

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
DRAINAGE DITCH COVERING**

(Ft.)

CODE 775

DEFINITION

A fabricated rigid or semi-rigid cover installed over a drainage ditch.

PURPOSE

This practice is applied as part of a water management system to achieve one or more of the following purposes:

- Reduce nutrient, pathogen, and/or pesticide transfer to drainage systems and subsequently to downstream receiving waters.
- Block the direct entry of pesticides applied thru sprinkler irrigation into drainage ditch water.
- Prevent the direct entry of liquid manure into drainage ditches during application by sprinkler systems.

CONDITIONS WHERE PRACTICE APPLIES

This practice is applicable to existing or proposed drainage ditches in or along cranberry bogs where the management of agricultural pest infestations is carried out using chemicals applied using sprinkler irrigation systems or by other means, or in or along fields where liquid manure is applied by means of sprinkler irrigation systems.

This practice does not apply to natural streams.

CRITERIA

General Criteria Applicable to All

Purposes

Covered ditches shall be located where they are not susceptible to damage from flooding, and provisions shall be made to protect the covering from other means of damage (e.g. animals).

Drainage ditch covering is only applicable to ditches that have a ditch cross section that is adequate for site conditions and stable side slopes.

Drainage ditches that are covered may have vertical side slopes provided they are stabilized by cribbing constructed of wood or other permanent and durable material.

Cribbing must be sound, stable and properly maintained. Indications of unsound cribbing are:

- Slumping of the ditch edges.
- Visible rotten lumber.
- Missing or broken members.

Drainage ditch covers must comply with all federal, state, and local laws.

Materials The type of material used for drainage ditch covers and cribbing, and the dimensions and thickness of the material used must be established on the basis of engineering considerations for each site.

Location, ditch size, supporting members, cultural practices, and method of construction, shall be evaluated in establishing the type of material and thickness to be used.

Ditch covers shall be plywood, plastic

sheeting or other permanent and durable material.

New or replacement ditch cribbing shall be constructed from treated structural grade lumber.

Lumber Lumber shall be structural sawn lumber and identified by commercial species and grade names.

Lumber used for ditch cribbing shall be pressure treated for ground contact. The use of lumber treated with creosote or pentachlorophenol is not allowable.

Plywood Plywood used for ditch covers shall be exterior grade, and pressure treated for ground contact. The use of wood products treated with creosote or pentachlorophenol is not allowable.

Pressure treated wood products (lumber and plywood) are restricted to those that are produced in accordance with the current "Best Management Practices for the Use of Treated Wood in Aquatic Environments" (BMP Manual) issued by the Western Wood Preservers Institute.

Plastic Sheeting Plastic Sheeting used for ditch covers shall be high density polyethylene (HDPE) with a minimum thickness of 0.125 inches.

Plastic sheeting shall only be used where there is not pedestrian or equipment loads on the ditch cover.

Hardware All hardware shall be galvanized or have equivalent protection.

Loads The design of wood structures shall comply with the current "National Design Specification for Wood Construction", American Forest and Paper Association.

New or replacement ditch cribbing shall be designed for lateral and vertical loads in accordance with applicable provisions of the current "ASCE Minimum Design Loads for Buildings and Other Structures (ASCE 7)". This seems to imply that covering of existing cribbing need not meet expected load scenarios.

Plywood ditch covers shall be designed for pedestrian and/or equipment loads on the ditch cover in accordance with applicable provision of the current "ASCE Minimum Design Loads for Buildings and Other Structures (ASCE 7)". Vehicle loads shall be based on the recommendations in the current American Society of Agricultural and Biological Engineers "Floor and Suspended Loads on Agricultural Structures due to use (ASAE EP378.4)".

Installation Drainage ditch covers shall have a minimum width equal to the outside width of the cribbing to facilitate the runoff of water from the cover onto the adjacent field or cranberry bog without draining into the drainage ditch.

Drainage ditch covers shall slope to one or both sides of the drainage ditch so that runoff flows to the adjacent field or cranberry bog.

Drainage ditch covers shall be installed so that there are no gaps exposed between adjacent sheets of the covering material. This may be accomplished by overlapping adjacent sheets or by covering any gaps with a durable material

Drainage ditch covers shall be securely anchored in-place in a manner that also allows for thermal expansion and contraction.

CONSIDERATIONS

Explore the use of alternative pesticide products and pest management strategies.

Examine alternative pesticide application methods that reduce pesticide application to non-target areas.

Revise the chemigation system to include:

- Chemical injection point locations immediately above the bog vegetation to reduce chemical travel distance and time.
- Installing direction-controlled, partial area sprinkler heads next to drainage

ditches. Use a nozzle sized for the smaller area.

- Gear-driven or rotator type sprinkler heads.
- Sprinkler heads located further from drainage ditches.
- Shut-off valves on full-circle sprinkler heads adjacent to drainage ditches.
- Scheduling irrigations to meet the crop consumptive use rate.
- Install buffers to separate adjacent surface waters from chemigation water.

Replace existing drainage ditches with subsurface drains or underground outlets

Evaluate alternative methods for the application of liquid manure adjacent to drainage ditches.

Consider manure application setbacks and buffers from streams, flowing drain lines, and sinkholes, to reduce risk of contamination.

PLANS AND SPECIFICATIONS

Plans and specifications for installing drainage ditch covering shall be prepared in accordance with the criteria in this standard and shall describe the requirements for applying the practice to achieve its intended purpose(s).

OPERATION AND MAINTENANCE

An Operation and Maintenance plan shall be developed for drainage ditch covers. The plan serves to document necessary actions to ensure that drainage ditch cover installations performs adequately throughout the expected life of the practice.

The Operation and Maintenance requirements shall be determined as part of the design.

REFERENCES

Anderson, Paul and Dale Davis, 2000. Evaluation of Efforts to Reduce Pesticide Contamination in Cranberry Bog Drainage. Washington State Department of Ecology, Olympia, WA. Publication No. 00-03-041

Anderson, Paul, 2010. Grayland Ditch, An Evaluation of Organophosphate Pesticides and Pesticide Test Kits. Washington State Department of Ecology, Olympia, WA. Publication No. 10-03-012

The Use of Treated Wood Products in Aquatic Environments: Guidelines to West Coast NOAA Fisheries Staff for Endangered Species Act and Essential Fish Habitat Consultations in the Alaska, Northwest and Southwest Regions, 2009. National Marine Fisheries Service (NOAA Fisheries)-Southwest Region,

Washington Administrative Code 220-110-060, "Construction of Freshwater Docks, Piers, and Floats and the Driving or Removal of Piling".