



1

Pond Appurtenances

For all embankment ponds:

1. Seepage control – (Filter Diaphragm or Anti-seep Collars)
2. Anti vortex devices
3. Trash racks

Other appurtenances that may be needed:

- Buoyancy control
- Pond drains
- Livestock water supply
- Fire protection / dry hydrants
- Wave erosion protection

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2

Seepage Control



Seepage along pipes* through the dam shall be controlled by:

- Filter and drainage diaphragm
- Antiseep collars

* Bleeder drains above or along the saturation zone do not require seepage control.

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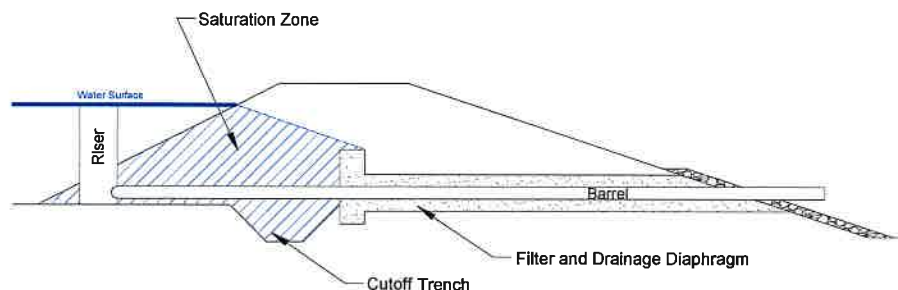
APPURTENANCES

3

3

Seepage Control

The **normal saturation zone** extends from the point of water contact with the inside slope of the embankment to the drainage system.



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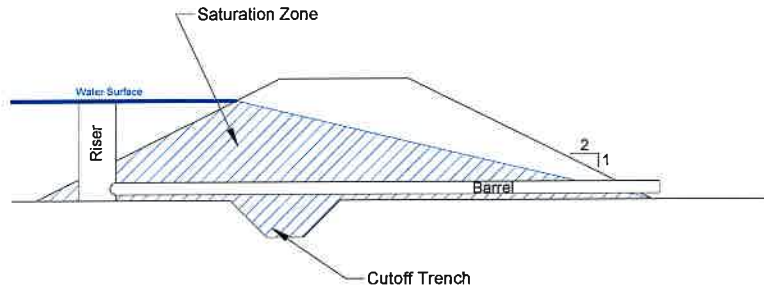
APPURTENANCES

4

4

Seepage Control

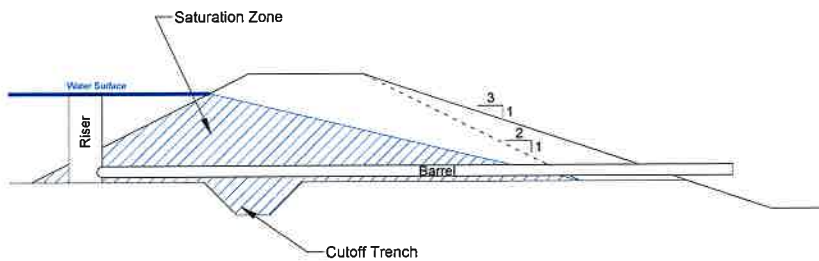
When no drainage system is used, this zone extends to the downstream toe of the dam.



5

Seepage Control

If the downstream slope of the embankment is flatter than 2:1, a 2:1 slope may be used to determine the saturation zone.



6

Filter & Drainage Diaphragm

Consists of fine concrete aggregate sand

- ASTM C-33, ODOT 703.02

Minimum dimensions:

- 2 ft. thick
- Extend vertically upward and horizontally three times the pipe diameter
- Extend vertically downward at least 18 in. below pipe invert

Located immediately downstream of the cutoff trench

Drain to outlet at embankment downstream toe

- Preferably use drain backfill envelope along pipe to outlet
- Protect drain fill from surface erosion with large rock

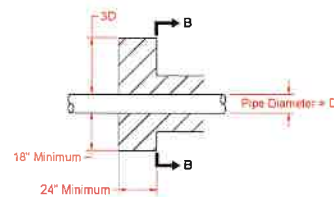
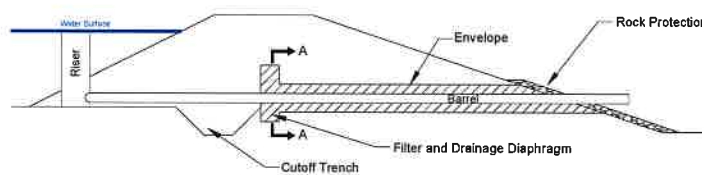
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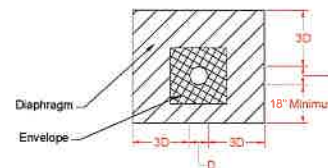
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7

Filter & Drainage Diaphragm



Section A-A



Section B-B

Note: The envelope consists of a square with side dimensions = $D + 24"$

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8

8