SUBSURFACE DRAIN
DESIGN AND CHECK DATA REQUIREMENTS

The following items must be addressed in the design folder for the Subsurface Drain. The following pages shall be included:

(1) Table of Contents
(2) Operation and Maintenance Plan
(3) Soils and Foundation Data
(4) Design Calculations
(5) Construction Specifications
(6) Engineering Drawings
(7) Erosion & Sediment Control Plan
(8) Quality Assurance Plan

Listed below are specific items that are required in the design:

Table of Contents

This organizes the design folder

Operation and Maintenance Plan

Check and clean outlets
Check for blowouts
Check for reduced flows from what is expected

Soils and Foundation Data

Soil type being drained

PA One Call serial number and the following statement shall be placed on the drawings:

"It is the duty of the Contractor to comply with the provisions of the Pennsylvania Act 287 (1974) as amended by Act 199 (2004) before performing any excavation work."

The following statement on trench safety shall also be placed on the drawings:

"The Contractor must comply with OSHA requirements Part 1926, subpart P for the protection of workers in trenches."

Documentation of any rock excavation or water from an unknown source

Design Calculations

Inflow rate per 1000 feet if interceptor type drain and "Q" (if needed)

Plot of profile of ground surface and proposed grade line (if needed)

Required capacity vs. available capacity for sub-mains and mains

In lieu of determining "Q" for simple random or interceptor lines, show length and grade with reference to the design data source

Construction Specifications

Enclose the applicable specification(s) 342 and 620.

Include any "additional conditions" or items that are site specific or must be defined to supplement the standard specification. (See instructions for use of Specifications.)

Add any special or "by-others" specifications.

Engineering Drawings

On each drawing sheet, the title block should show the operator's name, type of operation, county and the people involved in drawing and designing the subsurface drain.

Include any standard drawings made by NRCS or designed by others and concurred in by NRCS that are needed, and include them in the drawing index on the cover sheet.

Listed are items that should be included:

Plan View Sheet(s)

North Arrow
Utilities/roads
Benchmark(s)
Scale
Legend
Existing Structure
Existing trees
Profile locations
Construction limits
Drainage & outlet locations
Transfer line locations

Outlet location
Set backs (if applicable)

Cross Section Sheet(s)

Pipe profile
Reference to detail drawings
Original ground location
Any inlet & outlet elevations

Additional items to be included:

- Measurements to show that the subsurface was installed as planned
- Length of subsurface drain by size and kind of drain material
- Length, kind and size of outlet pipe
- Vertical distance between invert of outlet pipe and normal water level in outlet ditch or stream
- Filter or envelope thickness and kind of material (if filter is required by design)
- Method of blinding and covering joints
- Location sketch of lines installed
- Minimum cover required
- Installation of animal guard

Erosion & Sediment Control Plan

See DEP's Erosion and Sediment Pollution Control Program manual and the Conservation District requirements.

Quality Assurance Plan

What information is needed to design this system?

Is this system practical and cost effective to the problem?

What specific items need inspection and when?

Who will do the actual inspection?

Were the as-builts completed?