Dam Safety E-Newsletter

NJDEP BUREAU OF DAM SAFETY
Engineering and Construction

Spring 2017

New Website Updates!

Please be aware that the Bureau of Dam Safety has updated multiple forms on its website (*http://www.nj.gov/dep/damsafety/forms.htm*). Most notable of these updates is the addition of a Formal Inspection template to the Inspection Guidelines document. Please be sure to incorporate the Formal Inspection template in submissions of all future Formal Inspection Reports.

VISIT THE BUREAU OF DAM SAFETY WEBSITE TO LEARN MORE

National Dam Safety Awareness Day: May 31, 2017

National Dam Safety Awareness Day was created to memorialize the South Fork Dam failure in Johnstown, Pennsylvania that occurred on May 31, 1889. This dam failure was the worst dam-related disaster in the history of the United States where over 2,200 lives were lost. We encourage all dam safety stakeholders to educate themselves on best practices for dam safety by promoting the lessons learned from dam failures. Community outreach is essential and can help either to prevent future catastrophic dam failures or lessen the impacts of a dam failure. Please visit the Association of State Dam Safety Officials website for more information regarding National Dam Safety Awareness Day at *http://www.damsafety.org/*.

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Remains of South Fork Dam, Photo credit: National Park Service

Community Outreach Program

In an effort to further educate the public and emergency response communities, the Bureau periodically conducts Dam Safety Awareness training throughout the State. Currently, the Bureau is conducting training for all interested county and municipal emergency management coordinators throughout the State. This training focuses on identifying emergency conditions and emergency action planning.

Dam Owners Workshop @ The College of New Jersey: July 25, 2017

The Bureau of Dam Safety is inviting all New Jersey dam owners to attend a workshop at the College of New Jersey in Ewing Township, NJ on July 25, 2017. Attendees will learn about the importance of regular inspections, proper maintenance for dams, as well as other vital information regarding the New Jersey Dam Safety Program. Further details regarding the workshop will be forthcoming on the Bureau's website at *http://www.nj.gov/dep/damsafety/*.

Dam Safety in New Jersey - Joint Podcast with NJ DEP and NJ OHSP

DISCOVER DEP
podcast

On April 21, 2017, Bob Bostock co-hosted a podcast episode on dam safety with Audrey Miller of NJ OHSP's Preparedness Bureau. Bob and Audrey sat down with John Moyle, Division Director for NJ DEP's Division of Dam Safety and Flood Control, to talk about dam safety in New Jersey in light of the recent incident at the Oroville Dam. Topics of discussion include an explanation of the California Oroville Dam emergency that took place in February, a comparison of dam design, topography, and magnitude of the Oroville Dam and New Jersey dams, and why this type of event is unlikely to occur in New Jersey. The podcast also opened the door to spread the word about Governor Christie's press statement regarding new funding for New Jersey's dam rehabilitation loan program. Tune in to the podcast at *http://njdep.podbean.com/e/episode-52-dam-safety-in-new-jersey-joint-podcast-with-the-nj-office-of-homeland-security-and-preparedness/*.

Technical Design Topic: Conduit Penetrations, Pipe Cradles, & Filter Diaphragms

The United States Department of Agriculture's Natural Resources Conservation Service has reported that dam embankments are more likely to fail or be damaged in the vicinity of pipe conduit penetrations than at other locations on the dam (*Part 628 Dams, National Engineering Handbook, Chapter 45, January 2007*). These incidents are largely related to 1) the deteriorating condition of aged conduit materials such as corrugated metal pipes, or 2) poor compaction around pipe penetrations leading to uncontrolled seepage through an unfiltered exit. With the advancing age of many pipe conduits functioning as spillways and/or low level outlet systems in dams throughout the State, many dam owners are replacing* old, deteriorated pipes within dam embankments with new Ductile Iron Pipe (DIP), Reinforced Concrete Pipe (RCP), or High Density Polyethylene (HDPE) pipe**. Many existing pipe penetrations were installed with outdated construction methods, so it is important to realize the current practice for the installation of conduits through embankment dams. Two crucial design details for conduit penetrations through dam embankments are pipe cradles and filter diaphragms.

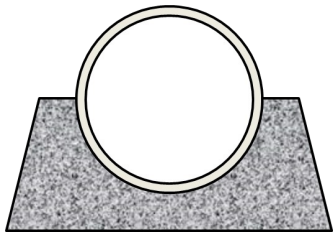
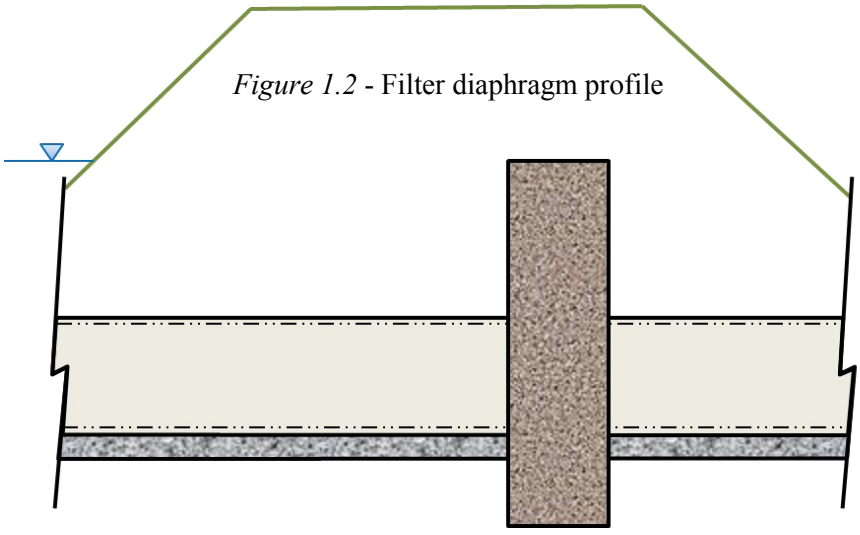


Figure 1.1 - Pipe conduit cradle

A pipe cradle (see Figure 1.1) consists of formed concrete that extends to the springline of the pipe conduit, poured on compacted earthen base material. A properly constructed pipe cradle eliminates well-known compaction issues that can occur at the haunches of the pipe by providing a positive, continuous slope for compaction. Anti-seep collars were historically used along pipes within embankment dams but are no longer considered to be acceptable due to difficulties with achieving proper compaction around the collar. A filter diaphragm (see Figures 1.2 & 1.3) provides protection against the migration of fine-grained embankment materials due to seepage along the pipe conduit. A properly designed filter diaphragm will remove any fine-grained embankment material from potential seepage along the pipe conduit. The filtered seepage flow can be collected, monitored, and discharged safely downstream with proper systems in place.

Figure 1.2 - Filter diaphragm profile



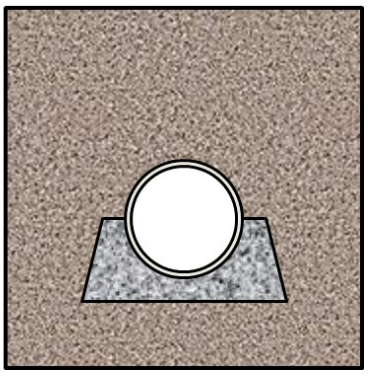


Figure 1.3 - Filter diaphragm

*It is noted that slip-lining can be a viable alternative to replacing deteriorated pipes, contact the Bureau of Dam Safety for guidance.

**High Density Polyethylene (HDPE) can be used for limited applications of pipe conduit penetrations in low hazard dams only. There are certain design cases where full encasement of HDPE pipe conduit is necessary based on loading conditions.

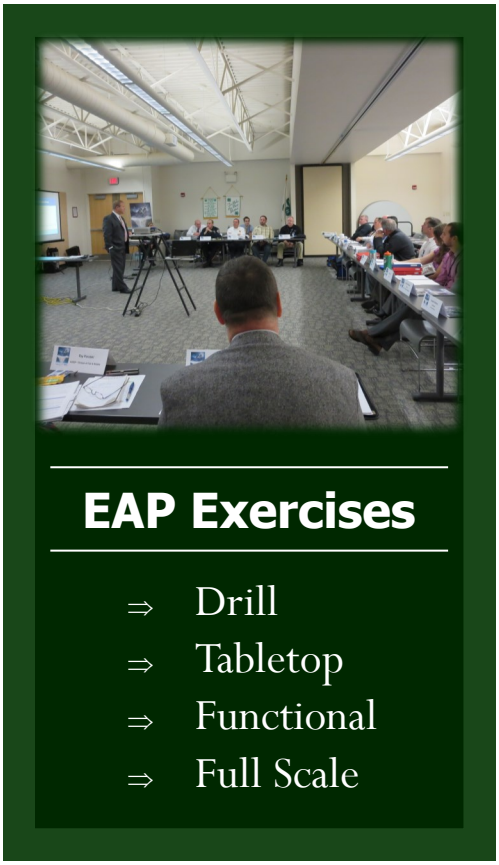
Emergency Action Planning & Exercises

An Emergency Action Plan (EAP) is a document intended to help save lives and reduce property damage in the event of a dam failure or other uncontrolled release of water. The New Jersey Dam Safety Standards (N.J.A.C. 7:20 et seq.) require that owners of Class I and Class II dams develop and maintain an updated EAP. It is the responsibility of each Class I and Class II dam owner to develop an EAP tailored to their respective dam.

In an effort to further assist the owners of Class I and Class II dams in developing their EAP's, the *Guidelines for Developing an Emergency Action Plan* was developed by the Bureau of Dam Safety (Bureau). The document includes a standardized EAP format with text and is available on the Bureau's website (www.nj.gov/dep/damsafety/forms.htm). Please keep in mind, however, that since an EAP is useful only if it accurately reflects site conditions, some modifications to the standardized text may occasionally be required. Accordingly, the standardized format should be used with care. Authorization to deviate from the standardized EAP format and text will be provided by the Bureau on a case-by-case basis.

EAP format and text is available on the Bureau's website
www.nj.gov/dep/damsafety/forms.htm

All EAP's are required to include inundation mapping which defines the area that would be impacted under various dam failure scenarios including a sunny day failure and the spillway design storm with failure. A dam breach analysis performed by a licensed New Jersey Professional Engineer is required to identify the potential inundation areas that are shown on the inundation mapping.



EAP's should be reviewed at least annually by the dam owner to ensure all information is up to date. If updates are necessary, they must be distributed to all EAP document holders. Once an EAP has been developed, periodic training and exercising of the plan is critical in ensuring preparedness of both the dam owner and the emergency response community. Personnel involved in implementation of the EAP should be trained periodically to ensure that they are thoroughly familiar with all elements of the plan, the availability of equipment, and their responsibilities and duties under the plan. Exercises allow owners to prepare scenarios for various emergency conditions and test the state of training and readiness of key personnel responsible for actions during an emergency. Exercises can vary in complexity as well as realism. The four standard types of exercises include drill, tabletop, functional, and full scale. Further discussion regarding the types of exercises is available in the Guidelines document. The Bureau recommends that all high and significant hazard dam owners exercise their EAP's on an annual basis. For further assistance with an EAP or questions regarding the planning of exercises, please contact the Bureau.

New Jersey Department of Environmental Protection

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Helpful Dam Safety Links

Association of State Dam Safety Officials

Responsible Dam Ownership

Living With Dams

FEMA - National Dam Safety Program

Bureau of Reclamation - Dam Safety Program

U.S. Army Corps of Engineers

★ UPDATED FORMS! Visit our website at www.nj.gov/dep/damsafety/

Boonton Dam - Morris County, NJ