

NATURAL RESOURCES CONSERVATION SERVICE
MISSOURI CONSTRUCTION SPECIFICATION
WASTE TREATMENT LAGOON
CODE 359

General

Construction operations shall be carried out in such a manner and sequence that erosion, air and water pollution will be minimized.

The completed job shall present a workman like 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.

Foundation preparation

The foundation area shall be cleared of trees, logs, stumps, roots, brush, boulders, sod, debris, and frozen soil. The topsoil and sod are to be stockpiled. After stripping, the foundation area will be prepared to assure bond with the fill by removing loose dry material, scarifying, disking, adjusting moisture, and compacting as necessary.

Excavation

The completed excavation shall conform to the lines, grades, and elevations shown on the drawings. Over excavation will be checked by the engineer.

Clay liner

A clay liner shall be installed as designated on the drawings. This work shall consist of constructing an impermeable earthliner for the inside slopes and the bottom of the earthen basin to the thickness shown on the drawings. Only soils approved by the engineer will be used. The soil shall be from designated borrow areas or as staked in the field. Compaction of the earthen liner shall be as specified on the drawings.

Suitable, in-place clay material in the bottom of the earthen basin and on the side slopes, may be used as the clay liner, if approved by the engineer. In this case, the lower 6 inches of excavation need not be removed but only scarified in place prior to compaction. Also, half of the liner may be constructed at a time to avoid removing the excavated material from the entire basin area. All areas, within the basin, disturbed by construction shall be scarified and recompacted as specified. Care shall be taken to assure that all of the clay liner is continuous within the area protected.

If insufficient or unsuitable clay material is encountered during construction, use of artificial liners may be necessary. Soil amendments may also be used to create an impervious layer. Consult with the designer to determine necessary actions for either case if it is not shown on the drawings.

The finished structure will be prefilled with water to a depth of 2 feet.

Fill placement

The material placed in the fill shall be free of detrimental amounts of sod, roots, frozen soil, stones with diameters more than one-half the layer thickness and other objectionable material. To the extent they are suitable (CL, CH, GC, SC), excavated materials are to be used as fill. The fill shall be homogeneous and shall contain no lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. All earthfill shall be placed to act as an impermeable barrier.

The fill shall be brought up in approximately horizontal layers not to exceed 9 inches in thickness when loose and prior to compaction. Each layer will be compacted by a minimum of two (2) passes (or until "walkout" of a liquid filled standard tamping roller unless otherwise specified. Operation of the roller will be continuous over the entire area during earth moving operations.

If the surface of any layer becomes too hard and smooth for proper bond with the succeeding layer, it shall be scarified parallel to the axis of the fill to a depth of not less than 2 inches before next layer is placed.

Moisture control

The minimum moisture content of the fill material and foundation shall be such that, 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. It is beneficial to place earthfill for the clay liner in as moist a condition as practicable.

To avoid drying cracks, the clay liner shall be kept moist. This will be accomplished by prefilling the earthen basin with water to two (2) feet above the basin bottom.

Inlet structures

Concrete or rock riprap chutes, designed to prevent erosion of the clay liner, shall be installed as shown on the drawings.

The inlet structure or conduit shall be placed on a firm foundation to the lines and grades shown on the drawings.

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 Construction Specification 750.

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

Plastic pipe larger than 6 inch diameter shall be as shown on the drawings. Plastic pipe 5 inch in diameter or smaller shall be Schedule 40 PVC conforming to ASTM D1785 or SDR 21. PVC conforming to ASTM D2241 or equivalent. Corrugated tubing shall be Polyethylene Heavy Duty tubing conforming to ASTM F405 or equivalent.

Geotextile fabric shall be non-woven, needle punched conforming to the following requirements:

- Tensile strength ----- 120 lbs min
- Bursting strength ----- 210 psi min
- Elongation at failure ----- 50% min
- Ultraviolet resistance ----- 70% tensile strength retained
- Puncture ----- 60 lbs min
- AOS-Standard sieve opening ----- #40 max
- Permitivity ----- 0.70/sec

Installation

Extreme caution must be exercised during backfill and compaction around structures or conduits to prevent damage, movement, or deflection. All intrusions into the clay liner will be backfilled and compacted to like conditions of the surrounding clay liner to maintain its integrity.

Materials

Materials and fabrication shall be as specified on the drawings and specifications.

Placement of topsoil

Available topsoil should be placed on the top and the exposed slopes of the pond embankment as well as all areas disturbed by construction outside the pond area including the borrow areas.

Vegetation

Vegetate the embankment and surrounding disturbed areas to control erosion. Refer to Critical Area Planting (342) for seeding and Mulching (484) recommendations or equivalent.

Additional details: _____

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Operation

A maximum operating level (upper pumpdown) and lower pumpdown markers will be set in the lagoon. Initiate pumping before the wastewater level reaches the upper marker. Pumping is to cease when the lower pumpdown marker is reached. The markers will be permanently installed in the lagoon.

Over time, solids will accumulate in the bottom of the lagoon. Agitate prior to pumping in order to get some of the settled solids into suspension and break up any floating mats. Failure to do this will shorten the life span of the facility.

Pump down the lagoon each fall to provide adequate storage through the winter and early spring.

Maintenance

Inspect the waste treatment lagoon periodically. Keep the grass mowed and weeds under control. Keep the embankment free of shrubs, trees, and burrowing animals.

Wastewater Utilization

The effluent from the waste treatment lagoon cannot be discharged to surface waters.

The effluent must be properly utilized to prevent water pollution. Follow the application information in the Comprehensive Nutrient Management Plan (CNMP). There is value in the manure product applied to the land. Use soils and effluent testing to guide in application. This will prevent pollution and help maximize profits.

Apply the effluent to fields or ridgetops where slopes are less than 10 percent. Maintain 50 feet of grassed buffer between the application area and facilities and streams. Do not spread effluent or manure solids within 50 feet of public roads or property lines. Provide a grassed buffer of 300 feet between the application area and losing streams, sinkholes, and wells.

Be "neighbor friendly" when pumping. Effluent may be odorous. Apply at times and to areas least affecting nearby residences.

Do not apply effluent or manure solid material immediately after a rain or within 12 hours of a forecasted rain. Do not apply to frozen or snow covered ground. Keep a record of where the material is spread.

Safety

Fence to exclude livestock, children, and others. Put up signs to warn others that the manure storage facility is dangerous.

Install a safety fence to prevent accidental entry of scraping equipment into the lagoon.

Additional details: _____
