

**U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
NEW YORK CONSERVATION PRACTICE GUIDELINE**

WATER AND SEDIMENT CONTROL BASIN

(NO.)

638

REFERENCES

National Handbook of Conservation Practices-Code 638, Water and Sediment Control Basin.
Lead Discipline: CED-AE

Commonly Associated Practices or Processes

The following conservation practices are commonly used in conjunction with this practice to address natural resource concerns and opportunities in New York. This does not imply that any or all of the listed practices must be included or that others may not be included in a conservation management system (CMS). Consult Section III of the Field Office Technical Guide for assistance in developing a CMS.

To determine whether a Conservation Practice Standard applies to this and any other associated practices in New York, check the following website: http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=NY. Select a County. On the eFOTG main screen, in the menu pane on the left side of the screen, open the Section IV folder to find the Conservation Practices for use in New York. Also included under Section IV are New York Construction Specifications, Engineering Job Sheets, Guidelines and/or Procedures relevant to the Practice Standards.

Table A: Commonly Associated Practice Standards or Processes

Number	Name
328	Conservation Crop Rotation
342	Critical Area Planting
362	Diversion
378	Pond
382	Fence
412	Grassed Waterway
468	Lined Waterway or Outlet
484	Mulching
585	Strip Cropping
590	Nutrient Management
595	Pest Management
600	Terrace
606	Subsurface Drain
620	Underground Outlet
633	Waste Utilization
EFH-2	Estimating Runoff Process

OTHER REFERENCES

The following references can be accessed from: <http://policy.nrcs.usda.gov>

NRCS National Agronomy Manual

NRCS National Planning Procedures Handbook (NPPH)

NRCS National Environmental Compliance Handbook (NEPA)

NRCS Engineering Field Handbook, NEH 650

Technical Release 62, Engineering Layout, Notes, Staking, and Calculations:

<http://www.info.usda.gov/CED/Default.cfm?xSbj=63&xAud=24>

Ponds – Planning, Design, Construction USDA-NRCS Agriculture Handbook Number 590

<http://www.in.nrcs.usda.gov/pdf%20files/PONDS.PDF>

New York State Department of Environmental Conservation References:

NYS DEC Guidelines for Design of Dams, Rev Jan 1989:

<http://www.dec.state.ny.us/website/dow/bprfp/ds/index.htm>

NYS Consolidated Laws, Environmental Conservation Title 5, Protection of Water, Section 15-0503, Protection of Water Bodies: Permit.

Article 15 Environmental Conservation Law, 6NYCRR, Part 608, Protection of Waters.

<http://www.dec.state.ny.us/website/dcs/streamprotection/index.html>

The following may be found in Local NRCS Field Offices:

New York Plant Materials Technical Reference No. 11, "A Guide to Conservation Plantings on Critical Erosion Areas"

New York State Drainage Guide (SCS) 9/87

CULTURAL RESOURCES

Cultural resource reviews will be conducted for all ground disturbing practices, components, or other activities, as per the State Level Agreement between NRCS and the New York State Historic Preservation Officer.

PERMITS AND NOTIFICATIONS

All permits, easements, and rights-of-way are the responsibility of the landowner.

Dig Safely NY (formerly the Underground Facilities Protection Organization, or UFPO) and non-member local utilities will be contacted according to the time required before construction to mark all applicable facilities in the construction area. This is the responsibility of the excavator.

Identification and the location of all other underground or overhead facilities is the responsibility of the landowner.

Erosion and Sediment Control - An erosion and sediment control plan shall be developed for all ground disturbing activities. For disturbed areas greater than one acre, the erosion and sediment control plan shall meet the planning, installation, and maintenance requirements of NYS Pollutant Discharge Elimination System General Permit for Stormwater Discharges. All erosion and sediment control structures and measures shall be installed prior to earth disturbing activities unless otherwise directed in the construction drawings and specifications.

Threatened and endangered (T&E) species review will be conducted for all projects as part of the NEPA process. This review will include an assessment of available records documenting the presence of T&E species in the project area. At a minimum, the New York State Department of Environmental Conservation and U.S Fish and Wildlife Service will be contacted for potential presence of listed species. If a T&E species is or was historically present at a site, document findings on the NRCS-CPA-52 form as appropriate and contact the NRCS Area Biologist for guidance on how to proceed with the project.

DECISION MAKER INVOLVEMENT AND PLAN REVIEW

Involve the decision maker at all stages of inventory and design. Review the conservation plan. Determine that the NEPA process has been completed and documented on a CPA-52 and that the project can proceed with no additional analysis required. All landowner decisions need to be documented. Ensure an operation and maintenance plan is provided to and reviewed with the decision maker.

INVENTORY AND EVALUATION

1. Review feasibility of planned location(s) for sediment basin(s) in relation to cropping system(s).
2. Determine if the water and sediment control basin is suitable for its intended use and the changes it could introduce into management of the affected watershed.
3. Investigate the drainage area of the proposed structure including drainage patterns, land use and cover type and condition.
4. Locate a suitable outlet and determine stability, safety, and property rights. Consider the potential for transport of nutrients and other contaminants to the receiving outlet location or water body. Check the downstream area for the possibility of negative effects. Consider the necessity of permission for using the selected outlet.
5. If a waterway/diversion is planned to serve as an outlet for the basin's discharge system, ensure that the established vegetative cover of the waterway/diversion will be suitable to safely discharge the additional flows from the planned structure.
6. A geologic site investigation shall be conducted by a qualified individual. Excavate a sufficient number of test pits to check for evidence of seepage, water table elevation, proximity to bedrock, permeability, and suitability for fill material. These test pits shall be excavated to a minimum depth of two feet below proposed pool bottom, and located along the centerline of the embankment, spillway(s), and borrow areas. The results shall be recorded on the NRCS NY-ENG-1, Backhoe Pit Log, or equivalent, and using the Unified Soil Classification System. Along the centerline of embankment, note the depth necessary for a positive cutoff trench and/or the need for seepage control.
7. If the site conditions and soils are favorable, establish a temporary benchmark (TBM) that will be serviceable throughout the construction period. Conduct a detailed survey to develop a topographic map, locate test pits, property lines, buildings, utilities, and any other features in the project area. Survey should allow contour closure above top of embankment elevation and include outlet grades and details.

DESIGN

The following design process is iterative. If the storage volume determined in step 6 is not adequate to store the required volume determined in step 5, change one or more of the variables and go through the process again until the storage requirement is met. You may find that the structure as proposed is not feasible.

1. Determine the drainage area (DA) above the proposed structure in acres. Complete Worksheet 1, EFH Chapter 2, to determine the runoff curve number for the drainage area. Determine the rainfall and runoff depth (in inches) for the desired storm frequency.
2. Using the collected survey data, plot the centerline profile of the underground outlet, and establish grades and depths for the conduit. Determine the maximum capacity (q) of the outlet in cfs, based on the pipe diameter, material and minimum grade available. Use the EFH Chapter 3 Exhibit 3-5 or

other hydraulics reference. Consider reducing the maximum q of the outlet pipe to allow for other sub-surface drainage inputs. Use the maximum or reduced q for the outlet design capacity required ($q_{req'd}$).

3. Divide the $q_{req'd}$ by the drainage area in acres to determine the discharge per acre.
4. With the runoff depth from step 1 and the discharge per acre from step 3, use the EFH Chapter 11, Exhibit 11-9 to find temporary storage in inches.
5. Calculate the storage required in the structure using the following formula:

$$\text{Temporary storage (in)} \times \text{DA (ac)} = \text{storage req'd. (SR) (ac-in)}$$
 Convert the volume of storage required to cubic feet:

$$\text{SR (ac-in)} \times 3630 \text{ (cf/ac-in)} = \text{SR (cf)}$$
 Increase required storage volume by the anticipated sediment accumulation, if any.
6. Determine the storage capacity provided by the proposed structure site, allowing for freeboard if it is required.
 Once it is determined that the storage requirement is met, then riser with orifice will be sized as outlined below.
7. Size the orifice to pass the design q determined in step 2, at average discharge head ($q_{req'd}$). Average discharge head can be determined as shown on page 8-71 of the EFH. Using the average head, enter exhibit 8-5, page 8-102 of the EFH, and obtain orifice size. Use the corresponding riser diameter from the exhibit.
8. Compile all design information in appropriate design folder.
9. Develop construction drawings and specifications for the project. Locate and describe all visible public utilities near the project. Show test pit locations on the plan view. Include profile showing conduit size, material, gradients, required and actual capacities, inlet locations, orifice elevations, and outlet details. Label all elevations, grades, and side slopes of the embankment.
10. To ensure practice integrity, refer to the practice standard and guideline for Critical Area Planting – Code 342. Include all vegetative specifications in the construction package.
11. A statement requiring the excavator to notify **Dig Safely NY** and non-member utilities for proper utility notification is **REQUIRED** on the drawings.
12. Develop a cost estimate and an O & M Plan for the project.
13. Determine your level of Job Approval Authority for the design class of this project, obtain approval from appropriate individual, if not qualified.

INSTALLATION

The construction and inspection will be in accordance with the practice(s) being installed.

1. Provide copies of the construction specifications and drawings to the landowner. Explain all aspects of the job before a contractor is secured. Review the O&M plan with the landowner to assure proper maintenance of the completed practice.
2. Review the job with landowner and contractor(s) prior to construction/installation. Ensure that all utilities applicable to the job site have been notified and marked prior to construction.
3. Schedule the construction start with the landowner and contractor(s). Coordination of all staking and construction timing with the contractor and landowner can assure an efficient use of manpower.
4. Make random construction checks during implementation. The checks should include:
 - Size, material, grade, location, bedding, cover, and properly installed animal guard on underground outlet pipe.
 - Size, material, type, location and height of riser and size of orifice.
 - Need for seepage control if necessary.

- Depth, width and compaction of cutoff trench when applicable.
 - Berm height, top width, side slopes and compaction.
5. During the final construction check, verify that the:
 - Outlet is stable and free of spoil and debris;
 - Construction spoil and debris are properly disposed of;
 - Completed earthwork and other disturbed areas are suitable for seeding establishment; and,
 - Final critical area planting requirements have been installed in accordance with the specifications.
 6. Erosion and sediment control structures will be maintained periodically and after every major runoff event until the disturbed area is fully protected.

CHECK OUT

All planned, designed, and installed conservation practices require documentation in the appropriate case file. Documentation must be sufficient to show:

1. The design conforms to the applicable standard;
2. The prepared construction drawings, specifications, plan maps, and/or job sheets accurately reflect the design;
3. The installed practice meets the requirements of the construction drawings, specifications, and practice standard; and
4. The “As Built” condition of the practice. Write “As Built” in red on drawings. Record all changes made during implementation in red. Practices not requiring drawings will have the “As Built” condition documented on plan maps, job sheets, and/or with narrative.

REPORTING

Enter all documentation in the Conservation Plan (Toolkit), contract document (Protracts) and Conservation Assistance Notes (NRCS-CPA-6/6A).

Report the practice and applicable components in the NRCS Progress Reporting System (PRS). Be certain to report benefits for all applicable resources and resource concerns as allowed in the NRCS progress reporting system.

OPERATION AND MAINTENANCE

Facilities, structures, and practices must be operated and maintained to ensure proper function and longevity. Periodic follow-up with the landowner is essential to ensure that all operation and maintenance (O&M) requirements are understood and followed.