708 – Sediment Traps & Basins

708.02 Temporary Sediment Basin

Definition:

A temporary sediment basin is a concentrated flow sediment control measure that causes deposition of soil particles by ponding and retaining sediment-laden run-off in a basin that is formed by construction of an embankment and/or excavated pooling area. The practice is designed and sized to accommodate the watershed run-off. The practice consists of a temporary settling basin, principal spillway, emergency spillway and dewatering device to control water levels and discharge rates to maximize sediment trapping efficiency.

Exhibit 708.02-A. A permanent stormwater basin modified to function as temporary sediment basin during construction.
Source: IDEM

Purpose:

- To minimize sediment discharges from construction areas by retaining stormwater run-off for a period of 48 hours to 72 hours to allow sufficient retention time for settling of suspended soil particles. Fine silt and clay sized particles will not be captured by this practice without additional measures.
- This practice is more efficient at trapping sediment than any of the other practices and typically is best located in perimeter areas to limit off-site sedimentation.
- To minimize sediment discharges from watersheds greater than 5 acres.

Notes:

- This measure may be used where failure of the embankment would not endanger life; damage homes, commercial or industrial buildings, main highways, or railroads; or disrupt public utility services.

- This measure is designed specifically for temporary control of stormwater run-off and sediment from large areas where sediment traps or other sediment control measures are not appropriate. Permanent stormwater management ponds may be used as temporary sediment basins provided that they meet the requirements of this section and that the construction sequence addresses converting the temporary sediment basin to the design specifications of permanent stormwater management pond. For the conversion of permanent stormwater management ponds from the temporary use as a sediment basin sediment cleanout may be required for the basin to meet the final basin design requirements.

Specifications:

Effectiveness:

- Sediment basins cannot trap all sediment and will likely release finer soil particles (fine silt and clay sized particles) therefore sediment basins will likely discharge sediment-stained water. Medium silt sized soil particles and larger can be expected to be trapped by this practice.
- Sediment basins as with all sediment controls are best used in an erosion and sediment control system with other control measures implemented in the watershed to minimize the total amount of sediment washing into the sediment basin. A comprehensive construction sequence utilizing such as the following practices will minimize sediment discharge.
    - Incremental seeding of disturbed areas to minimize the erodible footprint of the project.
    - Inlet sediment controls
    - Sheet flow sediment controls
    - Rapid stabilization of swales and conveyances
    - Run-off controls to minimize erosion potentials
- Trapping efficiency can be increased with the use of flocculants refer to Polymers (714.05).

Practice Definitions:

- **Dry sediment basins or dry permanent stormwater basins:** Are basins that are planned to completely dewater with no wet sediment storage or no permanent pool. Dry basins are designed to have sediment storage zones that completely dewater with little to no resulting wet sediment storage. The sediment storage zone volume of dry sediment basins is added to the dewatering zone storage volume to result in a basin that completely dewaters/drains.
- **Wet sediment basins or permanently wet stormwater basins:** Are basins that have a defined permanent pool elevation that are planned to only dewater down to the invert of the outlet dewatering device or structure.
- **Wet sediment storage zone (includes wet sumps):** Is the zone below the dewatering zone elevation and is defined by invert elevation of the outlet structure. Wet sediment storage zones do not dewater or drain therefore are intended to be water filled for long duration periods.
- **Dewatering zone:** The volume of the basin that is between the invert of the dewatering device outlet and typically the crest of the principal spillway. This zone is required to dewater by the design rate for this practice. The dewatering zone is a key component of sediment basin function. This zone is designed to fill and temporarily store sediment-laden run-off therefore allowing time for the suspended sediment particles to settle out into the sediment storage zone. This zone is designed to dewater such that it will be able to receive and store run-off from the next storm event.

- **Sediment storage zone:** Basin volume calculated for sediment deposition or storage which can either be wet (permanently water filled i.e., below the dewatering elevation) or dry with this required volume added to the dewatering zone volume as a part of the required total basin volume.
- **Riser (Riser structure outlet):** Vertical conduit of plastic, metal, or concrete used as an outlet point for temporary or permanent basins. Permanent storm water basins often have orifice outlets to result in discharges required by design requirement.
- **Outlet barrel pipe:** Outlet conduit for the riser structure that can consist of plastic, metal, or concrete used to discharge storm water from a temporary or permanent basin to meet local storm water ordinances.
- **Orifice:** Basin dewatering device outlet opening that is sized to meet the basin dewatering design requirements. Orifice opening can be found in floating dewatering devices and some riser structures.
- **Safety Ledge:** Where wet sediment storage areas are present with steep unvegetated side slopes present implement a safety ledge of 1 foot below the dewatering elevation and extending 10 feet wide around the margin of the pool area.
- **Emergency Spillway Crest:** The elevation at which the discharge through the emergency spillway will start to occur.
- **Emergency Spillway Control Section:** A level section of the emergency spillway that is at the crest elevation, design width, and a minimum of 20 feet long. This helps ensure spillway stability and hydraulic efficiency of the spillway.
- **Principal Spillway Crest:** The elevation of the riser at which discharge starts to occur.
- **Dewatering Device:** Device that allows the dewatering zone to fill and to discharge at the required rate to result in retention time pooling in the basin for sediment settle out to occur.
- **Flow path length:** The distance between any inflow point and the outlet structure. Locate concentrated storm water inflow(s) as far away from the sediment basin outlet as possible to provide for maximum flow path length, detention time and pollutant removal.
- **Effective Width:** Calculated by taking the square root of one half of the pool area (in square feet) at the crest of the principal spillway.

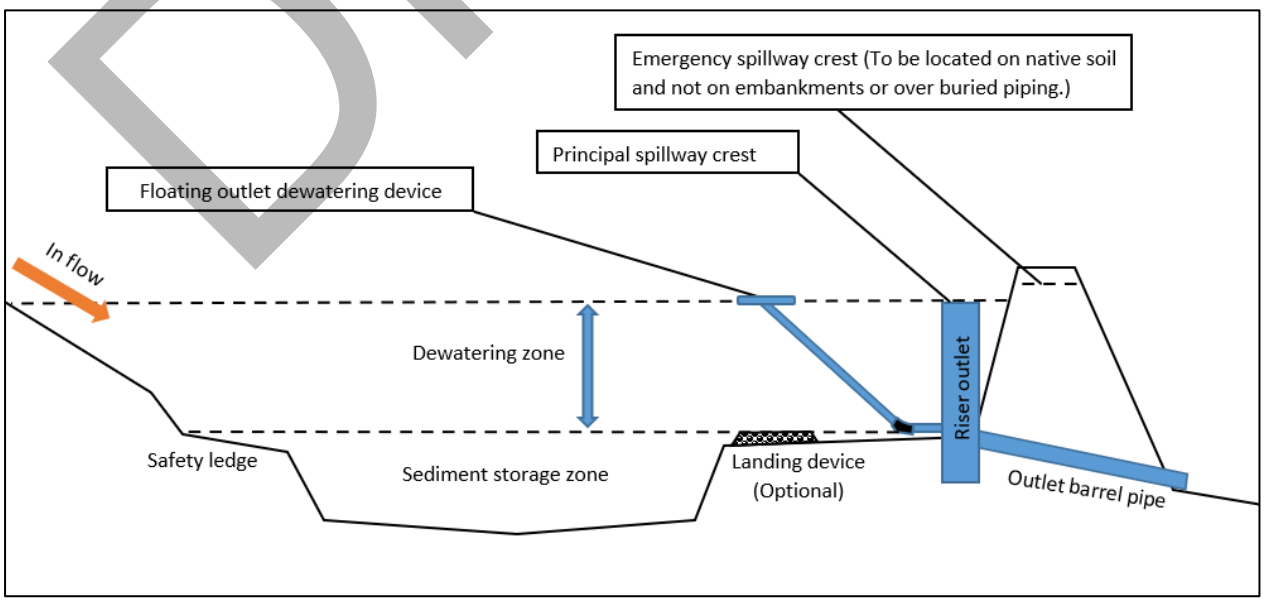


Exhibit 708.02-B. Typical sediment basin components when using the required Floating Outlet Dewatering Device (708.03). This drawing is intended to represent how the practice fits into the sediment basin practice and not intended to be a design drawing.
Source: IDEM File

Planning Considerations:

- Sediment basins are generally accepted methods for treating sediment-laden run-off from large watersheds. Sediment basins are usually placed near the perimeter of construction sites to intercept run-off to prevent off-site sedimentation. The construction sequence in the SWP3 will require the sediment basin installed prior to mass earthwork disturbances and allow it to remain functional for as long as possible, ideally until the area contributing runoff is stabilized with dense permanent vegetation or diverted to other appropriate controls. The typical components of a sediment basin are shown in Exhibit 708.02-B. Methods that dewater the basin utilizing measures that withdraw from the top of the water column (the least sediment-laden water) such as the Floating Outlet (708.03), Water Pumping (713.02) or equivalent measures are to be used until freezing conditions are likely to occur.
- Evaluate the basin location for the presence or absence of water resources. Do not locate in water resources, wetlands, streams, or drainage ways with defined bed or bank without appropriate permitting.
- Most practical and economical where the largest storage capacity can be obtained with the least amount of earthwork and at locations where run-off leaves the site.
- Locate the sediment basin as near to the sediment source as topography allows, taking into consideration the soil type, pool area, length of the dam, outlet location, emergency spillway conditions or routing and accessibility for cleanout and maintenance of the basin or pool area.
- Lay out the location and shape of the sediment basin, allowing for a length to width ratio of 2:1 or greater.
- Avoid steep slopes; slopes 2:1 or flatter are preferred and allows for the best potential for pool area storage development.
- Locate concentrated stormwater inflow(s) as far away from the basin outlet as possible. If the storm water inflow(s) cannot be located at or near the up-slope end of the basin, install Basin Baffles (708.06) to achieve a minimum flow path length of 2:1 or greater.
- Where applicable, divert run-off from adjoining, undisturbed areas away from the sediment basin to minimize basin watershed and sizing requirements.
- Where possible divert or convey basin inflows as far from outlet areas such as with Temporary Diversions (703.01).
- Sediment basin plans shall require and detail an orderly stabilization of basin banks/side slopes. For large basins that take an extended time to complete the side slopes shall be stabilized as the basin excavation progresses. At a minimum the plan should require Temporary Seeding (701.01) with anchored Mulching (702.07). Basin banks can also be stabilized such as but not limited to the following: Permanent Seeding (702.02), Dormant Seeding & Frost Seeding (702.03), anchored geotextile, aggregate or Riprap Slope Protection (702.12). All seeding practices shall use appropriate mulching applicable to the site conditions refer to the following mulching practices: Mulching (702.07) or Erosion Control Blanket (702.08).

- Access for sediment removal should be a planning consideration when locating sediment basins.
- Sediment basins maybe converted to a permanent stormwater basin for post-construction stormwater management or removed when construction/land disturbing activities have been completed and the watershed stabilized. Remove sediment deposits and shape basin to meet the design and storage requirements of the permanent stormwater basin.
- When implementing the Floating Outlet Dewatering Device (708.03) in a sediment basin that requires a change of dewatering devices to account for freezing conditions, then provide provisions in the SWP3 that describe how this change over is to occur. Provisions must allow the alternative dewatering devices to be installed or brought online in such a way that requires the minimal use of heavy machinery and equipment that can likely be difficult to use during periods of inclement weather and difficult wet soil conditions.
- Do not locate basin any closer than 20 feet from an existing building foundation.
- Locate basin to discharge onto stable ground, stable channel, or into a storm drain system that conveys the discharge in a non-erosive manner. Protect against scour at the discharge end of the spillway in accordance with Energy Dissipater (Outlet Protection) (705.01).

Timing:

- Must be installed prior to the start of upslope mass earth disturbance.
- SWP3 construction sequence or phasing provisions must require and detail how sediment basins will be installed and functional prior to mass earth disturbance of the upstream watershed.
- Stormwater basins modified to function as a sediment basin: The SWP3 should provide the dimensions and details necessary to function as a sediment basin prior to mass earth disturbance however it is not required to have the full extent of the final stormwater basin implemented.

Utilities:

- Evaluate and locate for the presence or absence of existing and planned utilities and stormwater drainage systems that would cause a delay in basin construction or impair basin function.
- Give special consideration to sediment basin location and potential interference with construction of proposed drainage ways, utilities and storm drains.

Structure Life:

- Typically, 3 years or less.
- If sediment basin is to be converted to a permanent post-construction stormwater basin, then the structures typically need to last 50 years.

Design Criteria:

For purposes of this practice the temporary sediment basin practice is broken into 6 parts which include:

- Pool Design
- Dewatering Zone Design
- Sediment Storage Zone Design
- Embankment/Dam Design

- Principal Spillway Design
- Emergency Spillway Design

Generally accepted practices and procedures shall be followed to meet these design criteria. Sediment basins shall be designed by a registered professional engineer. Run-off computations shall be based upon the worst soil-cover conditions expected to occur in the contributing drainage area during the anticipated effective life of the structure. Coefficients for soil should be assigned based on construction conditions of the soil.

Run-off volumes must be computed by accepted engineering methods such as the Natural Resources Conservation Service (NRCS) curve number method.

Pool Design:

- Contributing Drainage Area:
  - 30 acres maximum (designed by a qualified individual/professional engineer; larger drainage areas may be accommodated but may require additional design considerations.)
  - Where feasible off-site watersheds should be routed around the project disturbance with initial piping or stabilized open swale installation [refer to Temporary Diversion (703.01) or Permanent Diversion (703.02)].
  - Off-site watersheds must be included when calculating the dewatering zone volume in the design of the practice where not feasible to be diverted.
  - The SWP3 must show the watershed of the planned basin. When basin watersheds are delineated on the plans this shows the reviewing agency and site management what was used by the planner which is valuable in evaluating plan practices, critical for site management of practice watersheds, and critical in compliance site inspections.
- Surface Area: Variable (the larger the surface area, the greater the trapping efficiency). Maximize surface area with shallow depth maximizes trapping efficiency and helps keep sediment away from dewatering device.
- Pool Depth: Optimum depth 3 feet.
- Side Slopes: 2:1 or flatter.
- Safety: Sediment basins can be a significant safety hazard. The engineer must consider features or practices that will maintain a safe environment for construction personnel, inspectors, project coordinators and the public. Considerations should be given to the following items:
  - Slope of the banks.
  - Bank stabilization.
  - Install a fence around the area and erect warning signs if trespassing is likely.
  - Monitor basin for appropriate dewatering to minimize the basin pool depth.
  - Follow all state and local requirements for impoundment sites.
  - Implement a safety ledge for basins with wet pool sediment storage and/or steep side slopes.
- Where possible bring storm drainpipe and channel discharges into the sediment basin at a low velocity with erosion resistant outlets [(refer to sections for Run-Off Control (703.00) and Outlet Protection (705.00)].
- Flow Path Length:

- The ratio of flow path length to basin effective width must be 2:1 or greater.
- Flow path length is the distance from the inlet point to the outlet.
- Basin effective width is calculated by taking the square root of one half of the pool area (square feet) at the crest of the principal spillway.
- If the ratio is less than 2:1 then baffles are required to establish the required flow path length.

- Baffles [refer to Basin Baffles (708.06)]:
  - Used to increase flow path length between concentrated storm water inflow(s) into the basin and the basin outflow (outlet).
  - Where heavy sediment inflows are anticipated implement a system of baffles within the basin to contain more sediment in the upper end of the basin and therefore away from the dewatering device.
  - Baffles may be used to manage sediment deposition to areas easily cleaned out.
- Sediment clean out access: Provide access for mechanical cleanout and maintenance of the pool area.

Dewatering Zone Design:

- Provide a minimum storage volume:
  - to contain 5600 cubic feet of storage per acre of watershed or
  - calculate run-off volume for a 1-year frequency 24-hour storm event.
- The elevation at which the designed storage volume occurs will be at or below the elevation of the principal spillway crest.
- The dewatering zone should drain in no less than 48 hours and no longer than 72 hours after a run-off event for the minimum required storage volume.
- Dewatering Device:
  - Dewatering devices that withdraw from the surface of the water column discharge the least sediment-laden water. Implement practices such as the following: Floating Outlet (708.02), Water Pumping (713.02) or other equivalent devices/measures.
  - Alternative dewatering practices can be proposed if surface withdrawal is not feasible due to weather or other issues.
  - Dewatering Device alternatives for freezing time periods are to be installed with basin construction and left off-line until freezing time periods and must be able to be brought online easily with minimal use of heavy machinery and equipment that can be difficult to use during periods of inclement weather and difficult wet soil conditions. Alternative measures such as the Perforated Riser Outlet (708.04) and Rock Horseshoe (708.05) are measures that allow for the withdrawal from below the surface of the water column therefore discharges higher amounts of sediment.

Sediment Storage Zone Design:

- Minimum of 1,000 cubic feet per acre of disturbed drainage area.
- Sediment storage volume should not be included in the dewatering storage volume.
- If high rates of sediment are anticipated because of project duration, soil conditions or topography and site characteristics make it difficult to remove sediment from the sediment storage zone; the engineer should consider providing a larger amount of sediment storage.

- In leu of the minimum storage volume the designer can use the Revised Universal Soil Loss Equation (RUSLE) to calculate soil loss for determining sediment storage volume.

Embankment/Dam Design:
An engineer competent in dam design shall complete the construction plans. With the following recommendations and shall be considered by the designer (refer to NRCS National Engineering Handbook, Technical Releases, and Indiana NRCS Field Office Technical Guide for additional information).

- Height: 10 feet maximum or as per design.
- Required dam elevation: Emergency spillway crest shall be a minimum 1 foot above the principal spillway crest and 2 feet below the top of dam/embankment or by design.
- Top width: 6 feet minimum.
- Side slopes: 2.5:1 or flatter.
- Settlement Allowance: 10 percent of design height.
- Fill Material: Stable mineral soil compacted in 6 to 8-inch lifts at proper moisture content for compaction.
- Cut-off Trench:
    - Depth: 2 feet minimum and extending to a sufficiently impervious layer (determined by soils/geotechnical investigation/report).
    - Width: 2 feet minimum (bottom width adequate to accommodate equipment used for excavation, backfill, and compaction operations).
    - Side slopes: No steeper than 1:1.
    - Along the center line of the embankment.
    - Backfilled with appropriately impermeable soil material.

Principal Spillway Design:

The purpose of the principal spillway is to convey storm events that exceed the required dewatering zone storage capacity of the sediment basin through a pipe or open spillway having a controlled rate of flow. If the sediment basin will be converted to a permanent storm water basin that utilizes an open weir spillway, a temporary pipe and riser may be needed for the dewatering device.

- Minimum Capacity: The principal spillway will have a minimum capacity of a 10-year frequency, 24-hour duration storm event without discharging through the emergency spillway.
- The principal spillway must be designed with structural integrity to last a minimum of 3 years as a temporary measure or 50 years if a permanent structure.
- Outlet Barrel Pipe:
    - Must be able to withstand maximum external loading without yielding, buckling, or cracking.
    - Recommended minimum 8-inch diameter outlet barrel pipe.
    - Anti-seep provisions: Anti-seep collar(s) or filter diaphragm/granular drain shall be considered to prevent water from migrating along the outlet barrel pipe causing failure.
    - Riser outlet structure:
        - Riser outlet structures can be either temporary or permanent (for post-construction stormwater basins).
        - The designer should consider a trash rack if the watershed has extensive woody debris.
        - To minimize the stage required consider the use of an anti-vortex device.
        - A permanent riser may need to be modified for the temporary use as the outlet for the Floating Outlet (708.03) or Perforated Riser Outlet (708.04) dewatering devices.
        - Anti-flotation block: The engineer must consider flotation of the principal spillway. Sufficient weight greater than 1.1 times the buoyancy force must be present.
    - Outlet barrel pipe outlet apron must meet the requirements of Energy Dissipater (Outlet Protection) (705.01).

Emergency Spillway Design

- Capacity: The engineer must consider the need and capacity of an emergency spillway. Preventing water flow from overtopping an earthen fill is paramount. Limiting the total rise of the pool to prevent damage to other property or diverting flow to unprotected outlets could also be considered among other issues.
- A minimum spillway capacity of a routed peak flow from a 25-year frequency, 24-hour duration storm event plus 1 foot of freeboard. If the back slope of the berm is 20:1 or flatter the top of dam may be used as the emergency spillway.
- Locate the emergency spillway at one end of the embankment. Locate it in undisturbed soil outside the construction limits of the embankment.
- Locate the emergency spillway so that any flow will return to the receiving channel without damaging the embankment.

- Plan a trapezoidal channel with 3:1 or flatter side slopes with a control section that is straight, level and a minimum of 20-foot long. Emergency spillways should have an approach channel, a flat control section, and an exit channel.
- Must be appropriately stabilized prior to any flow such as with the following: erosion control blankets, riprap, or another suitable nonerosive material [Refer to Run-off Conveyance Systems (704.00)].

Materials:
The required materials for the construction of the basin and spillways are dependent upon the specific design and construction details of the basin and therefore cannot be provided as typical practice information.

Typical Installation:

Note: These are general installation guidelines that require specific modifications according to the design requirements.

Dam construction:

(1) Clear, grub, and strip all vegetation and root mat from the area where the dam is to be located and from the pool area, properly disposing of all trees, logs, limbs, vegetative matter, rocks and other objectionable materials in pre-designated disposal areas.
(2) Excavate the area for the embankment and remove any surface soil material containing a high amount of organic matter. Stockpile topsoil for spreading on the backside and top of dam.
(3) Excavate a 2-foot wide by a minimum of 2 foot deep, (per investigation and design), cut-off trench with 1:1 (or flatter) side slopes along the center line of the embankment, extending it all the way up the embankment side slopes.
(4) Place highly impermeable soil material of appropriate moisture content in the cut-off trench. Place material in 6 to 8-inch lifts, properly compacting each lift as it is placed.
(5) Scarify the soil surface in the area of the embankment base location.
(6) Using clean, stable mineral soil free of roots, woody vegetation materials, rocks, and other debris, construct the embankment in continuous 6 to 8-inch lifts over the entire length of the embankment, compacting each lift as it is placed. The soil material must be wet enough to form a ball without crumbling, yet not so wet that water can be squeezed out of it. Place the most permeable soil material in the downstream toe of the embankment and the least permeable material in the center and on the upslope side of the embankment. Route construction equipment over the length of the dam so that all parts of each soil lift are traversed by at least 1 wheel of the equipment. NOTE: Protect the spillway barrel with 2 feet of hand-compacted fill before crossing it with equipment.)
(7) Excavate the outlet apron (barrel outlet), allowing for the required thickness of the filter medium (if used not required when using geotextile underlayment) and riprap.
(8) Construct and compact the embankment until it is 10 percent above design elevation to allow for settling.
(9) Line the outlet apron excavation with the specified filter medium or geotextile fabric and place outlet riprap rock size per design and to result in a smooth rock elevation that meets the receiving grades/elevation with no over fall.

(10) Topsoil the backside and top of dam and stabilize immediately the dam and all disturbed areas downslope of the dam and any associated with the outlet apron installation and ensure that any receiving channel banks have been appropriately stabilized according to any water quality permitting requirements.
(11) Stabilize the embankment and sloping basin banks with seed and mulch (anchored in place) or another suitable erosion resistant cover.
(12) Where applicable place sediment cleanout reference stake at the 50 percent sediment storage zone design volume elevation of the sediment basin.

Principal Spillway (barrel pipe with implementation of sediment control outlet options):

(1) Install the spillway outlet barrel pipe and riser (if required) with watertight joints on a firm, even foundation.
(2) Place at least 1 watertight anti-seep collar around the outlet barrel pipe or implement a filter diaphragm measure. When using anti-seep collars: Place a 4-inch layer of moist, clayey, soil around the lower part of the barrel and compact it by hand to at least the density of the soil foundation, taking care not to raise the outlet barrel pipe from the foundation when compacting under the barrel haunches. (Do not use soil materials such as sand, aggregate, or silt.)
(3) Immediately following the installation of the outlet barrel pipe install the outlet apron.
(4) Install Dewatering Devices: Upon completion principal spillway the floating dewatering device will be installed and functional prior to the start of mass earth disturbing activities. Where applicable install alternative dewatering devices with dam and principal spillway piping/risers etc. but keep “offline” until potential freezing periods. Within the SWP3 the designer will provide provisions to bring optional dewatering devices “online”. The goal of the installation instructions should require minimal use of heavy machinery and equipment that can be difficult to use during periods of inclement weather and difficult wet soil conditions.
(5) If the basin requires draining to activate the dewatering device the following procedure shall be followed: Drain any water from the dewatering zone, refer to Water Pumping (713.02), without discharging sediment and remove any sediment deposits that prevents installation and function of the device.

Emergency Spillway:

Critical Item: There shall be no delay in implementing a stabilized emergency spillway. Stabilize the entire flowline of spillway due to the high potential for basin overflows in large run-off events.

Emergency spillway for earthen dam:

(1) Site the emergency spillway at one end of the embankment. Locate it in undisturbed soil outside the construction limits of the embankment. Emergency spillway shall not be, where possible, located on filled embankment or over the principal spillway piping due to these situations have high potential for embankment washout failures.
(2) Locate the emergency spillway so that any flow will return to the receiving channel without damaging the embankment and adjacent properties.
(3) Excavate a trapezoidal channel with 3:1 or flatter side slopes as specified in the construction plans. Maintain a straight, level, 20-foot long, minimum, channel through the control section.

(4) Stabilize emergency spillway, channel and outlet apron with the required stabilization/lining. Ensure to line the entire flow line of the trapezoidal channel with appropriate erosion resistant materials.

Emergency spillway for berm that has backslope 20:1 or flatter:

(1) The top of the berm must be level to avoid concentrated flows.
(2) Elevate berm over spillway pipe to prevent flow over outlet barrel pipe corridor.
(3) Grade backslope such that any flow will return to the receiving channel without damaging the embankment and adjacent properties.
(4) Stabilize berm front slope, top and backslope with required stabilization measures.

Basin Stabilization:

- Stabilize basin banks prior to mass earth disturbance of the upstream watershed at a minimum with Temporary Seeding (701.01) and Mulching (702.07).
- For basins that take longer to construct there shall be a plan to incrementally stabilize the basin slopes.
- Where seeding and mulching are not practical implement temporary stabilization with pinned/anchored geotextile.

Typical Maintenance:

- Inspect within 24 hours of a rain event and at least once every seven calendar days.
- Remove and properly dispose of sediment when it accumulates to one-half the sediment storage zone design volume.
- If floatable debris are affecting the dewatering device, then implement Sediment Basin Baffles (708.06) that extend above the pooling elevation to trap floatable debris away from inlet zone.
- Periodically check embankment, emergency spillway and outlet for erosion damage, piping, settling, seepage, or slumping along the toe or around the outlet barrel pipe, repair immediately.
- Monitor basin banks for erosion and repair and stabilize promptly.
- Where gully erosion is identified on basin banks repair and stabilize and consider run-off controls such as the following: Temporary Diversions (703.01), Temporary Slope Drains (703.07), or Rock-lined Chute (705.02) to divert run-off away from gullied area.
- Maintain and remove trash and other debris from outlet dewatering device, emergency spillway and pool area.
- If the pool level reaches the principal spillway elevation, then the dewatering zone should drain between the 48-hour minimum and 72-hour maximum. Reevaluate the basin dewatering control measure's outlet size and modify accordingly if it is not draining within the required time periods.
- If the basin requires draining for maintenance for outlet structures or to activate dewatering devices the drain any water from the dewatering zone, refer to Water Pumping (713.02), without discharging sediment and remove any sediment deposits that prevents installation and function of the dewatering devices.
- Remove temporary basin after drainage area has been permanently stabilized, inspected, and approved. Do so by draining any water (without discharging sediment), removing sediment to a

designated disposal area (if required), smoothing the site to blend with the surrounding area, and then stabilizing with seed and mulch or another appropriate measures.

- Permanent storm water basins: Remove the temporary dewatering devices with permanent plugging/sealing of any temporary riser orifices, temporary baffles, sediment at pipe and swale outlets, repair any gullies and stabilize pond banks, correct any deficiencies with outlet protection and remove sediment as needed to meet final design dimensions for a permanent pond.

Exhibit 708.02-B. This is an example of a permanent stormwater basin modified for use as a temporary sediment basin. A floating outlet has been installed as the sediment basin dewatering device. Permanent outlet structure orifice holes have been temporarily plugged until the temporary floating outlet is removed or not required when land disturbing activities have been completed and the site has been stabilized.
Source: IDEM

Exhibit 708.02-C: A temporary sediment basin has recently been constructed in late fall and is implementing a perforated riser dewatering device which is appropriate for the winter period (freezing conditions). The basin banks have been dormant seeded and mulched. The riprap lined trapezoidal shaped emergency spillway has been implemented on an undisturbed soil area and not on the filled dam area located just to the right of the spillway.
Source: IDEM

EXHIBIT 708.02-D

Temporary Sediment Basin Design Data Sheet

Computed by: _____ Date: _____

Project Name: _____ Basin: _____

Location: _____

Latitude: _____ Longitude: _____

Plans must contain all construction details, installation requirements, and design drawings necessary to construct the basin.

1. Total watershed area draining to basin:_____ acres
2. Total disturbed area draining to basin:_____ acres
3. Basin watershed delineated in SWP3 documents/plan sheets: Yes: ____ No: ____
   (Basin watershed used by the planner is valuable for evaluating plan practices by reviewing agency, critical for site management and critical in compliance inspections.)

Basin Volume Design

4. Dewatering zone storage volume required: _____ cubic feet
   (5600 cubic feet/acre of watershed or run-off from 1-yr., 24-hr. storm minimum)
5. Dewatering zone storage volume provided: _____ cubic feet
6. Sediment storage volume required: _____ cubic feet
   (1000 cubic feet/acre of disturbed watershed minimum)
7. Sediment storage volume provided: _____ cubic feet
8. Dewatering time: _____ hours
9. Flow though Dewatering Device: line 1 / line 7 / 3600 = _____ cfs
10. 10-yr., 24-hr. duration storm event peak flow through the principal spillway: _____ cfs
11. Principal spillway peak capacity: _____ cfs

Emergency spillway

12. Emergency spillway: 25-yr., 24-hr. duration storm event peak flow: _____ cfs
13. Emergency spillway capacity: _____ cfs
14. Emergency spillway width at control section: _____ feet
15. Emergency spillway control section length: _____ feet

Design Elevations

16. Outlet Barrel Pipe lower invert elevation: _____ feet
17. Outlet Barrel Pipe upper invert elevation: _____ feet
18. Principal Spillway Crest elevation: _____ feet
19. Emergency Spillway Crest elevation: _____ feet
20. Bottom of the dewatering zone elevation: _____ feet
21. Top of Dam (settled) elevation: _____ feet

Crest of Dewatering Device Options: (refer to dewatering device data sheets)

Flow Path

22. A = Surface area in square feet at crest of principal spillway: _____ square feet
23. Effective Width, $W_e = \sqrt{A / 2}$ = _____ feet
24. Flow Length (L_n) from inflow point to outlet = _____ feet
    (Compute for each inflow point)

Str # or Inflow Point	L_n	2 x W_e	Is $L_n \geq$ 2 x W_e? Yes or No	Baffle Provided? Yes or No	Length of Baffle Required (detailed on plan sheet)

If L_n is less than 2 x W_e then provide details for required baffle(s) to achieve the minimum 2:1 ratio for each concentrated inflow. [Refer to Sediment Basin Baffles (708.06)]

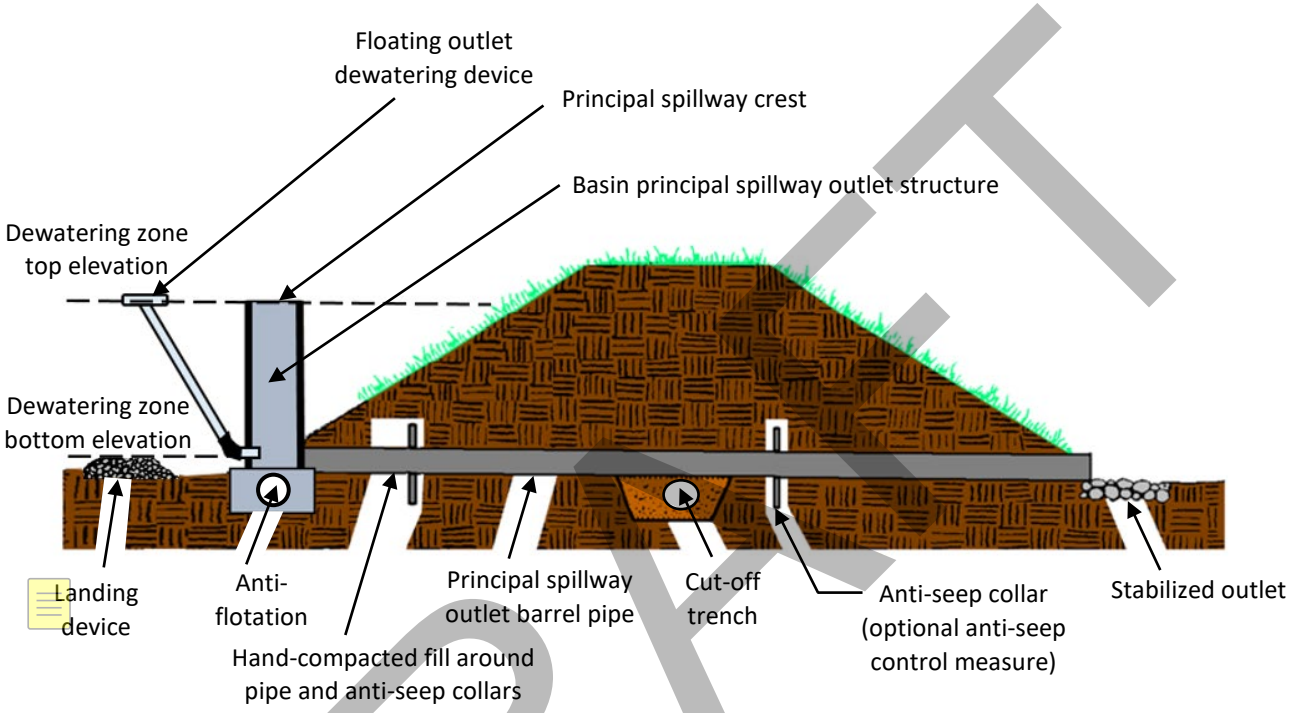
Are alternative dewatering devices to be implemented? Yes: ___ No: ___
If yes, the designer needs to supply justification for the use of alternative dewatering practices.

Note: When alternative dewatering devices to be implemented then provisions must allow the alternative dewatering device to be installed or brought online in such a way that requires the minimal use of heavy machinery and equipment that can likely be difficult to use during periods of inclement weather and difficult wet soil conditions.

Are appropriate provisions provided? Yes: ___ No: ___

EXHIBIT 708.02-E

COMPONENTS OF A TYPICAL TEMPORARY SEDIMENT BASIN (NOT TO SCALE)

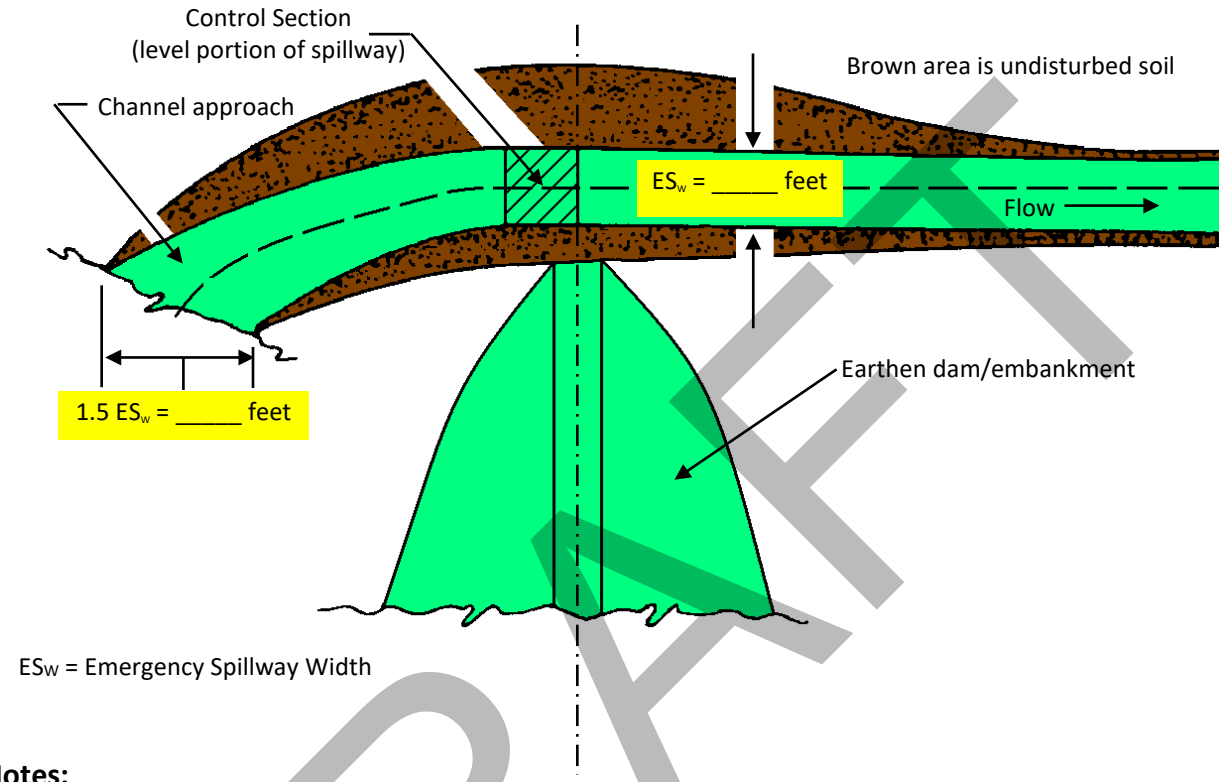


Note: The illustrations in this exhibit are not intended to serve as construction drawings. The diagrams are to be used to communicate the concepts for implementation of this control measure.

Source: IDEM File

EXHIBIT 708.02-F

COMPONENTS OF A TYPICAL EMERGENCY SPILLWAY (NOT TO SCALE)



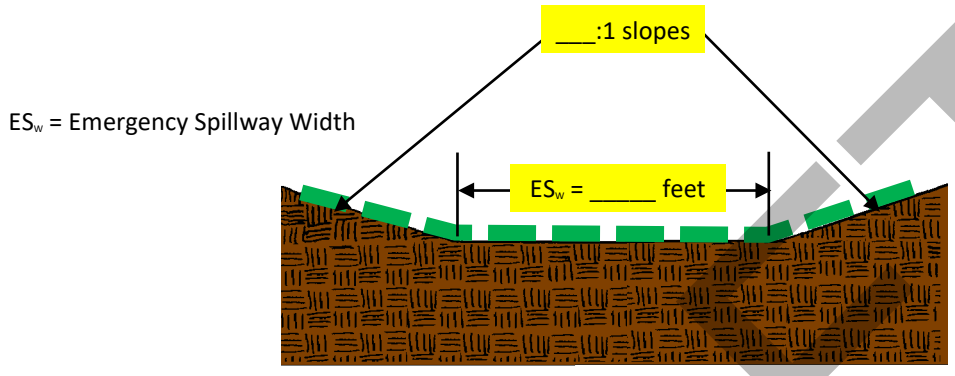
Notes:

- Emergency spillway best not to be located over piping or principal spillway barrel pipe or in filled materials due to the high potential for embankment washout failures.
- The illustrations in this exhibit are not intended to serve as construction drawings. The diagrams are to be used to communicate the concepts for implementation of this control measure.

Source: Adapted from USDA, Natural Resources Conservation Service

EXHIBIT 708.02-G

EMERGENCY SPILLWAY CROSS SECTION (NOT TO SCALE)



Notes:

- Show the entire flow line of the emergency spillway channel lined with erosion resistant materials: erosion control blanket seeding, riprap, or other appropriate materials.
- Emergency spillway best not to be located over piping or principal spillway barrel pipe or in filled materials due to the high potential for embankment washout failures.
- The illustrations in this exhibit are not intended to serve as construction drawings. The diagrams are to be used to communicate the concepts for implementation of this control measure.

Source: Adapted from USDA, Natural Resources Conservation Service