Sediment Trap

Description

A temporary runoff containment area to promote sedimentation prior to discharge of the runoff through a stabilized spillway.

Applications

- Drainage areas less than 5 acres.
- Areas along the perimeter of the site where sediment-laden runoff is discharged off-site.
- Areas requiring additional sediment containment measures such as bodies of water or discharge points to a drainage system.
- On-site discharge points to a stabilized or natural area or waterway.

Installation and Implementation Requirements

- Construct sediment trap prior to engaging in clearing, grubbing, or grading activities.
- Location shall be based on the following:
  - Area where a low embankment may be constructed across a swale.
  - Area where failure of sediment trap will not cause property damage or loss of life.
  - Area where maintenance crew may easily access sediment trap.

Sediment Trap

Installation and Implementation Requirements *(continued)*

- Sediment trap size shall be based on the following:
  - Minimum trap settling volume of 133 cubic yards per acre.
  - Minimum trap sediment storage volume of 33 cubic yards per acre.
  - Trap width shall be less than one-half of the trap length.
  - Flood volume.
  - Construct sediment trap by excavating ground or constructing an earthen embankment to create a containment area.

Construct sediment trap prior to engaging in clearing, grubbing, or grading activities.

- Area under embankment shall be cleared, grubbed, and stripped of vegetation and root mat.
- Fill material for embankment shall be free of roots, woody vegetation, oversized stones, rocks, organic material, or other objectionable material. Compact embankment by traversing with construction equipment.
- Stabilize trap outlet with stone or vegetation.
- Install fencing to prevent unauthorized entry and for safety purposes.
- All pipe joints shall be watertight when a riser is used.
- The top two-thirds of the riser shall be perforated with holes 1 to 4 inches in diameter. The holes shall be vertically spaced at 8-inch intervals and horizontally spaced at 10- to 12-inch intervals.
- Outlet crest elevation of an earth or stone outlet shall be a minimum of 1 foot below the top of the embankment.
- If the sediment trap is to remain in place for 14 calendar days or more, the embankments, berms, and other areas of exposed soil must be temporarily stabilized.

Considerations

- Applies to maximum drainage area of 5 acres. Drainage areas exceeding 5 acres shall implement Sediment Basins. *See* section SC-5 Sediment Basin for more information.
- Only removes large and medium size particles.
- Requires protective fencing.
- Do not install in live streams.
- Availability of right-of-way may limit size of sediment trap.

Sediment Trap

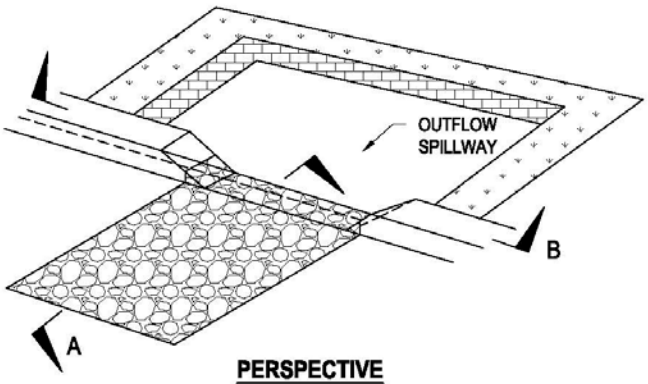
What to Inspect

- Are spillways or outlets obstructed or damaged?
- Is there evidence of erosion at the outlets?
- Are the areas stabilized around outlets?
- Is fencing damaged?

Maintenance

- Remove obstruction and repair damage as necessary.
- Remove sediment which has accumulated to within 1 foot of the maximum storage elevation.
- Properly dispose of sediment and debris removed from sediment trap.

Sediment Trap



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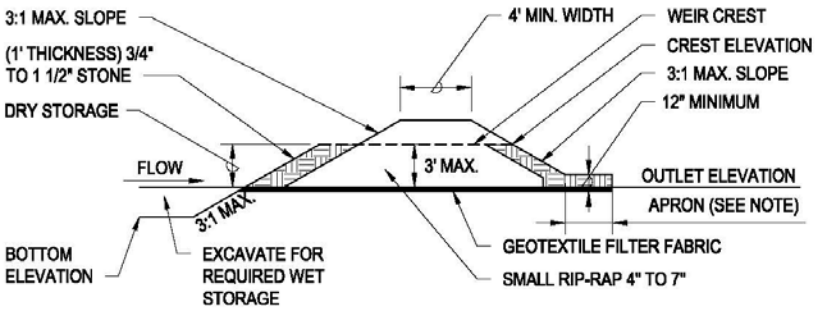

SECTION A
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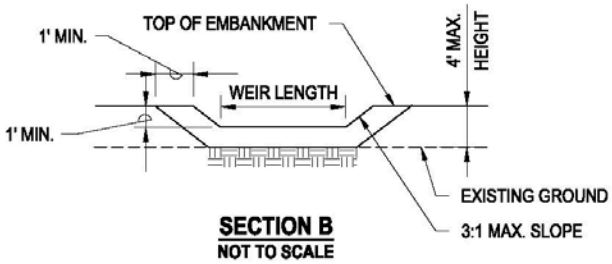
NOTE:

MAXIMUM DRAINAGE AREA = 5 ACRES



SECTION B
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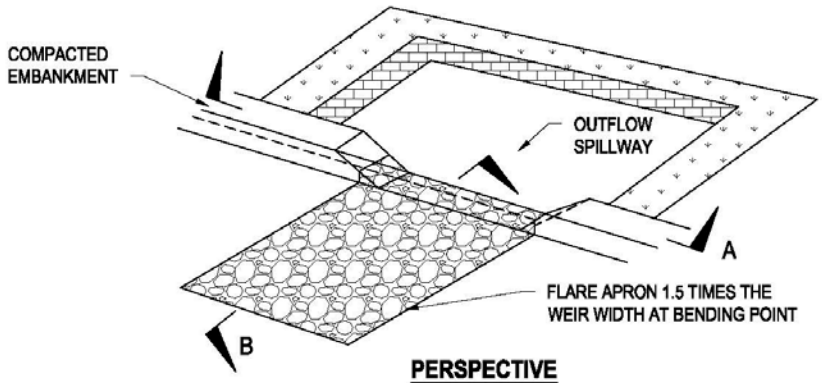
STONE OUTLET SEDIMENT TRAP

Sediment Trap



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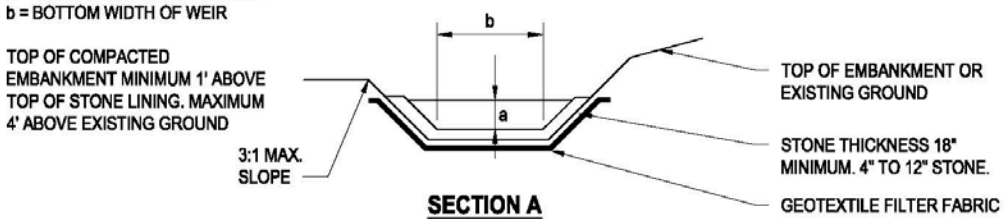
LEGEND:

a = MINIMUM DEPTH OF CHANNEL
b = BOTTOM WIDTH OF WEIR



SECTION A
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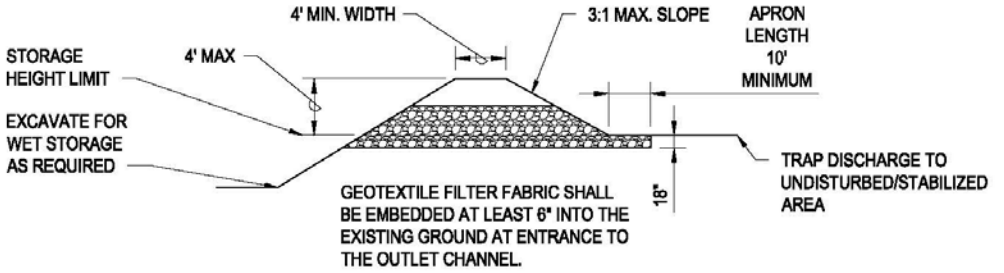


SECTION B
NOT TO SCALE

RIP-RAP SEDIMENT TRAP

Sediment Basin

Description

Temporary basin that intercepts sediment-laden runoff and allows sediment to settle prior to discharge of runoff from the site.

Applications

- Drainage areas larger than 5 acres.
- Areas where sediment-laden runoff is discharged to the drainage system or watercourses.

Installation and Implementation Requirements

- Construct sediment basins prior to clearing, grubbing, or grading activities.
- Location shall be based on the following:
  - Area where terrain forms a natural basin.
  - Area which minimizes construction interference.
  - Area where maximum benefit may be achieved from the existing terrain to minimize excavation or construction effort to install sediment basin.
  - Area where failure of sediment basin will not cause property damage or loss of life.

Sediment basins must be located in an area where failure of sediment basin will not cause property damage or loss of life.

Sediment Basin

Installation and Implementation Requirements *(continued)*

  - Area where maintenance crew may easily access sediment basin.
  - Area where permanent detention basin will be constructed.
- Sediment basin shall be designed to allow 70% to 80% of the sediment to settle during a 24- to 40-hour detention time.
- The sediment basin is divided into 2 zones:
  - Sediment storage zone with a minimum of 1 foot in depth.
  - Settling zone with a minimum of 2 feet in depth.
- Sediment basin design shall be based on the following requirements:
  - Settling zone volume shall be determined by the following equation:

    $V = 1.2(SD)Q/V_{SED}$

    Where:

    V = Settling zone volume.

    SD = Settling depth, which shall be a minimum of 2 feet and greater than the average distance from inlet to outlet of the basin divided by 200.

    V_{SED} = Settling velocity of the design soil particle (medium silt). The settling velocity of a medium silt soil particle is 0.00096 feet per second.

    $Q = CIA$

    Where:

    Q = Discharge rate measured in cubic feet per second.

    C = Runoff coefficient.

    I = Precipitation intensity for the 10-year, 1-hour rain event.

    A = Area draining into the sediment basin in acres.
  - Basin geometry for the sediment storage zone shall be determined by a minimum depth of 1 foot and 3:1 (H:V) or flatter side slopes extending from the bottom of the basin. Basin bottom shall be level.
  - Provide an emergency spillway with the top of the riser pipe 1 foot below the crest elevation.
  - Sediment basin length to settling depth ratio (L/SD) shall not exceed 200.
  - Sediment basin length to width ratio shall not be less than 6:1 or baffles shall be installed.
- Install and securely anchor anti-seep collar on the outlet pipe/riser.

Inlets, outlets, and slopes of sediment basins must be stabilized with rock or vegetation to minimize erosion.

Sediment Basin

Installation and Implementation Requirements *(continued)*

- Construct sediment basin by excavating ground or constructing an embankment of compacted soil. Embankments should be stabilized.
- Sediment basin may have more than 1 inflow point.
- Stabilize inlet, outlet, and slopes of basin with rock or vegetation.
- Install fencing to prevent unauthorized entry and for safety purposes.
- Refer to the *Storm Water Permanent Best Management Practices Manual* for more information.

Considerations

- Limited design life of 12 to 18 months.
- Sediment basin removes medium size particles.
- Additional BMPs such as seeding, mulching, and diversion dikes may be used to reduce the amount of sediment intercepted by the basin.
- Requires protective fencing.
- Inappropriate for installation in live streams.
- Availability of right-of-way may limit size of sediment basin.
- Large basins may be subject to state and local requirements for dam safety.

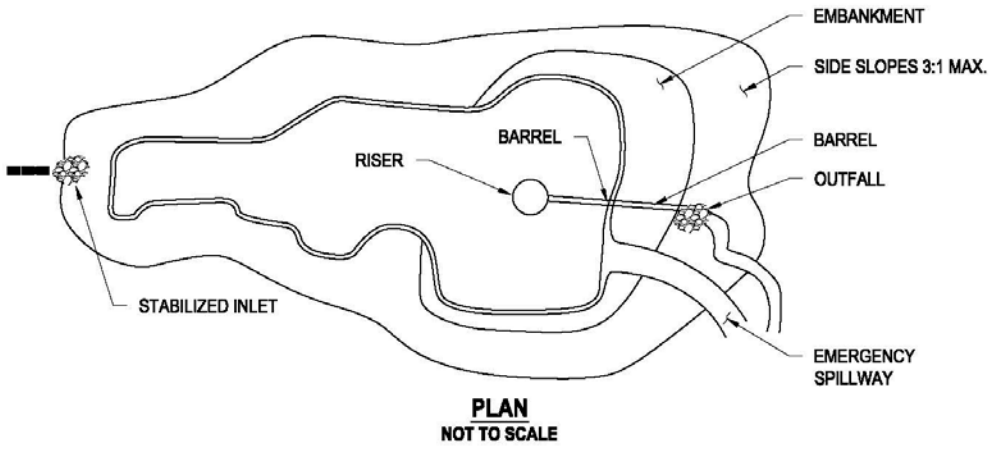
What to Inspect

- Is there evidence of obstructions or damage to inlets and outlets?
- Is there erosion around outlets?
- Is fencing damaged?

Maintenance

- Remove obstructions from inlets and outlets and repair damage as necessary.
- Stabilize outlets and repair fencing as necessary.
- Remove sediment when the sediment storage volume is one-half full.
- Properly dispose of sediment and debris removed from sediment basin.

Sediment Basin



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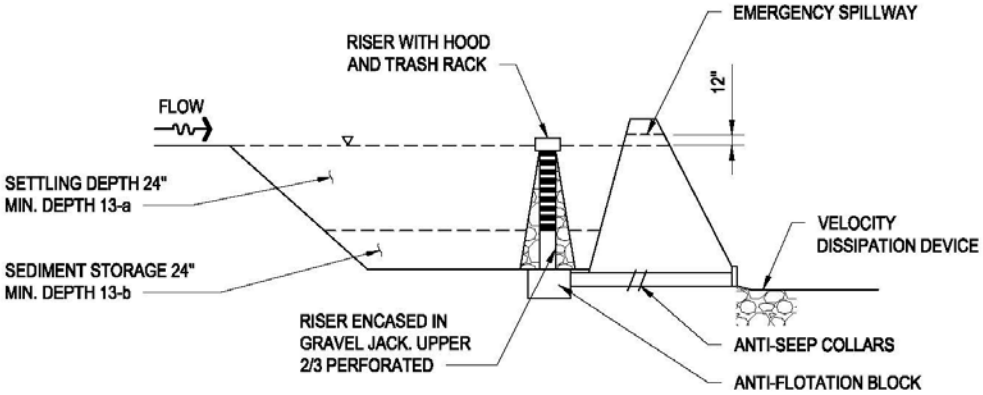

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SEDIMENT BASIN