NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

WATERING FACILITY

(No.)
Code 614

DEFINITION

A device (tank, trough, or other watertight container) for providing animal access to water.

PURPOSE

To provide watering facilities for livestock and/or wildlife at selected locations in order to:

- protect and enhance vegetative cover through proper distribution of grazing;
- provide erosion control through better grazing land management; or
- protect streams, ponds and water supplies from contamination by providing alternative access to water.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all land uses where there is a need for new or improved watering facilities.

CRITERIA

Impact to cultural resources, wetlands and Federal and state protected species shall be evaluated and avoided or minimized to the extent practicable during planning, design and implementation of this conservation practice in accordance with established National and Florida policy, General Manual (GM) Title 420-Part 401; Title 450-Part401, Title 190-Parts 410.22 and 410.26, National Planning Procedures Handbook (NPPH) Florida Supplements to Parts 600.1 and 600.6, National Cultural Resources Procedures Handbook (NCRPH), National Food Security Act Manual (NFSAM), and the National Environmental Compliance Handbook (NECH).

General Criteria Applicable To All Purposes

System capacity. Watering system storage capacity is critical to animal health. A trough or tank and water delivery system shall have adequate capacity to meet the water requirements of the livestock and/or wildlife using the watering facility. The minimum watering system storage capacity shall be 3-days. If a dependable alternative water source (such as a pond, lake, stream, etc.) is available in contiguous grazing units or a dependable backup power source is available and the livestock are checked daily, a minimum of a 1-day supply of water shall be all that is required. This minimum watering system storage capacity may be provided in a combination of troughs or tanks in adjoining pastures.

A dependable backup power source is a well maintained generator that is connected to the pump and has the capacity to energize the pump and all other critical components. A portable generator is not considered a dependable backup power source.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Watering facility size. The size of watering facilities should be based upon capacity and perimeter access space. The capacity (or storage) of a watering facility is dependent upon the animal type, dependability of the water supply and the flow rate to the watering facility. Use Table 1, as a minimum, for determining daily requirements, capacity, and depth of individual watering facilities.

Access space to the watering facility is dependent upon the number of animals drinking at any one time and the configuration of the watering facility. As a minimum, design the watering facility to accommodate 5% of the herd at one time. Allow 20 inches of perimeter per animal for circular tanks and 30 inches per animal for straight side tanks.

Table 1 – Minimum Requirements of Individual Watering Facilities

Type of Livestock	Daily Requirement[1/] gal/head/day	Min. Trough Size	
		Capacity gal	Depth inches
Beef cattle	12	70	12
Horse	12	70	12
Dairy Cattle			
Lactating	25	70	12
Non-lactating	15	70	12
Sheep and Goats	2	15	6
Swine	4	15	6

[1/] These requirements vary with climatic conditions, kinds of feed, size of animals, and other factors and may be increased as necessary.

Replenishment rate. Design the watering facility so that the inflow of water in a 2-hour period plus the individual watering facility (trough/tank) capacity equals or exceeds one-half the daily requirements for the livestock using the facility. Also, the flow rate shall be adequate enough to re-fill the watering facility in 10 hours or less. Minimum flow rate shall be 2 gpm.

Site. The site shall be well drained; if not, provide drainage measures. Gravel, pave or treat areas adjacent to the trough or tank that will be trampled by livestock to provide firm footing and reduce erosion. Gravel, paving material or other treatment will not be required if the native materials will provide firm footing and resist erosion without special treatment.

Design the protective surface around the trough according to Florida NRCS conservation practice standard Heavy Use Area Protection, Code 561.

Watering facility components. Provide automatic water level control and/or overflow facilities as needed. Protect valves or pipes with shields or covers to prevent damage by livestock. All valves and water control devices shall allow the design inflow rate. Pipe any overflow to a stable or suitable point of release. Protect the pipes from freezing and ice damage. Freeze-proof troughs or electric heaters may be used.

Install all watering facilities in a manner which will prevent the facility from being overturned.

Troughs with a capacity larger than 100 gallons shall be equipped with a minimum 1-inch drain plug to facilitate maintenance of the trough.

When a roof is placed over the trough to provide shade, design the roof for the appropriate wind loads and to be durable enough to withstand anticipated livestock and wildlife activities.

All exposed pipes, fittings, and appurtenances shall be galvanized or ultraviolet protected as appropriate.

Materials. All materials shall have a life expectancy that meets or exceeds the planned useful life of the installation. Common construction materials are reinforced concrete, steel, fiberglass and plastic. All designs shall meet the industry standards for the material being used. Generally applicable design requirements and procedures can be found in the documents referenced at the end of this standard.

Concrete structures shall be constructed with a concrete mix producing a minimum compressive strength of 3,000 psi at 28 days. Galvanized steel tanks shall have a minimum thickness of 20 gauge. Plastic and fiberglass structures shall be made of ultraviolet resistant materials or shall have a durable coating to protect the structure from deterioration due to sunlight.

CONSIDERATIONS

When windmills, solar or other unreliable power source is used, consider increasing the watering system storage capacity to 7 days.

Consider providing the livestock with access to a permanent water source (such as a pond, lake, stream, etc.) in the event of power loss.

This practice facilitates Florida NRCS conservation practice standard Prescribed Grazing, Code 528 which assists in supporting a more efficient grazing program. An efficient grazing program will reduce energy costs associated with planting, harvesting and storing feed by applying direct feeding through field grazing.

Install wildlife escape devices to provide small mammals, amphibians, and birds an avenue of escape from the tank. Refer to Section FL600.0505(f)(ii) of the National Range and Pasture Handbook for details on constructing wildlife escape ramps.

Evaluate topography to minimize trail erosion and flooding erosion from tank overflow.

Use portable water troughs that can be relocated between grazing events to disperse impacts from trampling vegetation.

Consider locating troughs at least 150 feet from wellheads.

Consider locating troughs at least 300 feet from streams, creeks, and other bodies of water to protect sensitive riparian areas.

Water supply pipelines should be at least 1 inch in diameter to reduce energy use.

Plan watering facilities at locations to optimize livestock distribution to fully utilize grazing lands. Grazing intensity declines significantly with distances from water of more than 800 feet. (See 1997 Missouri Grazing Manual, University of Missouri, 1997).

Consider the size of animals (domestic and wildlife) using the facility. Design watering facilities so small animals (e.g. calves, goats, deer, etc.) can access the water.

Locate watering facilities within 300 feet of where lactating dairy cattle are grazing. (See publication “Prescribed Grazing and Feeding Management for Lactating Dairy Cows”, New York State Grazing lands and USDA NRCS, January 2000).

Address algae and iron sludge accumulation in areas with water quality that is known to cause problems. Recommend chemicals such as copper sulfate and chlorine as needed, so long as local rules and regulations are followed.

PLANS AND SPECIFICATIONS

Plans and specifications for installing troughs and tanks shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. If the watering facility is a component of a system that includes additional conservation practices, the information necessary to construct these additional practices will be conveyed on the plans.

Development of plans will be guided by national Engineering Field Handbook, Part 650, Chapter 5, Preparation of Engineering Plans and shall be in accordance with National Engineering Manual, Parts 541 and 542.

As a minimum, plans and specifications shall include:

- location of watering facility,
- size and number of watering facilities,
- details of all appurtenances of watering facility including overflow preparations,
- foundation requirements including type and size,
- location of alternative water sources, if applicable,
- location of utilities and notification requirements.

OPERATION AND MAINTENANCE

Provide the landowner an O&M plan specific to the type of installed trough or tank. Include, as a minimum, the following provisions in the plan:

- check for debris, algae, sludge or other materials in the trough which may restrict the inflow or outflow system and treat as needed,
- check for leaks and repair immediately if any leaks are found,

- check the automatic water level device to ensure proper operation and repair as needed,
- maintain areas adjacent to the watering facility to prevent erosion, ponding, and provide firm footing,
- check to ensure the outlet pipe is freely operating and not causing erosion problems and repair as needed, and
- prepare guidance for winter weather, such as adding material in the storage area to allow for ice expansion without damage.

REFERENCES

Concrete, ACI 318, American Concrete Institute
Florida NRCS Conservation Practice Standard, Heavy Use Area Protection, Code 561
General Manual
Title 420-Part 401
Title 450-Part 401
Title 190-Parts 410.22 and 410.26
Manual of Steel Construction, American Institute of Steel Construction
Masonry, Building Code Requirement for Masonry Structures, ACI 530, American Concrete Institute
National Cultural Resources Handbook
National Engineering Field Handbook, part 650, Chapter 5
National Engineering Manual, Parts 541 and 542
National Environmental Compliance Handbook
National Food Security Act Manual
National Planning Procedures Handbook Florida Supplements to Parts 600.1 and 600.6
National Range and Pasture Handbook, Section FL600.0505(f)(ii)
Prescribed Grazing and Feeding Management for Lactating Dairy Cows", New York State Grazing lands and USDA NRCS, January 2000
Timber, National Design Specification for Wood, American Forest and Paper Association
1997 Missouri Grazing Manual, University of Missouri , 1997