PA521C. POND SEALING OR LINING – BENTONITE TREATMENT

DESIGN AND CHECK DATA REQUIREMENTS

The following items must be addressed in the design folder for pond sealing or lining with bentonite treated soil. (This can be part of the design folder for the pond design.)

Table of Contents

List key pages found in the design.

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

Soils and Foundation Data

Document compliance with PA One-Call before digging?

Written soils description for test pits and site specific comments are included?

Reference pit locations to site contour map.

Design Data

Important data recorded and consistent with the appropriate standard (e.g. PA378, PA313), including but not limited to:

- PA One-Call documentation
- Address slope stability, removal of over sized material, rock excavation, drainage, isolation from open foundation rock, and groundwater drainage system.
- Soils lab data with seepage estimates and liner calculations
- Sealing/liner alternatives considered
- Cost estimates

Construction Specifications

Enclose construction specification, PA521B and others applicable specifications (e.g. PA313, PA378, etc.).

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 PA521B.)

Add any special or “by-others” specifications.

Engineering Drawings

A bentonite soil liner design requires approval by a person with the appropriate Engineering job approval authority. If the liner is part of a Waste Storage Facility (PA313) is must be approved by a registered Professional Engineer or an Engineer with NRCS Engineering job approval authority for Waste Storage Facilities. If a DEP permit is required, additional details may be needed.

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.

<u>TITLE BLOCKS (each sheet)</u>
Operator’s name
Type of operation
Designer, drafter, checker
Engineer or Record approval (cover sheet only)
County

<u>COVER SHEET</u>
Site location
Index of drawings
Job Class
Certification Statement
Signature Block
Reference to specific Standard Drawings

<u>PLAN VIEW SHEETS:</u>
North arrow
Utilities, roads, and bench marks
Scale and legend
Access
Existing structures
Cross section locations

Construction limits
Limits of bentonite treated soil
Borrow and Spoil areas

SITE CONTOUR SHEET
Preferably same as Plan View Sheet):

North arrow
Bench marks
Scale
Soils test pit location
Existing structures
Contour lines
Property lines
Water well and spring location(s)
Water courses
Known sinkhole locations
Legend
Fencing and safety features

CROSS-SECTION SHEETS:
Two sections, minimum
Scale(s)
Soil test pit profile(s)
Structure/pipe configurations
Access ramp
Earthfill zones and slopes
Leak detection systems
Foundation drainage system
Reference to detail drawings

DETAIL SHEET(S): Sufficient details to install the bentonite treated soil liner; e.g. soil limits and type, mixing depths.

SAFETY:
Utility items
Excavation safety items
PA One-Call documentation
OSHA references as appropriate
Safety features such as signs, grates, gates, fencing, etc.

CONSTRUCTION SEQUENCE:
E&S control
Spoil and borrow areas
Special considerations
Special equipment
Vegetative requirements
Fencing and safety features
References to specific standards and drawings

Erosion and Sediment Control Plan

Refer to DEP Erosion and Sediment Pollution Control Program Manual. Include pertinent information in the design.

Construction Check Data

QUALITY ASSURANCE PLAN (QAP) Specific items to inspection and when
Inspector qualifications
Name of inspector(s)
Necessary inspection equipment & tests

ON-SITE VISITS: The QAP must include, at a minimum, as applicable to the specific job, onsite visits PRIOR to:

- Start of construction
- Completion of foundation excavation to observe and record the foundation conditions encountered and compare with the conditions assumed in the design.
- Construction of the bentonite treated soil liner to check the subgrade condition

Documentation

The following documents need to be assembled and maintained in the office for the life of the facility:

1. A full set of as-built drawings with:
   a. Items installed as designed; changes shall be recorded in a manner that the As-Built information is obvious, such as in bold and red.
   b. Notes describing the changes will be recorded on all sheets where changes occurred, including initials.
   c. Document the actual foundation and ground water conditions encountered if they differ from the site investigation and design assumptions.
   d. The certification statement, signature and date by a person with construction job approval; however a P.E. must certify the completion of all storage facilities.
2. Design Folder.
3. Survey check notes with final elevations shown in red.

4. Material certifications, etc.
5. Contractor's certification of conformance
6. Photographs, if applicable
7. Records of site visits and significant discussions
8. Other applicable construction records.

Operation & Maintenance Plan

Should include, but is not limited to:

- Precautions to avoid damage to the bentonite treated soil liner.
- How to inspect the liner for wear, leaks, erosion, etc.
- Define procedures for repairing the liner and if included, the soil cover.
- Drawdown restrictions, especially if the liner is covered with soil.
- Explain any monitoring requirements for leak detection systems under waste storage ponds.
- Safety precautions, including emergency action plans for containing and controlling discharge from leak detection systems.
- Other special situations, practices, conditions, and requirements for the individual operation.