

**Appendix 14C-1      General Instructions and Criteria  
                                 Pertaining to Use of  
                                 Highway Embankment as Dams**

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**Roadway Dams**

In accordance with the provisions contained herein, VDOT may approve the use of highway embankments as dams.

Highway embankments as referred to herein shall include all of those roads and streets within the jurisdiction of VDOT.

The term “dam” as used herein shall mean a barrier to confine or raise water for storage, a diversion, or to create a hydraulic head.

In general when a permit is requested for use of an embankment as a dam, whether it be an existing or proposed embankment within the highway system or one ultimately to become a part of the system, it must be accompanied by plans and supporting data as outlined in the following paragraphs.

1. Purpose of Impoundment
2. Location

A map of the vicinity with notations sufficient to accurately locate the project site will be required.

3. Plans

The plans shall in general contain the following:

- a. Plan of reservoir area and dam site showing contours
- b. Sectional view of dam taken through control structure
- c. Details of control structures showing dimensions, types of materials, cutoff or antiseep collars, anti vortex devices, energy dissipators, and other pertinent details applicable to the particular project
- d. Where channel outlets are used for spillways, sufficient profile and cross sections shall be shown to permit checking the hydraulic characteristics
- e. Where the existing embankments are to be used, details will be given as to existing drainage structures and the materials and compaction used in the construction of the dam

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4. Analyses – Computations

- a. Hydrologic data used and its source
- b. Hydrographs
- c. Hydraulic computations for control structures, outlet channels and other applicable devices

5. Administrative Procedures

The plans shall be prepared by a licensed engineer or by a governmental agency whose engineers have previously prepared similar plans. The National Resources Conservation Service (NRCS) will generally assist in plan preparations when the impoundment is for conservation purposes.

Prints of plans and copies of supporting computation data shall be submitted in duplicate, one set to be reviewed by the Department and remain in the files of the Central Office, and the other to be returned with any pertinent notations. Prior to approval, for construction, revised prints of plans will be submitted in triplicate, one for each for the Central, District, and Residency offices.

All requests will be initiated through the Resident Engineer and be forwarded through proper channels to the Central Office. Where applicable, the petitioner will be required to furnish a performance bond or certified check to cover cost of work and any balance not expended by the Highway Commission will be returned to the petitioner.

All costs shall be borne by the petitioner and no permit will be granted for work which will result in additional expenditures by the Department. Where protective devices such as guardrails do not exist or would normally not be provided by the Department, such protective devices will be provided at the expense of the petitioner.

Under no circumstances shall the Department be committed to reconstruction, relocation, adjustment or protection of the highway at the expense of Highway funds without approval of the Commissioner.

Construction inspection under the supervision of VDOT may be required or certification by petitioner, obtained from a licensed professional.

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6. Design Specifications & Criteria

- a. Watershed Area: The area contributing to a reservoir shall be accurately determined. Delineation on dependable topographic maps or aerial photographs, when available, may be used for this purpose.
- b. Reservoir Area: The area of the impoundment must be determined with sufficient accuracy at various elevations to permit the development of a storage curve. Where maps having a close contour interval (one or two foot) are available they may be used in lieu of field survey or reconnaissance.
- c. Dam:(Roadway embankments) : The embankment will, in addition to being constructed to the Department's specifications, have either a core or upstream blanket. If upstream blanket construction is used, the material will consist of a layer of highly impervious material placed on the reservoir floor and extended up the upstream slope of the embankment. In general a core will be required where the depth of impoundment is 15 feet or greater.
- d. Hydraulic Structure: All structures conducting the effluent through highway fills shall be adequate to pass the design flood originating in the watershed. Generally, structures shall be so designed and constructed that the maximum high water stage from the design storm shall not be higher than eighteen inches below the outer edge of the shoulder of the highway at it lowest point adjacent to the reservoir.

The design storm for impoundments, wherein the only consideration is the highway, will generally be for a return period of 25-year or 50-year.

Where the failure of the dam would result in property damage or hazard to life, the criteria found on DCR's web site at <http://www.dcr.virginia.gov> under Dam Safety should be followed.

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There are many factors to be considered which may necessitate special consideration and, therefore, anyone contemplating the construction of a road as a dam wherein the Department would have an interest is advised to consult with the Hydraulic Section prior to development of the plans.

No moveable gates or valves will be permitted to serve as outlet control structures; however, gates will be provided to permit draining for management purposes. In general, no portion of the roadway will be permitted to serve as a spillway.

- e. Landscaping: The shoreline shall be cleared of all weeds and stumps and maintained in a neat manner.

7. Legal Provisions

Where deemed necessary or desirable, by the Department, legal responsibilities and obligations shall be set forth as a condition in the permit or shall be provided for by a separate instrument.