USDA NRCS
Natural Resources Conservation Service

Erosion and Sediment Control During Farm Pond Construction

Alabama Guide Sheet No. AL 378B

Definition

During the construction of a pond, significant sediment loads can enter a stream system if the proper erosion control techniques and construction sequences are not utilized during construction. After construction, a pond provides excellent sediment control for the upstream drainage area.

Erosion and Sediment Control Practices

Disturb the least amount of land for the least amount of time. The construction of a pond should not begin until such time that it is possible to complete the construction without delay. That is, work should not begin and then the site lay idle while the contractor completes other jobs or waits for extended periods of seasonally bad weather to end. Ideally, pond construction should be done during periods with the least amount of rain in order to minimize construction time. This is generally during late summer and early fall. The contractor should also devote all efforts needed to complete the pond site as quickly as possible while meeting the construction specifications for the job.

The pool area of the pond should not be disturbed until such time as the foundation of the embankment, barrel pipe (drain pipe) with valve, and several feet of the embankment have been completed. This creates a sediment detention basin for the remainder of the work in or above the pool (clearing, borrowing areas, etc.) Also, the borrow area should only be expanded as additional earth fill material is required.

Diversion of clean water. Clean water that enters the work area of the pond site from the upstream drainage area or adjacent to the pond site should remain clean. This can be accomplished several ways. The barrel pipe can often be installed at a location away from the natural ditch. If so, the foundation, installation, and backfill work associated with the barrel pipe should be the first item completed on the site. The clean water in the ditch should then be diverted through the pipe while the remainder of the embankment work is completed. Diversions should be used when possible to divert clean runoff water away from any disturbed areas like the pool, emergency spillway, or borrow area.

Stop sediment at its source. Sediment can often be very difficult to control. It is much easier to control erosion. Any areas that have bare soil exposed to direct rainfall have the potential to erode and cause sediment. Soil that is exposed for periods longer than 1 week without on-going construction should be protected from possible erosion. One of the most cost-effective methods is to cover the exposed areas with mulch at a rate of 3 tons/acre. However, the mulch must be removed when construction resumes.

Control sediment. After the barrel pipe, valve, and a portion of the embankment are installed, the valve should be barely opened to allow slow drainage of storm runoff, and to allow for detention time and sediment deposition in the pool area instead of downstream. (Caution: Runoff from large storm events may overtop a partially completed embankment.) Borrow areas should be constructed to hold and retain runoff water in an area where borrowing has been completed rather than allowing the sediment-laden water to leave the site. Borrow areas and emergency spillway outlet slopes that allow

runoff to bypass the embankment should have silt fence barriers installed to control sediment. Cleared brush and trees should be placed in tightly packed windrows across the slope to serve as sediment barriers. The windrows should be removed as one of the last items of construction just prior to final vegetation. When the pool area is cleared and disturbed, the contractor should leave at least a 20-foot wide strip of undisturbed grass or vegetation adjacent to the natural drainage ditch in the pond area. This filter will aid in removing sediment before the water enters the stream. If the 20-foot wide strip has to eventually be cleared, it should be done only as the last item of construction and after the valve has been totally closed.

Establish permanent vegetation. As soon as the final grading is completed for the embankment, emergency spillway, and borrow areas, they should be vegetated according to Conservation Practice Standard Code 342–Critical Area Planting. Temporary seeding and/or mulching may be required until permanent-seeding dates can be met. Provide a good seedbed, fertilizer, lime, and mulch on all the areas being vegetated.

Operation and Maintenance

Erosion and sediment control practices must be properly operated and maintained in order to be effective. Practices must be inspected after every rain event of more than ¾ inch. Erosion that does occur should be promptly corrected. Sediment accumulations behind silt fences must be removed and properly spread in locations to be seeded. Additional practices may be needed if those installed originally are not effective.

Construction Sequence

While each pond site may differ slightly in construction, the general sequence of construction to control erosion and sediment during the construction of a pond is as follows:

1. Clear the work area immediately adjacent to the barrel pipe location.
2. Excavate the cut off underneath the barrel pipe location.
3. Expose a small borrow area while controlling potential sediment from leaving the site.
4. Backfill the cutoff underneath the barrel pipe location.
5. Install the barrel pipe and anti-seep collars or filter and drainage diaphragm.
6. Backfill the barrel pipe (minimum of 2 feet over the pipe).
7. Install the valve, riser pipe, and trash rack.
8. Install riser ballast.
9. Divert the drainage ditch in the pond bottom to the valve inlet.
10. Clear the remainder of the embankment footprint.
11. Place brush windrows as sediment barriers on the contour below cleared areas.
12. Place silt fence barriers where necessary.
13. Excavate the remainder of the cutoff on both sides of the barrel pipe.
14. Expose more borrow area as earth fill is required.
15. Backfill the below-ground core.
16. Begin above-ground core and embankment earth fill placement.
17. Leave the valve cracked open to allow for storm water detention.
18. Clear the pool area as needed while maintaining a 20-foot vegetative strip next to the drainage ditch.
19. Complete embankment earth fill placement and excavation of emergency spillway.
20. Close the valve.
21. Clear the 20-foot vegetative strip next to the drainage ditch if needed.
22. Remove all silt fences and brush windrows. Remove and/or spread silt accumulations.
23. Vegetate the site.
24. Inspect vegetation and make repairs as needed after the first few rain events.

References

NRCS AL Conservation Practice Standards
Code 378 - Pond
Code 342 - Critical Area Planting

NRCS AL Guide Sheet
AL 378 - Pond Construction