Conditions Where Practice Applies
A sediment tank is to be used on sites where excavations are deep, and space is limited, such as urban construction, where direct discharge of sediment laden water to stream and storm drainage systems is to be avoided.

Design Criteria

Location
The sediment tank shall be located for ease of clean-out and disposal of the trapped sediment, and to minimize the interference with construction activities and pedestrian traffic.

Tank Size
The following formula should be used in determining the storage volume of the sediment tank; pump discharge (G.P.M.) x 16 = Cubic Foot Storage.

An example of a typical sediment tank is shown on Figure 5A.22 on page 5A.48. Other container designs can be used if the storage volume is adequate and approval is obtained from the local approving agency. Commercially manufactured tanks are also available.
Figure 5A.22
Portable Sediment Tank

CONSTRUCTION SPECIFICATIONS

1. CLEAN OUT THE SEDIMENT TANK WHEN ONE THIRD (1/3) FILLED WITH SILT.

2. STEEL DRUMS ARE USED AS AN EXAMPLE DUE TO THEIR READY AVAILABILITY. ANY TANKS MAY BE USED, PROVIDING THAT THE VOLUME REQUIREMENTS ARE MET.

3. ALL SEDIMENT COLLECTED IN THE TANK SHALL BE DISPOSED OF IN A SEDIMENT TRAPPING DEVICE OR AS APPROVED BY THE INSPECTOR.

ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

PORTABLE SEDIMENT TANK
STANDARD AND SPECIFICATIONS
FOR
SEDIMENT BASIN

Definition

A temporary barrier or dam constructed across a drainage way or at other suitable locations to intercept sediment laden runoff and to trap and retain the sediment.

Scope

This standard applies to the installation of temporary sediment basins on sites where: (a) failure of the structure would not result in loss of life, damage to homes or buildings, or interruption of use or service of public roads or utilities; (b) the drainage area does not exceed 100 acres; and (c) the basin is to be removed within 36 months after the beginning of construction of the basin.

Permanent (to function more than 36 months) sediment basins, or temporary basins exceeding the classification requirements for class 1 and 2, or structures that temporarily function as a sediment basin but are intended for use as a permanent pool shall be classified as permanent structures and shall conform to criteria appropriate for permanent structures. These structures shall be designed and constructed to conform to NRCS Standard And Specification No. 378 for Ponds in the National Handbook of Conservation Practices and the New York State Department of Environmental Conservation, "Guidelines for the Design of Dams." The total volume of permanent sediment basins shall equal to or exceed the capacity requirements for temporary basins contained herein.

Classification of Temporary Sediment Basins

For the purpose of this standard, temporary sediment basins are classified as follows:

<table>
<thead>
<tr>
<th>Class</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Drainage Area (acres)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Max. Height(^1) of Dam (ft.)</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Min. Embankment Top Width</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Embankment Side Slopes</td>
<td>2:1 or Flatter</td>
<td>2 ½:1 or Flatter</td>
</tr>
<tr>
<td>Anti-Seep Control Required</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

\(^1\) Height is measured from the low point of original ground at the downstream toe of the dam to the top of the dam.

Purpose

The purpose of a sediment basin is to intercept sediment-laden runoff and reduce the amount of sediment leaving the disturbed area in order to protect drainage ways, properties, and rights-of-way below the sediment basin.

Conditions Where Practice Applies

A sediment basin is appropriate where physical site conditions or land ownership restrictions preclude the installation of other erosion control measures to adequately control runoff, erosion, and sedimentation. However, it is strongly encouraged to use a basin in addition to other ESC measures if practicable. It may be used below construction operations which expose critical areas to soil erosion. The basin shall be maintained until the disturbed area is protected against erosion by permanent stabilization.

Design Criteria

Compliance with Laws and Regulations

Design and construction shall comply with state and local laws, ordinances, rules and regulations, including permits.

Location

The sediment basin should be located to obtain the maximum storage benefit from the terrain and for ease of cleanout of the trapped sediment. It should be located to minimize interference with construction activities and...
construction of utilities. Whenever possible, sediment basins should be located so that storm drains may outfall or be diverted into the basin. Do not locate basins in perennial streams.

Size and Shape of the Basin

The minimum sediment storage volume of the basin, as measured from the bottom of the basin to the elevation of the crest of the principal spillway shall be at least 3,600 cubic feet per acre draining to the basin. This 3,600 cubic feet is equivalent to one inch of sediment per acre of drainage area. The entire drainage area is used for this computation, rather than the disturbed area above, to maximize trapping efficiency. The length to width ratio shall be greater than 2:1, where length is the distance between the inlet and outlet. A wedge shape shall be used with the inlet located at the narrow end.

Surface Area

Recent studies (Barfield and Clar 1985; Pitt, 2003) indicate that the following relationship between surface area and peak inflow rate gives a trapping efficiency of 75% for silt loam soils, and greater than 90% for loamy sand soils:

\[ A = 0.01 \times Q_p \quad \text{or,} \quad A = 0.015 \times D.A. \]

(whichever is greater)

where,

\[ A = \text{the basin surface area, acres, measured at the service spillway crest; and} \]

\[ Q_p = \text{the peak inflow rate for the design storm.} \]

(The minimum design storm will be a 10 year, 24 hour storm under construction conditions).

D.A. = contributing drainage area.

One half of the design sediment storage volume (67 cubic yards per acre drainage area) shall be in the form of a permanent pool, and the remaining half as drawdown volume.

Sediment basins shall be cleaned out when the permanent pool volume remaining as described above is reduced by 50 percent, except in no case shall the sediment level be permitted to build up higher than one foot below the principal spillway crest. At this elevation, cleanout shall be performed to restore the original design volume to the sediment basin.

The elevation corresponding to the maximum allowable sediment level shall be determined and shall be stated in the design data as a distance below the top of the riser and shall be clearly marked on the riser.

The basin dimensions necessary to obtain the required basin volume as stated above shall be clearly shown on the plans to facilitate plan review, construction, and inspection.

Spillway Design

Runoff shall be computed by the method outlined in: Chapter 2, Estimating Runoff, Engineering Field Handbook available in the Natural Resources Conservation Service offices or, by TR-55, Urban Hydrology for Small Watersheds. Runoff computations shall be based upon the worst soil cover conditions expected to prevail in the contributing drainage area during the anticipated effective life of the structure. The combined capacities of the principal and emergency spillway shall be sufficient to pass the peak rate of runoff from a ten-year frequency storm.

1. Principal spillway: A spillway consisting of a vertical pipe or box type riser joined (watertight connection) to a pipe (barrel) which shall extend through the embankment and outlet beyond the downstream toe of the fill. The minimum capacity of the principal spillway shall be 0.2 cfs per acre of drainage area when the water surface is at the emergency spillway crest elevation. For those basins with no emergency spillway, the principal spillway shall have the capacity to handle the peak flow from a ten-year frequency rainfall event. The minimum size of the barrel shall be 8 inches in diameter. See Figures 5A.25, 5A.26, and 5A.27 on pages 5A.60, 5A.61, and 5A.62 for principal spillway sizes and capacities.

A. Crest elevation: When used in combination with an emergency spillway, the crest elevation of the riser shall be a minimum one foot below the elevation of the control section of the emergency spillway.

B. Watertight riser and barrel assembly: The riser and all pipe connections shall be completely watertight except for the inlet opening at the top, or a dewatering opening. There shall not have any other holes, leaks, rips, or perforations in the structure.

C. Dewatering the basin: The drawdown volume will be discharged over a 10 hour period. The size of the orifice to provide this control can be approximated as follows:

\[ A_o = \frac{A_s \times 2h^{0.5}}{T \times C_d \times 20,428} \times \frac{122,568}{122,568} \]

where,

\[ A_o = \text{surface area of the dewatering orifice} \]

\[ A_s = \text{surface area of the basin} \]

\[ h = \text{head of water above orifice} \]

\[ C_d = \text{coefficient of contraction for an orifice (0.6)} \]

\[ T = \text{detention time needed to dewater the basin (10 hours)} \]

D. Anti-vortex device and trash rack: An anti-vortex device and trash rack shall be securely installed on top of the riser and shall be the concentric type as shown in Figure 5A.29(1) and 5A.29(2) on pages 5A.64 and 5A.65.

E. Base: The riser shall have a base attached with a
watertight connection and shall have sufficient weight to prevent flotation of the riser. Two approved bases for risers ten feet or less in height are: 1) a concrete base 18 in. thick with the riser embedded 9 in. in the base, and 2) a \( \frac{1}{4} \)” minimum thickness steel plate attached to the riser by a continuous weld around the circumference of the riser to form a watertight connection. The plate shall have 2.5 feet of stone, gravel, or compacted earth placed on it to prevent flotation. In either case, each side of the square base shall be twice the riser diameter.

For risers greater than ten feet high, computations shall be made to design a base which will prevent flotation. The minimum factor of safety shall be 1.20 (Downward forces = 1.20 x upward forces). See Figure 5A.30 on page 5A.66 for details.

F. Anti-Seep Collars: Anti-seep collars shall be installed around all conduits through earth fills of impoundment structures according to the following criteria:

1) Collars shall be placed to increase the seepage length along the conduit by a minimum of 15 percent of the pipe length located within the saturation zone.

2) Collar spacing shall be between 5 and 14 times the vertical projection of each collar.

3) All collars shall be placed within the saturation zone.

4) The assumed normal saturation zone (phreatic line) shall be determined by projecting a line at a slope of 4 horizontal to 1 vertical from the point where the normal water (riser crest) elevation touches the upstream slope of the fill to a point where this line intersects the invert of the pipe conduit. All fill located within this line may be assumed as saturated.

When anti-seep collars are used, the equation for revised seepage length becomes:

\[
2(N)(P) = 1.15(L_s) \quad \text{or,} \\
N = \frac{0.075(L_s)}{P}
\]

Where: \( L_s \) = Saturated length is length, in feet, of pipe between riser and intersection of phreatic line and pipe invert.

\( N \) = number of anti-seep collars.

\( P \) = vertical projection of collar from pipe, in feet.

5) All anti-seep collars and their connections shall be watertight.

See Figure 5A.31(1) and 5A.31(2) on pages 5A.67 and 5A.68 for anti-seep collar design and Figure 5A.32 on page 5A.69 for construction details. Seepage diaphragms may be used in lieu of anti-seep collars. They shall be designed in accordance to USDA NRCS Pond Standard 378.

G. Outlet: An outlet shall be provided, including a means of conveying the discharge in an erosion free manner to an existing stable channel. Where discharge occurs at the property line, drainage easements will be obtained in accordance with local ordinances. Adequate notes and references will be shown on the erosion and sediment control plan.

Protection against scour at the discharge end of the pipe spillway shall be provided. Measures may include basin, riprap, revetment, excavated plunge pools, or other approved methods. See Standard and Specification for Rock Outlet Protection, page 5B.21.

2. Emergency Spillways: The entire flow area of the emergency spillway shall be constructed in undisturbed ground (not fill). The emergency spillway cross-section shall be trapezoidal with a minimum bottom width of eight feet. This spillway channel shall have a straight control section of at least 20 feet in length; and a straight outlet section for a minimum distance equal to 25 feet.

A. Capacity: The minimum capacity of the emergency spillway shall be that required to pass the peak rate of runoff from the 10 year 24-hour frequency storm, less any reduction due to flow in the pipe spillway. Emergency spillway dimensions may be determined by using the method described in Figure 5A.33 on page 5A.70.

B. Velocities: The velocity of flow in the exit channel shall not exceed 5 feet per second for vegetated channels. For channels with erosion protection other than vegetation, velocities shall be within the non-erosive range for the type of protection used.

C. Erosion Protection: Erosion protection shall be provided for by vegetation as prescribed in this publication or by other suitable means such as riprap, asphalt or concrete.

D. Freeboard: Freeboard is the difference between the design high water elevation in the emergency spillway and the top of the settled embankment. If there is no emergency spillway, it is the difference between the water surface elevation required to pass the design flow through the pipe and the top of the settled embankment. Freeboard shall be at least one foot.

**Embankment Cross-Section**
Class 1 Basins: The minimum top width shall be eight feet. The side slopes shall not be steeper than 2:1.

Class 2 Basins: The minimum top width shall be ten feet. The side slopes shall not be steeper than 2 ½:1.

Entrance of Runoff into Basin

Points of entrance of surface runoff into excavated sediment basins shall be protected to prevent erosion. Considerable care should be given to the major points of inflow into basins. In many cases the difference in elevation of the inflow and the bottom of the basin is considerable, thus creating a potential for sever gullying and sediment generation. Often a riprap drop at major points of inflow would eliminate gullying and sediment generation.

Diversions, grade stabilization structures or other water control devices shall be installed as necessary to ensure direction of runoff and protect points of entry into the basin. Points of entry should be located so as to ensure maximum travel distance of entering runoff to point of exit (the riser) from the basin.

Disposal

The sediment basin plans shall indicate the method(s) of disposing of the sediment removed from the basin. The sediment shall be placed in such a manner that it will not erode from the site. The sediment shall not be deposited downstream from the basin, adjacent to a stream or floodplain. Disposal sites will be covered by an approved sediment control plan.

The sediment basin plans shall also show the method of disposing of the sediment basin after the drainage area is stabilized, and shall include the stabilization of the sediment basin site. Water contained within the storage areas shall be removed from the basin by pumping, cutting the top of the riser, or other appropriate method prior to removing or breaching the embankment. Sediment shall not be allowed to flush into a stream or drainage way.

Chemical Treatment

Precipitation of sediment is enhanced with the use of specific chemical flocculants that can be applied to the sediment basin in liquid, powder, or solid form. Flocculants include polyacrylimides, aluminum sulfate (alum), and polyaluminum chloride. Cationic polyelectrolytes have a greater toxicity to fish and other aquatic organisms than anionic polyelectrolytes because they bind to the gills of fish resulting in respiratory failure (Pitt, 2003).

Chemical treatment shall not be substituted for proper erosion and sediment control. To reduce the need for flocculants, proper controls include planning, phasing, sequencing and practice design in accordance to NY Standards. Chemical applications shall not be applied without written approval from the NYSDEC.

Safety

Sediment basins are attractive to children and can be very dangerous. Local ordinances and regulations must be adhered to regarding health and safety. The developer or owner shall check with local building officials on applicable safety requirements. If fencing of sediment basins is required, the location of and type of fence shall be shown on the plans.

Construction Specifications

Site Preparation

Areas under the embankment shall be cleared, grubbed, and stripped of topsoil to remove trees, vegetation, roots, or other objectionable material. In order to facilitate cleanout and restoration, the pool area (measured at the top of the pipe spillway) will be cleared of all brush, trees, and other objectionable materials.

Cutoff-Trench

A cutoff trench shall be excavated along the centerline of earth fill embankments. The minimum depth shall be two feet. The cutoff trench shall extend up both abutments to the riser crest elevation. The minimum bottom width shall be four feet, but wide enough to permit operation of excavation and compaction equipment. The side slopes shall be no steeper than 1:1. Compaction requirements shall be the same as those for embankment. The trench shall be dewatered during the back-filling/compaction operations.

Embankment

The fill material shall be taken from approved areas shown on the plans. It shall be clean mineral soil free of roots, woody vegetation, oversized stones, rocks, or other objectionable material. Relatively pervious materials such as sand or gravel (Unified Soil Classes GW, GP, SW & SP) shall not be placed in the embankment. Areas on which fill is to be placed shall be scarified prior to placement of fill. The fill material shall contain sufficient moisture so that it can be formed by hand into a ball without crumbling. If water can be squeezed out of a ball, it is too wet for proper compaction. Fill material shall be placed in six to eight-inch thick continuous layers over the entire length of the fill. Compaction shall be obtained by routing and hauling the construction equipment over the fill so that the entire surface of each layer of the fill is traversed by at least one wheel or tread track of the equipment or by the use of a compactor. The embankment shall be constructed to an elevation 10 percent higher than the design height to allow for settlement.
Pipe Spillway

The riser shall be securely attached to the barrel or barrel stub by welding the full circumference making a watertight structural connection. The barrel stub must be attached to the riser at the same percent (angle) of grade as the outlet conduit. The connection between the riser and the riser base shall be watertight. All connections between barrel sections must be achieved by approved watertight bank assemblies. The barrel and riser shall be placed on a firm, smooth foundation of impervious soil. Pervious materials such as sand, gravel, or crushed stone shall not be used as backfill around the pipe or anti-seep collars. The fill material around the pipe spillway shall be placed in four-inch layers and compacted under and around the pipe to at least the same density as the adjacent embankment.

A minimum depth of two feet of hand compacted backfill shall be placed over the pipe spillway before crossing it with construction equipment. Steel base plates on risers shall have at least 2 ½ feet of compacted earth, stone, or gravel placed over it to prevent flotation.

Emergency Spillway

The emergency spillway shall be installed in undisturbed ground. The achievement of planned elevations, grades, design width, entrance and exit channel slopes are critical to the successful operation of the emergency spillway and must be constructed within a tolerance of +/- 0.2 feet.

Vegetative Treatment

Stabilize the embankment and emergency spillway in accordance with the appropriate vegetative standard and specification immediately following construction. In no case shall the embankment remain unstabilized for more than seven (7) days.

Erosion and Pollution Control

Construction operations shall be carried out in such a manner that erosion and water pollution will be minimized. State and local laws shall be complied with concerning pollution abatement.

Safety

State and local requirements shall be met concerning fencing and signs, warning the public of hazards of soft sediment and floodwater.

Maintenance

1. Repair all damages caused by soil erosion and construction equipment at or before the end of each working day.

2. Sediment shall be removed from the basin when it reaches the specified distance below the top of the riser (shall not exceed 50 percent capacity). This sediment shall be placed in such a manner that it will not erode from the site. The sediment shall not be deposited downstream from the embankment, adjacent to a stream or floodplain.

Final Disposal

When temporary structures have served their intended purpose and the contributing drainage area has been properly stabilized, the embankment and resulting sediment deposits are to be leveled or otherwise disposed of in accordance with the approved sediment control plan. The proposed use of a sediment basin site will often dictate final disposition of the basin and any sediment contained therein. If the site is scheduled for future construction, then the basin material and trapped sediments must be removed, safely disposed of, and backfilled with a structural fill.

When the basin area is to remain open space, the pond may be pumped dry, graded, and back filled.

Information to be Submitted

Sediment basin designs and construction plans submitted for review to a local municipality, Soil and Water Conservation District, or other agency shall include the following:

1. Specific location of the basin.

2. Plan view of the storage basin and emergency spillway, showing existing and proposed contours.

3. Cross section of dam, principal spillway, emergency spillway, and profile of emergency spillway.

4. Details of pipe connections, riser to pipe connections, riser base, anti-seep control, trash rack cleanout elevation, and anti-vortex device.

5. Runoff calculations for 1 and 10-year frequency storms, if required.

6. Storage Computation
   A. Total required
   B. Total Available
   C. Level of sediment at which cleanout shall be required; to be stated as a distance from the riser crest to the sediment surface.

7. Calculations showing design of pipe and emergency spillway.

Note: Items 5 through 7 above may be submitted using the design data sheet on pages 7A.54 through 7A.59.
TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

Computed by_____________________ Date____________ Checked by____________________ Date____________

Project________________________________________________________ Basin #__________________________
Location__________________________ Total Area draining to basin _________________________________ Acres

BASIN SIZE DESIGN

1. Minimum sediment storage volume = 134 cu. yds. x__________acres of drainage area = ___________cu.yds.
2. a. Cleanout at 50 percent of minimum required volume = ________cu. yds.
   b. Elevation corresponding to scheduled time to clean out_______________
   c. Distance below top of riser___________feet
3. Minimum surface area is larger of 0.01 Q(1)__________or, 0.015 DA = ___________ use ___________acres

DESIGN OF SPILLWAYS & ELEVATIONS

Runoff
4. \( Q_{p(10)} = \) cfs
   (EFH, Ch. 2, TR-55, or Section 4; Attach runoff computation sheet)

Pipe Spillway \( (Q_{ps}) \)
5. Min. pipe spillway cap., \( Q_{ps} = 0.2 \times \) ac. Drainage = ________cfs
   Note: If there is no emergency spillway, then req’d \( Q_{ps} = Q_{p(10)} = \) cfs.
6. \( H = \) ft. Barrel length = ________ ft
7. Barrel: Diam. _______inches; \( Q_{ps} = (Q) \times \) x (cor.fac.) = ________cfs.
8. Riser: Diam. _______inches; Length ________ft.; h = ________ft. Crest Elev. _____________
9. Trash Rack: Diam. _______inches; H = ________inches

Emergency Spillway Design
10. Emergency Spillway Flow, \( Q_{es} = Q_{p} - Q_{ps} = \) cfs.
11. Width _______ft.; \( H_p = \) ft Crest elevation ___________; Design High Water Elev. ___________
    Entrance channel slope _____________% ; Top of Dam Elev. ___________
    Exit channel slope _____________%

ANTI-SEEP COLLAR/ SEEPAGE DIAPHRAGM DESIGN

Collars:
12. \( y = \) ft.; \( z = \) :1; pipe slope = ______% , \( L_o = \) ft.
   Use _______collars, _______ - _______ inches square; projection = _______ ft.

Diaphragms:
# _______ width _______ ft. height _______ ft.

DEWATERING ORIFICE SIZING

13. \( Ao = \frac{A_c \times (2h)^{0.5}}{122,568} = \) sq. ft.; h = ______ ft.; therefore use, ____________________
1. Minimum required sediment storage volume is 134 cubic yards (3600 cubic feet) per acre from each acre of drainage area. Values larger than 134 cubic yards per acre may be used for greater protection. Compute volume using entire drainage area although only part may be disturbed.

2. The volume of a naturally shaped basin (no excavation in basin) may be approximated by the formula \( V = (0.4)(A)(d) \), where \( V \) is in cubic feet, \( A \) is the surface area of the basin, in square feet, and \( d \) is the maximum depth of the basin, in feet. Volume may be computed from contour information or other suitable methods.

3. If volume of basin is not adequate for required storage, excavate to obtain the required volume.

4. The minimum surface area of the basin pool at the storage volume elevation will be the larger of the two elevations shown.

5. USDA-NRCS TR-55 or the NRCS Engineering Field Handbook, Chapter 2, are the preferred methods for runoff computation. Runoff curve numbers will be computed for the drainage area that reflects the maximum construction condition.

6. Required minimum discharge from pipe spillway equals 0.2 cfs/ac. times total drainage area. (This is equivalent to a uniform runoff of 5 in. per 24 hours). The pipe shall be designed to carry \( Q_p \) if site conditions preclude installation of an emergency spillway to protect the structure.

7. Determine value of “\( H \)” from field conditions; “\( H \)” is the interval between the centerline of the outlet pipe and the emergency spillway crest, or if there is no emergency spillway, to the design high water.


9. See Riser Inflow Curves, Figure 5A.25 on page 5A.60.

10. Compute the orifice size required to dewater the basin over a 10 hour period.


12. Compute \( Q_{es} \) by subtracting actual flow carried by the pipe spillway from the total inflow, \( Q_p \).

13. Use appropriate tables to obtain values of \( H_p \), bottom width, and actual \( Q_{es} \). If no emergency spillway is to be used, so state, giving reason(s).

14. See Anti-Seep Collar / Seepage Diaphragm Design.

15. Fill in design elevations. The emergency spillway crest must be set no closer to riser crest than value of \( h \), which causes pipe spillway to carry the minimum, required \( Q \). Therefore, the elevation difference between spillways shall be equal to the value of \( h \), or one foot, whichever is greater. Design high water is the elevation of the emergency spillway crest plus the value of \( H_p \), or if there is no emergency spillway, it is the elevation of the riser crest plus \( h \) required to handle the 10-year storm. Minimum top of dam elevation requires 1.0 ft. of freeboard above design high water.
Pipe Spillway Design

To use charts for pipe spillway design:

- Enter chart, Figures 5A.26 and 5A.27 on Pages 5A.61 and 5A.62 with H and required discharge.
- Find diameter of pipe conduit that provides equal or greater discharge.
- Enter chart, Figure 5A.25 on Page 5A.60 with actual pipe discharge. Read across to select smallest riser that provides discharge within weir flow portion of rating curve. Read down to find corresponding h required. This h must be 1 foot or less.

Example:

Given: Q (required) = 5.8 cfs, L = 60 ft., H = 9 ft. to centerline of pipe = Free outlet
Find: Pipe size, actual Q and size of riser, use corrugated metal pipe, n = 0.025

Q of 12 in. pipe = 5.95 cfs x (correction factor) 1.07 = 6.4 cfs from the Pipe Flow Chart. From Riser Inflow Curves (Figures 5A.25 on page 5A .60), smallest riser = 18 in. ( @ h = 0.60).

Design Example #1

Snooks Pond is a senior citizen assisted living center under construction. A sediment basin will be utilized as a component of the erosion and sediment control plan for the project. The Drainage area to the basin is 20 acres, the one year storm peak discharge is 32 cubic feet per second, and 88 cfs for the 10 year storm based on analysis of the site under maximum construction condition. Design the sediment basin when the overall head (H) is 10 feet and the smooth steel pipe spillway is used. An emergency spillway can be constructed on the site. Base the design volumes and elevations on the stage storage curve developed for the natural topography or as excavated.

Design Example #2

Us the same data as example #1, but no emergency spillway is possible (see Page 7A. 59).

Notes:
1. Use a 1.0 foot minimum between riser crest and emergency spillway crest, thus riser crest = 1.0 ft.
2. To provide 50% of the storage as permanent pool, the dewatering orifice is set at the out elevation.
Figure 5A.23
Sediment Basin

MAXIMUM DRAINAGE AREA = 100 ACRES

ADAPTED FROM DETAILS PROVIDED BY USDA - NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE