Anaerobic Digester – Controlled Temperature, Code 366

I. References

A. Design Criteria

1. Alabama FOTG Section IV, conservation practice standard, Anaerobic Digester, Code 366.

B. Design Procedure

1. NEH Part 651, AWMFH, Chapter 10.

C. Design/Layout Surveys

1. TR-62 Engineering Layout, Notes, Staking & Calculations.
2. NEFH Part 650, Chapter 1, Engineering Surveys.

II. Documentation

A. Preliminary Investigation

Make a preliminary investigation of the need and feasibility of an anaerobic digester considering the purpose of the digester (produce biogas, reduce greenhouse gas emissions, etc.), existing operation, site topography, floodplain, operator's interest and management ability to operate the facility or availability of consultants to provide the services

Determine the characteristics of the manure to be used in the digester. The characteristic of the manure is necessary to access the applicability of this practice.

B. Engineering Surveys

1. An accurate topographic survey of the proposed location shall be taken and shall extend a minimum of 50 feet beyond the limits of the proposed facility and in sufficient detail to determine drainage patterns in the vicinity of the proposed anaerobic digester. The proposed location of the anaerobic digester shall be referenced so that it can be staked in the field. The survey should show the location of existing buildings, utilities, electrical hookup source, wells, existing buried pipelines, drainage ditches, streams, etc., in the vicinity of the proposed facility.
2. Note the location of any utilities or utility markers.

C. Design

1. Determine the type of digester applicable for the type and characteristics of waste used.
2. Determine the size and dimensions including minimum design storage, rainfall (if necessary), retention time, and freeboard for the digester vessel.
3. Determine the size, grade, and location of all inlet and outlet pipes.
4. Determine the type, thickness, and quality of the digester cover. See NRCS conservation practice standard Waste Facility Cover, Code 367. Include all applicable appurtenances for installing the digester cover.
5. Design the gas collection, transfer, and control system.
6. Design the gas utilization system.

7. Design and specify all monitoring equipment needed to properly operate the facility.
8. Design and specify all safety requirements for the facility including warning signs.
9. Develop engineering plans and specifications. As a minimum the plans and specifications shall include:
    a. Planned location of the digester on the topographic survey and location of all appurtenances necessary in the operation of the digester.
    b. Size, location, and grade of all inlet and outlet pipes.
    c. Dimensions of the digester vessel. Include typical cross sections of the digester including cover.
    d. Details of the gas collection system, including type of pipe, devices, sizes, location, material, and grades.
    e. Details of gas control facility, piping layout, components, electrical service if required, and protection from the elements.
    f. Appropriate gas safety equipment or protective measures.
    g. Location of utilities and notification requirements.
10. Compute quantity of all materials (digester vessel, earth fill, digester cover, pipes, etc.) when used as basis of payment.
11. Develop an O&M Plan specific for the site.

D. Construction Layout

Review the plans and specifications with the landowner and contractor prior to the start of construction. Ensure the landowner/contractor thoroughly understand their responsibilities including obtaining all permits, easements, etc.

Record all layout information in the engineering field book or in the electronic field book.

1. Set sufficient stakes to guide the contractor in installing the practice. As a minimum, stake the corners of the facility.
2. Stake the location and elevations of all pipes, etc.

E. Construction

Adequate site visits and checks shall be made during construction to verify that the plans and specifications are followed.

Any changes in the design must be reviewed and concurred by the landowner and shall be approved by the designer and person with appropriate engineering design job approval authority.

F. Construction Checkout

Record the following information on the engineering plans and in the engineering field book.

1. Location of the anaerobic digester and appurtenances.
2. Constructed dimensions and elevations of the anaerobic digester.

3. Structural components.
    a. Type, quality, and quantity of digester cover installed. Check the anchorage of the cover to determine if installed correctly.
    b. Type, quality, and quantity of all inlet and outlet pipe installed.
    c. Details of the gas collection system.
    d. Details of the gas control facility.
    e. Document all safety equipment installed.
4. Verify and document that all required warranties are on file.
5. Prepare as-built drawings showing final construction dimensions, details, etc.
6. If the practice meets NRCS standards and specifications, then the statement "This practice meets NRCS practice standards and specifications" shall be placed on the checkout document and signed and dated by the responsible person with appropriate level of engineering job approval authority.

G. Reporting and/or Certifying

After it has been determined and documented that the practice meets NRCS plans and specifications, it can be reported and certified. The extent of the practice to be reported is the number of anaerobic digesters installed. The extent certified shall be the quantities used as the basis of payment.