NATURAL RESOURCES CONSERVATION SERVICE

MISSOURI CONSTRUCTION SPECIFICATION

WATERING FACILITY

(tank or trough)

CODE 614

GENERAL

Construction operations shall be carried out in a manner and sequence that erosion and air and water pollution are minimized and held within legal limits.

The completed job shall present a workmanlike appearance and shall conform to the line, grades, and elevations shown on the drawings or as staked in the field.

All operations shall be carried out in a safe and skillful manner. Safety and health regulations shall be observed and appropriate safety measures used. Contractor shall be assured that all state laws concerning buried utilities have been met.

All trees, stumps, roots, brush, weeds, and other objectionable materials shall be removed from designated work area.

MATERIALS

Tanks shall be as shown on drawings. All tanks shall be durable enough to withstand forces exerted by water, soil, and livestock. Permanent tanks shall have a minimum design life of 10 years. Crushed rock or gravel shall be hard durable rock. Concrete for the pad or tank shall conform to Construction Specification 750, Reinforced Concrete. Geotextile shall conform to Construction Specification 753, Geotextile.

PLACEMENT

Tanks should be placed on suitable subgrade material. Location of tanks will be as shown on the plan map and/or drawings. If freezing is a concern watering facility should face south where possible.

PADS

The area adjacent to the tank (or trough) shall be protected from livestock traffic. Pads shall be constructed as shown on the drawings.

ADDITIONAL DETAILS - ALL FACILITIES

Shutoff valves Shutoff valves are recommended for every installation. Locate valve access away from tank and protect from livestock.

Backflow prevention devices Air gaps or check valves are required on any watering facility connected to a water system used for human consumption. Install backflow prevention devices according to manufacturer's instructions. For air gap protected watering facilities, install device to maintain air gap under all operating conditions.

Outlets and Overflows: The overflow pipe on gravity flow systems will be one pipe size larger than the inflow pipe to insure adequate capacity.

The overflow or outlet pipe shall be installed to minimize plugging by floating debris. One method is to install two ninety degree elbows at the top of a vertical pipe so water will enter the pipe from below the water surface.

The overflow pipe is used to keep the water from freezing, extend it at away from the tank and animal traffic to a 4' x 5' x 4' (3 CY) gravel pit or to free draining outlet. Protect the free draining outlet from livestock damage.

Installation: For tanks placed in a fence line, add metal or treated posts on both sides of the tank. Posts should be anchored in a manner that would allow them to be used as a corner post. See fence specification sheet.

The installation height of the watering facility will be according to manufacturer installation information or such that animals cannot enter the watering facility per the following:

1. Watering facility (tank) edge is above the ground 18-24 inches for large animals such as horses and beef animals.
2. Watering facility (tank) edge is above the ground 12 inches for smaller animals such as goats and sheep.

When watering facility edge is lower, animals are much more prone to slipping into the tank.

Small Animal Escape: On tanks where small animal escape feature or device will be installed the feature or device will be attached to the watering facility or be non-removable by normal livestock use.

ADDITIONAL DETAILS—BURIED CONCRETE WATERING FACILITIES

Place a minimum of 2 feet of earth fill over the back of the freeze proof concrete tank. Headwalls and wing walls are recommended to keep soil from eroding into the drinking area. Headwalls/wing walls used to contain the soil over the tank may be constructed of treated wood or may be concrete walls supplied with the tank. If treated wood, use ground contact treated lumber.

Seed the earth fill to grass and protect it by fencing consisting of a minimum of 3 strands of barb wire or 1 strand of electric.

For more insulation, add 1" foam insulation board approved for ground contact around both sides and top portion of the tank.

ADDITIONAL DETAILS—TIRE TANKS

Heavy equipment tire shall be free of breaks or cracks that could allow excessive leakage.

Fill bead under tank using concrete with a minimum compressive strength of 3500 psi. Filling the bead with bentonite alone will not be allowed.

Steel belted tires should be avoided since they can cause problems during installation and if steel belts are exposed, they could cause injury to animals.

ADDITIONAL DETAILS-COMMERCIAL BALL OR LID TYPE WATERING FACILITIES

Insulated energy free watering facilities will be installed according to manufacturer's guidelines.

Heat well: A critical component to an energy-free tank is a ground source heat well (an opening under the tank that allows ground heat to rise to the tank to protect from freezing). Most manufacturers will specify type of heat well to be installed with their tank. If no manufacturer instructions are available, install the heat well in the following manner:

1. Minimum 12 inches diameter and 4 feet deep.
2. Allowable materials to use:
    a. Corrugated plastic pipe
    b. Large diameter PVC pipe
    c. Chimney tiles
    d. Other materials as specified on the drawings
3. Tank should cover heat well opening completely to ensure no loss of heat. Do not close off top of heat well with materials such as insulation or lumber. This blocks ground heat from rising to the tank.

ADDITIONAL DETAILS—PORTABLE TANKS/HYDRANTS

On portable tanks not permanently plumbed, but of a size that prevents mobility, consider installing gravel heavy use area protection for a minimum of six feet from the tank. A good example of this might be large, galvanized tanks.

Supply pipe and fittings can be galvanized or PVC. Consider treating all galvanized pipe and fittings with paint or polyurethane to prevent corrosion.

Hydrants: Install the hydrant adjacent to a fence to protect it from livestock. Install a T-post or small wooden post next to hydrant and secure with hose clamps or similar for support.

Consider rotating the hydrant so that the hydrant handle is perpendicular to the supply line to reduce stress on pipe joints.

Place 5 gallons of clean gravel around and below the bleed off valve to provide proper drainage.

Place the hydrant slightly higher than the supply pipeline to reduce the chance of air-locking.

VEGETATION

Topsoil shall be added, if needed, to establish vegetation on all disturbed areas. Refer to JS-AGRON-25 for seeding and mulching recommendations or equivalent.

Additional Details: _____

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NATURAL RESOURCES CONSERVATION SERVICE

MISSOURI OPERATION AND MAINTENANCE

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OPERATION AND MAINTENANCE

The operation and maintenance plan for the system is the responsibility of the landowner. The tank or trough shall be checked frequently.

1. Check periodically to see if debris is restricting the inflow or outflow system.
2. Repair any cracks or wall separations.
3. Check the automatic water level device to insure that it is operating properly.
4. Inspect the outlet pipe to be sure it has a free-draining and is not causing any erosion problems.
5. Prepare the watering facility for winter weather. For tanks fitted with non-automatic thermostats, adjust the ball valve to allow water to continuously flow through tank during cold weather periods. During periods of non-use, shut off water and drain tank
6. Algae can clog overflows or create toxic conditions in livestock water troughs or tanks. Sunlight and warm water with nutrients will promote algae growth. Ideally, cleaning tanks weekly will reduce nutrients, slowing algae growth. Algae in tanks can be controlled chemically with copper sulfate or chlorine bleach. The amounts shown below are provided for estimation purposes only. Follow the supplier's guidelines and federal, state and local rules when adding chemicals to water to be used by livestock.
    a. Apply copper sulfate crystals into the water every two to four weeks as needed. Dissolve the crystals in warm water and pour throughout the tank to achieve the best results. Typically about one-half teaspoon of copper sulfate crystals will treat 350 gallons of water. Keep in mind, copper sulfate will increase deterioration of metal. Use this with caution around sheep and horses. Copper sulfate can become toxic to sheep as it builds up in their system over time. Horses also can be sensitive to this chemical.
    b. Add 2 to 3 ounces of chlorine bleach for every 50 gallons of water in the tank every week. Bleaches without scents, are recommended.
    c. Stock goldfish in the tank at a rate of 3-4 goldfish per 100 gallons. This works best if goldfish are added before the algae becomes a problem.

    Copper sulfate or chlorine application does not require livestock to be kept away from the tank, but best results occur if active ingredient concentration is maintained for at least 5 minutes.
7. If small animals have access to the watering facility and it is not fitted with an escape device, be aware that animals that die in the water can quickly decrease water quality.
8. Check for vandalism and normal wear and deterioration. Repair any damage that would prevent the system from working properly.
9. Remove large accumulations of manure at or near the tank or trough.

10. Inspect the condition of the pad or surfaced area around the tank and repair or replace materials, as needed.
11. Inspect and maintain wildlife watering facility berm or emergency spillway as needed.

Additional Details: _____

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