NATURAL RESOURCES CONSERVATION SERVICE
GENERAL SPECIFICATION

WASTE STORAGE FACILITY

(No.)

CODE 313

A. Embankment

FOUNDATION PREPARATION

The foundation area shall be cleared of trees, logs, stumps, roots, brush, boulders, sod, and rubbish. The topsoil and sod shall be stockpiled during construction and spread on the completed dam and spillways.

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.

Foundation areas shall be kept free of standing water when fill is placed on them.

FILL PLACEMENT

The material placed in the fill shall be free of sod, roots, frozen soil, and stones more than 6 inches in diameter (except for rock fills), and other objectionable material.

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. If zoned fills of substantially differing materials are specified, the zones shall be placed according to lines and grades shown on the drawings. The complete work shall conform to the lines, grades, and elevations shown on the drawings.

Fill material shall be obtained from selected borrow areas or as approved by 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. Material that is too wet shall be dried to meet this requirement, and material that is too dry shall be wetted and mixed until the requirement is met. Moisture content shall be determined by a method approved by NRCS.

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 a minimum of 3 passes 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.

B. 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.

C. Clay Liner

MATERIAL

Liner material shall be obtained from selected borrow areas or as approved by the designated technician.

MOISTURE CONTROL

The moisture content of the liner material shall be as specified in Section H, Construction Details. Material that is too wet shall be dried to meet this requirement, and material that is too dry shall be wetted and mixed until the requirement is met. Moisture content shall be determined by a method approved by NRCS.

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

Compaction of the liner material shall be as specified in Section H, Construction Details.

D. 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.

E. Renovation of Existing Facility

SCOPE

Implementation of this conservation practice shall consist of all work necessary to complete the renovation of earthen waste impoundments that have served the design life and are in need of structural repair. The renovated facility shall meet all current design requirements for storage and/or treatment volume.

EFFLUENT REMOVAL

Prior to removal of any effluent from the waste impoundment, a Comprehensive Nutrient Management Plan (CNMP) must be prepared and approved. Removal of all effluent, to the greatest extent possible, including solids, slurry and liquid shall be achieved in order to renovate the waste impoundment.

Vigorous agitation of the effluent should result in the accumulated solids being suspended in the liquid creating slurry that can be pumped into spreading equipment. When removal of effluent from the bottom and side slopes using earth- moving equipment is needed, the liner shall not be disturbed. Wheel or track mounted machinery used for removal of the effluent shall not be equipped for aggressive excavation. Only smooth mouthed buckets or blades with no rippers, scarifiers, or ripper teeth should be used to minimize ground disturbance of the liner. If liner is disturbed, it shall be repaired by methods approved by NRCS.

EFFLUENT DISPOSAL

All waste removed from the waste impoundment shall be transferred and spread according to an approved CNMP and in accordance with all local, state and federal laws, rules and regulations.

EMBANKMENT

The supporting embankment around the waste impoundment shall meet the neat lines and grades as shown on the attached drawings. The supporting embankments must also meet the minimum construction tolerances in this specification. All eroding and low areas will be filled with suitable fill material and re-vegetated during renovation.

LINER CERTIFICATION

If the existing liner cannot be determined to meet the requirements of the appropriate practice code 521, a new liner shall be designed and installed as stated in the attached design.

PUMP DOWN MARKER

In order to meet current design requirements a change in the waste impoundment operating levels could occur due to increased or decreased animal numbers, wash water volume, waste water volume, feed efficiency, storage or treatment period, etc. The permanent markers shall be checked and reinstalled if necessary to meet the current or existing design.

CONSTRUCTION TOLERANCES

All elevations shall not deviate more than 0.1feet from design elevations

An embankment will be acceptable with respect to side slopes when the following conditions are met upon completion of construction:

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

F. CONCRETE

DESIGN MIX

The concrete mixture unless specified otherwise shall have a minimum 28 day compressive strength as shown on the plans and shall be no less than six bag per cubic yard mix (94 lbs per bag) with a maximum of 7 gallons of water per bag. The concrete shall be a standard Type I Portland cement with washed sand and gravel. Clean water shall be used in the mix. Calcium chloride and other chemical admixtures for concrete will not be accepted unless expressly specified in the drawings or specifications.

CONSISTENCY

The amount of water used in the concrete shall be the minimum necessary to obtain the required workability. No mixing water in excess of the amounts called for in the job mix shall be added during mixing, hauling, or after arrival at the delivery point. The consistency of the concrete shall be such that it can be worked readily into the corners and angles of the forms and around reinforcing but without permitting the materials to segregate or excess free water to collect on the surface. The slump shall be between two and four inches as tested by 'The Test for Slump for Portland Cement Concrete, ASTM Specification C-143.

FORMS

Forms shall be of wood, steel, or other approved material and shall be mortar tight. Forms shall be true to the lines and grades specified and sufficiently rigid to prevent objectionable deformation under load. Form surfaces shall be smooth, free from irregularities, dents, sags or holes. Rods used for internal ties shall be so arranged that, when the forms are removed, metal will not be less than one inch from any concrete surface. Forms for walls and vertical sections two feet high and higher shall be stabilized with adequate tie rods, walers, catheads, and sufficient bracing to prevent shifting or movement of forms during placing of concrete.

Forms for exposed surfaces shall be coated with a non-staining form release agent that shall be applied before the concrete is placed. All excess release agent on the form surfaces and any surfaces requiring bonding with concrete shall be removed.

Prior to placement of concrete the forms and subgrade shall be free of chips, sawdust, debris, water, ice, snow, extraneous oil, mortar, or other harmful substances or coatings and temperature of all surfaces to be in contact with the new concrete be no colder than 400°F. Any oil on the reinforcing steel or other surfaces required to be bonded to the concrete shall be removed. Earth surfaces shall be firm and damp.

All form removal shall be accomplished in such a manner as to prevent damage to the concrete. Forms for floor slabs and such work may be removed after a minimum of 24 hours. Forms for walls shall be left in place for a minimum of three days. All repair work must be done immediately after removal of forms.

TIMING AND TEMPERATURE

Concrete shall be placed within one-and-one-half hours after introduction of cement to the aggregates.

Concrete shall not be placed when the outside temperature is expected to fall below 400°F at the time the concrete is delivered and placed at the work site. Concrete shall not be exposed to freezing temperatures during the curing period. Concrete, when deposited in the forms during hot weather, will have a temperature not greater than 90°F at the time of placement. Ice may be used as a portion of the mixing water to control temperature provided all ice is included in the total mixing water and is melted during the mixing process. When the outside temperature reaches or exceeds 90°F, the concrete shall be placed within 45 minutes after batching.

CONVEYANCE AND PLACING

No concrete shall be placed until the in-place subgrade, forms, reinforcing steel, and any other items involved or affected by the concrete placement have been approved by the engineer or his agent. All concrete floor slabs which will have waste stored on them shall be placed on 6 mil polyethylene sheeting covering the entire foundation.

Concrete shall be conveyed from mixer to forms as rapidly as practicable by methods that will prevent segregation or loss of ingredients. Hoppers and chutes, pipes, or elephant trunks may be used. There shall be no vertical drop greater than five feet.

Unless otherwise authorized, all concrete shall be placed upon clean, damp surfaces free from frost, ice, standing and running water, and never upon soft mud, dried porous earth, or fill that does not meet specified compaction requirements.

Concrete shall be deposited as close as possible to its final position in the forms. Concrete shall be thoroughly consolidated by rodding or mechanically vibrating the concrete in place supplemented by hand spading and tamping to remove air voids. Vibrating equipment shall be used when pouring walls and other thin sections.

Concrete floor slabs may be placed in one continuous pour or may be placed in sections at different times. When placed in different sections the formed edges of each section shall be keyed to lock the edges of adjacent sections together. The edge forms may be removable metal or wood forms or galvanized metal designed to be left in place. Contraction joints if called for on the drawings shall be placed at the locations shown, and may be formed or sawed joints.

FINISHING

Defective concrete, honeycombed areas, voids left by the removal of tie rods, and unacceptable ridges left on concrete surfaces shall be repaired immediately after the removal of forms unless otherwise authorized. Voids left by the removal of tie rods shall be reamed and completely filled with mortar.

Defective concrete shall be repaired by cutting out the unsatisfactory material and placing new concrete that shall be secured with keys, dovetails or anchors. Excessive rubbing of formed areas will not be permitted. All unformed surfaces of concrete, exposed in the completed work, shall have a float finish without additional mortar.

CURING

Concrete shall be prevented from drying for a curing period of at least seven days after it is placed. All concrete shall be cured by keeping continuously moist for the entire curing period, or until curing compound is applied. Moisture shall be maintained by sprinkling, flooding, fog spraying or by covering with materials kept continuously moist such as canvas, cloth mats, straw, sand, polyethylene or other approved material. Wood forms left in place during the curing period shall be kept wet. Formed surfaces shall be thoroughly wetted immediately after forms are removed and shall be kept wet until patching and repairs are completed. Water or covering shall be applied in such a way that the concrete surface is not eroded or otherwise damaged.

If a curing compound is used, it shall be applied to all concrete surfaces except construction joints and surfaces to which other concrete will be bonded an a rate not less than one gallon per 150 square feet of surface. The compound shall be sprayed on the moist concrete surfaces as soon as free water has dis-

appeared, but shall not be applied to any surface until patching, repairs and finishing of that surface are complete. Curing compound shall meet the requirements of ASTM Specification C-309, Type 2, white pigmented.

G. Timber and Steel Fabrication and Installation

Above ground structures, such as composting facilities, shall be constructed on a firm foundation to the lines and grades shown on the plans. Premanufactured steel or timber structures may be used and will be of a design approved by a registered professional engineer. Dimensions and spacings shown on the plans and drawings are minimums required for the fifty year wind and snow loads. These dimensions and spacings may be altered if the result is a stronger structure, with prior approval of the engineer. In no case will the dimensions and spacings be modified in a way that would reduce the strength of the structure. All framing shall be true and exact. Timber and steel shall be accurately cut and assembled to a close fit.

Appropriate bracing for safety and structural stability during construction shall be used.

WOOD AND TIMBER

All material shall be sound wood, free from decay, and of now quality. All timber beams shall be dense, structural quality, and graded in accordance with the Standard Grading Rules for Southern Pine Lumber. Unless otherwise specified, all timber and lumber shall be furnished in American Standard dressed sizes. All sizes specified are nominal sizes.

All structural timber, posts, poles and lumber, except roof girders, rafters, purlins, knee braces, and attic bracing shall be pressure treated. All timber, with the exception of purlins, shall be pressure treated to a minimum retention of 0.4 lbs/ft^3 ACQ or CCA (Type A, B, or C), or 0.41 lbs/ft^3 CBA-A, or 0.21 lbs/ft^3 CA-B.

Posts and poles shall be set plumb and to the depths shown on the drawings. Backfill around posts/poles shall be concrete as shown on the drawings. Posts/Poles shall be temporarily braced until girders, plates, or other members are installed to maintain plumb alignment.

All timber and lumber stored at the site of the work shall be neatly stacked on supports at least twelve inches above the ground surface and protected from the weather by suitable covering. Untreated material shall be so stacked and stripped as to permit free circulation of air between the tiers. Treated timber may be close stacked. The use of cant hooks, peavies or other pointed tools, except end hooks will not be permitted in the handling of the structural timber or lumber. Treated timber shall be handled with rope slings or other methods which will prevent the breaking or bruising of the outer fibers, or penetration of the surface in any manner.

STEEL

All material shall be free of holes, dents, bends and excessive pitting and rust. All steel members shall be of the composition, grade, shape and size as specified on the plans and drawings.

FASTENERS

Connections between wood members requiring bolts may be initially done with appropriately sized nails until such a time as it is expedient to add the bolts, unless specified otherwise in the drawings.

All welded joints shall be of the thickness and type as shown on the plans and drawings. All welded joints unless otherwise specified shall be continuous welded. Prior to welding all joints must be fitted in a skillful manner, and free of rust, dirt, grease, oil or other residue.

Holes for machine bolts shall be bored with a bit of the same size as the bolt. Appropriately sized washers shall be used in all bolt heads and nuts.

TRUSSES

Trusses may be metal or wood and shall be designed to accommodate the roof loads specified in the

construction details and shall be installed on the spacing compatible with the design. Trusses shall have a minimum of 12 inches of overhang. Trusses may be prefabricated manufactured trusses and will be installed in accordance with the manufacturer's recommendations. All trusses will be of a design approved by a registered professional engineer. A copy of the truss certification shall be provided to the NRCS approving authority prior to installation.

Truss anchorage and associated supports shall be as shown on the drawings or other acceptable methods as approved by the engineer.

H. Vegetation

A protective cover of vegetation shall be established on all exposed areas of embankments, spillways, spoil areas, and borrow areas.

I. 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.

The lagoon shall be fenced around the perimeter and warning signs posted to prevent unintended access.

J. Construction Details

I have reviewed these specifications and agree to construct and maintain the practice in accordance with the accompanying plans, designs, and operation & maintenance plan for this practice.

_____ _____

Cooperator's Signature Date