NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE GENERAL SPECIFICATIONS

Texas

GRADE STABILIZATION STRUCTURE

(No.)

Code 410

1. SCOPE

The work shall consist of all construction operations and furnishing all materials as required by the drawings and specifications for the complete 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, 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. LOCACTION

The location of the excavation, earthfill and mechanical structure shall be as specified on the drawings or as staked in the field

3. 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 must conduct their own search and discovery for utilities in order to lesson or avoid potential damages. During planning, the owner\operator must complete a TX-ENG-80A, UTILITIES INVENTORY to document know utilities. The owner\operator or their representative must complete TX-ENG-80B, COOPERATOR CONFIRMATION OF THE ONE-CALL UTILITY SAFETY SYSTEM to comply with State law prior to any ground disturbance and return to a USDA-NRCS representative.

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 which 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 inspections will vary by structure type. For an embankment with a pipe installation, critical points 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.

Critical points of inspection for other types of structures will be specified in the Construction Detail section of this specification

5. MATERIALS

All materials required for mechanical structures shall be as specified on the drawings or in the construction details section of this specification. All specified materials shall be transported and delivered to the site in such a manner to prevent damage to the materials.

6. CONTROL OF WATER

Control or removal of surface or groundwater 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, as required, 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 specified earthfill 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 placement of earthfill. Suitable excavated materials may be used in the permanent earthfill.

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. All construction shall be performed in a professional manner, and the job site shall have a neat appearance when finished.

9. AUXILIARY SPILLWAY EXCAVATION (WHEN SPECIFIED)

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. All construction shall be performed in a professional manner, and the job site shall have a neat appearance when finished.

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 Detail 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 with a minimum 12 inch thickness of fertile soil remaining to facilitate revegetation when not located under an anticipated water level.

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 earthfill in place and the earthfill 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.

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.

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.

Unless otherwise specified in the Construction Details, the stockpiled topsoil shall be spread over the outer surface of the earthfill. 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 (WHEN SPECIFIED)

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 otherwise specified in Construction Details, compaction of drainfill shall be by one of the following methods.

Method 1. 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.

Method 2. 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)

Method 3. 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.

When foundation and embankment drains are required, the contractor shall provide a copy of certification that drainfill material meets specifications.

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.

The method of compaction shall be specified in Construction Details. Compaction of fill (other than adjacent to the mechanical structure) shall be by one of the following methods:

Method 1. 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.

Method 2. Controlled operation of loaded hauling and spreading equipment over the fill so that the entire surface of each layer or lift is traversed by not less than one wheel track of the equipment.

Method 3. 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.

Method 4. 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 mechanical structure (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. MECHANICAL STRUCTURE

Unless otherwise specified, the mechanical structure shall be installed in accordance with the manufacturer's recommendations. Additional requirements will be shown on the drawings or in the construction details section of this specification. All construction shall be performed in a professional manner, and the job site shall have a neat appearance when finished.

16. 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 designed foundation prior to placement of earthfill and the upper limit shall be the specified neat lines of the settled fill surface. Payment for earthfill in the foundation and core trench shall not exceed the design dimensions unless a lower foundation and/or larger core trench is required and approved by NRCS personnel due to unforeseen site conditions. 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.

Mechanical Structures. Unless otherwise specified, the quantity of each component of the mechanical structure for which cost has been established in the county will be measured.

An onsite check of the completed installation will be performed by a USDA-NRCS representative to measure installed dimensions and quantities.

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17. CONSTRUCTION DETAILS

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

In Section 12. Foundation and Embankment (when specified), Method_____shall be used.

In Section 14. Compaction, Method___shall be used

ATTACHMENTS:

1. TX- ENG-80B, Cooperator Confirmation of the One-Call Utility Safety System Form
2. Responsibilities for Conservation Systems Constructed with NRCS Technical Assistance.
3. Grade Stabilization Structure Operations & Maintenance Plan.
4.

This general specification, attached construction details and the requirement for completion of a TX-ENG-80B have been reviewed with me and I agree to install my grade stabilization structure according to these general specifications.

_____ _____

Owner \ Operator ***Date***