DESIGN REPORT FOR THE CONSTRUCTION OR ALTERATION OF VIRGINIA REGULATED IMPOUNDING STRUCTURES

Note: Any executed Design Report for construction of an impounding structure must be mailed to the appropriate Regional Engineer. In addition, a completed Certificate and Permit Application Fee Form (DCR199-192) and the required fee must be mailed under separate cover to: Virginia Department of Conservation and Recreation, Division of Finance, Accounts Payable, 600 E. Main St., 24th Floor, Richmond, Virginia 23219.

Reference: Impounding Structures Regulations, 4VAC 50-20-10 et seq., including 4VAC 50-20-240, Virginia Soil and Water Conservation Board

1. Project Information:
   a. Proposed Construction: ________________________________
      Proposed Alteration: ________________________________
   b. Name of Impounding Structure: ___________________________
   c. Inventory Number: ___________________________ (Leave blank if new Construction)
   d. Name of Reservoir: ________________________________
   e. Purpose of Reservoir: ________________________________

2. Impounding Structure Hazard Classification:
   a. Hazard Potential Classification Table I Impounding Structure Regulations:
      (Check one) □ High □ Significant □ Low

3. Location of Impounding Structure:
   a. City or County: ________________________________
   b. Located ______ feet/miles upstream/downstream of Highway Number ____________
   c. Name of river or stream: ________________________________
   d. Latitude: ____________________ Longitude: ________________

4. Ownership:
   a. Owner’s Name: ________________________________
      If a corporation, name of representative: ________________________________
   b. Mailing Address: ____________________________________________
   c. Telephone: (Residential) ____________________ (Business) ________________
   d. Other means of communication: ________________________________

5. Design Engineer:
   a. Design Engineer and Design Firm: ________________________________
   b. Design Engineer Virginia License Number: ____________________________
   c. Mailing Address: ____________________________________________
   d. Telephone: (Business) ________________________________

6. Impounding Structure Data:

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a. Type of material: earth ________ concrete ________ masonry ________ Other: __________

Note: Identify datum used for elevations.
   For new construction, complete the design configuration column.
   For alteration, complete both the existing and design configuration columns.

<table>
<thead>
<tr>
<th></th>
<th>Existing Configuration</th>
<th>Design Configuration</th>
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</thead>
<tbody>
<tr>
<td>b. Top of Dam Elevation</td>
<td></td>
<td>Feet</td>
</tr>
<tr>
<td>c. Streambed Elevation at Toe (Lowest)</td>
<td></td>
<td>Feet</td>
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<tr>
<td>d. Height of Impounding Structure</td>
<td></td>
<td>Feet</td>
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<tr>
<td>e. Crest Length (Exclusive of Spillway)</td>
<td></td>
<td>Feet</td>
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<tr>
<td>f. Crest Width</td>
<td></td>
<td>Feet</td>
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<tr>
<td>g. Upstream Slope (Horizontal to Vertical)</td>
<td>H: V</td>
<td>H: V</td>
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<tr>
<td>h. Downstream Slope (Horizontal to Vertical)</td>
<td>H: V</td>
<td>H: V</td>
</tr>
</tbody>
</table>

7. Reservoir Data
   Existing Configuration | Design Configuration Acre-feet
   a. Maximum Capacity
   b. Maximum Pool Elevation
   c. Maximum Pool Surface Area Acres
   d. Normal Capacity
   e. Normal Pool Elevation
   f. Normal Pool Surface Area Acres
   g. Freeboard (to lowest crest elevation)

8. Spillway Data
   Type | Construction Material | Design Configuration | Invert Elevation Feet
   a. Low Level Drain
   b. Principal Spillway
   c. Emergency Spillway

9. Watershed Data:
   a. Drainage Area: __________ square miles
   b. Type and Extent of Watershed Development:
   c. Time of Concentration: __________ (hours)
   d. Routing Procedure: __________ Routing Model used: __________
   e. Spillway Design Flood used (check and state source):
      PMF, source
      ½ PMF, source
      100 Year, source
      Other, source
   f. Design inflow hydrograph: Volume: __________ acre-feet
      Peak inflow: __________ cfs
      Rainfall duration of design inflow hydrograph: __________ hours
   g. Freeboard during passage of spillway design flood: __________ feet
   h. Provide printouts for 6, 12, and 24 hour models
10. Additional Information:
Provide as attachments to the Design Report the following information. Note: For alteration permits the details of this information is to be in accordance with the scope of the proposed alteration:

a. A description of properties located in the dam break inundation zone downstream from the site of the proposed/existing impounding structure, including the location and number of structures, buildings, roads, utilities and other property that would be endangered should the impounding structure fail.
b. Evidence that the local government or governments have been notified of the proposal by the owner to build or alter an impounding structure.
c. Maps showing the location of the impounding structure that include the county or city in which the proposed/existing impounding structure is located, the location of roads and access to the site, and the outline of the impoundment. Existing aerial photographs or existing topographic maps may be used for this purpose.
d. A report of the geotechnical investigations(s) of the foundation soils, bedrock, or both and of the materials to be used to construct or alter the impounding structure.
e. Design assumptions and analyses sufficient to indicate that the impounding structure will be stable during construction or alteration and during the life of the impounding structure under all conditions of impoundment operations, including rapid filling, flood surcharge, seismic loadings, and rapid drawdown of the impoundment.
f. Evaluation of the stability of the impoundment rim area to safeguard against impoundment rim slides of such magnitude as to create waves capable of overtopping the impounding structure and evaluation of rim stability during seismic activity.
g. Design assumptions and analyses sufficient to indicate the seepage in, around, through, or under the impounding structure, foundation, and abutments will be reasonably and practically controlled so that internal or external forces or results thereof will not endanger the stability and integrity of the impounding structure. The design report shall also include information on graded filter design.
h. Calculations and assumptions relative to hydraulic and structural design of the spillway or spillways and energy dissipater or dissipaters. Spillway capacity shall conform to the criteria of Table 1 and 4VAC50-20-52.
i. Provisions to ensure that the impounding structure and appurtenances will be protected against unacceptable deterioration or erosion due to freezing and thawing, wind, wave action, and rain, or any combination thereof.
j. Other pertinent design data, assumptions, and analyses commensurate with the nature of the particular impounding structure and specific site conditions, including when required, a plan and water surface profile of the dam break inundation zone.
k. A description of the techniques to be used to divert stream flow during construction so as to prevent hazard to life, health and property, including a detailed plan and procedures to maintain a stable impounding structure during storm events, a drawing showing temporary diversion devices, and a description of the potential impoundment during construction.
l. A plan for project construction monitoring and quality control testing to confirm that construction materials and performance standards meet the design requirements.
m. Plans and specifications as required by 4VAC50-20-310, signed and sealed by the engineer.

List of attached drawings and specifications:
CERTIFICATION BY OWNER'S ENGINEER

I hereby certify that the information provided in this Design Report has been examined by me and found in my professional judgment to be true and correct.

Signed: ___________________________ Virginia Number: ______________

Professional Engineer’s Signature Print Name

This __________ day of ______________, 20 ___.

Engineer’s Virginia Seal:

CERTIFICATION BY OWNER

I hereby certify that I have received this Design Report.

Signed: __________________________________________________________________________

Owner’s Signature Print Name

This __________ Day of ______________, 20 ___.

Mail the executed form to the appropriate
Department of Conservation and Recreation
Division of Dam Safety and Floodplain Management
Regional Engineer