

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

Description Structure that prevents erosion by intercepting, diverting, and conveying surface run-on (storm water entering the site) to a stabilized area or other sediment trapping device.

- Applications**
- Drainage areas smaller than 10 acres.
 - Direct runoff around unstable or disturbed areas to a stabilized water course, drainage pipe, or channel.
 - Divert runoff to sediment basins or sediment traps.
 - Intercept runoff at the point of concentration.
 - Supplement other sediment control measures.
 - Intercept and divert runoff to prevent sheet flow over sloped surfaces.
 - Convey surface runoff down sloping land.

- Installation and Implementation Requirements**
- Firmly compact to minimize erosion and prevent unequal settling.
 - Drain to a stabilized outlet.
 - Drain sediment laden runoff to a sediment trapping device.
 - Ensure continuous, positive grade along dike to prevent ponding of runoff.
 - Stabilize earth dikes with vegetation, chemicals, or other physical devices.
 - Conform to predevelopment drainage patterns and capacities.
 - The design of dikes shall be submitted to the HWY-OM Engineer or Hydraulic Section staff for review. The review will evaluate structural stability and drainage capacity.
 - Design flow and safety factor shall be determined by an evaluation

Installation and Implementation Requirements (Continued)

of risks associated with overtopping, flow backups, or washout of structures.

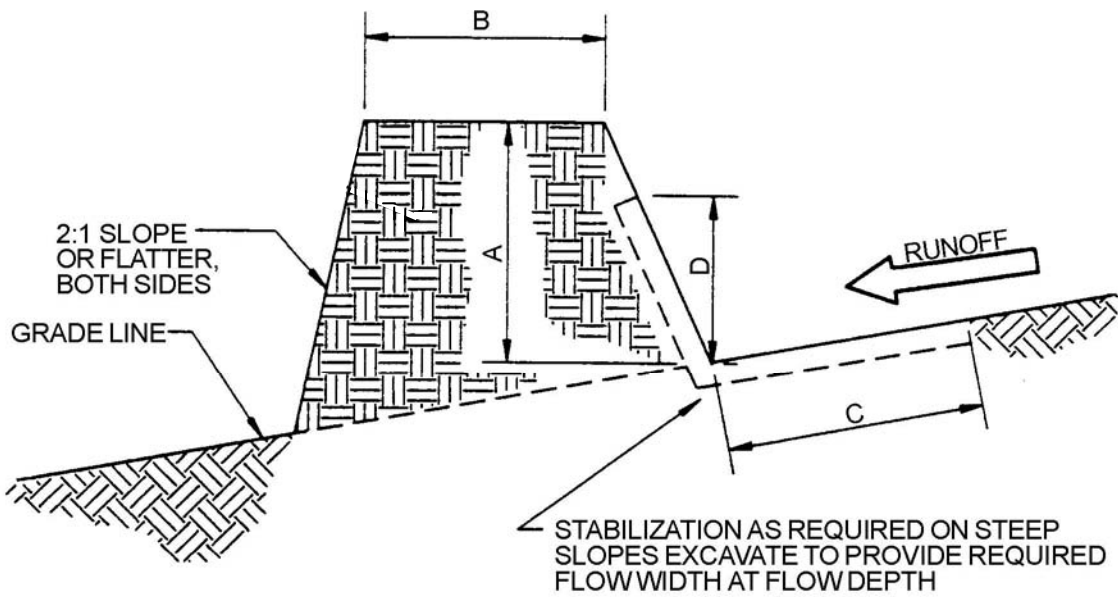
- Evaluate potential run-on from off-site properties.
- Flow velocity limit shall be determined by on-site soil type and drainage flow patterns.
- Establish minimum flow velocity requiring lining (rip-rap, geotextile filter fabric, vegetation, concrete) for earthen diversion devices. Refer to Highways Division's *Hawaii Statewide Uniform Design Manual for Streets and Highways*.
- Incorporate an emergency overflow section or bypass area into the design for storms exceeding the design storm.

Limitations

- Unsuitable for use as a sediment trapping device.
- Use of additional sediment and erosion control devices may be required to prevent scour and erosion in recently graded dikes.
- Select size and location to prevent unintended consequences such as erosion along steep and unlined ditches and ponding within the travelway or material storage areas. Alteration of existing waterways and clearing of existing vegetation are subject to permit requirements of the U.S. Army Corps of Engineers and state or local agencies.

Inspections and Maintenance

- Remove dikes after stabilization of the surrounding drainage area or completion of construction.
- Inspect dikes 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. Inspections shall include the following:
 - Check for erosion along berms. Restore all bare areas with the appropriate lining material;
 - Remove accumulated sediment and debris; and
 - Inspect dike walls for cracks, washouts, animal habitation, exposed materials, and other signs of potential failure. Restore areas with the appropriate materials. Coordinate restoration with the HWY-OM Engineer or Material Testing and Research Section as necessary. The Hydraulic Section shall also be consulted for problems associated with structural design or runoff flow patterns.



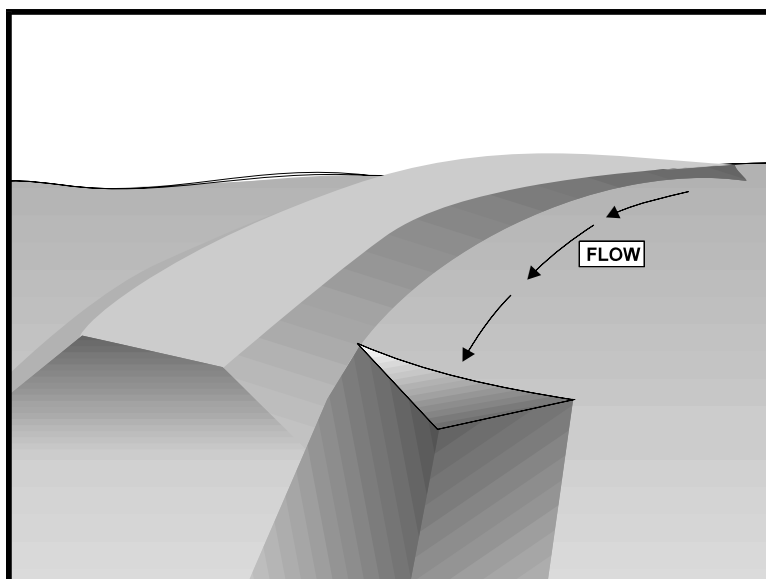
REQUIREMENTS BASED ON UPSTREAM DRAINAGE AREA

	DIKE 1 (5 ACRES OR LESS)	DIKE 1 (5-10 ACRES)
A-DIKE HEIGHT	18"	36"
B-DIKE WIDTH	24"	36"
C-FLOWWIDTH	4'	6'
D-FLOWDEPTH	8"	15"

EARTH DIKE

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



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

Description Structures that prevent erosion by intercepting, diverting, and conveying surface run-on (storm water entering the site) to a stabilized area or other sediment trapping device.

- Applications**
- Drainage areas smaller than 5 acres.
 - Direct runoff around unstable or disturbed areas to a stabilized water course, drainage pipe, or channel.
 - Divert runoff to sediment basins or sediment traps.
 - Intercept runoff at point of concentration.
 - Supplement other sediment control measures.
 - Intercept and divert runoff to prevent sheet flow over sloped surfaces.
 - Convey surface runoff down sloping land.

- Installation and Implementation Requirements**
- Firmly compact to minimize erosion and prevent unequal settling.
 - Drain to a stabilized outlet.
 - Drain sediment laden runoff to a sediment trapping device.
 - Ensure continuous, positive grade along swale or ditch to prevent ponding of runoff.
 - Stabilize earth drains or swales with vegetation, chemicals, or other physical devices.
 - Conform to predevelopment drainage patterns and capacities.
 - The design of swales or ditches shall be submitted to the HWY-OM Engineer or Hydraulic Section staff for review. The review will evaluate structural stability and drainage capacity.

Installation and Implementation Requirements (Continued)

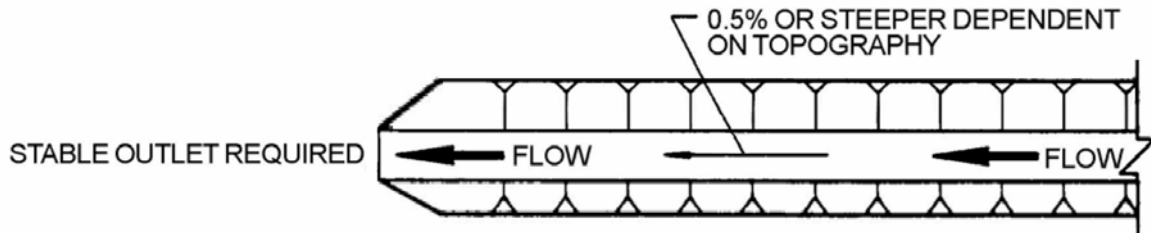
- Design flow and safety factor shall be determined by an evaluation of risks associated with overtopping, flow backups, or washout of structures.
- Evaluate potential run-on from off-site properties.
- Flow velocity limit shall be determined by on-site soil type and drainage flow patterns.
- Establish minimum flow velocity requiring lining (rip-rap, geotextile filter fabric, vegetation, concrete) for earthen diversion devices. Refer to Highways Division's *Hawaii Statewide Uniform Design Manual for Streets and Highways*.
- Incorporate an emergency overflow section or bypass area into the design for storms exceeding the design storm.

Limitations

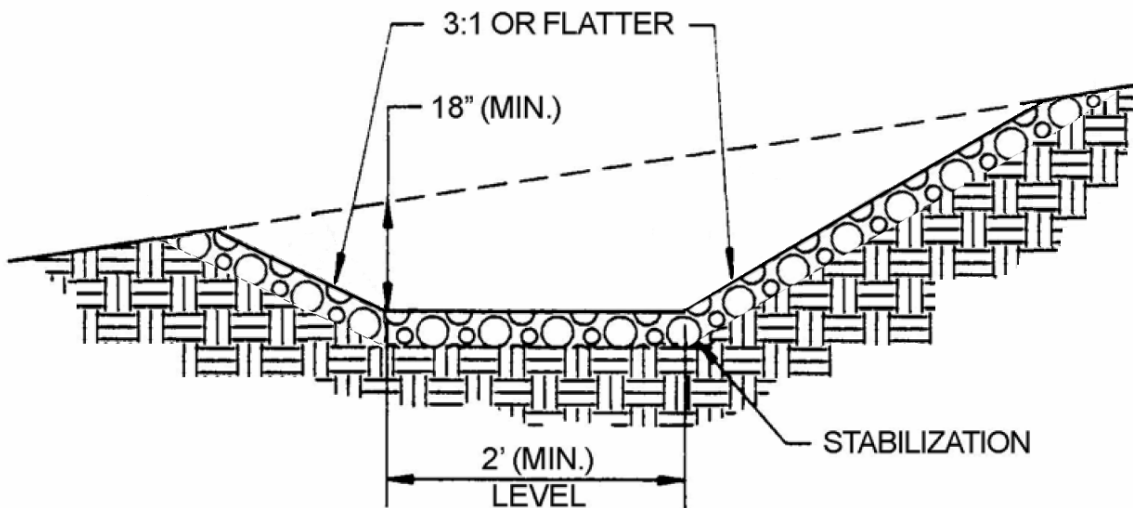
- Unsuitable for use as a sediment trapping device.
- Use of additional sediment and erosion control devices may be required to prevent scour and erosion in recently graded swales and ditches.
- Select size and location to prevent unintended consequences such as erosion along steep and unlined ditches and ponding within the travelway or material storage areas. Alteration of existing waterways and clearing of existing vegetation are subject to permit requirements of the U.S. Army Corps of Engineers and state or local agencies.
- Ditches and swales may require check dams or lining to prevent erosion.

Inspections and Maintenance

- Remove temporary swales and ditches after stabilization of the surrounding drainage area or completion of construction.
- Inspect swales and ditches 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. Inspections shall include the following:
 - Check for erosion along channel linings, embankments, or beds of ditches. Restore all bare areas with the appropriate lining material;
 - Remove accumulated sediment and debris; and
 - Inspect embankments, compacted fills, and earthen channel sidewalls for cracks, washouts, animal habitation, exposed materials and other signs of potential failure. Restore areas with the appropriate materials. Coordinate restoration with the HWY-OM Engineer or Material Testing and Research Section as necessary. The Hydraulic Section shall also be consulted for problems associated with structural design or runoff flow patterns.

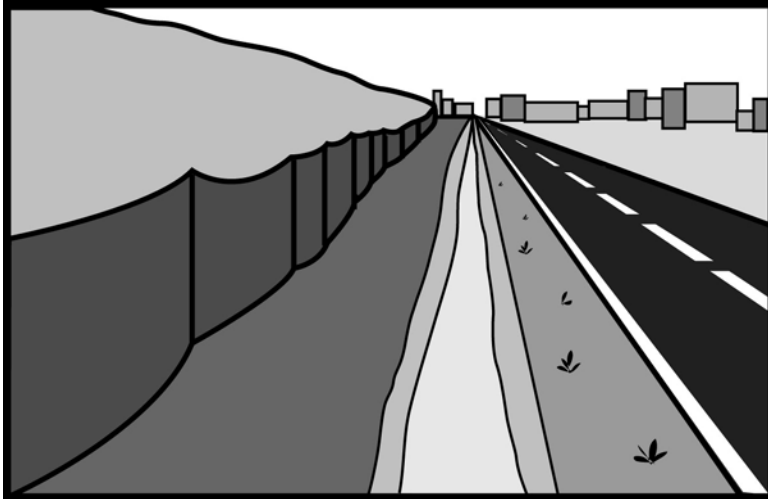


PLAN
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TEMPORARY DRAINAGE SWALE



Description

Devices to intercept, divert, and convey off-site surface runoff around or away from the project site to prevent site erosion. Run-on (storm water entering the site) diversion devices include dikes, swales, and slope drains.

Applications

- Along paved surfaces to intercept runoff.
- Upslope from project site to prevent erosion of disturbed areas located on-site.
- Downslope of project site to convey runoff to a sediment control device such as a sediment trap or sediment basin.
- Around material storage areas, maintenance and fueling areas, or areas with runoff containing contaminants or pollutants.
- Below steep grades to intercept concentrated runoff.
- Located around adjacent property and buildings, diversion devices can provide protection from stormwater runoff.

Installation and Implementation Requirements

- Size diversion devices appropriately.
- Immediately stabilize earth dikes and swales. Refer to SC-6 (Earth Dike) and SC-7 (Temporary Drains and Swales) in this manual for more information.
- Refer to SC-11 (Slope Drains and Subsurface Drains) in this manual for more information.

Limitations

- Run-on diversion devices do not remove sediment from runoff.
- Ditches and swales may require check dams or lining to prevent erosion.

Run-on Diversion

EC-8

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 channels embankments, and ditch beds for erosion, washout, and accumulated sediment and debris.
- Remove accumulated sediment and debris and repair damages as necessary.