

**NATURAL RESOURCES CONSERVATION SERVICE
MISSOURI CONSTRUCTION SPECIFICATION**

**WASTE STORAGE FACILITY
(FABRICATED FACILITY)**

CODE 313-A

GENERAL

Construction operations shall be carried out in a manner and sequence such that erosion and air and water pollution will be minimized and held within legal limits. **A land disturbance permit from the Missouri Department of Natural Resources may be needed if the disturbed area is greater than one (1) acre in size.**

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.

SITE PREPARATION

All trees, logs, stumps, brush, boulders, and similar materials are to be removed from construction area and disposed of in a manner consistent with environmental concerns and proper functioning of the structure. The topsoil and sod are to be conserved if needed.

MATERIALS

Materials required and fabrication details shall be as specified on the drawings and as shown below.

Installation and materials for concrete and reinforcing steel shall conform to Reinforced Concrete (750) construction specification.

Rock riprap and bedding shall be sound, durable rock conforming to gradation shown on the drawings. Geotextile may be used in lieu of riprap bedding. Metal, concrete blocks and drain materials shall be as shown on the drawings.

Treated lumber shall conform to manufacturer's recommendations for installation locations (above ground or below ground) for the treatment method utilized. The treated lumber will be installed with the manufacturer's recommended fasteners or approved equal. All other lumber shall be as shown on the drawings.

Geotextile fabric shall conform to Missouri Construction Specification Geotextile (753) for the installation conditions.

Plastic pipe larger than 6 inch diameter shall be as shown on the drawings. Plastic pipe 5 inch in diameter and smaller shall comply with one of the following:

- PVC pipe will be schedule 40 conforming to ASTM D1785 or SDR 21 conforming to ASTM D2241 or equivalent.
- PE Corrugated tubing shall be Polyethylene Heavy Duty tubing conforming to ASTM F405 or equivalent.

EXCAVATION

To the extent needed, all suitable materials removed from the specified excavation shall be used in the construction earth fill areas of the structure. All the spoil deposited adjacent to the structure and in the adjacent area shall have a positive grade to drain away from the structure and/or to a stable outlet.

BACKFILL PLACEMENT

The material placed in the fill shall be free of detrimental amounts of sod, roots, frozen soil, stones over 6 inches in diameter (except for rock fills), and other objectionable material. To the extent they are suitable, excavated materials are to be used as fill material. The distribution and gradation of materials shall be such that there will be no lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. Foundation areas shall be kept free of standing water when fill is being placed on them.

The placing and spreading of the fill shall be started at the lowest point of the foundation and the fill shall be brought up in approximately horizontal layers not to exceed 9 inches in thickness. Each layer will be spread, processed, and shall be compacted by complete coverage with the hauling and spreading equipment or 2 passes of standard tamping roller in conformance with drawings. Compaction of backfill in confined spaces shall consist of complete coverage of each lift with one pass of the hand directed compaction equipment or equivalent. Care must be taken when the embankment closure is filled, the side slopes of the existing embankment shall be excavated until moist material is uncovered and a good bond can be secured.

Compaction of backfill adjacent to structures shall be done in a manner to avoid damage to the structure. The time limits shown in construction specification 750 shall be met for concrete structures.

Backfill shall be constructed to the lines and grades shown on the drawings. Finish shall be smooth, uniform, and ready for seedbed preparation.

MOISTURE CONTROL

The moisture content of the fill material and foundation shall be such that the required compaction can be obtained. The minimum moisture content of fill material and foundation shall be such when kneaded in the hand, the fill material will form a ball which does not readily separate. The maximum moisture content is when conditions are too wet for efficient use of the hauling and compaction equipment.

FINISH AND CLEANUP

The structure area and the designated spoil areas will be finished in a relatively smooth condition ready for seeding. All rocks 3 inches in diameter or larger and roots shall be removed from the surface areas to be seeded.

VEGETATION

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

Proper operation and timely maintenance of this system will minimize pollution and extend its useful life. The following recommendations should be followed.

- Refer to the applicable portions of the overall waste management system operation and maintenance plan.
- This waste storage structure is designed for the number days of storage for the number and type of livestock shown on the plan. Changes in number or types of livestock could affect the operation and use of the structure.
- The critical periods for storage are:
 1. Winter when the fields are wet, snow covered, or frozen.
 2. Midsummer when fields are unavailable for spreading manure because of the growing crops.
 3. Spring, summer, or fall when the fields are very wet.
- Read and follow the safety plan for operating and maintaining the structure.
- Fill areas around structures where there has been excessive settlement.
- Check walls and floors after each emptying for cracks and/or separations and promptly make needed repairs.
- Check foundation subdrains and outlets to be sure they are kept open. Check outflow from these drains when the storage structure is in use to determine if there is leakage from the storage structure into these drains. Leakage may be detected by the color and smell of the outflow, by lush dark green growth of vegetation around the outlet, by the growth of algae in the surface ditch, or by the vegetation being killed by the outflow. If leakage from the structure is detected, repairs should be made to prevent the possible contamination of the ground water and surface waters.
- Good vegetative cover should be established and maintained on all areas disturbed during the installation and operation of the structure. Reestablish vegetation on bare areas. Fertilize as needed to maintain vigorous growth. Mow at least annually to control weeds, and brush and to prevent smothering from accumulated growth. Delay mowing until after July 15th to avoid destruction of wildlife habitat.
- Check frequently for burrowing animals around the structure. Remove them when they are found and promptly repair any damage.
- Inspect haul roads and approaches to and from the storage facility to determine the need for stone, gravel, or other stabilizing material.
- Check fences or other barriers placed on or around the structures. Make prompt repairs when needed.

Additional Details: _____

**NATURAL RESOURCES CONSERVATION SERVICE
MISSOURI SAFETY PLAN**

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GENERAL

The following safety items apply to all types of waste storage structures.

1. All lids, gates, hatch covers, and safety grills must be secured in place when tanks and pit openings are left unattended, to prevent accidental and unauthorized entry by people. It has been reported that heavy slide-in-place covers have been moved by livestock.
2. Never leave ladder unattended, standing against an above ground waste storage structure.
3. Farm animals must be excluded from the storage area.
4. It is recommended that all waste storage and treating structures be posted with signs, at each access and entry point, with the following or similar warning: **DANGER - KEEP OUT - this is a waste storage/treatment facility and prolonged exposure may hazardous to your health. Do not enter without first reviewing the written safety plan.**

WASTE STORAGE TANKS AND PITS

1. Warning signs, ladders, ropes, bars, rails, and other devices shall be provided, as appropriate, to insure the safety of humans and livestock and to prevent them from using the facility for other than the intended purpose.
2. Waste storage structures must be considered "High Hazard Areas." The biodegradation of waste forms noxious gases such as methane (CH₄), hydrogen sulfide (H₂S), ammonia (NH₃), and carbon dioxide (CO₂). It is recommended that all waste storage and treating structures be posted with signs, at each access and entry point, with the following or similar warning: **DANGER - KEEP OUT - this is a waste storage treatment facility and exposure will cause DEATH. Do not enter without first reviewing the written safety plan.**
3. With the proper gas to air ratio, some of the gases can be explosive. Be cautious with open flames, welding torches, and arcs, electrical motors with brushes that spark, (e.g., electric saws, electric drills, shop vacs), when near waste storage structures. Be sure the work area is well ventilated.
4. Pipelines from enclosed buildings shall be provided with a water-sealed trap and vent or similar devices to control gas entry into the buildings.
5. Agitation of liquid manure can release large volumes of noxious gases. Provide adequate ventilation during agitation and emptying of the storage structures. If there is a question regarding the adequacy of ventilation, the animals should be evacuated from the building and the operator should wear an oxygen mask.
6. Operators should avoid working alone during agitating and emptying of these structures.

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7. An empty pit, tank, or other storage facility that has contained liquid/slurry manure should not be entered because gases may remain in the structure. When it is necessary for someone to enter one of the structures for repairs, the following precautions must be taken:
 - a. There should be at least two (2) people -- one to remain on the outside and one to enter the structure.
 - b. The person entering the structure must have a safety harness with a safety line attached to a winch or hoist so the "outside" person can pull the other out without entering the structure.
 - c. The one entering must have an air mask which furnishes outside air through an air line and compressor, scuba equipment with air tanks, or other means of positively furnishing outside air to the "inside" person.
 - d. Gas masks must not be used because they operate on the principle of chemically removing unwanted gases from the "so the wearer can breathe safely. In manure structures, the "air" has been displaced by the noxious gases and when the gases area removed by the gas mask, the wearer will suffocate because there is no air to breathe.

Additional Details: _____
