

STATEMENT OF WORK
Denitrifying Bioreactor (605)
Michigan

These deliverables apply to this individual practice. For other planned practice deliverables refer to those specific Statements of Work.

Specific responsibility for the deliverables depends on the source of engineering technical assistance to NRCS-Michigan customers. Responsibilities for the four available sources of engineering assistance are described in NRCS-Michigan [Roles and Responsibilities for Engineering Technical Assistance](#).

DESIGN

Deliverables:

1. Design documents that demonstrate criteria in NRCS practice standard have been met and are compatible with other planned and applied practices. Include:
 - a. Practice purpose(s) as identified in the conservation plan.
 - b. List of required permits to be obtained by the client and regulations to be met
 - c. Evaluation of impacts to adjacent properties and structures.
 - d. Compliance with NRCS national and state utility safety policy (NEM Part 503-Safety, Subpart A-Engineering Activities Affecting Utilities 503.0 through 503.6).
 - e. List of facilitating practices
 - f. Practice standard criteria-related computations and analyses to develop plans and specifications including but not limited to:
 - i. Geology and Soil Mechanics (NEM Subpart 531a)
 - ii. Hydrology/Hydraulic, including computer design printouts
 - iii. Vegetation
 - iv. Structural, Mechanical and Appurtenances
 - v. Environmental Considerations, including threatened and endangered species
 - vi. Cultural Resources Considerations
 - vii. Safety Considerations (NEM Part 503-Safety, Subpart A, 503.10 through 503.12)
 - viii. A tile map includes tile sizes, materials, depth, and locations of all tile draining to the denitrifying bioreactor. If a tile map is unavailable, provide documentation on how the denitrifying bioreactor was sized, including drainage area.
2. Written plans and specifications including sketches and drawings shall be provided to the client that adequately describes the requirements to install the practice and obtain necessary permits. The Construction drawings must include the notes shown on page 2 of the NRCS-Michigan standard drawing cover sheet ([8½ x 11](#)). Design plans shall include, but are not limited to:
 - a. Location map with legal description.
 - b. Plan view drawing showing location and stations of the practice to be constructed, and relevant benchmark elevations and descriptions.
 - c. A plan view of the layout of the denitrifying bioreactor and associated components.
 - d. Typical cross-section(s) of the bioreactor.
 - e. Profile(s) of the bioreactor including inlet(s) and outlet(s).
 - f. Details of required structures for water level control
 - g. Seeding requirements, if needed.
 - h. Quantities of all components.
 - i. Construction and material specifications that describes site specific installation requirements of the bioreactor, media, and associated components.
 - j. Signature/initials and date for design and design check.
3. Quality Assurance Plan (NEM Part 512 - Construction, Subpart D - Quality Assurance Activities, 512.30 through 512.33). An inspection plan and quality control plan is required.
4. Operation and maintenance plan specific to the denitrifying bioreactor.

**STATEMENT OF WORK
Denitrifying Bioreactor (605)
Michigan**

5. Certification that the design meets NRCS standards and specifications and is in compliance with applicable laws and regulations (NEM Part 505 - Non-NRCS Engineering Services, Subpart A - Introduction, 505.0 and 505.3)

INSTALLATION

Deliverables:

1. Preconstruction conference with client and contractor. Review roles and responsibilities.
1. Verification that client has obtained required permits and located all utilities in the project area. (copy of permit or other documentation showing permits have been acquired)
2. Staking and layout according to plans and specification including applicable layout notes
3. Installation inspection and roles of the contractor for inspection requirements
 - a. Actual materials used (NEM Part 512 - Construction, Subpart C – Evaluation of Construction Materials, 512.20 through 512.23; Subpart D - Quality Assurance Activities, 512.33)
 - b. Inspection records- All inspection narratives/notes
 - c. Documents showing compliance with Quality Assurance Plan and Inspection Plan
4. Facilitate and implement required design modifications with client and original designer. Include documentation giving explanation and justification of need for modification
5. Advise client/NRCS on compliance issues with all federal, state, tribal, and local laws, regulations and NRCS policies during installation

CHECK OUT

Deliverables:

1. As-built documentation
 - a. Extent of practice units applied
 - b. As-built drawings (NEM Part 512, Construction, Subpart F – As-builts, 512.50 through 512.52)
 - c. Final quantities
2. Certification that the application meets NRCS standards and specifications and is in compliance with permits (NEM Part 505 – Non-NRCS Engineering Services, Subpart A - Introduction, 505.3).
3. Progress reporting

REFERENCES

- NRCS-Michigan Field Office Technical Guide ([FOTG](#)), Section IV, Conservation Practice Standard – Denitrifying Bioreactor (Code 605)
- NRCS National Engineering Manual ([NEM](#)), Part 624, section 16 Drainage and Part 650, Chapter 14, Water Management (Drainage)
- [NRCS-Michigan Operation and Maintenance Plans](#)
- [NRCS-Michigan Construction Specifications](#)
- [Michigan Climate Information](#)
- National Engineering Handbook ([NEH](#))
- NRCS National Environmental Compliance Handbook
- NRCS Cultural Resources Handbook