



DATE: March 25, 2022

MEMORANDUM

To: All Regional Engineers and Staff

From: Josh Colley, PE – State Dam Safety Engineer

Subject: Guidelines for Maintenance, Repair and Modification Activities on Dams

On September 25, 2020 a memorandum (memo) was issued providing common examples of activities that constitute maintenance, repairs, or modifications. The purpose of this memo is to revise this guidance to reflect recent changes in the North Carolina Dam Safety Program's (Dam Safety) guidance regarding trees on dams. Specifically, that small and large trees are defined as those with diameters at breast height of less than or greater than six inches, respectively. The new revised guidance is provided below:

In order to assist dam owners to comply with NCGS 143-214.27 and 15A NCAC 02K, Dam Safety has created the following guidelines providing examples of common work activities falling within the categories of Maintenance, Repair, and Modification, and whether they therefore require or do not require submittals to Dam Safety for review and/or approval. Please note this list is not exhaustive and is subject to change. Should any proposed activities, whether listed below or not, present a probable likelihood of adversely impacting the safe operation of the dam, or if you are unsure the scope of any activities, please contact me directly at 919-707-9214. Please note that plans for maintenance or repair do not currently require a fee for review. However, fees are required for review of plans to modify an existing dam.

The following activities constitute Maintenance, and thus do not require Dam Safety authorization – no fee required for review:

1. Mowing.
2. Reseeding and revegetation of grass cover on bare areas.
3. Cutting and controlling of trees, brush, and woody vegetation less than six inches in diameter at breast height.
4. Removal of debris, driftwood, and above-ground portions of fallen, overturned, dead or unhealthy trees on dams from storm events.



5. Application of herbicides to riprap armoring to control vegetative growth.
6. Bathymetric or land surveying.
7. Inspections of roadways on top of dams.
8. Replacement or repair in-kind of above-ground portions of piezometers, inclinometers, and observation wells.
9. Cleaning or replacement in-kind of trash racks. Minor repairs e.g. welding of rebar racks or sheet metal skimmers will also be considered maintenance.
10. Installation of flow measuring weirs in stream courses greater than 15 feet away from the downstream toe of dams.
11. Exploratory test borings and geotechnical borings up to six inches in diameter into earthen embankments and concrete dam components performed under the supervision of a Professional Engineer licensed in the State of North Carolina. A courtesy notification should be provided to our office when such activities are to occur. All borings must be grouted after completion.
12. Lubrication and exercising of gates, valves, valve stems and operators.
13. Replacement or repair in-kind of valve stems and operators with no changes to dimensions or flow capacity.
14. Electrical or mechanical repair or relocation of valve and gate actuators by qualified personnel.
15. Replacement in-kind of actuators and actuator control or support structures by qualified personnel.
16. Painting of exterior and interior surfaces of dam componentry.
17. Installation, repair or removal of signage on or around a dam.
18. Cleaning of pipes and pipe outfalls.
19. Visual or video inspections of pipe outfalls.
20. Replacement or supplementation in-kind of existing riprap located on the dam.
21. Replacement in-kind of existing paving and aggregate cover without significant elevation change (less than 0.1 foot) to crest elevation for existing access roadways on dams.
22. Replacement or repair in-kind of spillway access or safety structures, provided there is no excavation into dam embankments.
23. Replacement or repair in-kind of existing flashboards and existing items associated with flashboards. Addition or removal of flashboards for the purposes of temporarily adjusting impoundment levels (e.g. ahead of storms, for lake edge/dock maintenance, etc.) will also be considered maintenance.
24. Repair of existing minor (non-integral to operation of dam) surficial stormwater control structures associated with existing access roadways on dams, provided there is no excavation into dam embankments.
25. Repair of erosion rills or gullies less than twelve inches in depth (or less than one lift of fill) not requiring backfill compaction.
26. Repair of surficial wave erosion on the upstream toe of dams not requiring backfill compaction or additional armoring.



27. Excavation of CCR material from coal ash impoundments or tailings from mining impoundments not requiring alteration of the dam.
28. Installation, repair or removal of electrical systems not requiring excavation into the dam by qualified personnel.
29. Replacement or repair in-kind of fish ladders.
30. Replacement or repair in-kind of floating structures tethered with minimal localized measures (guy wires/anchors, helical piers, cabling, etc.), except within the confines of a spillway.

The following activities constitute Repairs, and thus require Dam Safety authorization – no fee required for review:

1. Excavation and backfilling required for complete root-ball removal of trees, brush, and woody vegetation greater than six inches in diameter at breast height.
2. Removal of exposed root networks or uprooted portions of fallen, overturned, dead or unhealthy trees on dams from storm events.
3. Repair of erosion rills or gullies twelve inches or greater in depth (or one lift or greater of fill) requiring backfill compaction.
4. Repair of wave erosion on the upstream toe of dams requiring backfill compaction or additional armoring.
5. Instances of work requiring backfill compaction.
6. Repair of any slide events or any damage resulting from slope instability.
7. Repair of any sinkhole events.
8. Repair of existing electrical systems (poles, overhead electric lines, underground electric lines, etc.) requiring excavation into the dam.
9. Repair or replacement in-kind of any security fencing into a dam, spillway, associated appurtenances not causing change to flow capacity. Fencing may not be placed across spillways, and, generally, all fencing is strongly discouraged.
10. Repair or replacement in-kind of existing security systems.
11. Repair of existing piezometers, inclinometers, and observation wells.
12. Repair of existing toe drains.
13. Repair of existing bottom drains.
14. Repair of existing permanent siphon systems.
15. Repair of existing permanent structures located in spillways.
16. Repair of existing sliplining of pipes through dams.
17. Repair of existing sluice gates.
18. Replacement or repair in-kind of valves and gates with no changes to dimensions or flow capacity.
19. Installation of new actuators and actuator control or support structures by qualified personnel.
20. Repairs to existing trash racks not covered under #23 in the Maintenance section.



21. Repair of existing utility structures (gas lines, water lines, sewer lines, fiber optic lines, etc.).
22. Installation of flow measuring weirs in stream courses less than 15 feet away from the downstream toe of dams.
23. Exploratory test borings and geotechnical borings greater than six inches in diameter into earthen embankments and concrete dam components performed under the supervision of a Professional Engineer licensed in the State of North Carolina. All borings must be grouted after completion.
24. Installation or removal of paving and aggregate cover to roadways on dams.
25. Installation of new riprap placed on the dam.
26. Installation, repair or removal of spillway access or safety structures which may or may not require excavation into dam embankments.
27. Repairs to flashboards and items associated with flashboards not covered under #9 in the Maintenance section.
28. Replacement in-kind of RCP joints.
29. Replacement or repair in-kind of sealant on joints or cracks on concrete dam components.
30. Repair to spalling or major cracks on concrete dam components.
31. Repair of voids within or beneath spillways.
32. Repair of existing foundation structures (piers, piles, footings, etc.).
33. Installation or removal of existing minor (non-integral to operation of dam) surficial stormwater control structures associated with existing access roadways on dams.
34. Repair of existing minor (non-integral to operation of dam) surficial stormwater control structures associated with existing access roadways on dams requiring excavation into dam embankments.
35. Instances of repair work done in response to a Dam Safety Program (or associated agencies) issued Notice of Deficiency, Dam Safety Order, or other enforcement action.

The following activities constitute Modifications, and thus require Dam Safety authorization – fee required for review:

1. Installation of all new gates, valves, valve stems and operators.
2. Modification or removal of gates, valves, valve stems and operators that involve changes to dimensions or flow capacity.
3. Instances of work resulting in a change to spillway dimensions or flow capacity.
4. Instances of work resulting in a change to crest elevation or upstream/downstream slope grades.
5. Instances of work resulting in a change to the dam section e.g. installation of anchors, sheet piles, etc.
6. Installation or removal of a spillway or spillway system.



7. Installation or removal of any security fencing into a dam, spillway, associated appurtenances or causing change to flow capacity. Fencing may not be placed across spillways, and, generally, all fencing is strongly discouraged.
8. Installation or removal of security systems.
9. Installation or removal of fish ladders.
10. Installation or removal of electrical systems (poles, overhead electric lines, underground electric lines, etc.) requiring excavation into the dam.
11. Installation or removal of piezometers, inclinometers, and observation wells.
12. Installation or removal of toe drains.
13. Installation or removal of bottom drains.
14. Installation or removal of permanent siphon systems.
15. Installation or removal of permanent structures located in spillways.
16. Installation or removal of sliplining existent pipes through dams.
17. Installation or removal of sluice gates.
18. Installation or removal of trash racks with the exception of pre-fabricated/pre-engineered trash racks (e.g. specified by a municipality, vendor specific, etc.).
19. Installation of new seepage control filters, cutoff structures, or other seepage control measures.
20. Installation of new, or permanent removal of existing, flashboard systems.
21. Installation or removal of utility structures (gas lines, water lines, sewer lines, fiber optic lines, etc.).
22. Installation or removal of foundation structures (piers, piles, footings, etc.).

