

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE GENERAL SPECIFICATIONS**

WASTE STORAGE FACILITY

Waste Storage Pond

(No.)

CODE 313

SCOPE

This specification shall consist of the clearing, grubbing, excavation, backfill, other appurtenances and services required for the construction of the waste storage pond and the disposal of all cleared and excavated materials. Construction shall be conducted in such a manner that erosion, water, air, and noise pollution will be minimized and held within legal limits as established by state and federal regulations, including AgPDES and NPDES permits.

All structures shall be constructed according to plans furnished by the Natural Resources Conservation Service (NRCS) and in accordance with the NRCS's engineering standards for these practices, as well as local building codes, state laws and regulations and current industry standards. Any deviation from the approved drawings and specifications must be approved by the engineer prior to construction.

PUBLIC AND PRIVATE UTILITIES

Utilities are defined to be public or private, overhead and underground power or communication lines, and any pipelines. The landowner\operator\contractor shall conduct their own search and discovery for utilities in order to lessen or avoid potential damages, injuries or loss of life. During planning, the owner\operator should complete an OK-ENG-45 UTILITIES INVENTORY FORM to document known utilities in order to comply with State law prior to any ground disturbance and return it to a USDA-NRCS representative.

QUALITY CONTROL

Quality Control of all materials and construction procedures is the responsibility of the landowner and contractor. NRCS will make periodic review(s) of the work for the benefit of the agency which will include the final construction check.

FOUNDATION PREPARATION

The foundation area shall be cleared of all trees, logs, stumps, roots, brush, boulders, sod, and rubbish. All stumps, roots, and root clusters having a diameter of one inch or larger shall be grubbed out to a depth of at least two feet below subgrade elevation. The topsoil and sod shall be removed from all borrow and earthfill areas and stockpiled during construction to be spread on the completed dam, spillways and other disturbed areas.

Foundation surfaces shall be sloped no steeper than a ratio of 1-1/2 horizontal to 1 vertical. The foundation area shall be prepared to adequate moisture content and density, and the surface shall be thoroughly scarified, to allow for proper compaction and bonding of the first layer of fill material to the foundation.

The cutoff trench and any other required excavations shall be dug to the lines and grades shown on the drawings. If they are suitable, excavated material may be used in the permanent fill.

Foundation areas shall be kept free of standing water prior to and during earthfill placement.

FILL PLACEMENT

Fill shall not be placed until the required excavation and foundation preparation have been completed. Fill shall not be placed upon a frozen surface, nor shall snow, ice, or frozen material be incorporated in the fill. The material placed in the fill shall be free of detrimental amounts of sod, roots, frozen soil, stones more than 6 inches in diameter (except for rock fills), and other objectionable material.

Fill shall be placed in approximately horizontal layers. The thickness of each layer before compaction shall not exceed 10 inches. Materials placed by dumping in piles or windrows shall be spread uniformly to not more than 10-inch thickness before being compacted. Hand compacted fill, including fill compacted by manually directed power tampers, shall be placed in layers whose thickness before compaction does not exceed 4 inches.

If openings or sectionalized fills are required, the slope of the bonding surfaces between the embankment in place and the embankment to be placed shall not be steeper than a ratio of 3 horizontal to 1 vertical. The bonding surface shall be treated the same as that specified for the foundation to ensure a good bond with the new fill.

The distribution and gradation of materials shall be such that no lenses, pockets, streaks, or layers of material shall differ substantially in texture or gradation from the surrounding material. If it is necessary to use materials of varying texture and gradation, the more impervious material shall be placed in the center and upstream parts of the fill. The complete work shall conform to the lines, grades, and elevations shown on the drawings.

Fill material shall be obtained from selected borrow areas meeting the approval of the designated technician. Unless otherwise designated, it shall be obtained within the storage and/or treatment area of the structure.

Moisture Control. The moisture content of the fill material shall be adequate for obtaining the required compaction. Fill material which is too dry shall be moistened by adding water or by thoroughly mixing with moist fill until an acceptable moisture level is obtained. Fill material which is too wet shall be allowed to dry naturally or shall be dried by disking or shall be thoroughly mixed with dry fill material until an acceptable moisture level is obtained.

The moisture content of the fill shall be maintained within the limits to:

1. Prevent bulking or dilatence of the material under the action of the hauling or compacting equipment.
2. Prevent adherence of the fill material to the equipment.
3. Ensure the crushing and blending of the soil clods and aggregation into a homogeneous mass.
4. Contain adequate moisture so that a sample can be hand molded without the mold oozing through the fingers or squeezing out any water.

As a minimum, the fill material shall contain enough moisture to be able to form a ball when squeezed in the hand that will not separate when tapped with a pencil. Dry foundation materials shall have moisture added to the top six inches to meet that required for fill material prior to placement of the first layer of fill.

Compaction. Construction equipment shall be operated over each layer of fill to insure that the required compaction is obtained. Special equipment shall be used if needed to obtain the required compaction. Each lift shall be compacted by routing the fill equipment so that the entire surface of each layer shall be traversed by the track tread, or by an approved equivalent method.

Fill adjacent to structures shall be compacted to a density equivalent to that of the surrounding fill by means of hand tamping or manually directed power tampers or plate vibrators. Heavy equipment including backhoe mounted power tampers, or vibrating compactors and manually directed vibrating rollers, shall not be operated within 2 feet of any structure. Towed or self-propelled vibrating rollers shall not be operated within 5 feet of any structure. Compaction by means of drop weights operating from a crane or hoist will not be permitted.

The passage of heavy equipment will not be allowed: (1) over cast-in-place conduits prior to 14 days after placement of the concrete; (2) over cradled or bedded precast conduits prior to 7 days after placement of the concrete cradle or bedding; or (3) over any type of conduit until the backfill has been placed above the top surface of the structure to a height equal to one-half the clear span width of the structure or pipe or 2 feet, whichever is greater.

Construction Tolerances.

The checkout elevation of the top of the embankment shall not be less than 0.1 foot below the designed elevation including the shrinkage. There is no specified upper limit for overbuild of the embankment as long as the overbuild does not create a danger or interfere with other appurtenances. When an auxiliary spillway is constructed, the finished elevations shall not vary more than (+) or (-) 0.1 foot.

All other elevations that deviate more than 0.1 feet from design elevations must be evaluated for design adequacy except centerline elevation of berms may be +/- 0.5-feet.

An embankment will be acceptable with respect to side slopes when conditions a) and b) or a) and c) are met upon completion of construction.

a).

Planned Side Slope	Planned Unsettled Slopes		Steepest Acceptable Side Slopes
	With 5% Settlement	With 10% Settlement	
2:1	1.91:1	1.82:1	1.5:1
2.5:1	2.38:1	2.27:1	2.0:1
3:1	2.86:1	2.73:1	2.5:1
4:1	3.81:1	3.64:1	3.5:1

b). The planned cross section with allowance for settlement can be superimposed upon and within the plotted cross section of the completed dam, or

c). Exception to b): The cross section will be accepted if it meets a) above, and the sum of the front and back slopes is equal to or greater than the sum of the planned unsettled slopes. (For example, a dam with 2:1 and 3:1 planned slopes and a 10 percent settlement would have a sum of 4.55:1.)

The completed spillway excavation shall conform to the lines, grades, bottom width, and side slopes shown on the plans as nearly as skillful operation of excavating equipment will permit.

EXCAVATION

All applicable sections for supporting embankments will apply, including that for clearing and grubbing, foundation preparation, excavation, and pollution control and project completion.

The completed excavation shall conform to the line, grades, and elevations shown on the drawings and staked in the field. All work shall be completed in a skillful and workmanlike manner. The completed job shall present a workmanlike appearance.

The excavated earth shall be disposed of in the locations specified on the plans and spread or shaped to a uniform top and side slopes so it can be disked or mowed with regular farm equipment.

LINER

A new liner shall be designed and installed according to the current rules established by the industry regulatory agency. If the liner is designed by an NRCS engineer it shall be designed based on the criteria found in the conservation practice standard and in accordance with guidance provided in the Agriculture Waste Management Field Handbook, Appendix 10D.

The liner placement shall be installed as specified in the site specific construction specifications prepared by the design engineer. Liner specifications will depend on the type of liner being installed, soil properties of the base and liner material.

COMPUTATION OF EARTH FILL AND/OR EXCAVATION QUANTITIES

Quantities of earth fill and/or excavation shall be computed by approved methods. The earth fill and/or excavation extent will be the sum of the fill and excavation components as defined below:

Fill. The volume of material required for construction of the supporting embankment to the designed settled elevation and dimensions.

- The volume is to be calculated from natural ground before foundation stripping.
- If there are vertical banks to be sloped then the fill amount will be calculated as if these items have already been completed.
- The volume required to backfill the core trench is only included when excavated material cannot be placed in the embankment as it is being excavated. (This means the material must be either stockpiled for later use or is not suitable for fill and must be wasted.)

Excavation. The volume of material required for excavation to the designed neat lines and grades.

- The volume of material required to be excavated to construct the designed centerline dam core trench below natural ground, before foundation stripping (after vertical banks are sloped).
- Volume of material required to be excavated to construct a designed storage/treatment reservoir. When a structure involves a designed excavated pit and a designed embankment the excavated pit volume will be the extent. Exception – fill will be the extent when the volume of fill for the designed embankment is greater than the excavated pit volume.

TOPSOIL SPREADING

Topsoil shall be spread to a uniform thickness of 6 inches on all earthfill, spillways and disturbed areas.

Spreading shall not be done when the ground or topsoil is frozen, excessively wet or otherwise in a condition detrimental to the work. Surfaces designated to be covered shall be lightly scarified just prior to the spreading operation.

After placement is completed, the surface of the topsoil shall be finished to a reasonably smooth surface.

VEGETATION

A protective cover of vegetation shall be established on all exposed areas of embankments, spillways, spoil areas, and borrow areas, according to the guidelines in Oklahoma NRCS Critical Area Planting (342) standard. Vegetation must be in accordance with the specifications developed for the project.

PUMP DOWN MARKER

A permanent marker shall be installed to meet the current or existing design. Such markers enable the operator to quickly and easily determine the level of the waste effluent in the storage pond and the point at which pumping or emptying should begin. The presence of a durable, easily read marker gives inspection or regulatory personnel confidence that a manure storage facility is being managed properly.

POLLUTION CONTROL AND PROJECT COMPLETION

Construction operations shall be carried out so that erosion and air and water pollution are minimal. All work shall be conducted in a skillful and workmanlike manner. The completed job shall present a workmanlike appearance.

Fencing and cover to control erosion and pollution shall be established as needed. Appropriate safety measures, such as warning signs, rescue facilities, and fencing, shall be provided as needed.