NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE GENERAL SPECIFICATIONS
Texas

POND (EMBANKMENT)

(No.)
CODE 378

1. SCOPE

The work shall consist of all construction operations and furnishing all materials as required by the drawings and specifications for the installation of the works. All work shall be conducted in a skilled and workmanlike manner. The completed job shall present a workmanlike appearance. Construction operations shall be carried out so that erosion and air and water pollution are minimized and held within legal limits. Appropriate safety measures, such as warning signs, rescue facilities, and fencing shall be provided as needed.

2. LOCATION

The location of the embankment, borrow area, emergency spillway, and appurtenant structures shall be as specified on the drawings or as staked in the field.

3. PUBLIC AND PRIVATE UTILITIES

Utilities are defined to be overhead and underground power or communication lines, and pipelines. The contractor should conduct their own search and discovery for utilities in order to lessen or avoid potential damages. The owner/operator shall complete TX-ENG-80A, Utilities Inventory, during planning and return it to the NRCS representative. The owner/operator shall also ensure that TX-ENG-80B, Cooperator Confirmation of the One-Call Utility Safety System is completed and returned to the NRCS representative prior to layout or any ground disturbance.

4. 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 will include the final construction check.

NRCS will be notified 72 hours prior to critical point of inspections. Inspections will only be performed during normal NRCS working hours Monday through Friday. Critical point of inspection include the inspection and approval of the foundation of the embankment before placement of the earthfill; installation of foundation and embankment drains; and the final subgrade and installation of the conduit.

5. MATERIALS

Materials required for the pipe conduit and appurtenances shall be as specified on the drawings or in the Construction Details section of this specification.

6. CONTROL OF WATER

Control or removal of surface or ground water shall be performed as needed to complete the required construction in accordance with the specifications and drawings. The foundation area

shall be kept free of standing water during fill placement. The cutoff trench shall be kept free of water during backfilling.

7. FOUNDATION PREPARATION

The foundation area shall be cleared of trees, logs, stumps, roots, brush, boulders, sod, and rubbish, and shall be stripped to sufficient depth to remove all objectionable material. The topsoil and sod shall be stockpiled and spread on the outer surface of the embankment unless otherwise specified in the Construction Details. Foundation surfaces shall be sloped no steeper than 2:1. The foundation area shall be thoroughly scarified before placement of the fill material. The surface shall have moisture added or it shall be compacted if necessary so that the first layer of fill material can be compacted and bonded to the foundation.

The cutoff trench and any other required excavation shall be excavated to the lines and grades shown on the drawings or as staked in the field and shall be backfilled with suitable material in the same manner as specified for the earth embankment. Suitable excavated materials may be used in the permanent embankment fill.

Existing stream channels in the foundation area shall be sloped no steeper than a ratio of two horizontal to one vertical. They shall be deepened and widened as necessary to remove all stones, gravel, sand, stumps, roots, and other objectionable material, and to accommodate compaction equipment.

8. PIPE CONDUIT INSTALLATION (WHEN SPECIFIED)

The pipe conduit barrel shall be placed on a firm foundation to the lines and grades shown on the drawings or as staked in the field. Anti-seep collars shall be of materials compatible with the pipe and shall be installed so that they are watertight. The pipe shall be installed according to the manufacturer's instructions. The pipe shall be firmly and uniformly bedded throughout its length and shall be installed to the line and grade shown on the drawings. Select backfill shall be placed around the conduit in layers not more than 4 inches thick before compaction, and each layer shall be thoroughly compacted to the density of the surrounding material by hand tamping, or by using manually directed power tampers or plate vibrators. A minimum of one foot of fill shall be placed over the top of the pipe before construction equipment is allowed to pass. Anti-seep collars, anti vortex devices, trickle tubes, and other appurtenances shall be installed as shown on the drawings or as specified in the Construction Detail.

9. AUXILIARY SPILLWAY EXCAVATION

The completed emergency spillway shall conform to the lines, grades, bottom width, and side slopes specified on the drawings or as staked in the field.

10. BORROW EXCAVATION

All borrow areas outside the pool area shall be graded and left in such a manner that they are well drained. The location, extent, and depth of borrow pits will be designated in the Construction Details or staked in the field. Borrow pits shall be excavated and dressed in a manner to eliminate steep or unstable slopes or other hazardous conditions.

11. PLACEMENT OF EARTHFILL

Earthfill shall not be placed until the required excavations, bank sloping, and site preparation have been completed, inspected, and approved by the Natural Resources Conservation Service personnel.

The earthfill shall be constructed to the dimensions specified on the drawings or as staked in the field. The materials placed in the fill shall be free of all sod, roots, frozen soil, stones, *or* other matter which will interfere with the performance of the earthfill material. The maximum uncompacted layer thickness shall be nine inches and the maximum particle size shall not exceed six inches.

The placing and spreading of fill material shall be started at the lowest point of the foundation and the fill brought up in approximately horizontal layers of such thickness that the required compaction can be obtained with the equipment used. The fill shall be constructed in continuous horizontal layers except where openings or sectionalized fills are required. In those cases, the slope of the bonding surfaced between the embankment in place and the embankment to be placed shall not be steeper than 3 horizontal to 1 vertical. The bonding surface shall be treated the same as that specified for the foundation so as to insure a good bond with the new fill.

If there is a stoppage in the placement of earthfill and prior to placement of new earthfill, the old earthfill shall be scarified and the existing material remove or the moisture adjusted to the correct content to ensure an adequate bonding of materials.

The distribution and gradation of materials throughout the fill shall be such that there will be no lenses, pockets, streaks, or layers of material differing substantially in texture and gradation from the surrounding material. Where 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.

Unless other wise specified in the Construction Details, the stockpiled topsoil shall be spread over the outer surface of the embankment. The topsoil will be considered as part of the earthfill.

Drainfill shall be kept from being contaminated by adjacent fill during placement by either placing it in a cleanly excavated trench or by keeping the drain at least 1 ft. above the adjacent earthfill.

Selected drainfill and backfill material shall be placed around structures, pipe conduits, and antiseep collars, as about the same rate on all sides to prevent damage from unequal loading.

12. FOUNDATION AND EMBANKMENT DRAINS

Foundation and embankment drains, if required, shall be placed to the line and grade shown on the drawing. Detailed requirements for drain material and any required pipe shall be shown on the drawings and/or specified in Construction Details.

Unless other wise specified in Construction Details, compaction of drainfill shall be by one of the following methods:

a. Drainfill shall be placed uniformly in layers not to exceed 8 inches thick before compaction. Each layer shall be flooded and thoroughly wetted prior to induce compaction.

b. Each layer of drainfill shall be compacted by a minimum of 2 passes of a vibratory plate compactor weighing at least 160 pounds. The compactor shall have a minimum centrifugal force of 2,450 pounds at a vibrating frequency of no less than 5,000 cycles per minute (or by a minimum of 2 passes of a vibratory smooth wheeled roller weighing at least 325 pounds with a centrifugal force of 2,250 pounds at a vibrating frequency of no less than 4,500 cycles per minute).

c. Other equivalent methods approved by the Engineer

The material shall be placed to avoid segregation of particle sizes and to ensure the continuity and integrity of all zones. No foreign material shall be allowed to become intermixed with or otherwise contaminate the drainfill.

Traffic shall not be permitted to cross over drains at random. Equipment cross-overs shall be maintained, and the number and location of such crossovers shall be established and approved before the beginning of drainfill placement. Each crossover shall be cleaned of all contaminating material and shall be inspected and approved by the engineer before the placement of additional drainfill material.

Any damage to the foundation surface or the trench sides or bottom occurring during placement of drainfill shall be repaired before drainfill placement is continued.

The upper surface of drainfill constructed concurrently with adjacent zones of earthfill shall be maintained at a minimum elevation of 1 foot above the upper surface of adjacent earthfill.

13. MOISTURE CONTROL

The moisture content of the fill material shall be adequate for obtaining the desired compaction. Material that is too wet shall be dried to meet this requirement, or be removed. Material that is too dry shall have water added and mixed with the fill material as needed to comply with the above requirement.

Unless otherwise specified, the in place moisture content of the fill material shall be at or above the plastic limit as determined by shaping the soil material into an elongated pat and rolled by hand on a smooth surface or between the palms into a thread about 1/8 inch in diameter without crumbling (too dry) or spreading into a thin layer (too wet), the feel method, speedy moisture tester, or other appropriate methods.

14. 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. If a minimum required density is specified, each layer of fill shall be compacted as necessary to obtain that density.

Unless other wise specified in Construction Details, compaction of fill (other than adjacent to the pipe conduit) shall be by one of the following methods:

a. Controlled operation of the earthmoving and spreading equipment over the fill so that the entire surface of each layer or lift is traversed by not less than one tread track of the equipment.

b. Compaction of each lift by not less than two (2) complete passes of a roller weighing not less than one thousand (1000) pounds per foot of roller width.

c. Other equivalent methods approved by the Engineer.

Allowance for shrinkage or settling shall be made at the rate of 5 percent, except that this shall be increased to 10 percent for dams constructed with bulldozers and 20 percent with draglines. Where a combination of equipment is used, the type of equipment having the higher percentage factor shall govern.

Dragline construction is limited to 10 feet of total embankment height.

Select backfill shall be placed around the conduit (when applicable) in layers not more than 4 inches thick before compaction, and each layer shall be thoroughly compacted to the density of the surrounding material by hand tamping, or by using manually directed power tampers or plate vibrators.

Fill adjacent to concrete structures shall not be compacted until the concrete has had time to gain enough strength to support the load.

15. MEASUREMENT

Excavation. Unless otherwise specified, measurement for excavation will not be made.

Earthfill. Unless otherwise specified, the volume of earthfill will be determined from design dimensions as shown on the drawings and as staked in the field.

Unless otherwise specified, the design dimensions shall be defined as follows. The lower limit shall be the approved foundation of the embankment prior to placement of earthfill and the upper limit shall be the specified neat lines of the settled fill surface. The approved foundation may need to be resurveyed prior to placement of earthfill to compute quantities.

Volume of earthfill will be computed to the nearest cubic yard. No reduction will be made for embedded conduits and appurtenances.

Pipe Conduit. Unless otherwise specified, measurement of pipe conduit installed will not be made.

Drain Fill. Unless otherwise specified, measurement of the certified drain fill material installed will not be made.

16. CONSTRUCTION DETAIL

The following listed drawings are attached and are a part of these construction specifications. (Include other applicable items - mark out and initial items listed and not applicable.)

a. TX-ENG-48 - Construction Data for Pond Dam (developed when dam is staked)

b. TX-ENG-204-1 – Low Head Drop Inlet

c. TX-283 - Fabrication Details and Bill of Materials for Standard Corrugated Metal Pipe Drop Inlet Structure

d. TX-ENG-0455 - Base for Corrugated Metal Vertical Inlet

e. TX-ENG-0454 - Guard Rails with Anti-Vortex Plate for Corrugated Metal Vertical Inlet

f. TX-EN-0457 – Sand Drainage Diaphragm For Principal Spillway

g. Contractor shall provide copy of certification that drainfill material meet specifications.

h. Responsibilities For Conservation Systems Constructed with NRCS Technical Assistance Landowners.

i. Pond – Operation and Maintenance Plan

This construction specification, attached construction details, and the requirement for completion of a TX-ENG-80A and TX-ENG-80B have been reviewed with me and I agree to install this practice according to these construction specifications.

_____ _____

Owner/Operator ***Date***