



ODNR Guidelines for Excavation and Construction along Buckeye Lake Dam

Introduction and Safety Considerations

This document provides guidelines to help the Ohio Department of Natural Resources (ODNR) and its immediate neighbors along Buckeye Lake Dam work together to achieve their goals now that the dam improvement project has been completed. A key to success will be the willingness of adjacent property owners and local officials to inform ODNR of their plans for building projects along the dam, as well as working with the department to ensure public safety is not threatened and all property rights are respected.

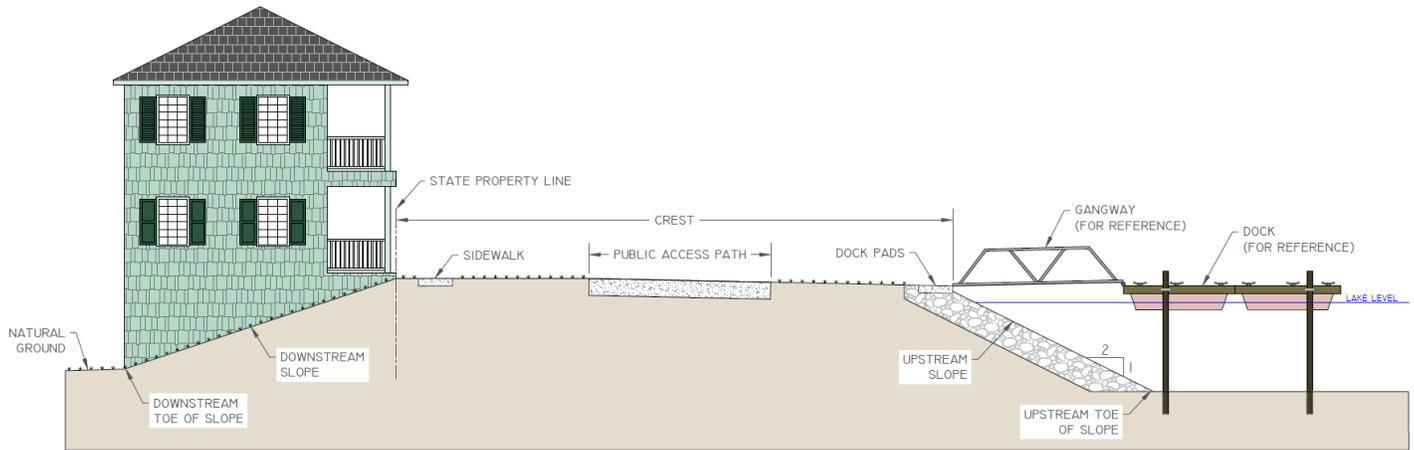
ODNR's most important mission is to ensure the safety of the community. We have little interest in adjacent property development beyond protecting the dam by making sure adjacent excavation and construction projects adhere to professional engineering best practices and standards of care.

As the owner of this Class I High Hazard Potential dam, ODNR is required to protect the dam's structural integrity to safeguard the community from a catastrophic dam failure. Rehabilitation work for the dam was completed in 2019, and ODNR is tasked with maintaining the condition and safe operation of the dam. ODNR is achieving this goal by implementing procedures and risk reduction measures urged by the U.S. Army Corps of Engineers in its 2015 report on the dam's then unsafe condition. A key recommendation: "To the extent allowable, prevent additional construction of residences and appurtenant structures (i.e. wall systems, patios, swimming pools, sidewalks, and utilities) within the embankment, which would otherwise constitute additional embankment defects."

Also, like all landowners, the State of Ohio has the legal right to have its land supported and held in place from the sides by its neighbors' land under the property-rights principle of "lateral support." ODNR respects neighbors' rights to improve their own properties. We are also obliged to protect State property from harm or encroachment. We will use every reasonable and legal remedy available to protect the structural integrity of the dam and the State's property rights.

The following guidelines are organized according to where along the dam excavation and construction activities would take place. They are designed to help achieve these key objectives:

- Ensure excavations and construction **on private property** along the dam do not lead to embankment slope instability or failure, expose the soil-cement structure that is the core of the new dam, lead to the creation of new seepage pathways through the dam, or otherwise harm neighboring State property or endanger the public.
- Prevent excavation, construction or placement of materials **on State property** that could harm the dam or other State property; impede dam safety inspections, repairs and emergency response; unduly hinder the public's use of State parkland; or otherwise use State property without permission.



Typical Embankment Diagram

1. Guidelines for adjacent property owners for work at the downstream toe of the downstream embankment slope.

- Avoid excavations along the downstream toe of the downstream slope deeper than what is typical for single-family residential construction without a basement, or vertical post holes deeper than 4 feet.
 - The downstream toe is generally the intersection of the downstream slope and the natural ground.
 - A typical foundation excavation should be a concrete slab on grade or a standard frost depth footer of 36 inches.
- Provide electronic boundary survey data and construction plans to the Buckeye Lake State Park Office before starting work.
 - Boundary survey data from an Ohio registered professional surveyor.
 - ODNR will review the plans and may request additional information or changes, if needed.
 - Please allow 30 working days for ODNR's review of the information.
- If the foundation design is deeper than a typical 36-inch-deep footer and over-excavation of the downstream toe is requested, provide additional details as needed to ensure the safety and structural integrity of the downstream toe.
 - Deeper excavations at the downstream toe designed and sealed by an Ohio registered professional engineer specializing in geotechnical engineering.
 - Deck building and post hole digging will typically **not** need to be designed by a registered professional engineer.

2. Guidelines for adjacent property owners for work on the downstream slope of the embankment.

- Avoid excavations into the downstream slope of the embankment deeper than what is typical for single-family residential construction without a basement.
 - The downstream slope is the area from the embankment crest, located just lakeward of the homes lining the dam, down the slope to the downstream toe.
 - A typical foundation excavation should be a concrete slab on grade or a standard frost depth footer of 36 inches.
- Provide electronic boundary survey data and construction plans to the Buckeye Lake State Park Office before starting work.
 - Boundary survey data from an Ohio registered professional surveyor.
 - ODNR will review the plans and may request additional information or changes, if needed.
 - Please allow 30 working days for ODNR's review of the information.
- Provide details for proposed excavation and foundation construction in the downstream slope. These details are to ensure the safety and structural integrity of adjacent State property and the dam embankment crest.

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- Details should include lateral support design plans defining how neighboring State property will be supported during and after excavation.
- Design plans are especially important for wide excavations of the downstream embankment slope that are deeper than 3 feet.
- Plans are designed and sealed by an Ohio registered professional engineer specializing in geotechnical engineering.
- Deck building and post hole digging less than 24 inches in diameter will typically **not** need to be designed by a registered professional engineer.
- At a minimum, design plans follow the Occupational Safety and Health Administration (OSHA) regulations for cut slope stability and support of excavation as outlined in 29 CFR 1926, Subpart P.
 - The existing embankment at Buckeye Lake Dam is granular soil that was mechanically placed as a fill and by its nature is considered “disturbed”. Therefore, OSHA soil classifications “Stable Rock” and “Type A” soil from Table B-1 of 29 CFR 1926, Subpart P cannot be considered for design or be approved by ODNR.
- Acceptable support of excavation methods (See Attachment 1):
 - Drilled pile and lagging (e.g. small diameter drilled shafts, auger cast piles, or drilled soldier piles)
 - Concrete masonry unit walls (CMU)
 - Steel sheeting braced excavation support
 - Composite sheeting braced excavation support
 - Other exterior braced excavation support
- Unacceptable support of excavation methods:
 - Driven shoring protection
 - Vibrated shoring protection
 - Anchored shoring protection
- Monitoring of open excavation and support operations follow Occupational Safety and Health Administration (OSHA) regulations 29 CFR 1926.651(k) Inspections. Signs of distress or movement in the embankment must be addressed immediately with additional bracing or shoring protection measures prior to proceeding with building construction. ODNR must be notified immediately in the event of an embankment slope movement or failure.

3. Requirements for adjacent property owners for work on State property including the embankment crest, the upstream slope from the embankment crest into the lake, and other State land.

- Property owners shall not undertake excavation, construction, placement of materials, or other activities described below on State property without written permission from ODNR.
 - State property includes the embankment crest and upstream dam slope, as well as several public access corridors extending from the downstream embankment toe up to the embankment crest.
 - The embankment crest and upstream slope is considered to be the area from the existing homes along the dam extending out into the lake to the farthest extent of the underwater rock riprap along the upstream toe.
- State property between the homes and the lake will generally be kept in turf grass by ODNR, with the exception of structures ODNR installed as part of the dam improvement project.
 - The exceptions include the residential sidewalk placed near the homes along the dam and the public access path on top of the new dam structure, both running the length of the dam.
 - Exceptions also include the small concrete pads that mark the prescribed locations for any future privately installed docks along the front of the dam.
- The following activities on State property **may be allowed** with written permission from ODNR:
 - Property owners may obtain a License from ODNR authorizing the exclusive use of the crest of the dam between the State property line and the sidewalk for certain purposes that will not damage the dam and will still allow for its inspection and maintenance. Under the License, property owners:
 - Shall maintain the area
 - May install non-grouted, non-cemented pavers no larger than 8x8 inches

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- May plant flowers
- May place personal property limited in weight that can easily be removed by hand
- Shall not excavate deeper than 4 inches
- Shall not plant woody vegetation (trees, shrubs, bushes)
- Shall not place or construct heavy or permanent improvements, including decks; boardwalks; cantilevered structures; cemented stone or brick paths or patios; and concrete paths or patios.
- Property owners shall obtain a Right of Entry from the Buckeye Lake State Park Office to use State property to temporarily stage supplies or light equipment needed for home maintenance when their access would otherwise not be feasible.
- Activities that encroach on State property or pose a safety risk to the dam or public **shall be prohibited**, including:
 - Placement of heavy loads above 1,500 pounds or use of heavy equipment on State property along the crest or upstream slope.
 - Stockpiling excavated material along the embankment crest
 - Use of motorized vehicles on the residential sidewalk or access path except as used for handicapped accessibility in accordance with the Americans with Disabilities Act.
 - Overnight placement of personal property, including equipment and furniture, on State property, without written permission from ODNR.
 - Penetrations of any kind into State property.
 - Encroachments of any kind onto State property unless authorized by the License above.
 - Installation of dock pilings into the riprap rock under water along the dam's upstream slope.
 - Installation of fixed gang planks that cannot be easily removed for dam inspection and maintenance.
 - Removal of survey flags, pins, monuments, and other items used to establish property lines.
 - Removal of sod or turf from State property.

Thank you for your understanding as we continue to preserve Buckeye Lake for generations to come.

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Attachment 1

Acceptable Support of Excavation Methods

General Schematic

