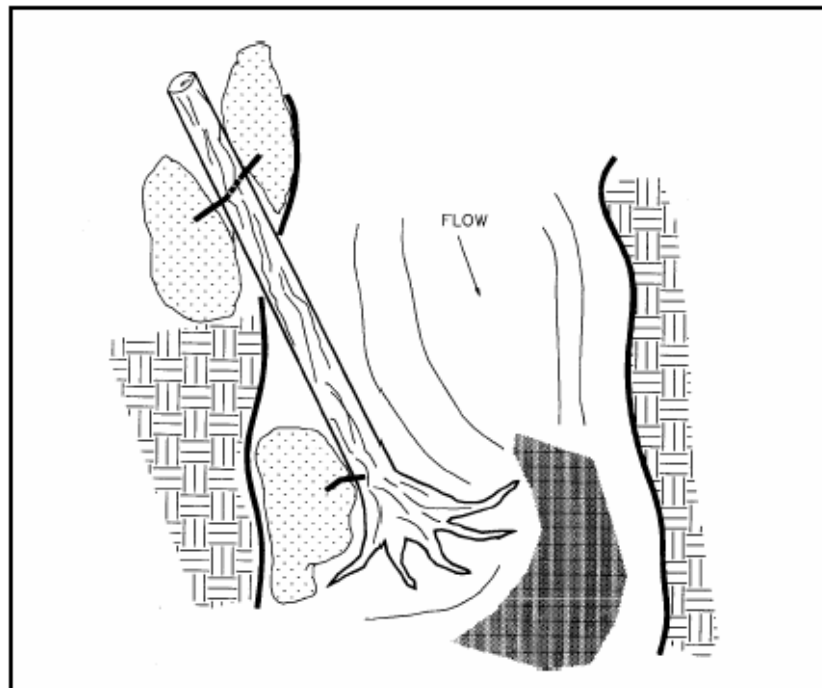
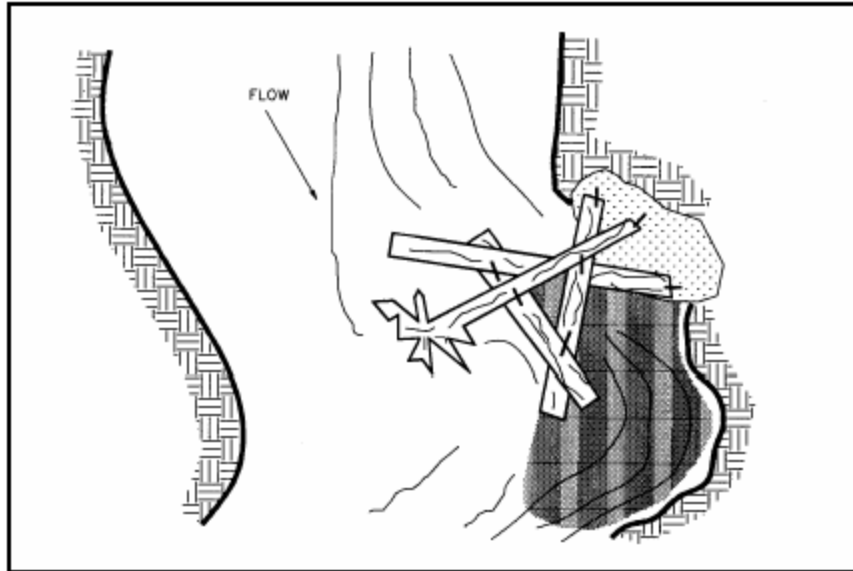


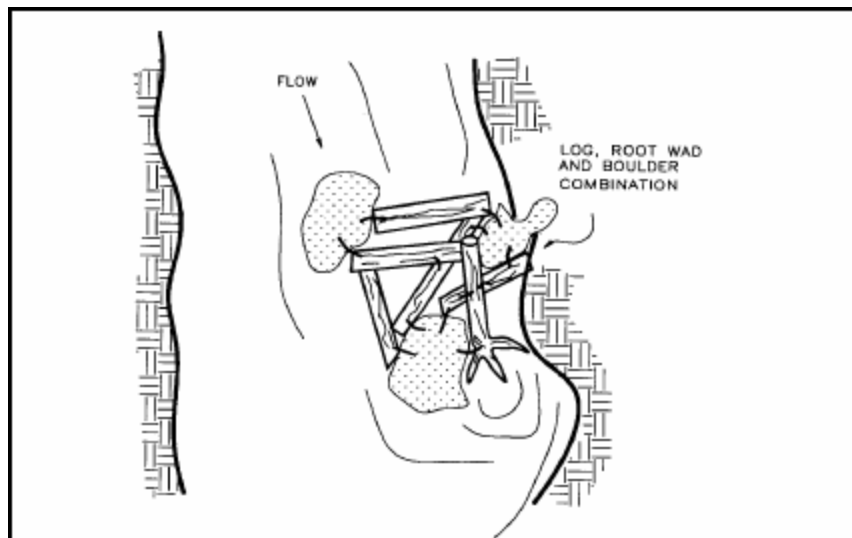
Divide Log



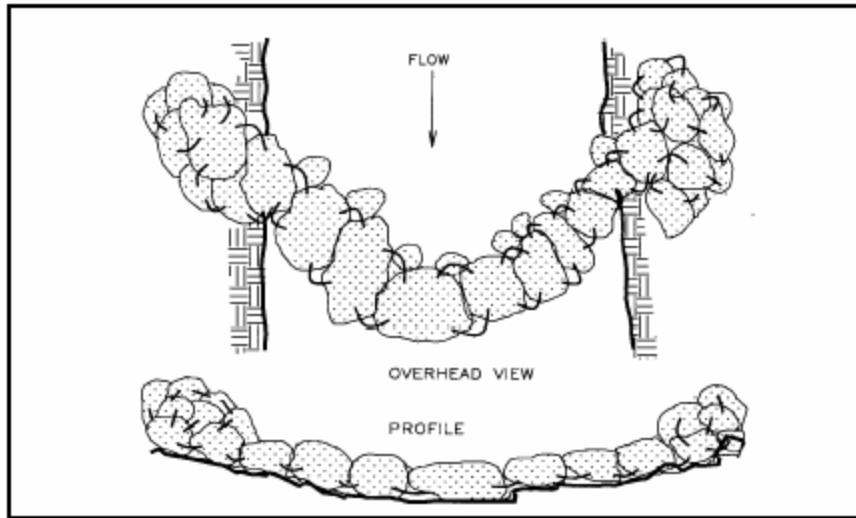
Digger Log



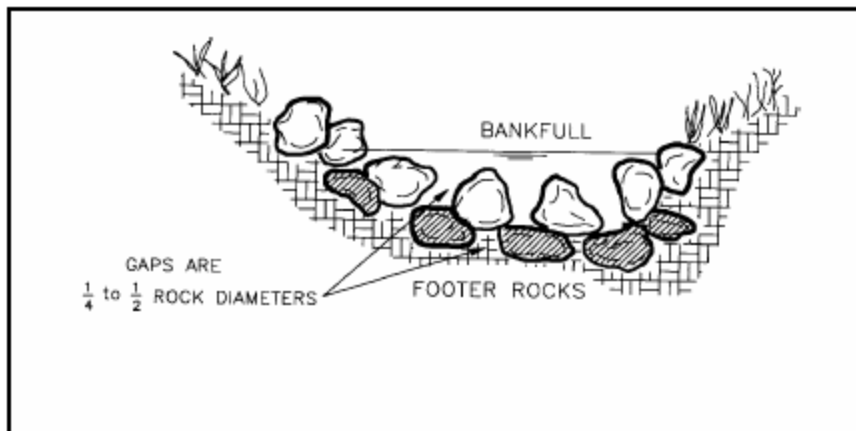
Spider Logs



Log, root wad, and boulder combination



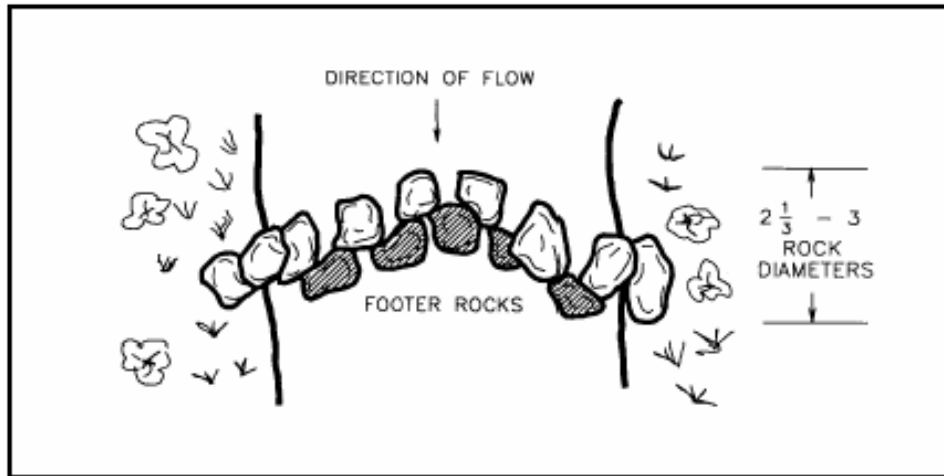
Downstream-V boulder weir



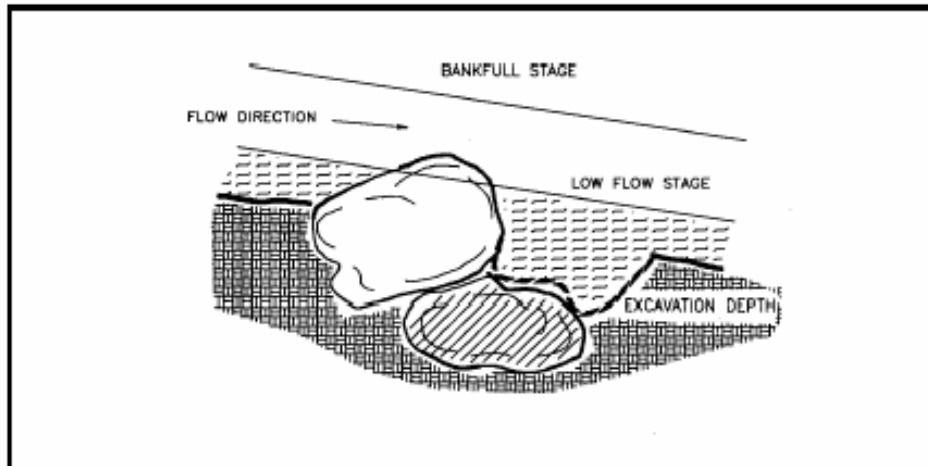
Vortex boulder weir, cross section view (Rosgen, 1993)

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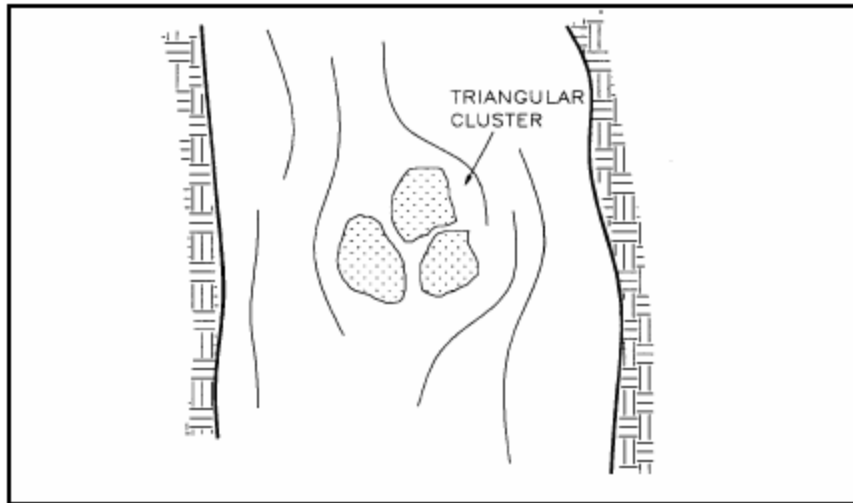
Vortex boulder weir, plan view (Rosgen, 1993)



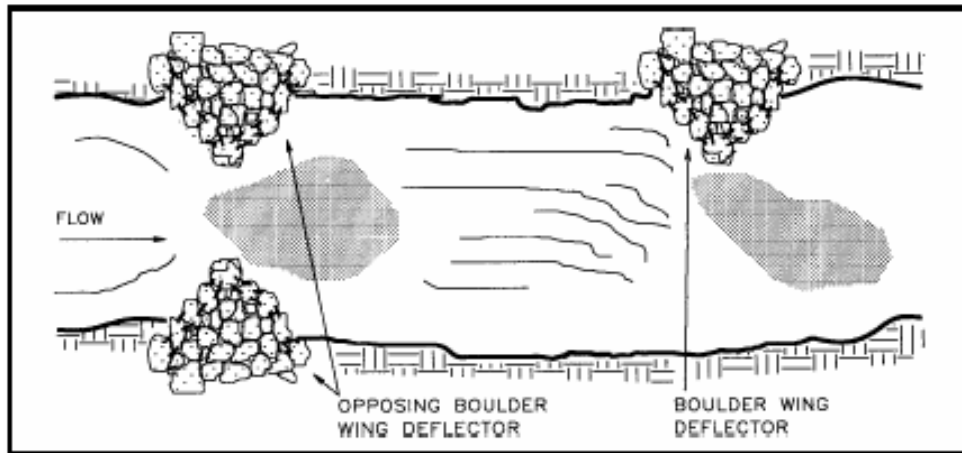
Vortex boulder weir, profile view (Rosgen, 1993)

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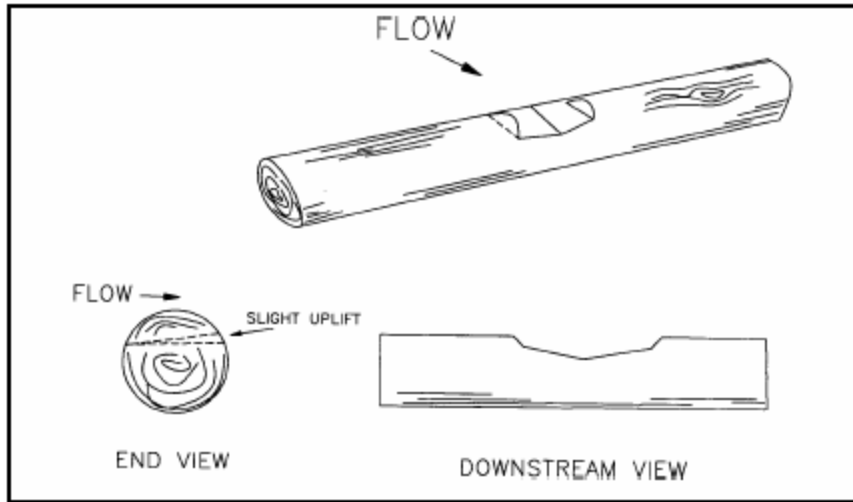
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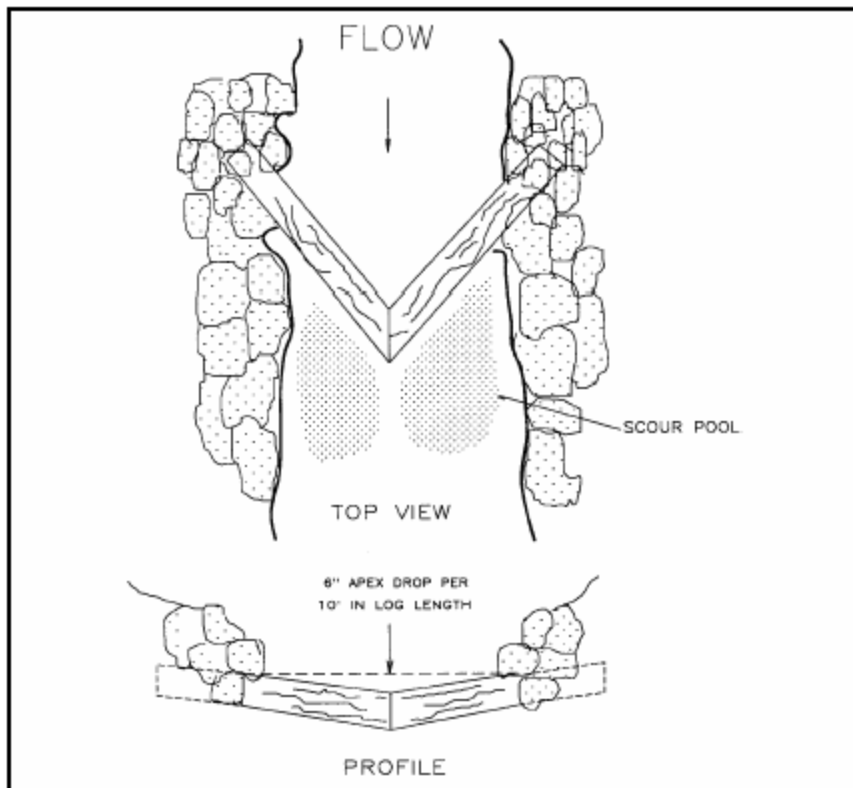
Boulder cluster



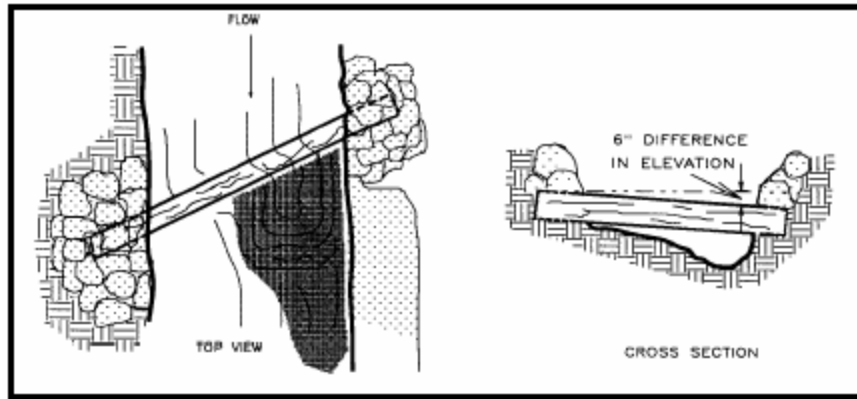
Single and opposing boulder wing-deflectors



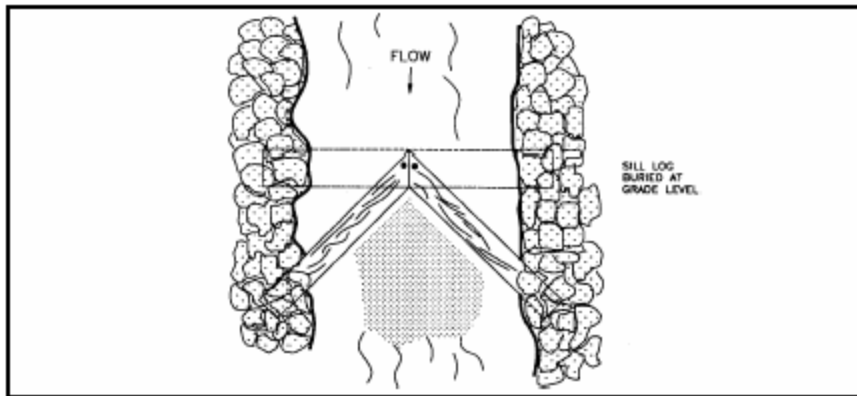
Straight log weir with low-flow notch



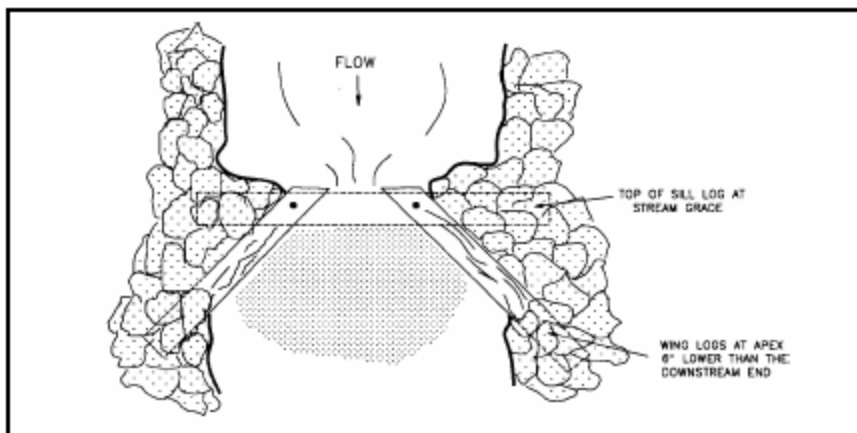
Downstream-V log weir



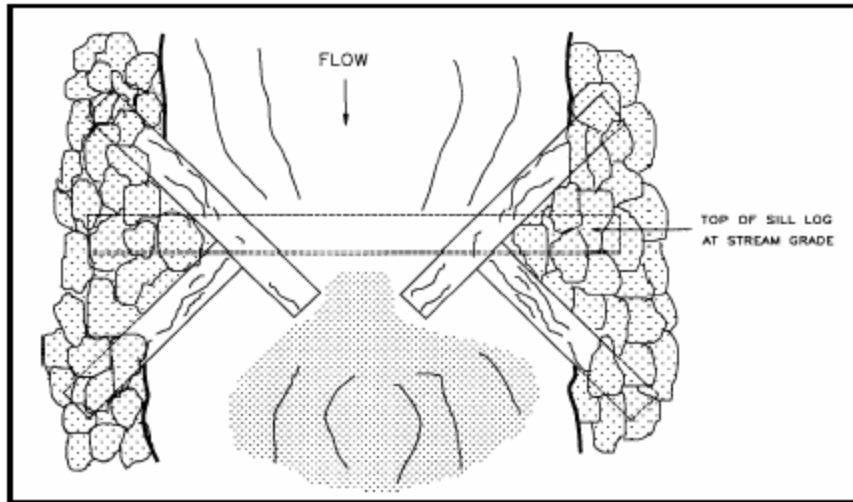
Diagonal log weir



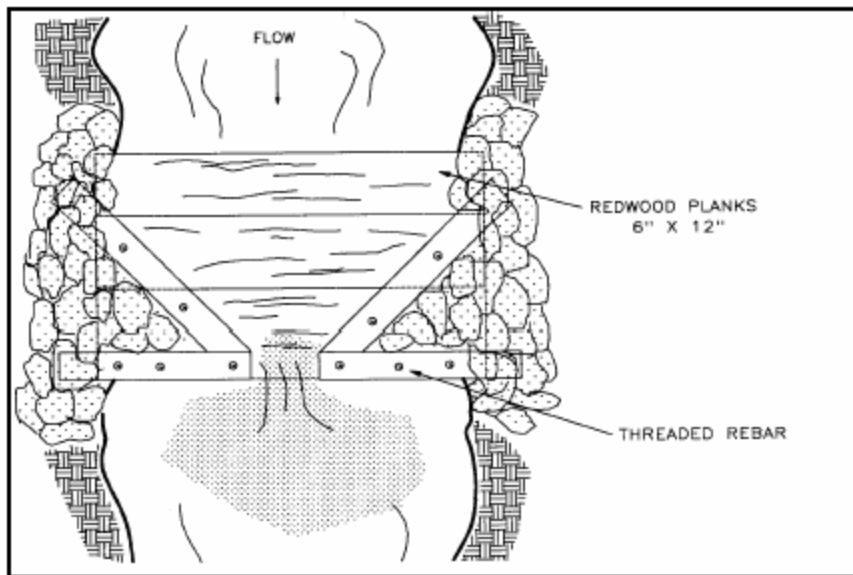
Upstream-V log weir



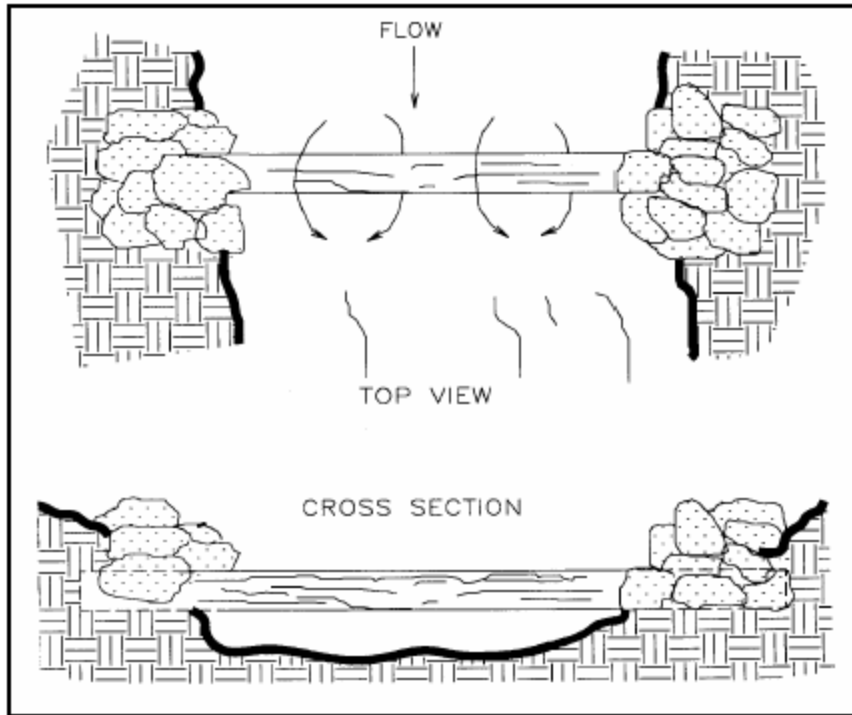
Upstream-V log weir with a low-flow notch



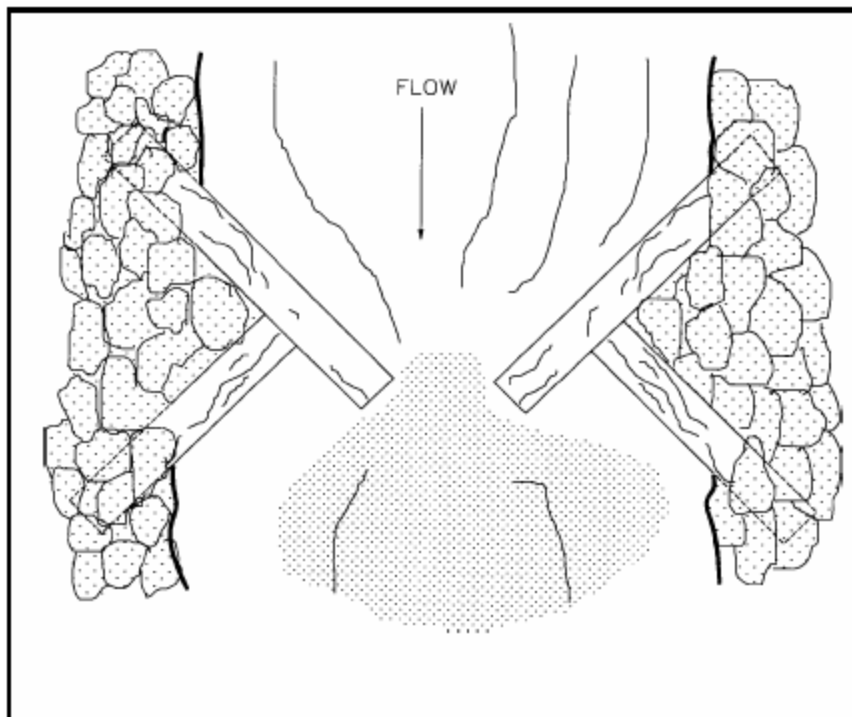
Opposing log deflectors over a sill log



Log constrictors over planks



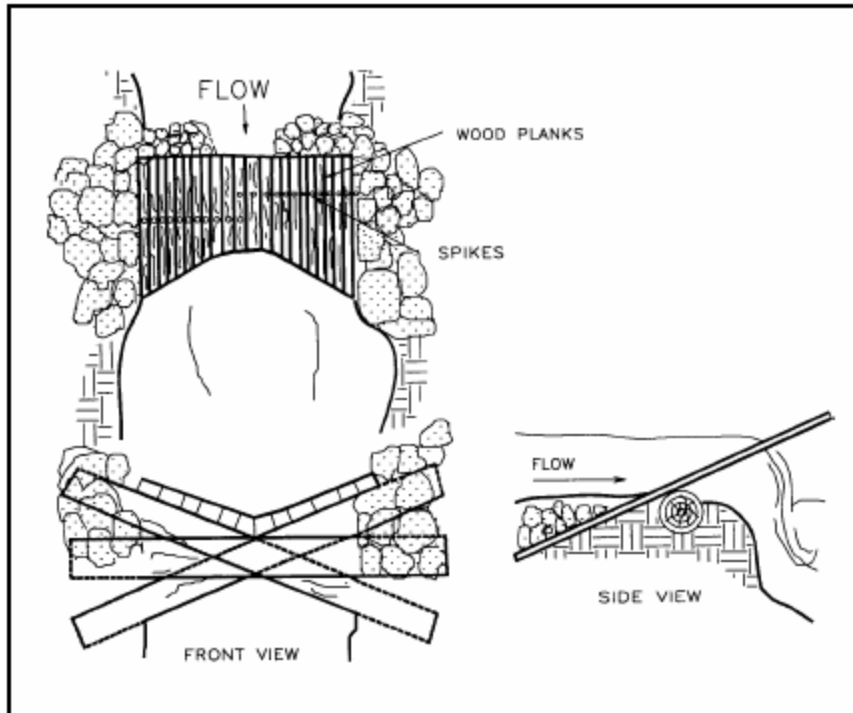
Upsurge weir



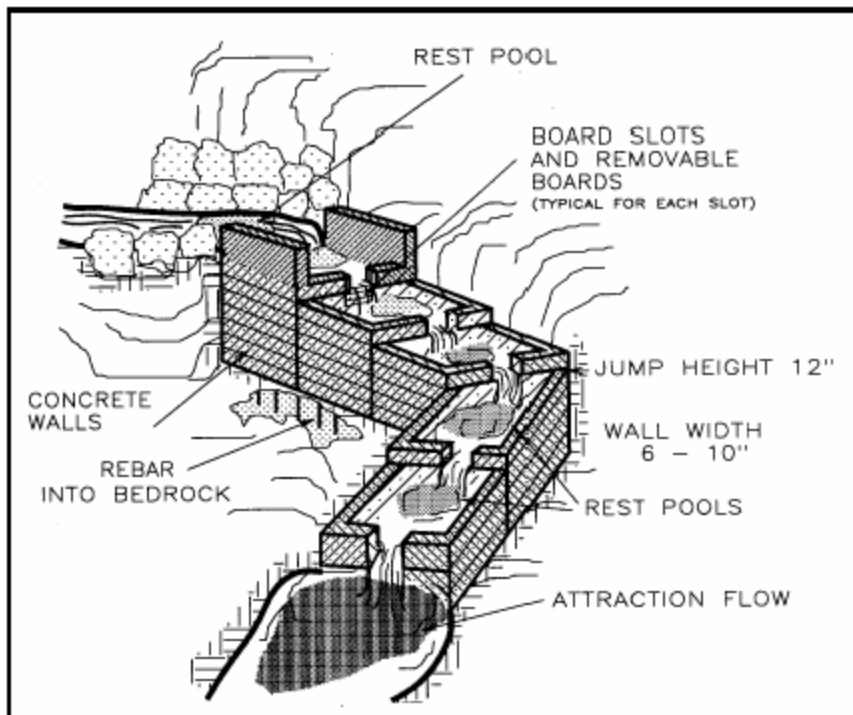
Opposing log wing-deflector

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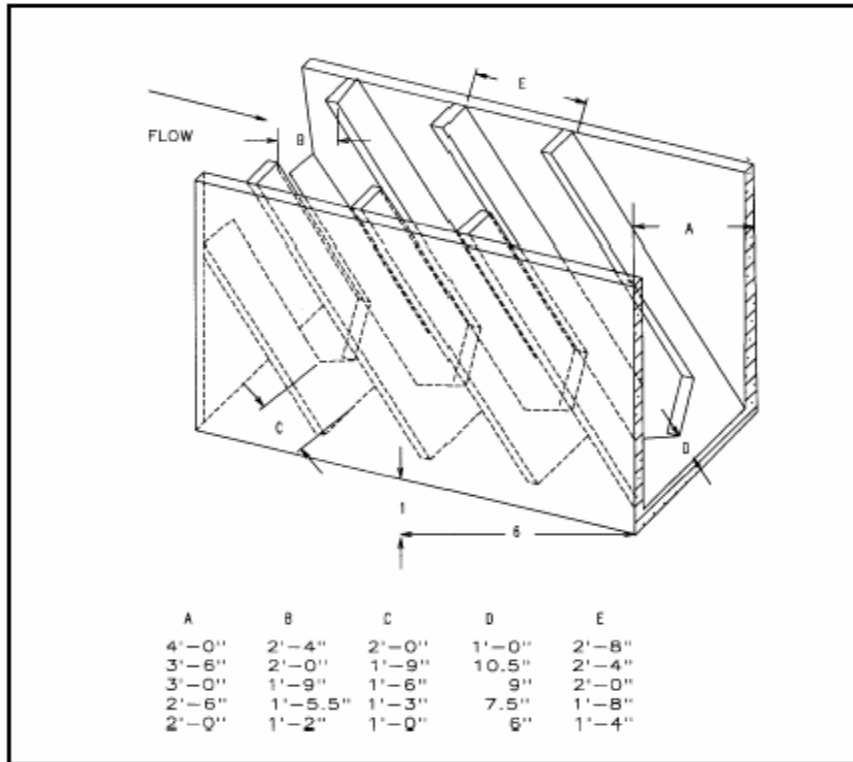
Hewitt ramp



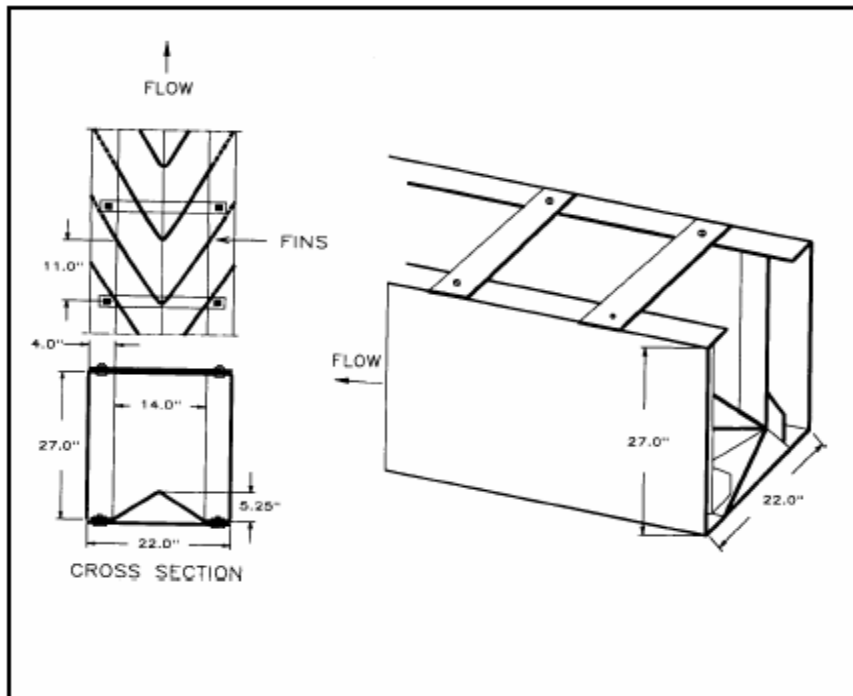
Step-and-pool fishway

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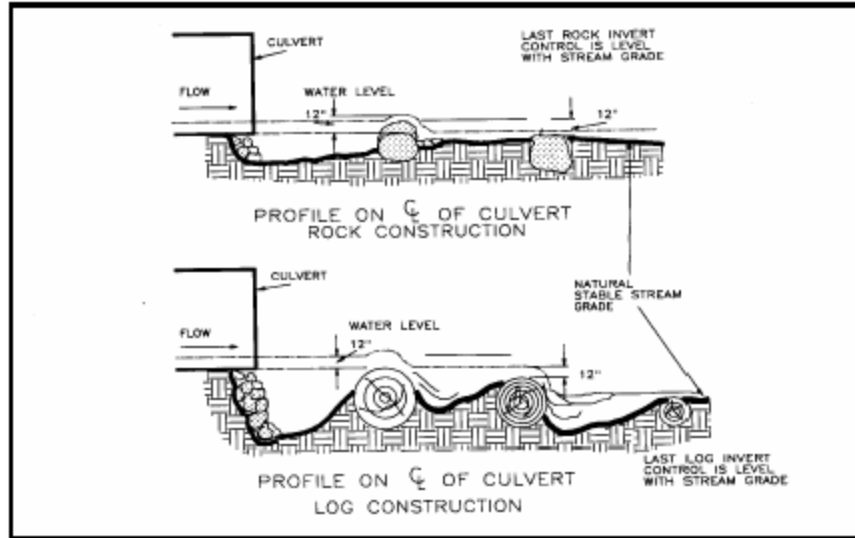
Denil fishway



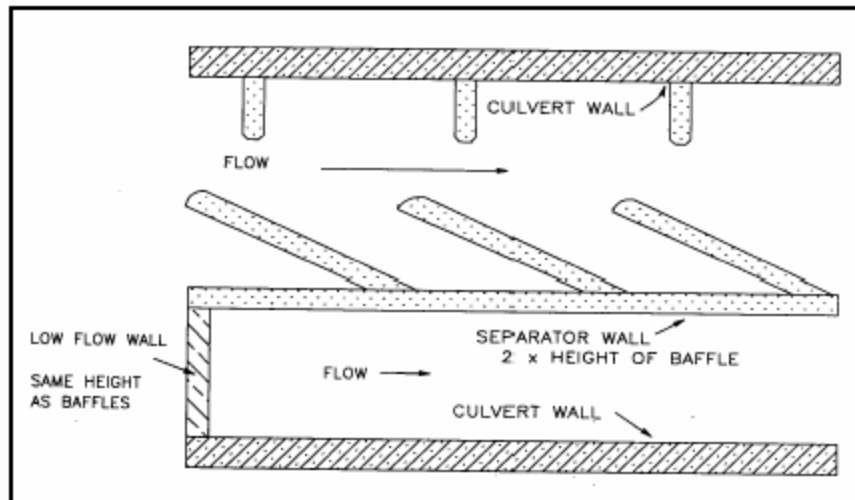
Alaskan step-pass

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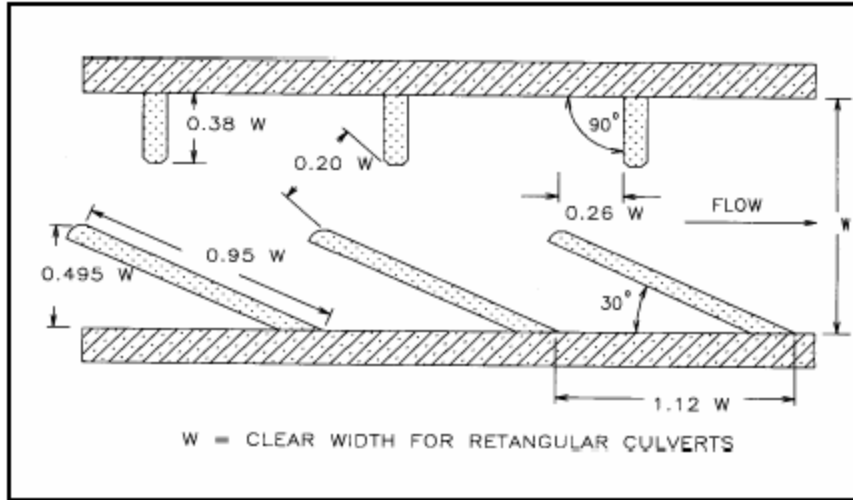


Back-flooding weirs

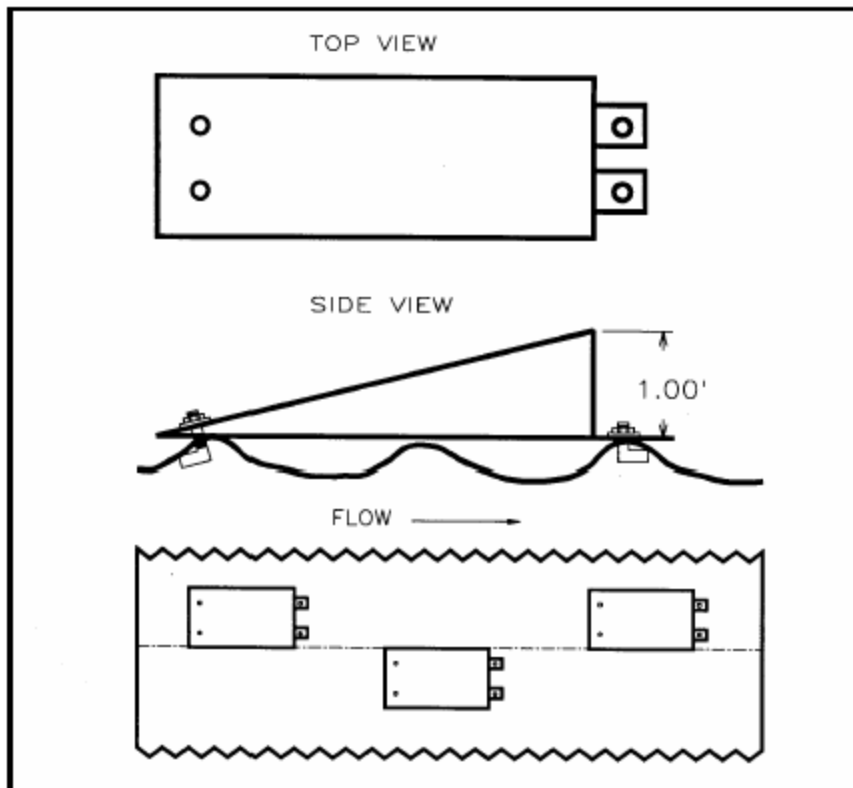


Washington baffles with a separator wall

(*Stream Enhancement Guide*, British Columbia Ministry of Environment, 1980, p. 42)



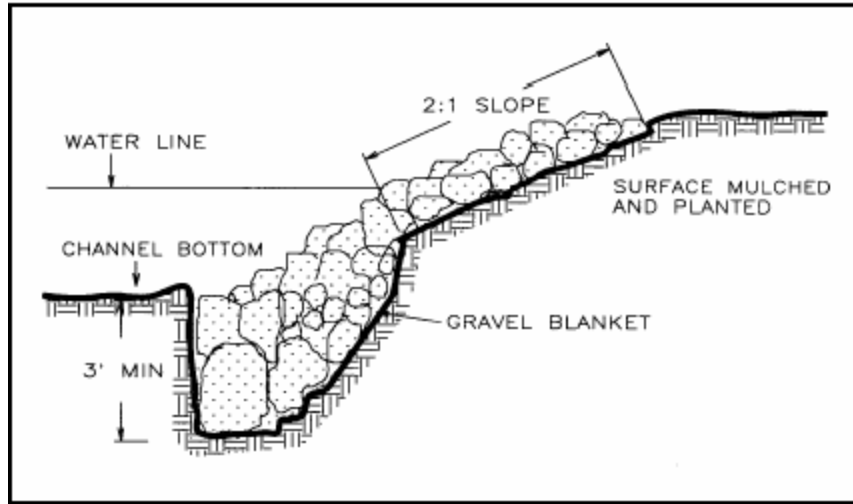
Washington baffles
 (*Stream Enhancement Guide*, British Columbia Ministry of Environment, 1980, p. 42)



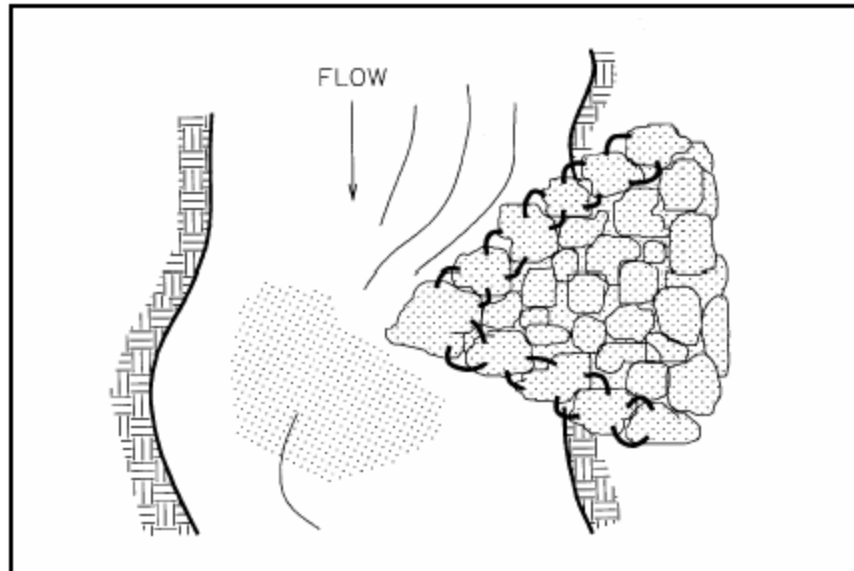
Corrugated metal pipe steel ramp baffles

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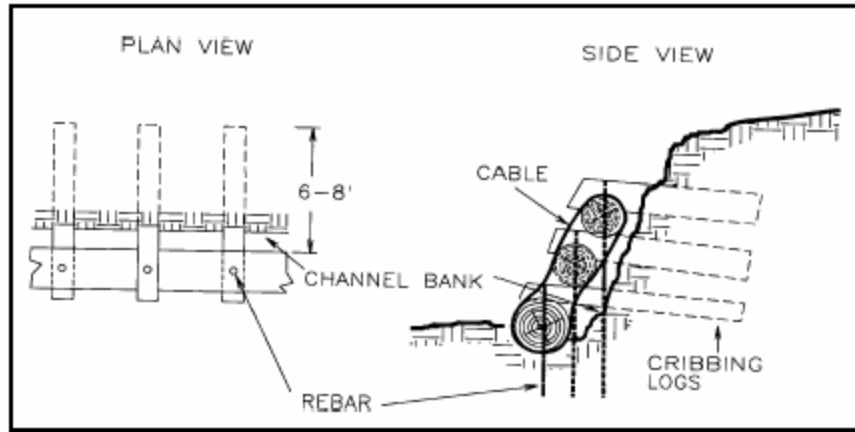
Riprap



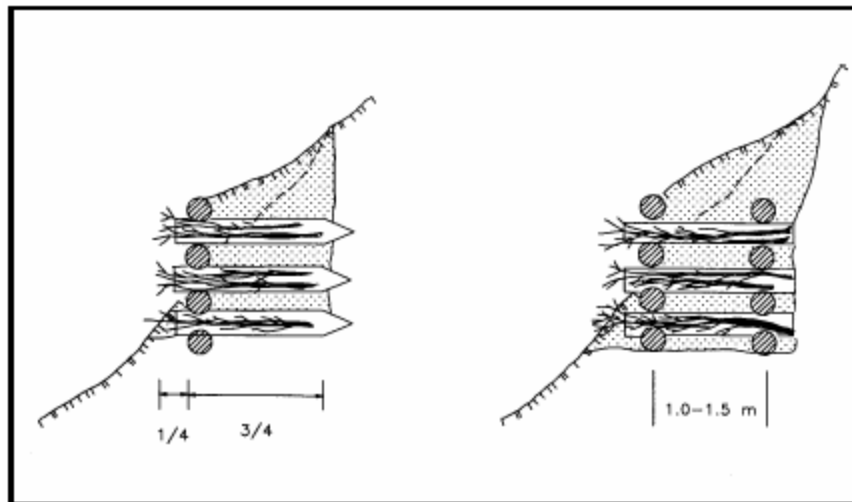
Boulder wing-deflector

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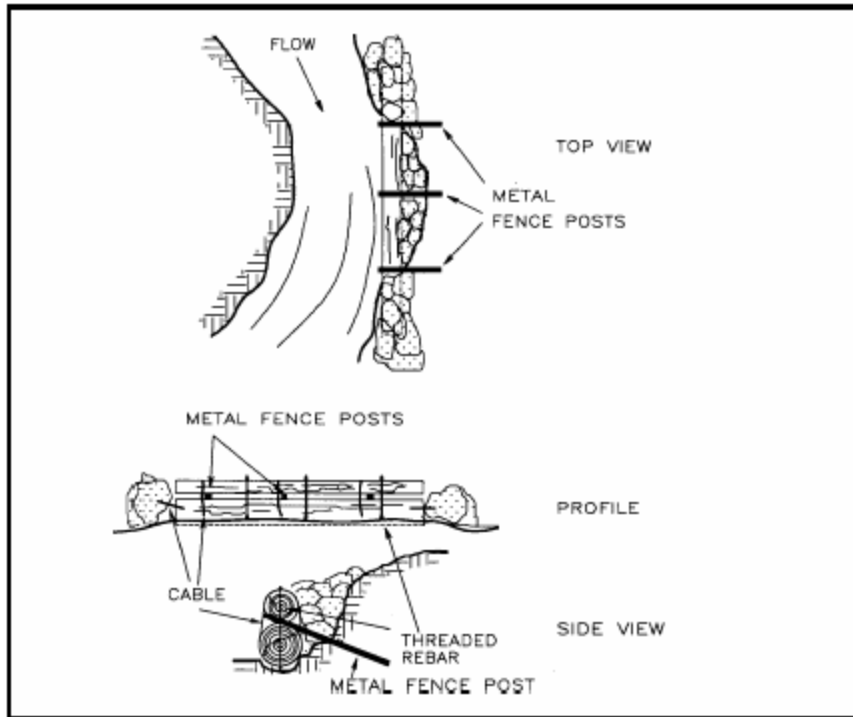
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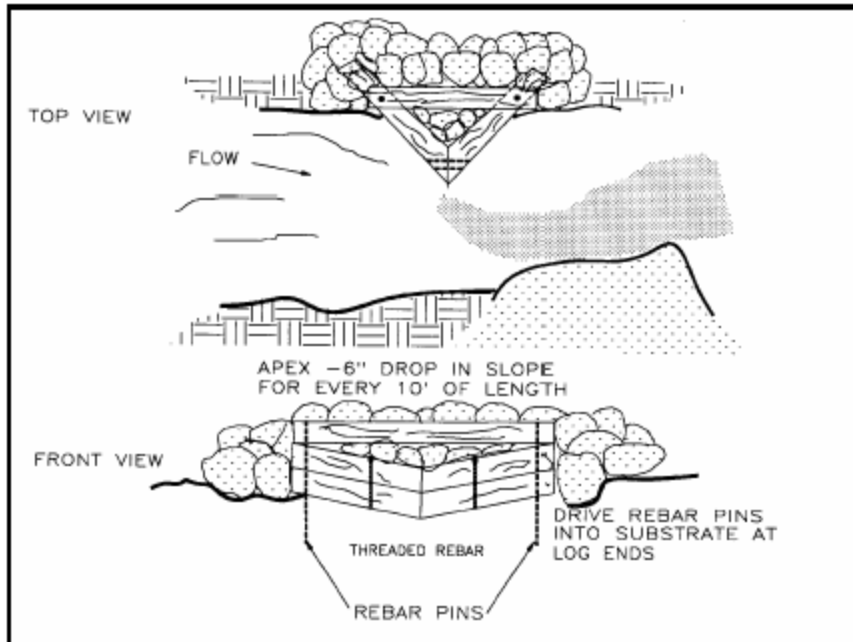
Log Cribbing



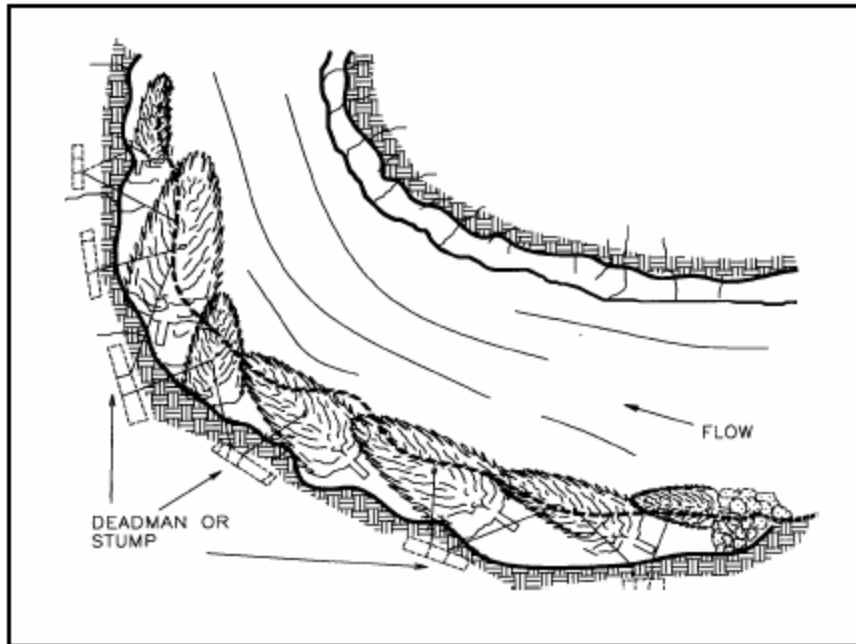
Live Vegetative Crib Wall (Scheichtl and Stern, 1996)



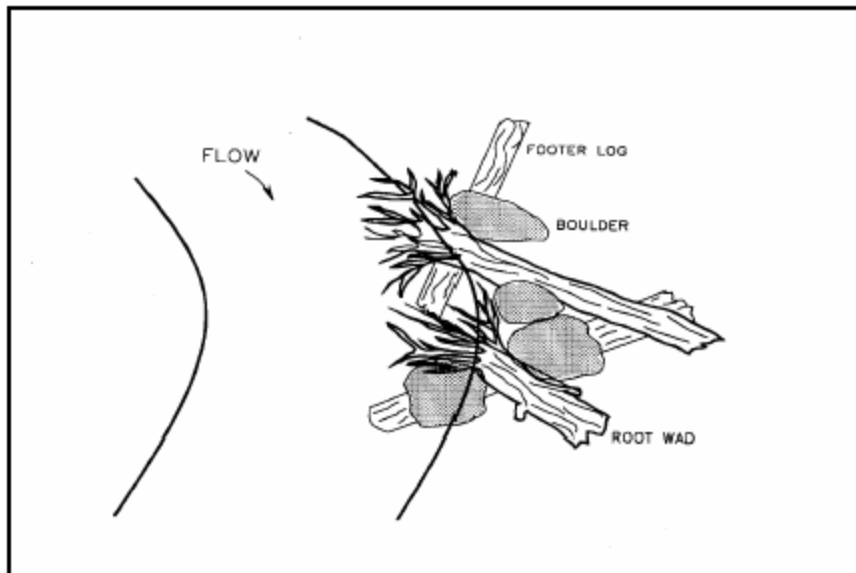
Log bank armor



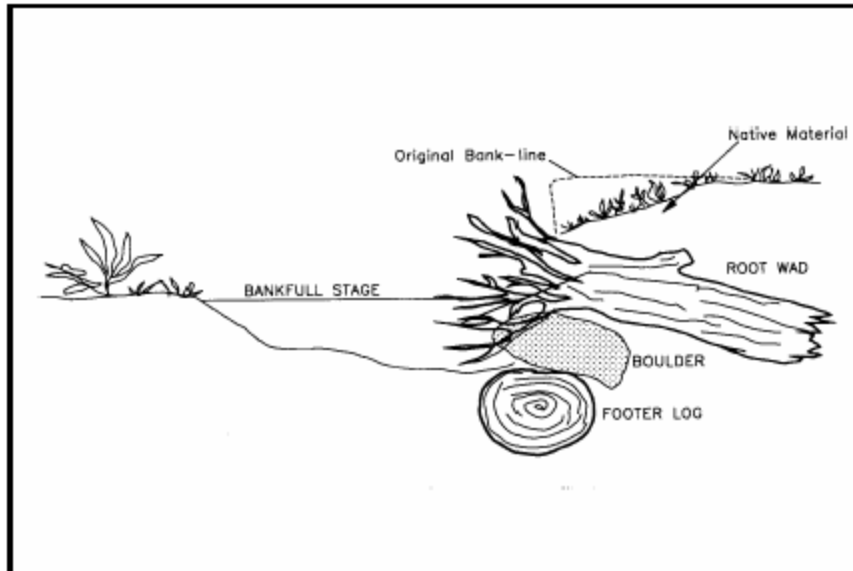
Log wing-deflector



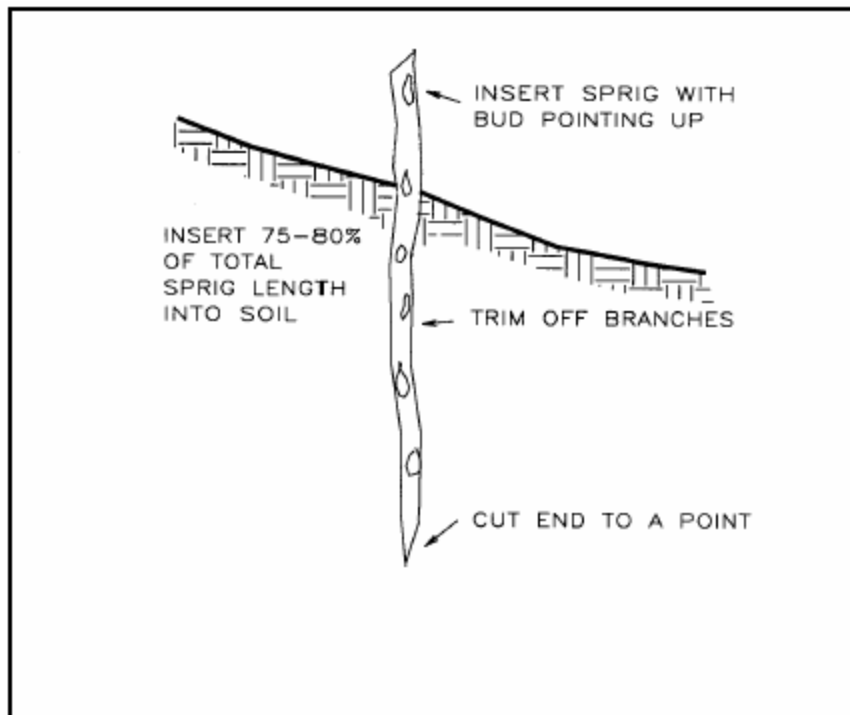
Tree revetment



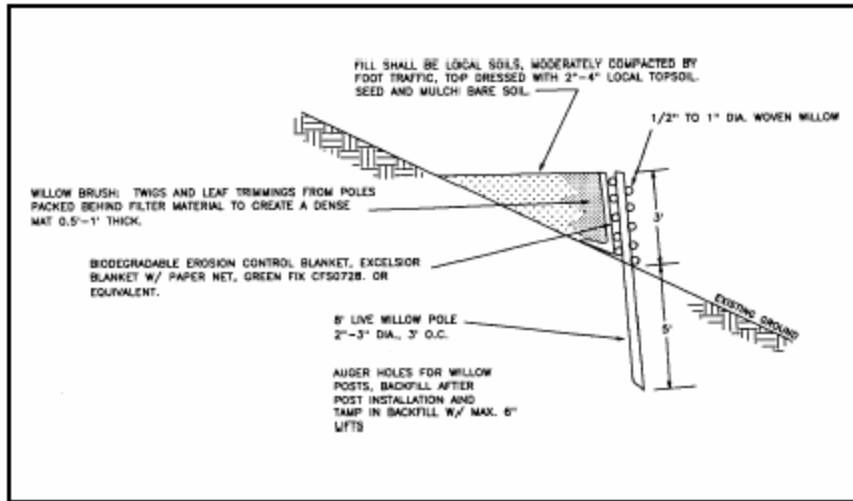
Plan view of native material revetment (Rosgen, 1993)



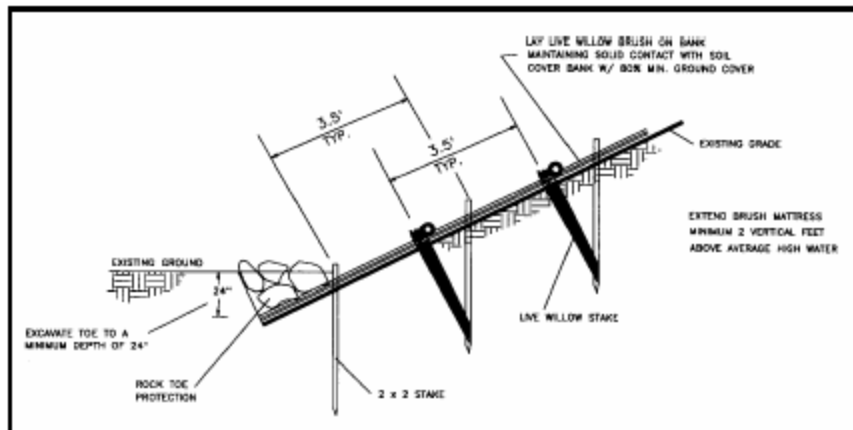
Native material revetment (Rosgen, 1993)



Willow sprigging (Prunuske, 1987)



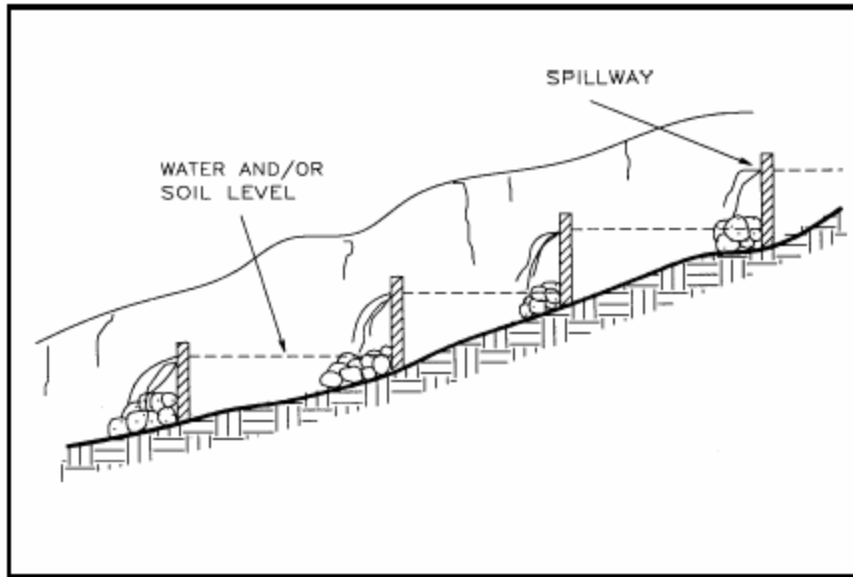
Willow Wall Revetment (L. Prunuske, 1997)



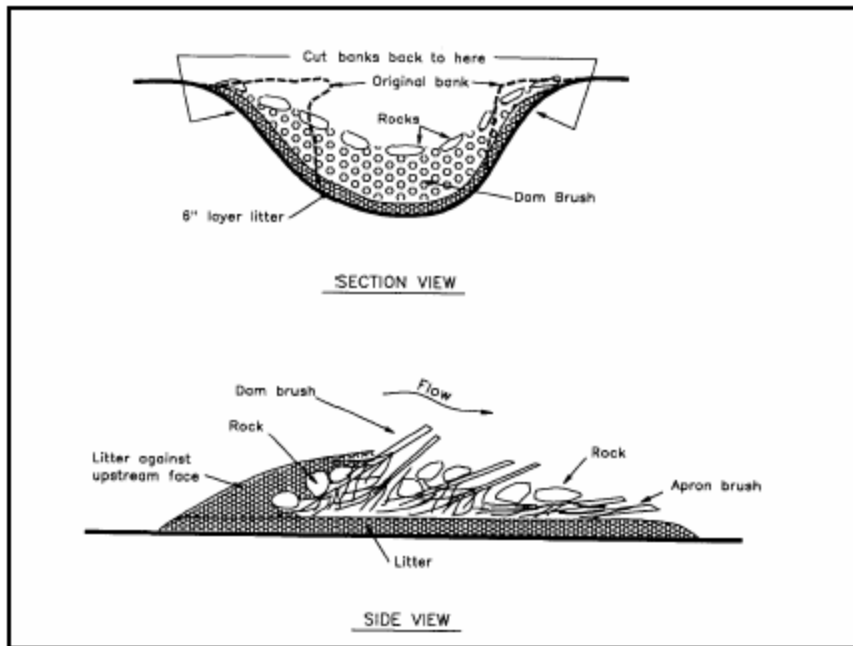
Brush Mattress Cross Section (L. Prunuske, 1997)

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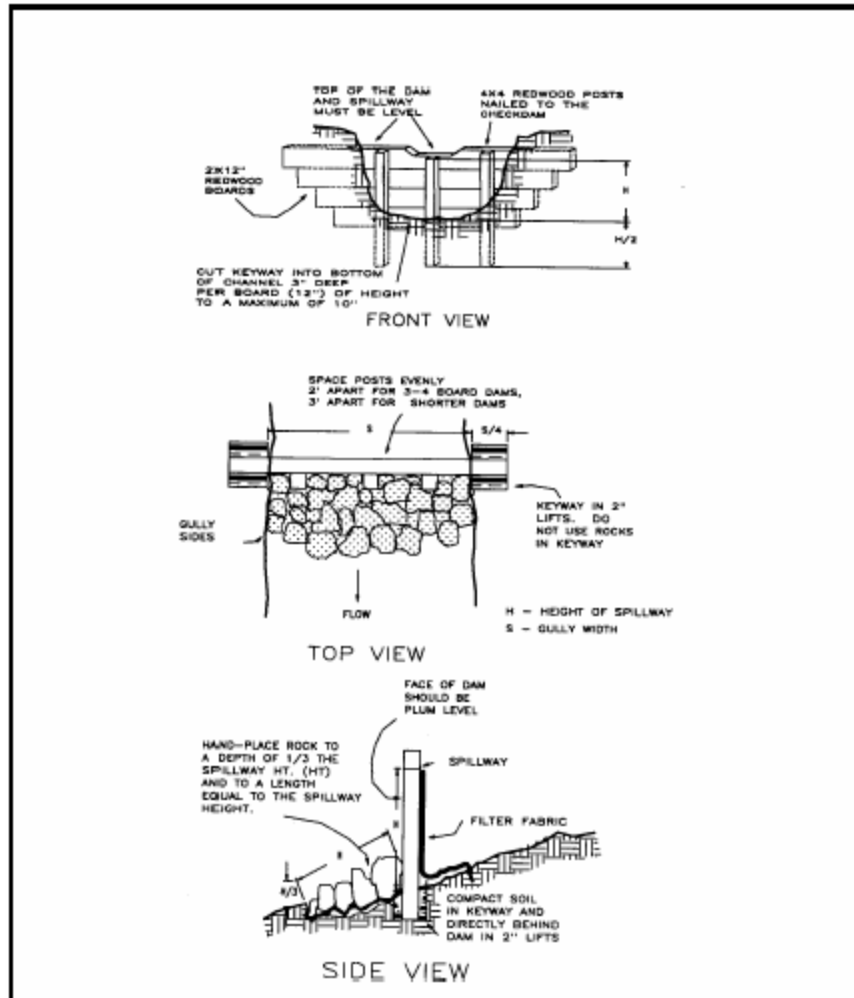
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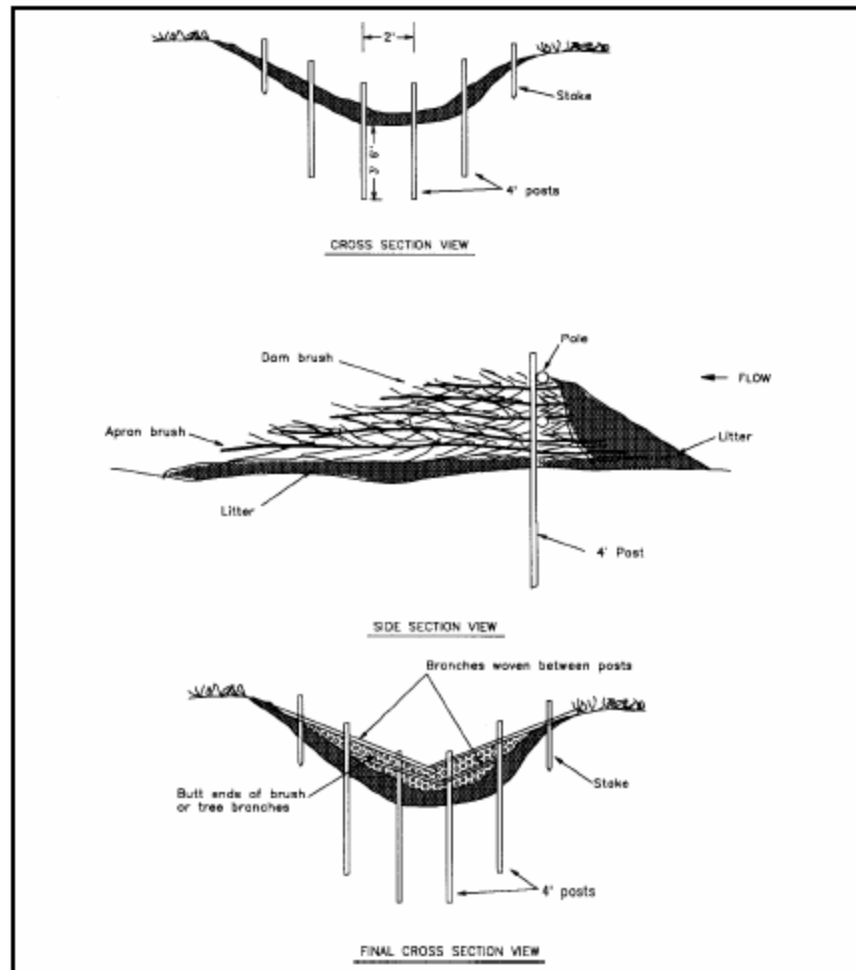
Checkdam placement (Prunuske, 1987)



Brush and Rock Checkdam (Kraebel and Pilsbury, 1934)



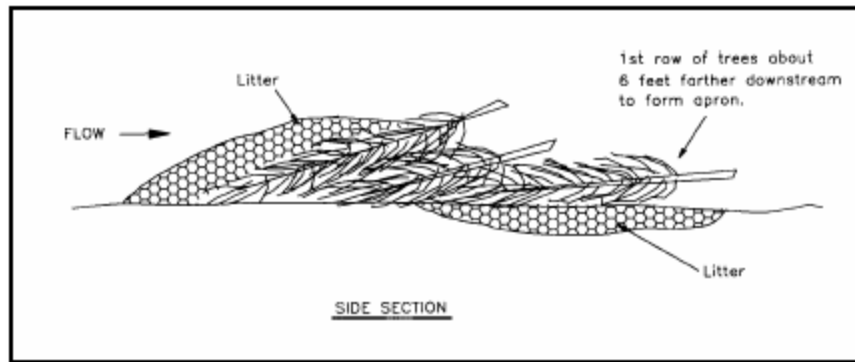
Redwood board checkdam (Prunuske, 1987)



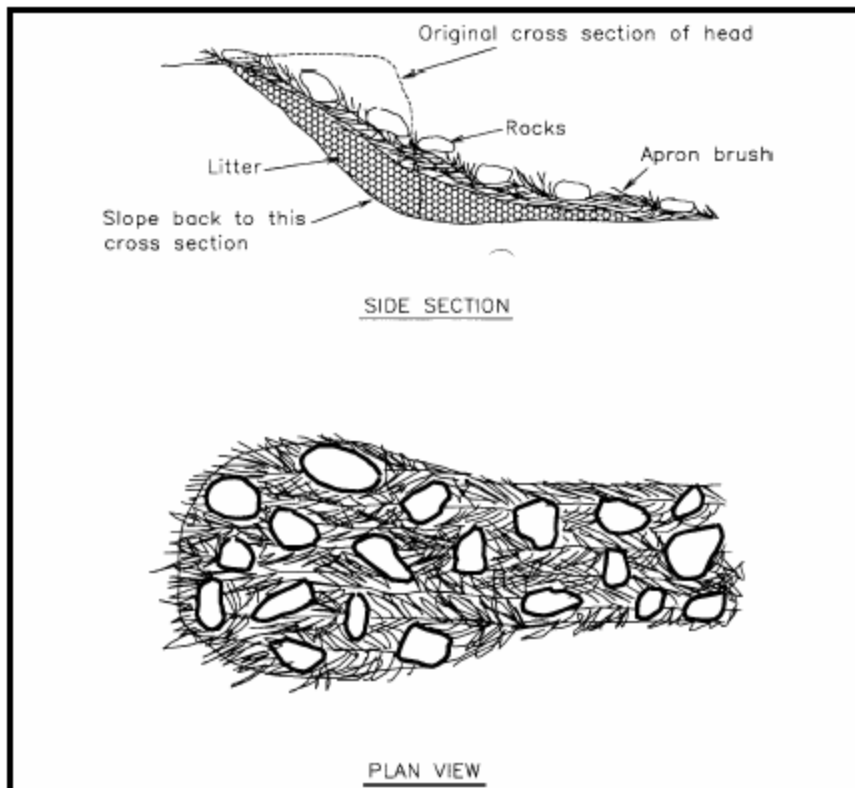
Post Checkdam (Kraebel and Pillsbury, 1934)

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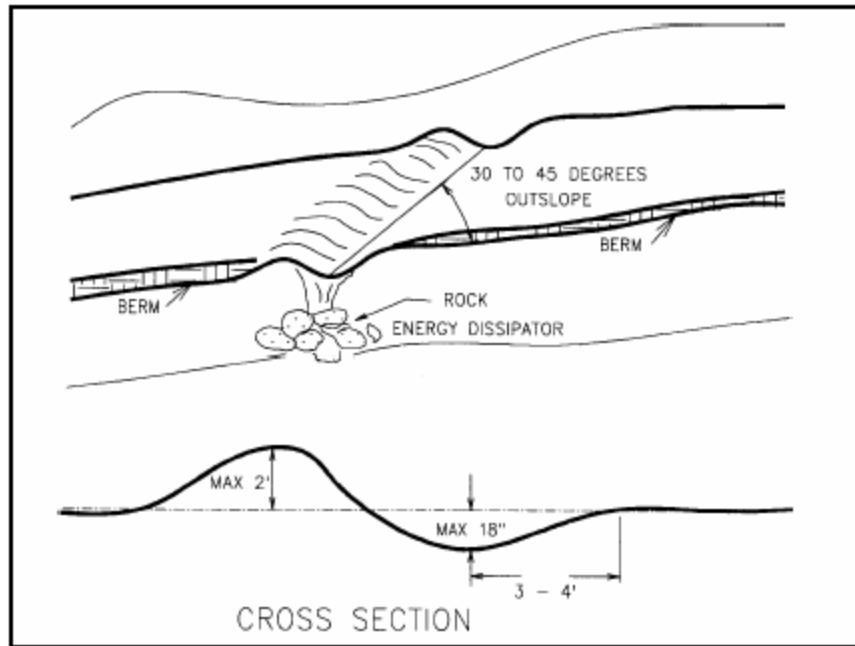
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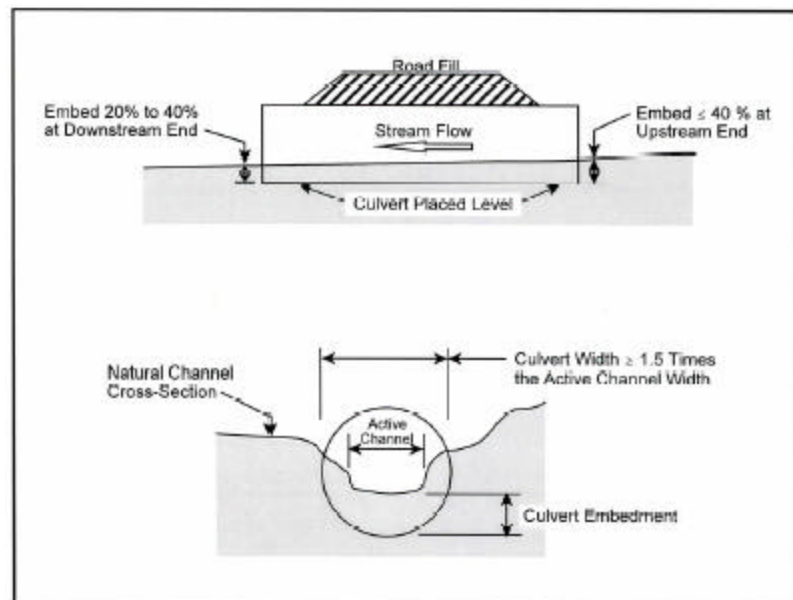
Tree Checkdam (Kraebel and Pillsbury, 1934)



Brush and Rock Mattress (Kraebel and Pillsbury, 1934)



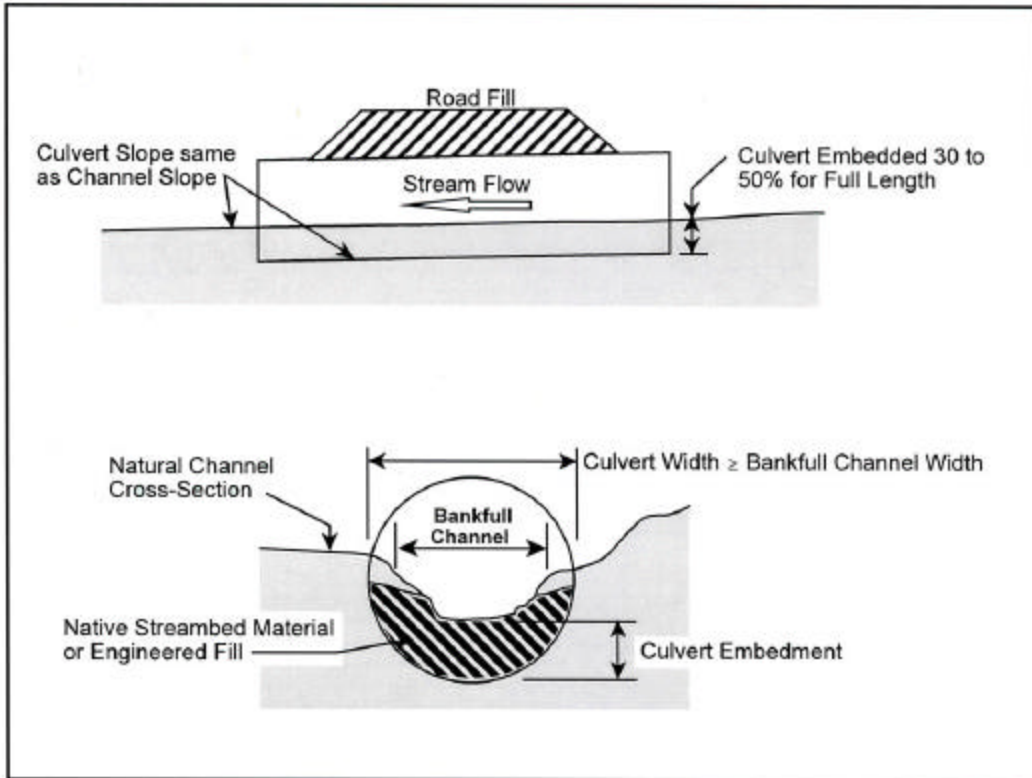
Waterbar



Active channel design option

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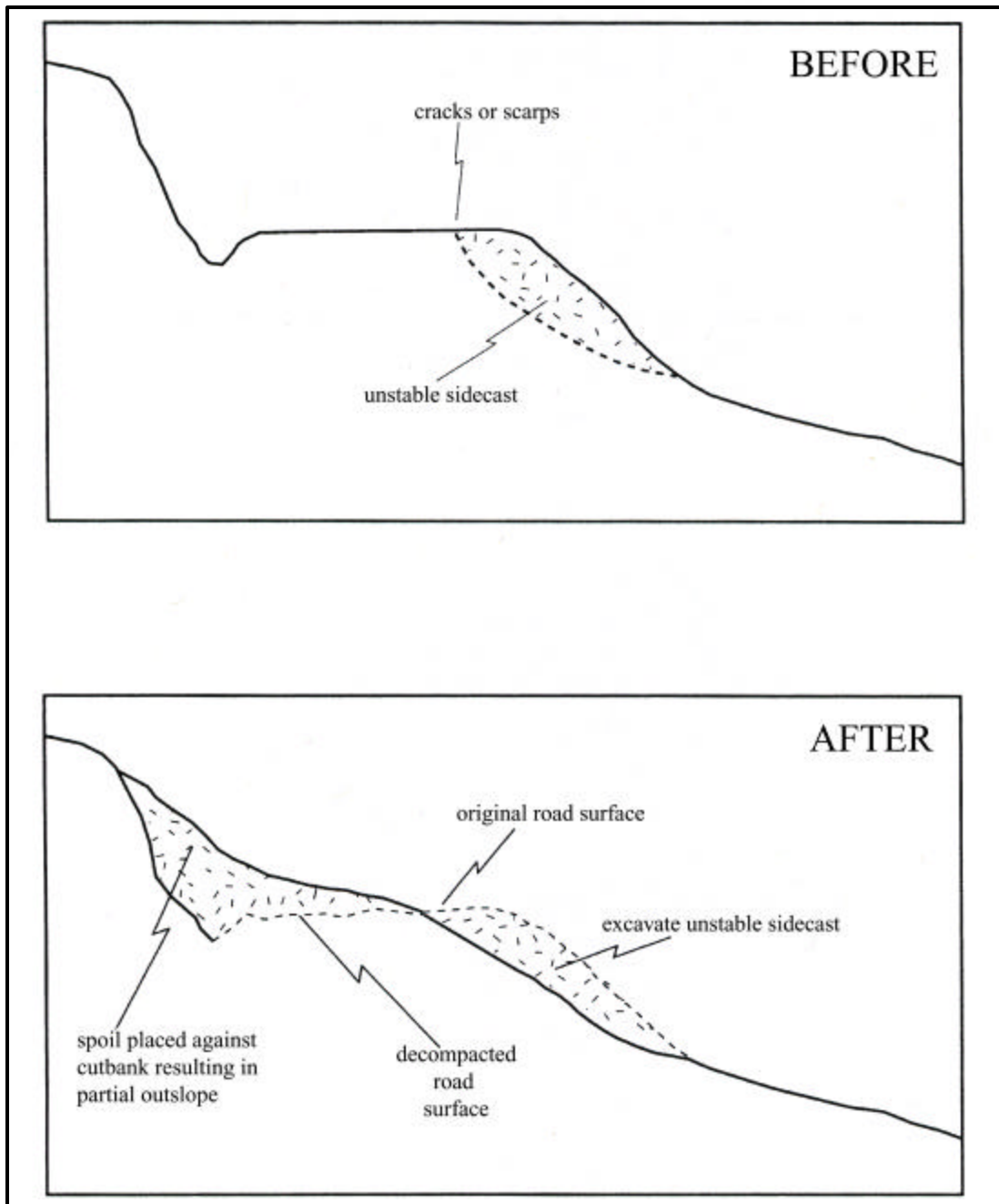
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Stream simulation design option

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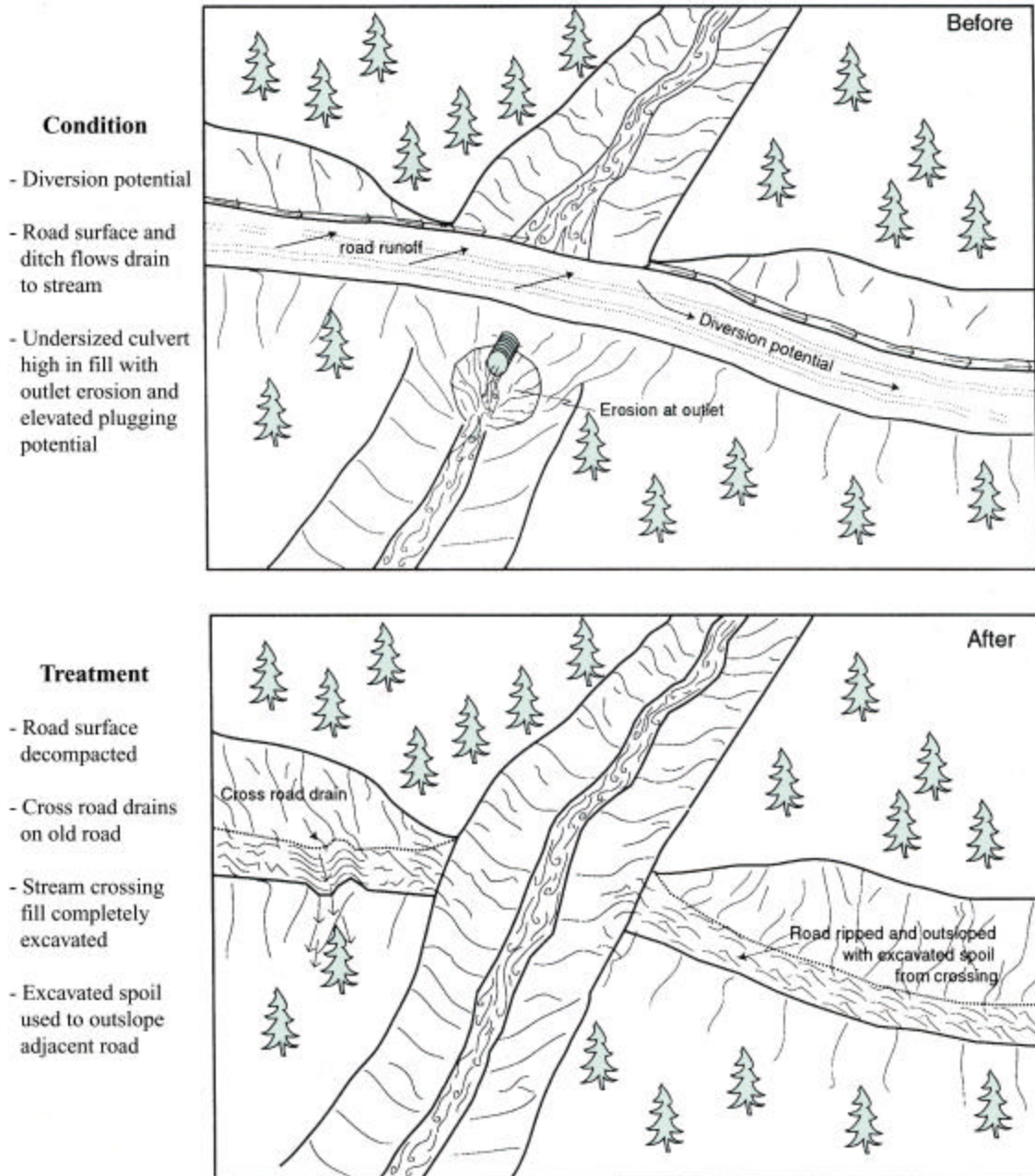
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Ripping or decompaction of the road surface and outsloping to approximate original grade

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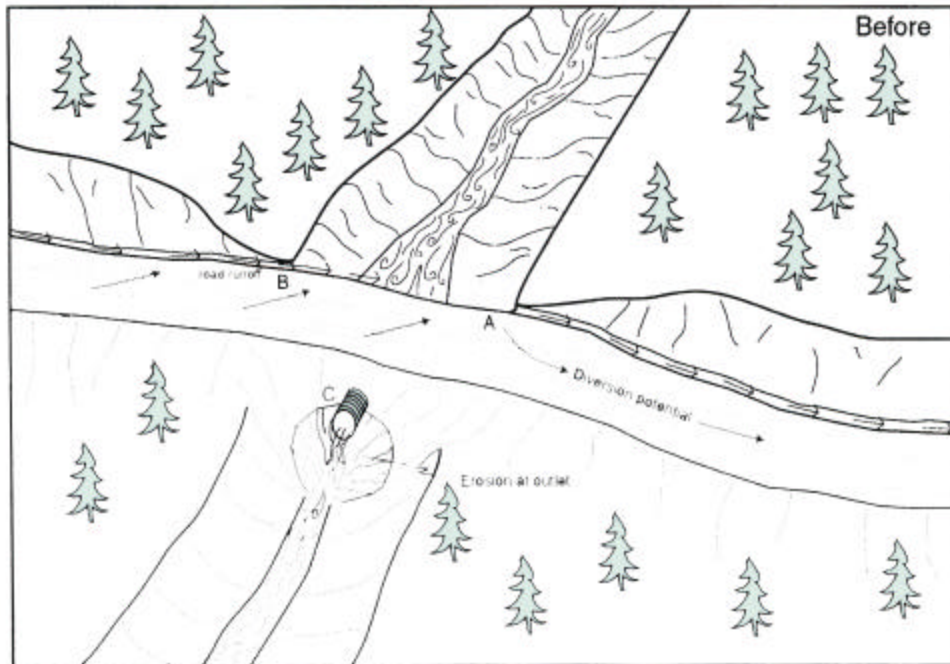
Stream crossing excavations for decommissioning

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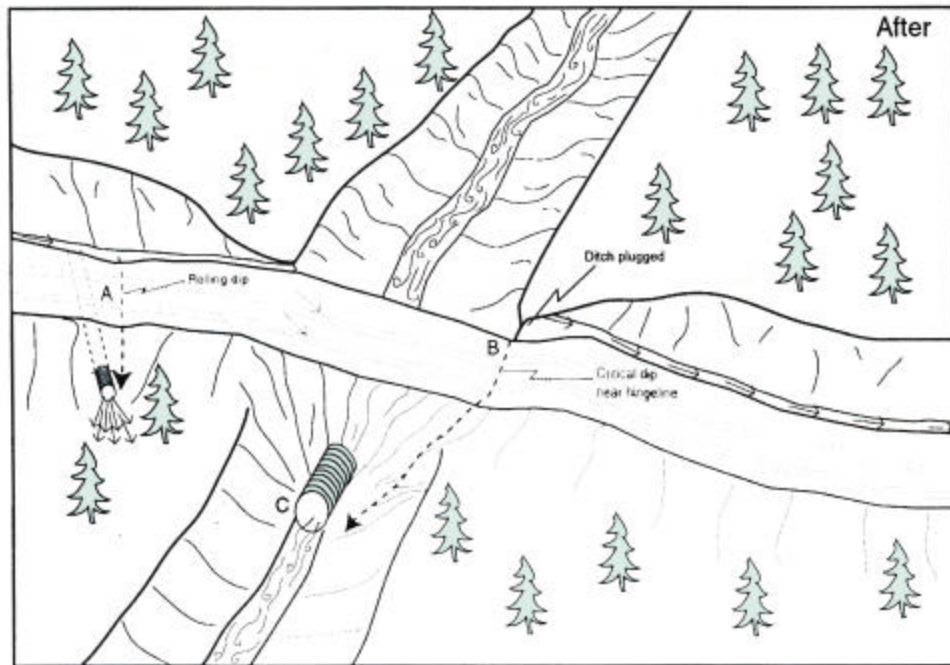
Common Problems

- A - Diversion potential
- B - Road surface and ditch flows drain to stream
- C - Undersized culvert high in fill with outlet erosion

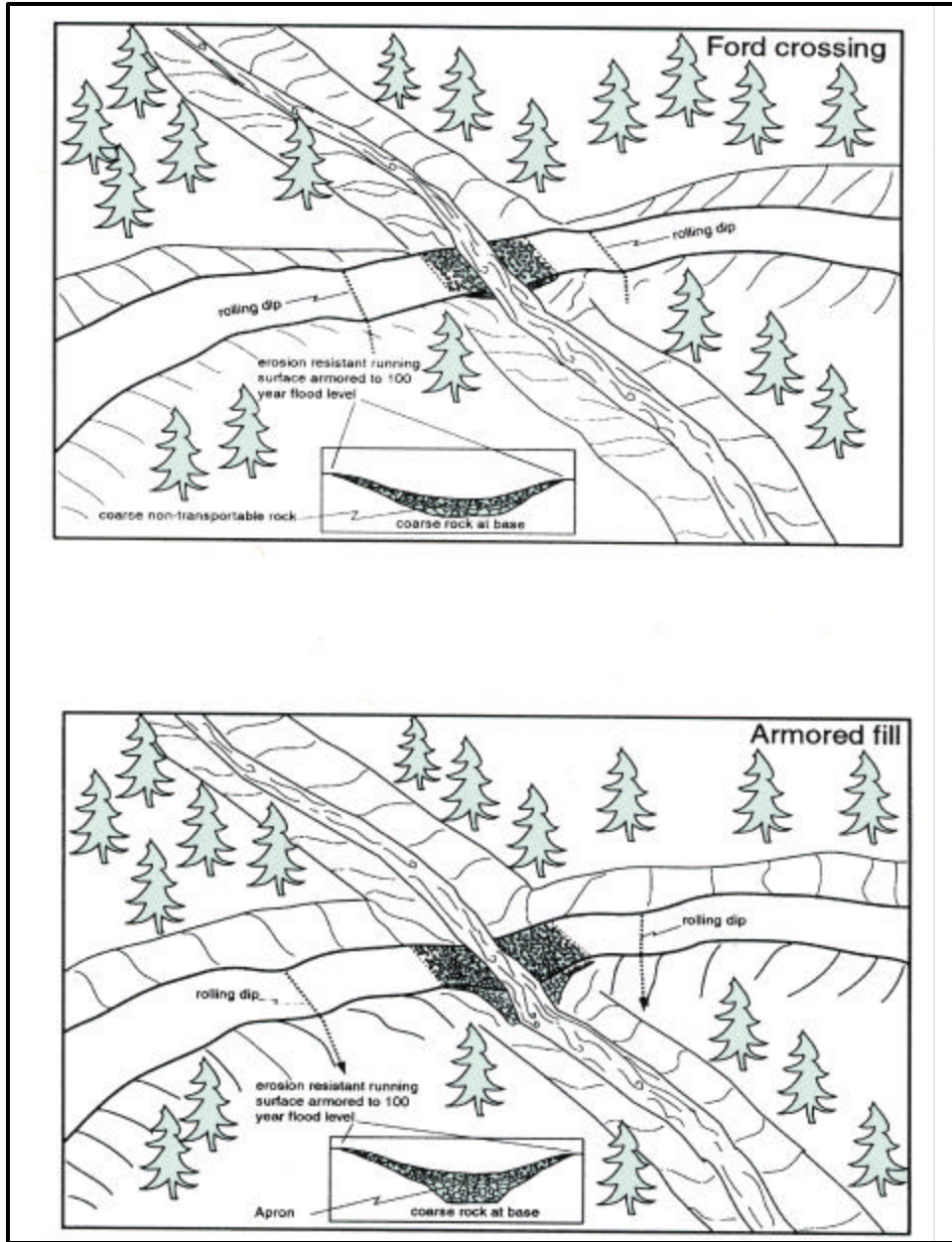


General Standards

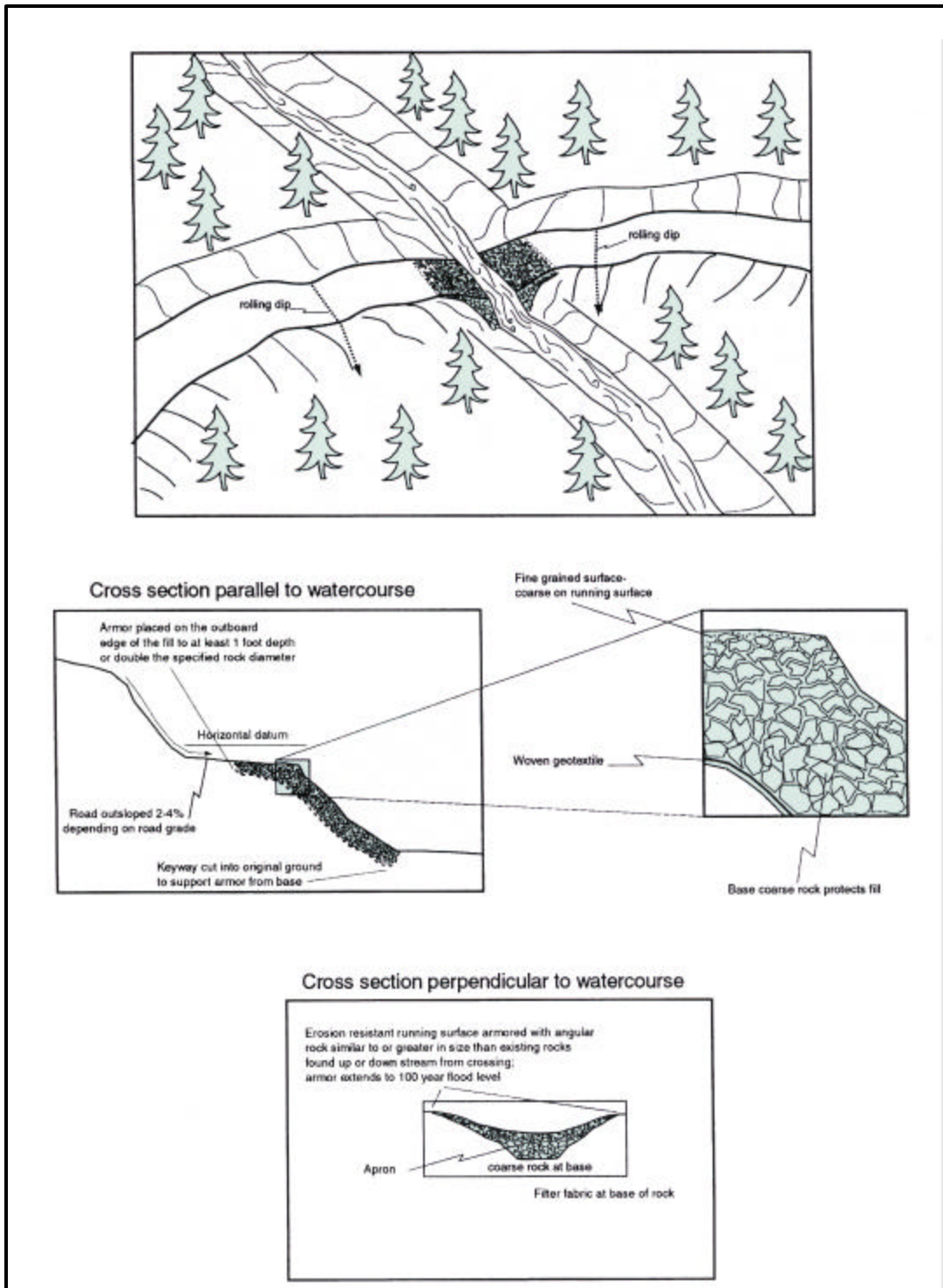
- A - Road surface and ditch "disconnected" from stream
- B - No diversion potential
- C - 100 year culvert set at base of fill



Typical upgraded stream crossing



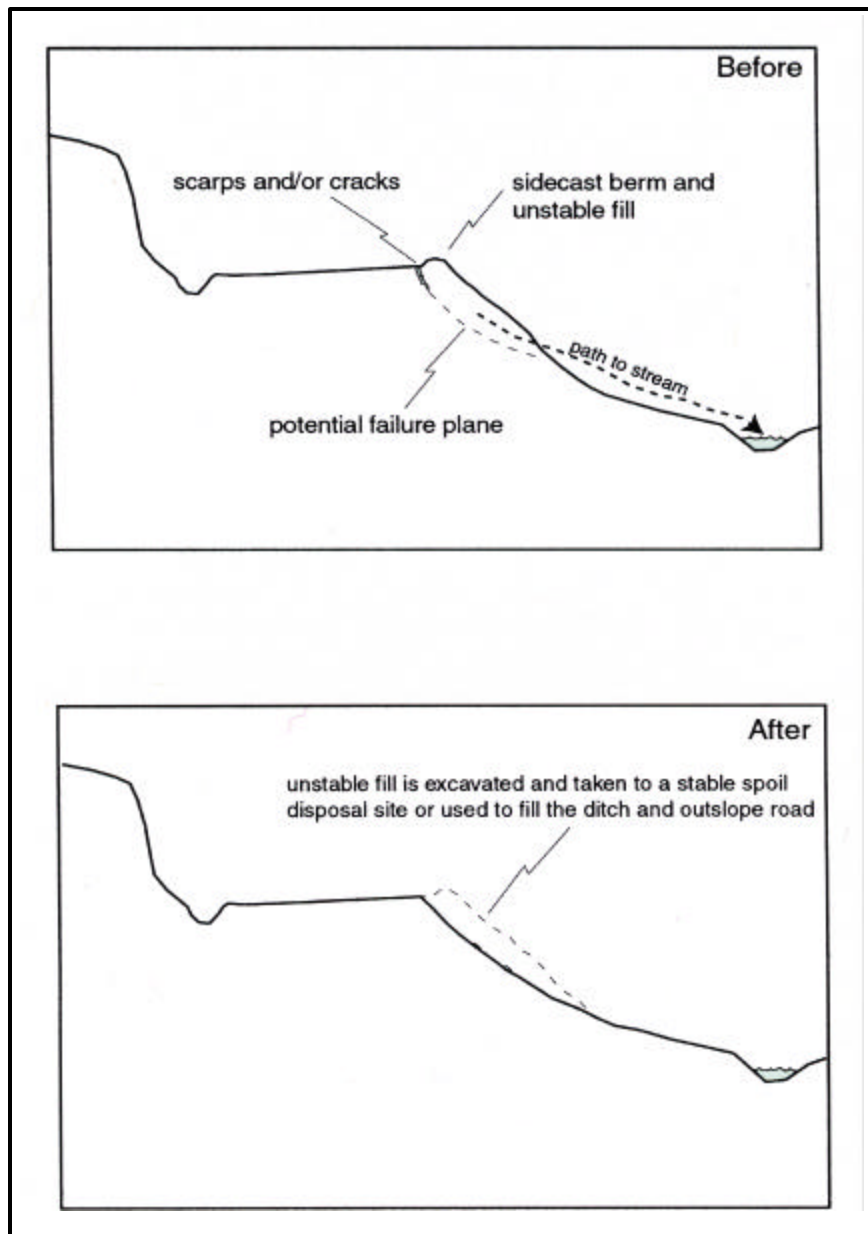
Typical armored fill stream crossing



Installation and specification of typical armored fill crossing

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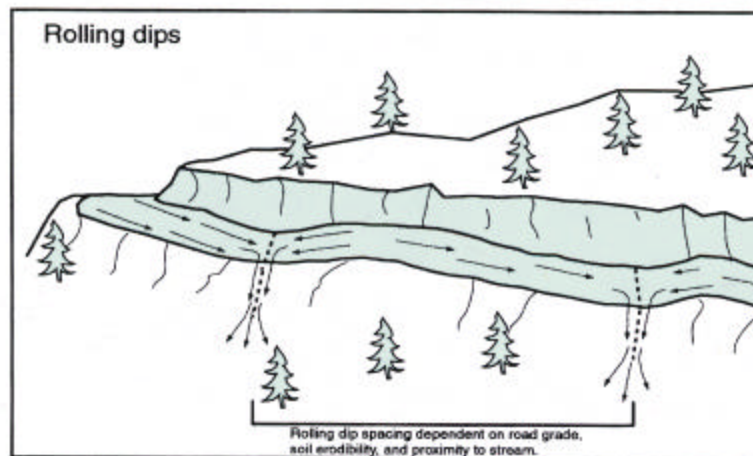
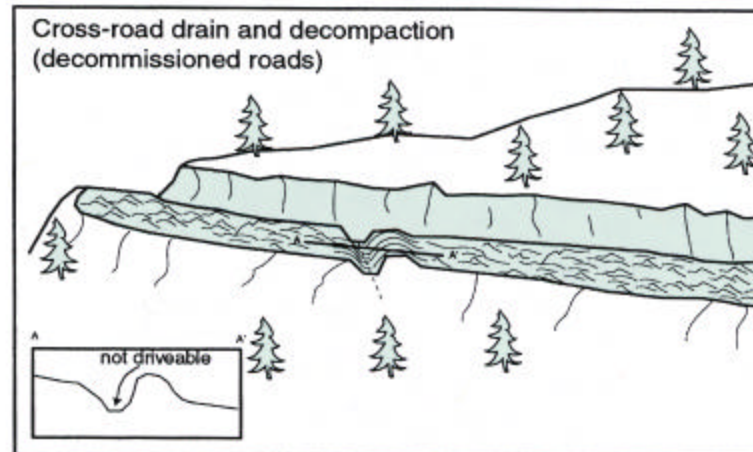
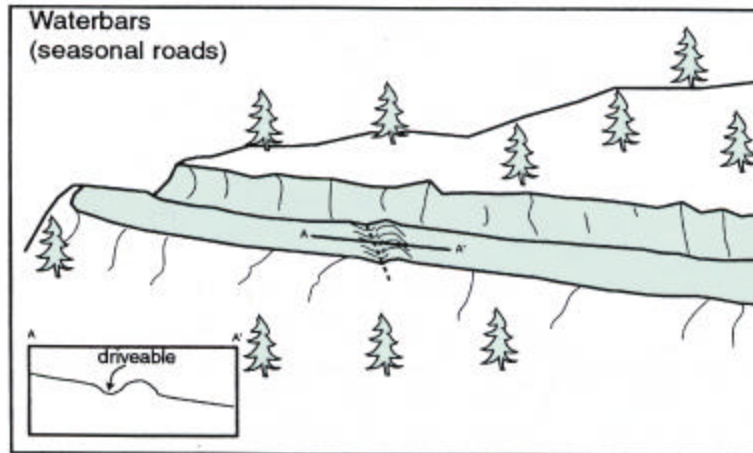
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Removal of unstable sidecast materials

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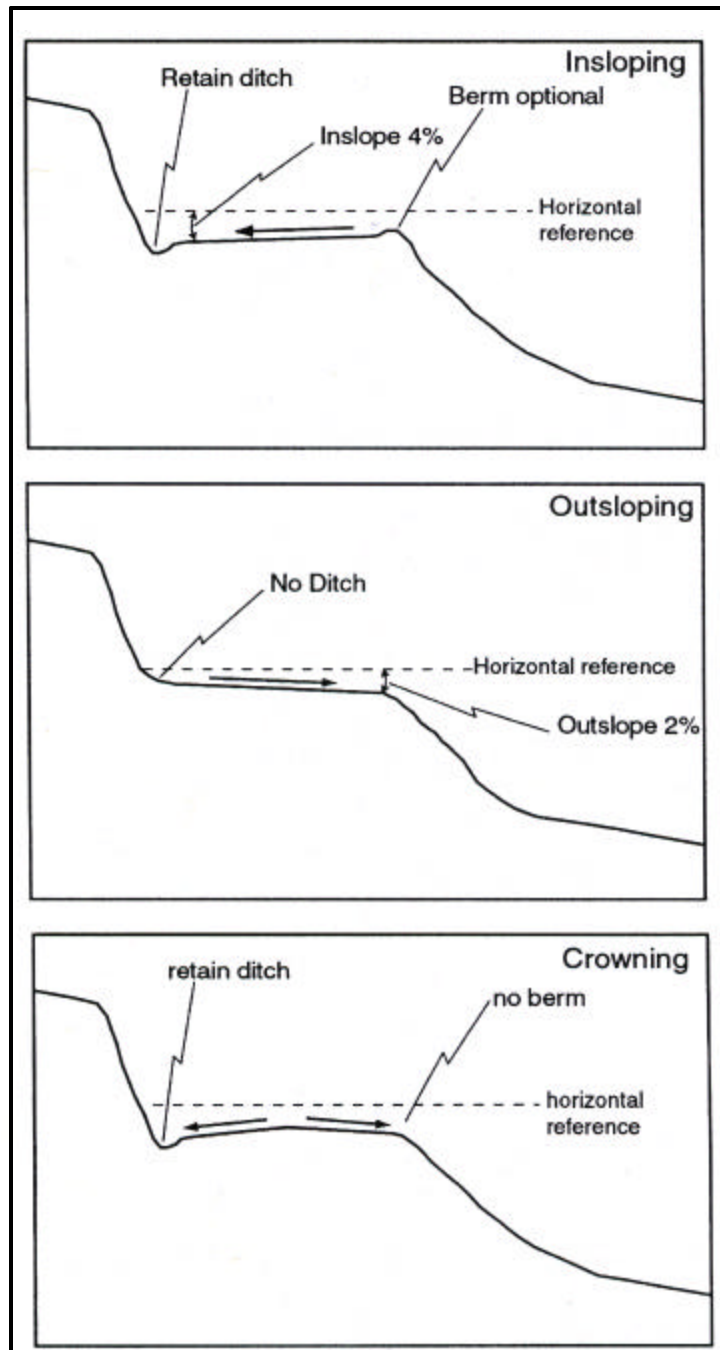
Project Location: SF District
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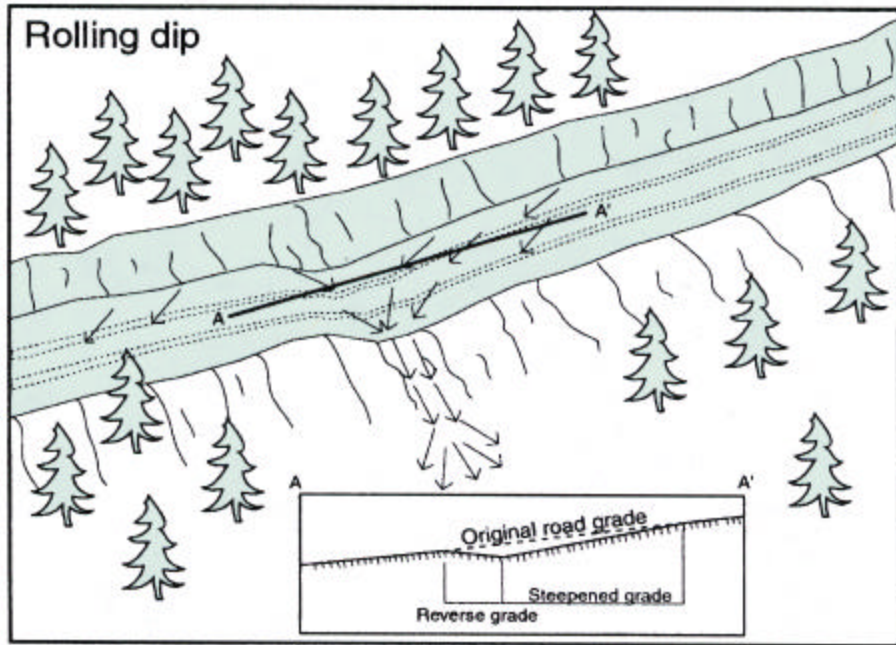
Techniques for dispersing road runoff

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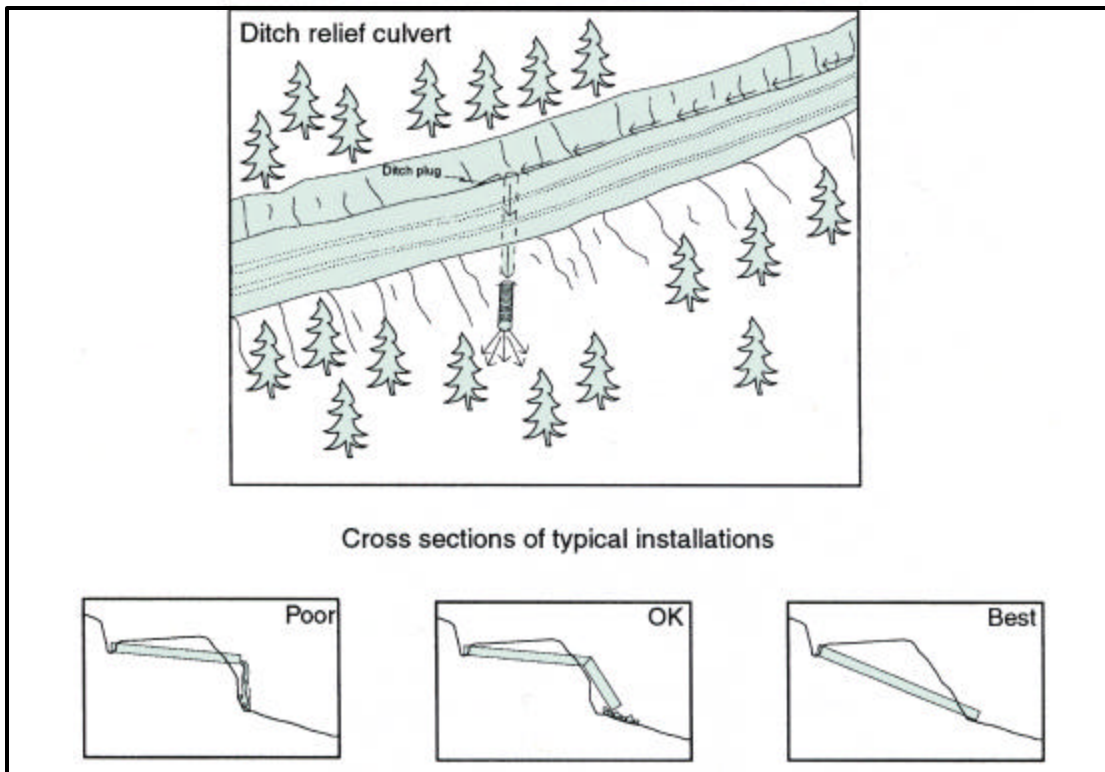
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Utilizing road shape to reduce surface runoff rates



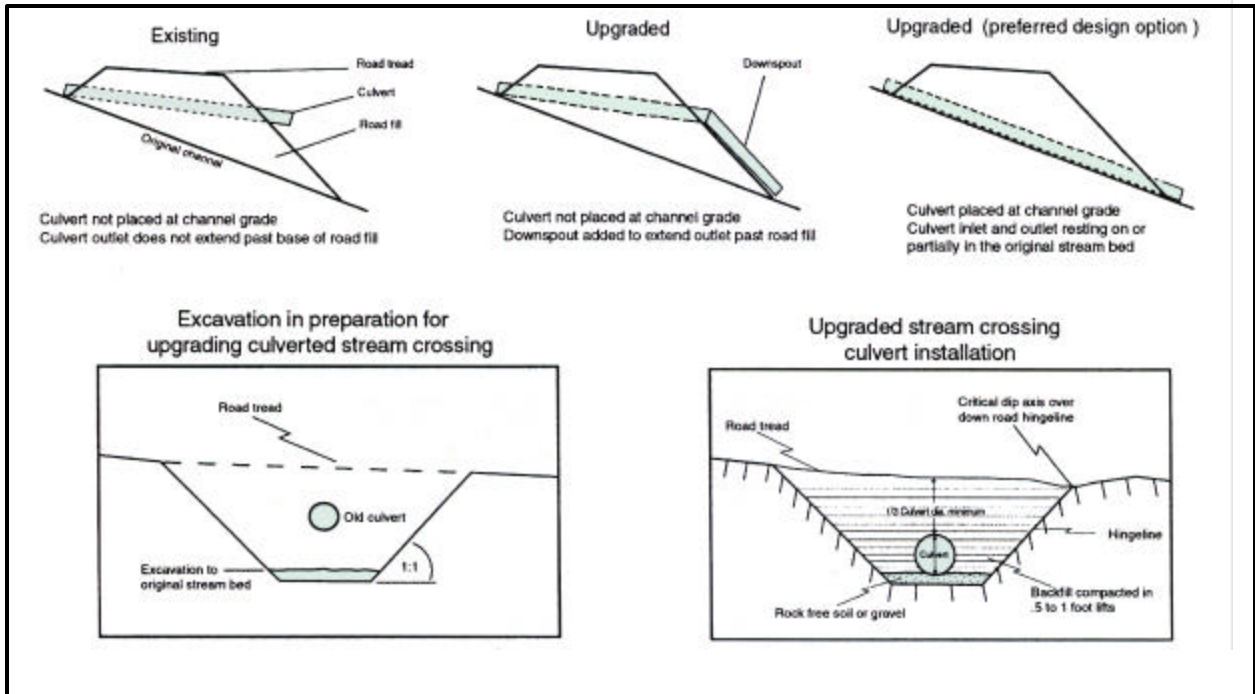
Specifications and use of rolling dips to reduce ditch erosion and surface runoff



Typical ditch relief culvert installation

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Typical stream crossing culvert installation on non fish-bearing streams