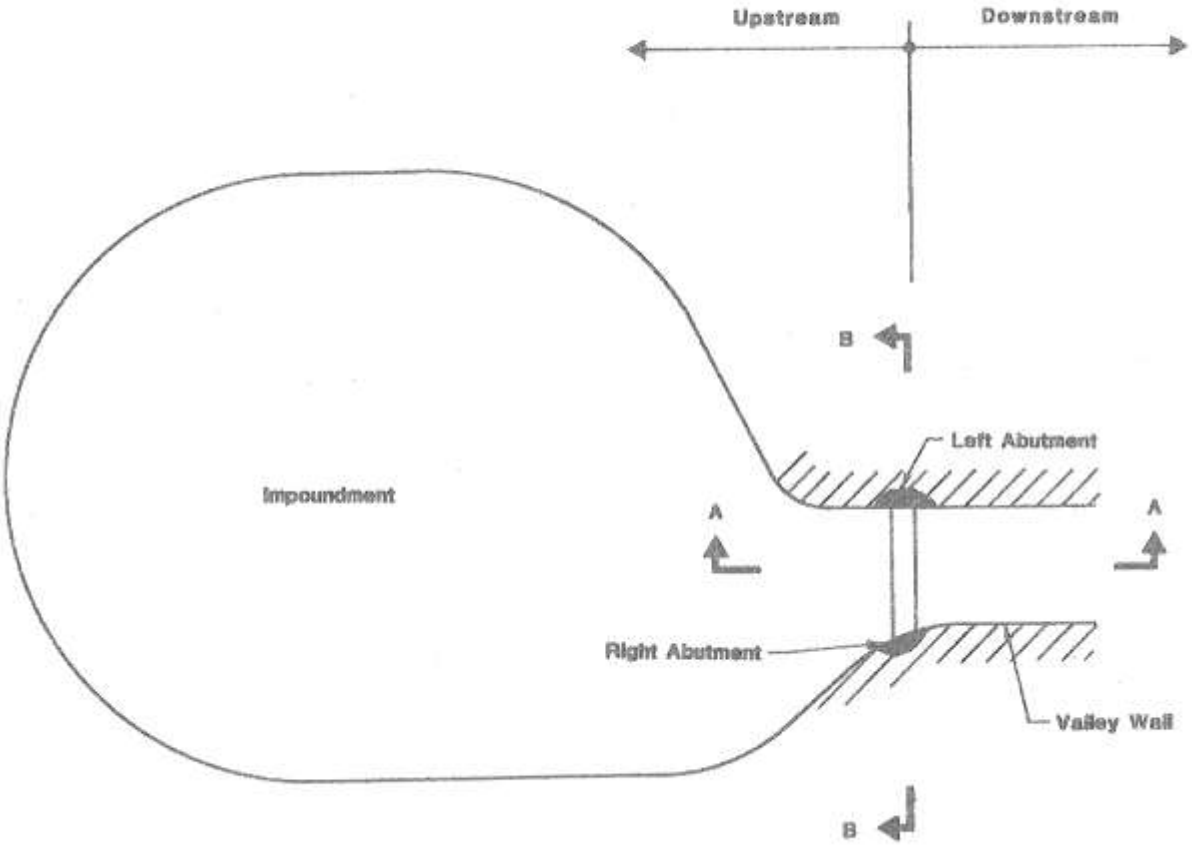
Training Wall: A wall built to confine or guide the flow of water.

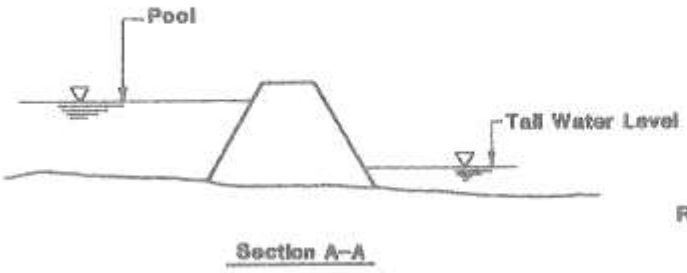
Trash Rack: A screen comprising metal or reinforced concrete bars located in the waterway at an intake so as to prevent the ingress of floating or submerged debris.

For more information relative to the design, construction, maintenance and operation of dams, please contact the NHDES Dam Bureau at (603) 271-3406 or email damsafety@des.nh.gov. General information is available at NHDES Dam Bureau Webpage. You may also visit our office at 29 Hazen Drive, Concord, NH.

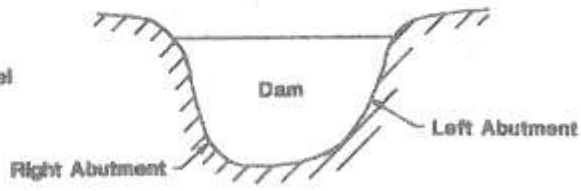
This fact sheet is accurate as of December 2019. Statutory or regulatory changes or the availability of additional information after this date may render this information inaccurate or incomplete.

BASIC NOMENCLATURE OF A DAM



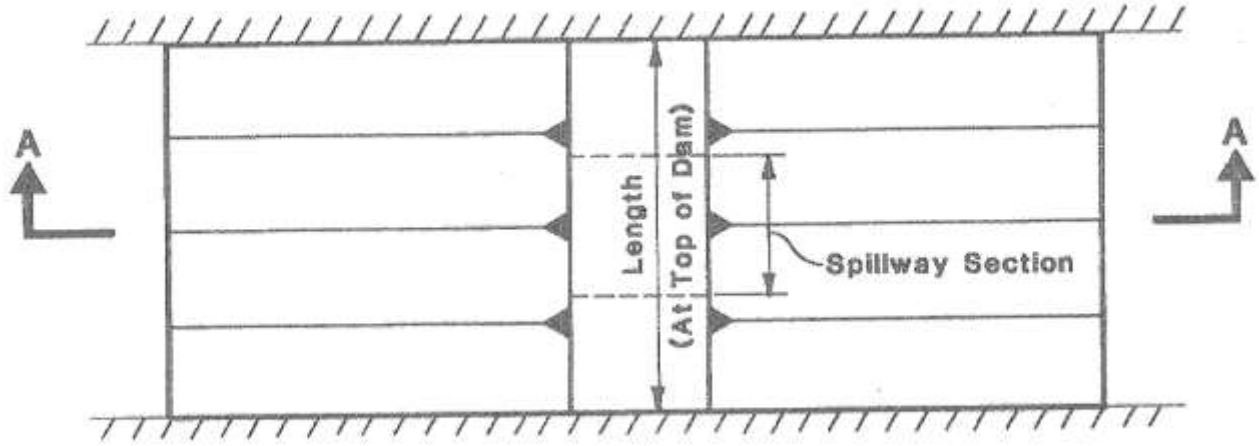


Section A–A

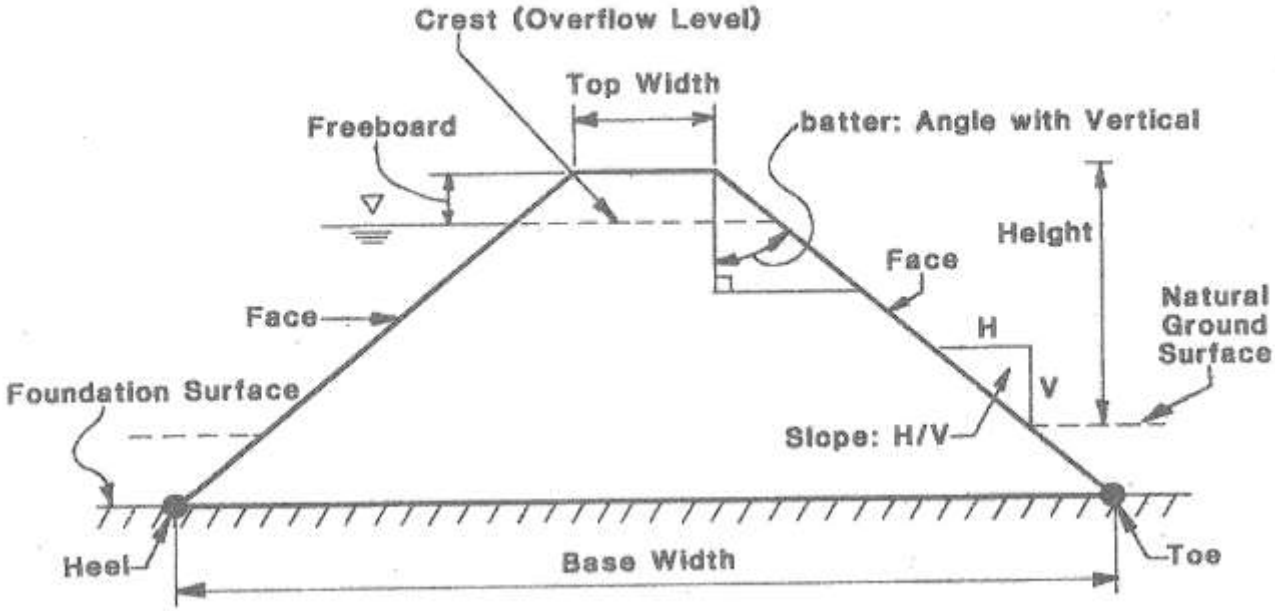


Section B–B

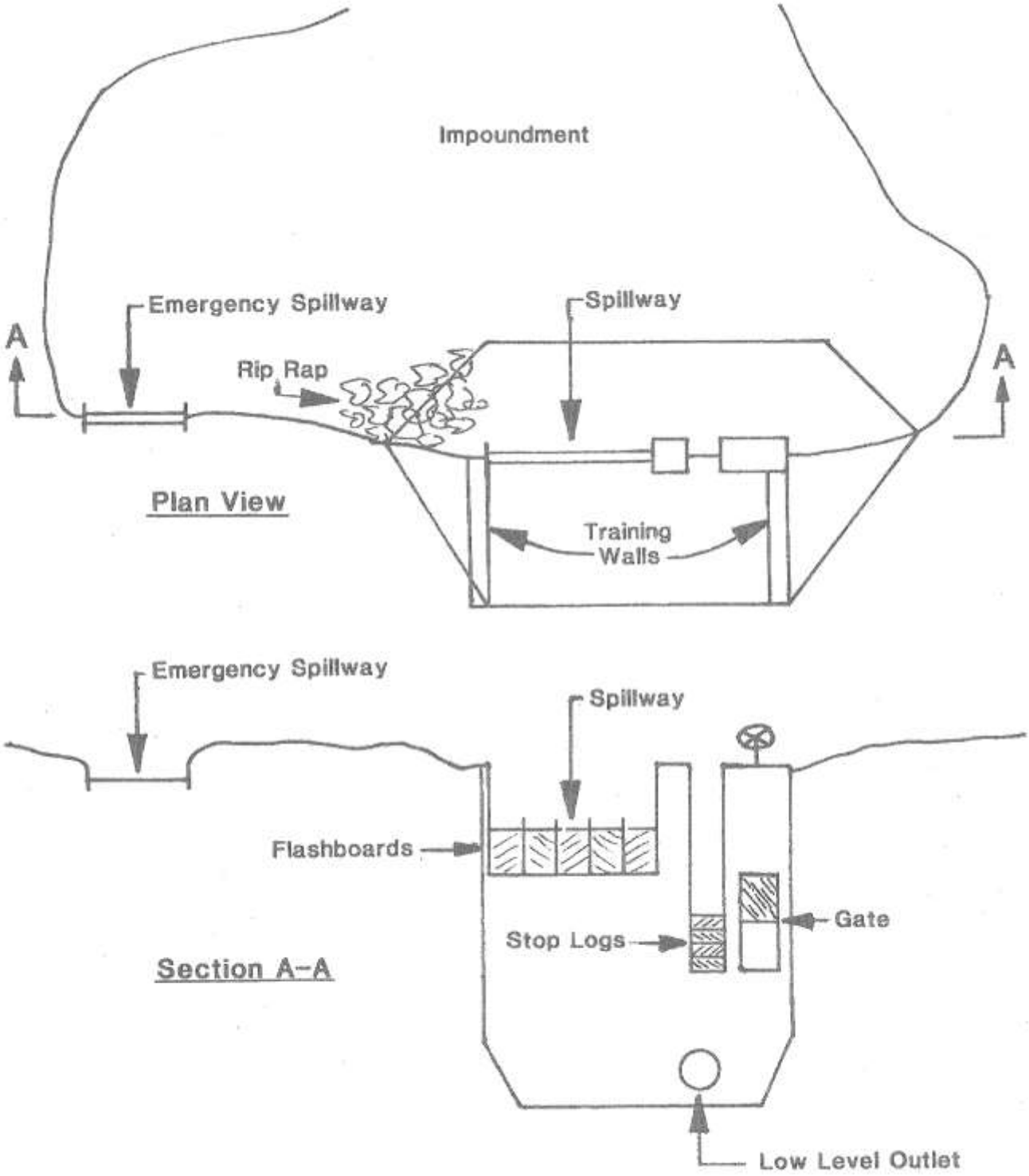
DAM GEOMETRY



PLAN VIEW



SECTION A-A



Operating Elements