



378. CONSTRUCTION SPECIFICATIONS

Pond (378)

_____ Land Owner _____ Service Center

_____ County _____ Date

1. SCOPE

This item consists of the clearing, excavation, backfill, concrete and other appurtenances required for the construction of the excavated or embankment ponds and the disposal of all cleared and excavated materials for the water impoundment.

Construction operations are carried out in such a manner that erosion, air, water and noise pollution will be minimized and held within legal limits as established by Federal, state and local laws, rules and regulations.

2. LOCATION

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

3. PUBLIC AND PRIVATE UTILITIES

Utilities are defined to be overhead and/or underground power-lines, communication lines, gas lines, pipelines, etc. All utilities discovered to be in the work area are shown on the drawings or sketches. However, absence of indicators on the drawings or sketches does not assure the nonexistence of utilities in the work area. The contractor and owner shall be alerted to conduct their own search and discovery for utilities in order to lessen or avoid potential damages. The owner/operator is responsible and shall notify all utilities and complete, WV- Eng-46 Utilities Inventory, prior to layout or any ground disturbance and return it to NRCS representative.

4. CLEARING

Clear the foundation area of all brush, trees, stumps, roots, brush, boulders, sod and debris as much as practicable.

Dispose of all material from the area by burning or removing from the site. All burning or disposal shall conform to local and state laws and regulations.

5. EXCAVATION OR SPOIL

The completed pond, berms or spoil banks and waste material shall conform as nearly to lines, dimensions, grades and slopes shown on the plans or staked at the site as skillful operations of the excavating equipment permit.

6. MATERIALS

Pipe spillways, drain pipes, and water supply pipes shall be firmly and uniformly bedded throughout their length.

Install to the line and grade shown on the drawings.

Inlet structures, outlet structures, seepage drains, and valves and other fittings shall be installed as detailed or noted on the drawings.

The type, applicable specification, schedule, and wall thickness or gage of pipe will be as shown on the drawings.

Seepage drains, if required, will be constructed of materials and to the dimensions shown on the drawings. Sand for seepage drains will be fine concrete aggregate meeting the requirements of ASTM C33.

Water troughs and pipelines downstream of the embankment will be installed as shown on the drawings and as detailed in the specifications for pipeline and watering facility.

Concrete used in construction of inlets shall be ready-mixed concrete (3,000 psi, 6 bags per cubic yard mix), pre-bagged commercially available concrete mix, or be hand mixed on-site. Cement will be Type I or IA meeting the requirements of ASTM C150 and aggregates will meet the requirements of ASTM C33. Coarse aggregate will be size number 57 or number 67 for ready-mix and hand mixed concrete. Hand mixed concrete shall be mixed at a ratio of 1 part cement, 2 parts sand, and three parts coarse aggregate. Pre-bagged concrete mix will be mixed according to the manufacturers' recommendations. Mixing water will be clean and free of substances that would affect the strength or durability of the concrete. Concrete will be mixed to a consistency that will allow consolidation in the forms, but not so wet that aggregates separate from the mortar (approximately 3" to 6" slump).

Concrete will be mixed and placed in the forms in a timely manner so it does not begin to set prior to placement, or cold joints are not formed between successive layers. Forms shall be mortar tight and unyielding as concrete is placed.

Reinforcing steel shall be placed as shown on the drawings and held securely in place while concrete is placed.

Riprap for slope or pipe outlet protection, if required, will be commercially available limestone riprap or on-site field stone that had demonstrated its durability against weathering. Riprap size, gradation, and details of installation will be as shown on the drawings.

7. EARTH FILL EMBANKMENT

The earth embankment or artificial barrier is constructed of soil to a predetermined size and shape, together with any associated spillways and appurtenant works that does or may impound or divert water. Follow the specifications outlined in the construction plan, soil mechanics laboratory reports and geologic investigation report.

8. EARTHFILL PLACEMENT

Selected backfill material shall be placed, in layers not exceeding four inches in thickness, around structures and pipe conduits at approximately the same rate on all sides to prevent damage from unequal loading, and shall be hand compacted. Construction equipment shall not be permitted within two feet of structures or conduits.

When it is necessary to use materials of varying texture and gradation, the more impervious material shall be placed in the upstream and center portions of the embankment. All fill materials shall be obtained from required excavations or designated borrow areas.

The placing of fill shall be in horizontal layers and placed in layers not exceeding eight inches in thickness. Each layer shall be left with a rough surface prior to placement of

subsequent layers. The fill shall be maintained so that surface drainage will occur in the upstream direction during placement.

Drain fill shall be protected from being contaminated by adjacent soil materials during placement by either placing it in a cleanly excavated trench or by keeping the drain fill material at least one foot above the adjacent earth fill.

Compaction of embankments with heights of ten feet or less, between the centerline low point and the auxiliary spillway crest elevations, may be accomplished by traversing the surface area of each layer with not less than four passes of the construction equipment, in lieu of a tamping roller or rubber-tired hauling equipment, reference WV 723-Earthfill specifications for fill heights greater than 10 feet.

Other: _____

9. FOUNDATION PREPARATION

Based on the type of Earth Embankment (I, II, III or IV) reference Appendix A in the WV Conservation practice standard (378).

10. PIPELINE AND APPURTENANCES PLACEMENT

Place pipelines so that they are protected against hazards imposed by traffic, livestock, farm operations, freezing temperatures, or soil cracking. Other means of protection must be provided if the depth required for protection is impracticable because of shallow soils over rock or for other reasons. Abrupt changes in grade must be avoided to prevent rupture of the pipe. Trenches for plastic pipelines shall be free of rocks and other sharp-edged materials, and the pipe shall be carefully placed to prevent damage. Plastic pipelines may be placed at the elevation indicated on the plans by plow-in equipment when the soils are suitable and rocks and boulders will not damage the pipe.

Joints between sections of pipe shall be designed to remain water tight after joint elongation caused by foundation consolidation. Make joints watertight by using couplings, gaskets, caulking or welding according to the manufacturer recommendations. Connections of PVC plastic pipe to less flexible pipe or structures must be designed to prevent stress concentrations and pipe rupture.

11. TESTING

Inspect the pipeline for leaks and pressure test pipelines. Allow the joints of the assembled pipeline to set as recommended by the manufacturer. All concrete thrust blocks must be cured for a minimum of 3 days. Pipeline shall be pressure tested by one of the following methods:

- a. Before backfilling, fill the pipe with water and test at the design working head or at a minimum head of 10 ft. or whichever is greater. All leaks must be repaired, and the test must be repeated before backfilling.
- b. Pressure test at the working pressure for 2 hours. The allowable leakage shall not be greater than one gallon per diameter inch per mile. If the test exceeds this rate, the defect must be repaired until retests show that the leakage is within the allowable limits, but all visible leaks must be repaired.

12. BACKFILLING

All backfilling shall be completed before the pipeline is placed in service. For plastic or copper pipe, the initial backfill shall be of selected material that is free of rocks or other

sharp-edged material that can damage the pipe. Deformation or displacement of the pipe must not occur during backfilling. Plastic pipelines installed by the plow-in method require surface compaction and shaping in addition to the normal plow-in operations. Installation and backfilling shall be done in a workmanlike manner. Provisions shall be provided for stabilizing disturbed areas and controlling erosion, as necessary. WV CPS Critical Area Planting 342

13. VEGETATION

A protective cover of vegetation shall be established on all exposed surfaces of the embankment, auxiliary spillway, and borrow area where soil and climatic conditions permit. Lime and fertilizer will be spread at the rate shown on the drawings and will be disked into the soil to a depth of four inches to prepare a seedbed. Seed, sod, mulch, and soil amendments will be applied at the rate shown on the drawings. The area will be watered and maintained until a permanent cover is established. If soil or climatic conditions preclude the establishment of a permanent vegetative cover, than seasonal/temporary vegetation in combination or separately with permanent vegetation or a temporary non-vegetative protection (mulches, gravel, etc.) measure may be used until vegetation can be established.

Establish a perennial vegetation filter strip at least 50 feet wide around excavated ponds. Seed all disturbed areas and vegetate according to the recommendations for permanent seeding as stated in Conservation Practice Standard 342, Critical Area Planting, the Pennsylvania Agronomy Guide, or the plans.

14. EROSION AND POLLUTION CONTROL

Construction operations shall be carried out so that erosion and sediment are controlled during construction, and air and water pollution are minimized. Best management practices (BMP's) for construction shall be installed and maintained as needed and according to NPDES permit, if required.

15. INSPECTION OF MATERIALS

All materials used in the fabrication and installation of the principal spillway, trash rack, valves and other fittings, shall be visually inspected prior to or during their installation to assure quality and integrity of material.

16. CONSTRUCTION OPERATIONS

Construction operations shall be carried out in such a manner and sequence that erosion and air and water pollution will be minimized and held within legal limits. All disturbed areas will be graded smooth and blended with the surrounding ground, prior to seeding operations.

Measures and construction methods that enhance fish and wildlife values shall be incorporated as shown on the drawings.

Appropriate safety measures, such as warning signs, rescue facilities, fencing, etc., will be installed as shown on the drawings.

17. ADDITIONAL CONDITIONS WHICH APPLY TO THE PROJECT ARE:

Reference the following construction plans and drawings or other information pertinent to construction of the pond and associated appurtenances.

ASSOCIATED WVENG DRAWINGS FOR PONDS (378)

- _____ WVENG_DWG_378_ Pond Plan View Field Sheet
- _____ WVENG_DWG_378_ Farm Pond With Drop Inlet
- _____ WVENG_DWG_378_ Pond-Concrete Drop Inlet Cross Section
- _____ WVENG_DWG_378_ Pond- Auxiliary Spillway Details
- _____ WVENG_DWG_378_ Drop Inlet
- _____ WVENG_DWG_516_ Valve Access and Subsurface Outlet Detail
- _____ WVENG_DWG_378_ Sand Diaphragm
- _____ WVENG_DWG_378_ Farm Pond No Principal Spillway (WVENG-8)
- _____ WVENG_DWG_378_ Farm Pond with Straight Inlet (WVENG-9)
- _____ WVENG_DWG_378_ Farm Pond with Concrete Drop Inlet Side Hill (WVENG-10)
- _____ WVENG_DWG_378_ Hood Inlet with Baffle Corrugated Metal (WVENG-11)
- _____ WVENG_DWG_378_ Pipe Drop Inlet with Baffle Corrugated Metal (WVENG-12)
- _____ Other: _____
- _____ Other: _____
- _____ Other: _____
- _____ Other: _____