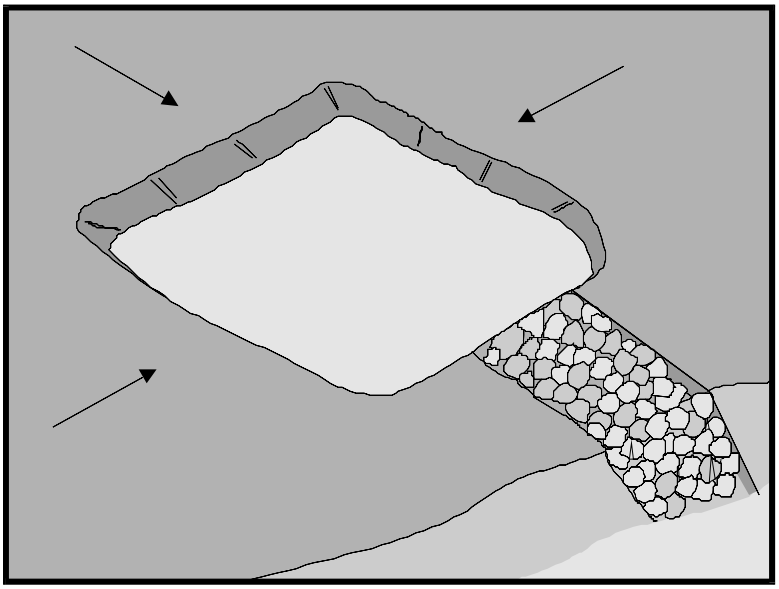
Sediment Trap SC-15



Source: Caltrans Construction Site Best Management Practices Manual, 2003.

Description

A temporary runoff containment area, which promotes 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; and
  - Area where maintenance crew may easily access sediment trap.
- 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 half of the trap length; and
  - Flood volume which may contain a major flood without damage to upstream areas or overtopping the embankment.

Installation and Implementation Requirements (Continued)

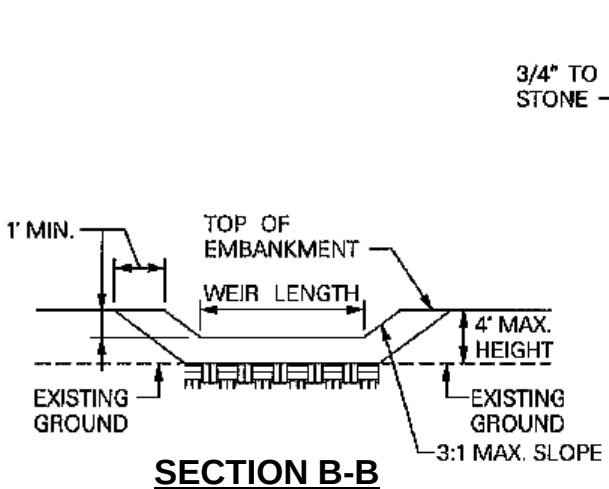
- Construct sediment trap by excavating ground or constructing an earthen embankment to create a containment area.
- Area under embankment shall be cleared, grubbed, and stripped of vegetation and root mat.
- Fill material for embankment shall be free of roots, woody vegetation, over-sized stones, rocks, 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 2/3 of the riser shall be perforated with holes 1 to 4 inch 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.

Limitations

- Applies to maximum drainage area of 5 acres. Drainage areas exceeding 5 acres shall implement Sediment Basins. Refer to SC-16 (Sediment Basin) in this manual 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.

Inspections and Maintenance

- Inspect weekly during dry periods as well as within 24 hours of any rainfall of 0.5 inch or greater which occurs in a 24-hour period and daily during periods of prolonged rainfall.
- Inspect spillway and outlet for obstructions or damage. Remove obstructions and repair damage as necessary.
- Inspect outlet for erosion and stabilize as necessary.
- Inspect fencing for damage and repair as necessary.
- Remove sediment which has accumulated to within 1 foot of the top of the dry storage volume.
- Properly dispose of sediment and debris removed from sediment trap.



SECTION B-B
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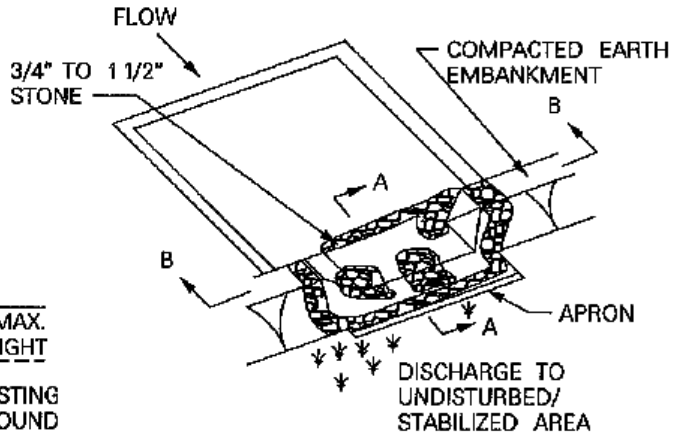

PERSPECTIVE VIEW
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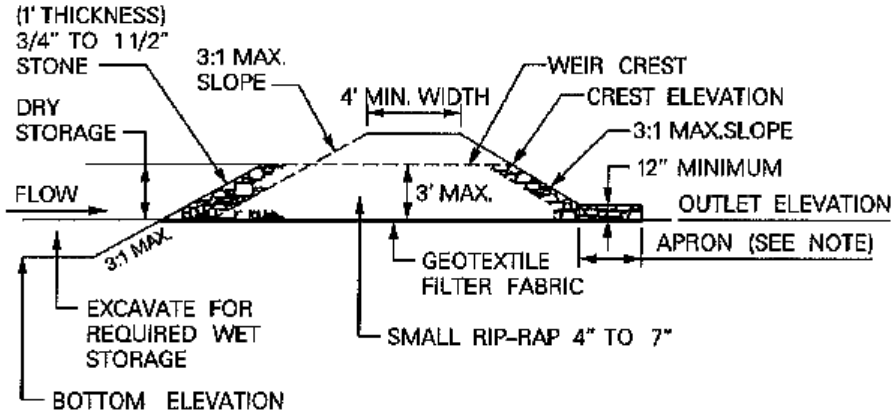

SECTION A-A
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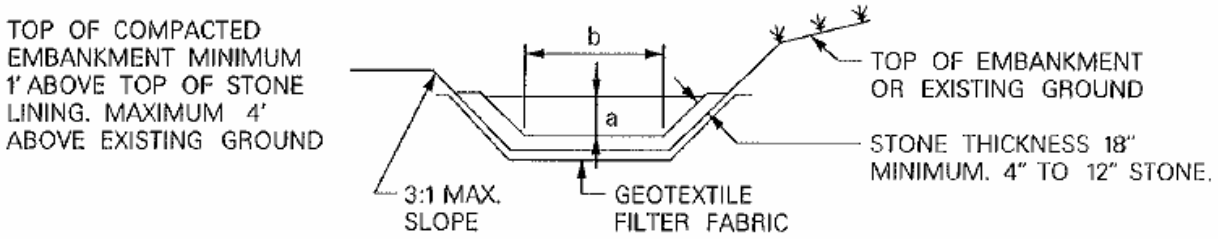
NOTE: MAXIMUM DRAINAGE AREA = 5 ACRES.

STONE OUTLET SEDIMENT TRAP

Source: Maryland Standards and Specifications for Soil Erosion and Sediment Control, 1994.

LEGEND

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



CROSS SECTION
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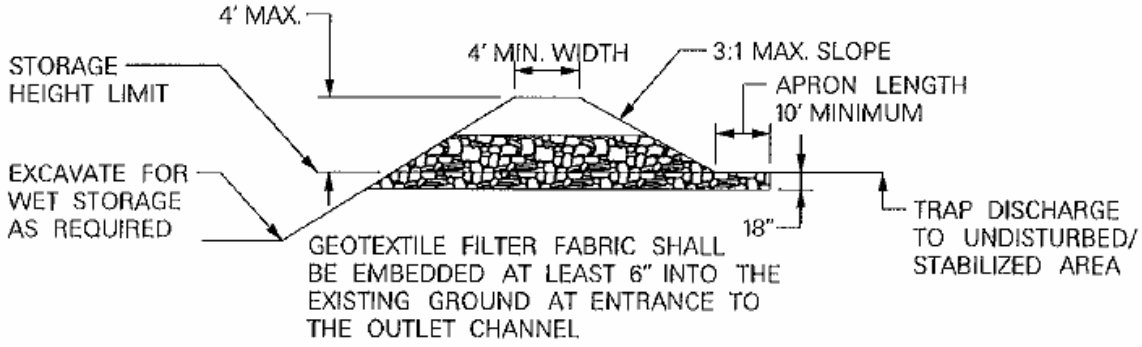

PROFILE
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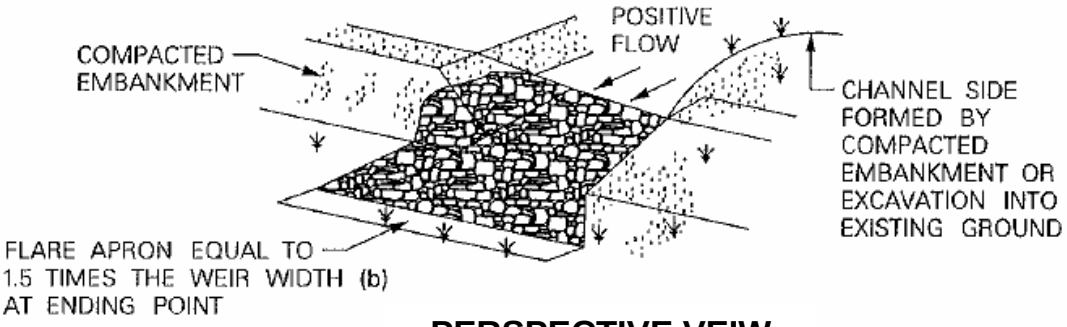

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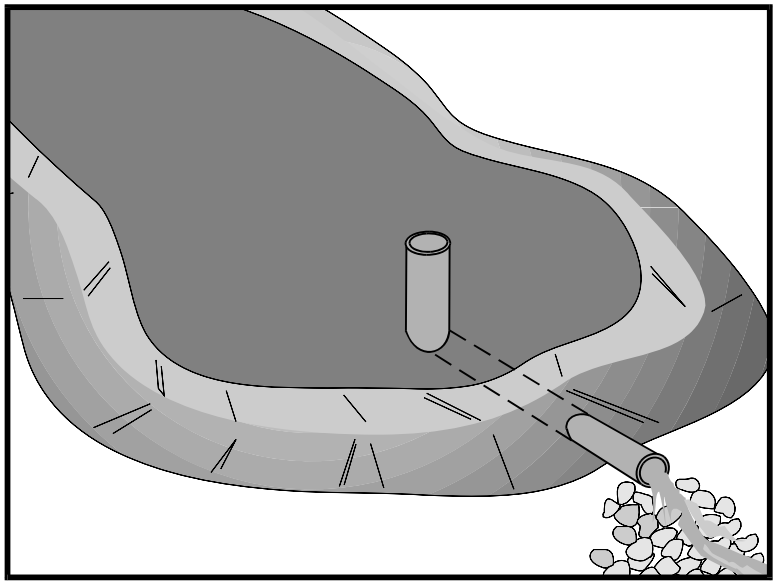
NOTE: MAXIMUM DRAINAGE AREA = 5 ACRES.

RIP-RAP SEDIMENT TRAP

Source: Maryland Standards and Specifications for Soil Erosion and Sediment Control, 1994.

Sediment Basin SC-16



Source: Caltrans Construction Site Best Management Practices Manual, 2003.

Description

A temporary basin which intercepts sediment-laden runoff and allows sediment to settle prior to discharge of the 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;
  - Area where maintenance crew may easily access sediment basin; and
  - Area where permanent detention basin will be constructed.
- Sediment basin shall be designed to allow 70 to 80 percent of the sediment to settle during a 24 to 40 hour detention time.
- The sediment basin is divided into two zones:
  - Sediment storage zone with a minimum of 1 foot in depth and
  - Settling zone with a minimum of 2 feet in depth

Installation and Implementation Requirements (Continued)

- 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 3:1or 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; and
  - Sediment basin length to width ratio shall not be less than 6:1 or baffles shall be installed.
- Anti-seep collar shall be securely anchored and installed on the outlet pipe/riser.
- Construct sediment basin by excavating ground or constructing an embankment of compacted soil.
- Sediment basin may have more than one inflow point.
- Stabilize inlet, outlet, and slopes of basin with rock or vegetation.
- Install fencing to prevent unauthorized entry and for safety purposes.

Limitations

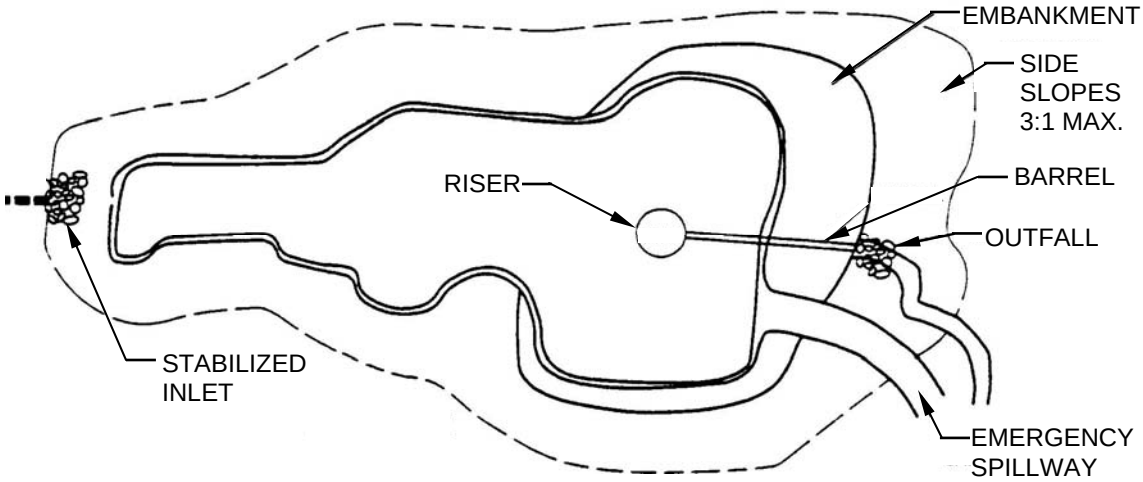
- Limited design life of 12 to 18 months.
- Sediment basin removes medium size particles.
- Additional BMPs such as seeding, mulching, and diversion dikes may be used to reduce the amount of sediment intercepted by the basin.

Limitations (Continued)

- 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/local requirements for dam safety.

Inspections and Maintenance

- Inspect weekly during dry periods as well as within 24 hours of any rainfall of 0.5 inch or greater which occurs in a 24-hour period and daily during periods of prolonged rainfall.
- Inspect inlet and outlet for obstructions or damage. Remove obstructions and repair damage as necessary.
- Inspect outlet for erosion and stabilize as necessary.
- Inspect fencing for damage and repair as necessary
- Remove sediment when the sediment storage volume is half full.
- Properly dispose of sediment and debris removed from sediment basin.



PLAN
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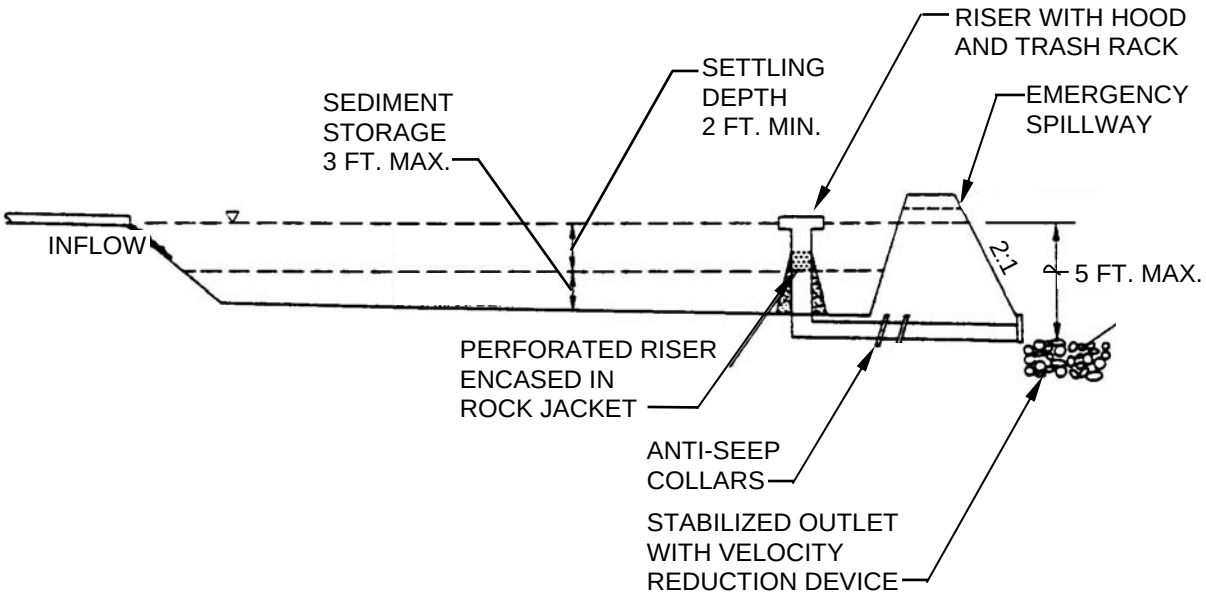

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SEDIMENT BASIN

Source: CCH Best Management Practices Manual for Construction Sites in Honolulu, 1999.