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Michael O. Leavitt
Governor

Ted Stewart
Executive Director

James W. Carter
Division Director

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

1594 West North Temple, Suite 1210
Box 145801
Salt Lake City, Utah 84114-5801
801-359-3940 (Fax)
801-538-5319 (TDD)

UTAH DIVISION OF OIL, GAS AND MINING
FACSIMILE COVER SHEET

DATE: November 5, 1996

FAX # 561-1861

ATTN: Vicky Bailey

COMPANY: Earth Fax

FROM: Sharon Falvey

DEPARTMENT: DOGM

NUMBER OF PAGES BEING SENT (INCLUDING THIS ONE): 11

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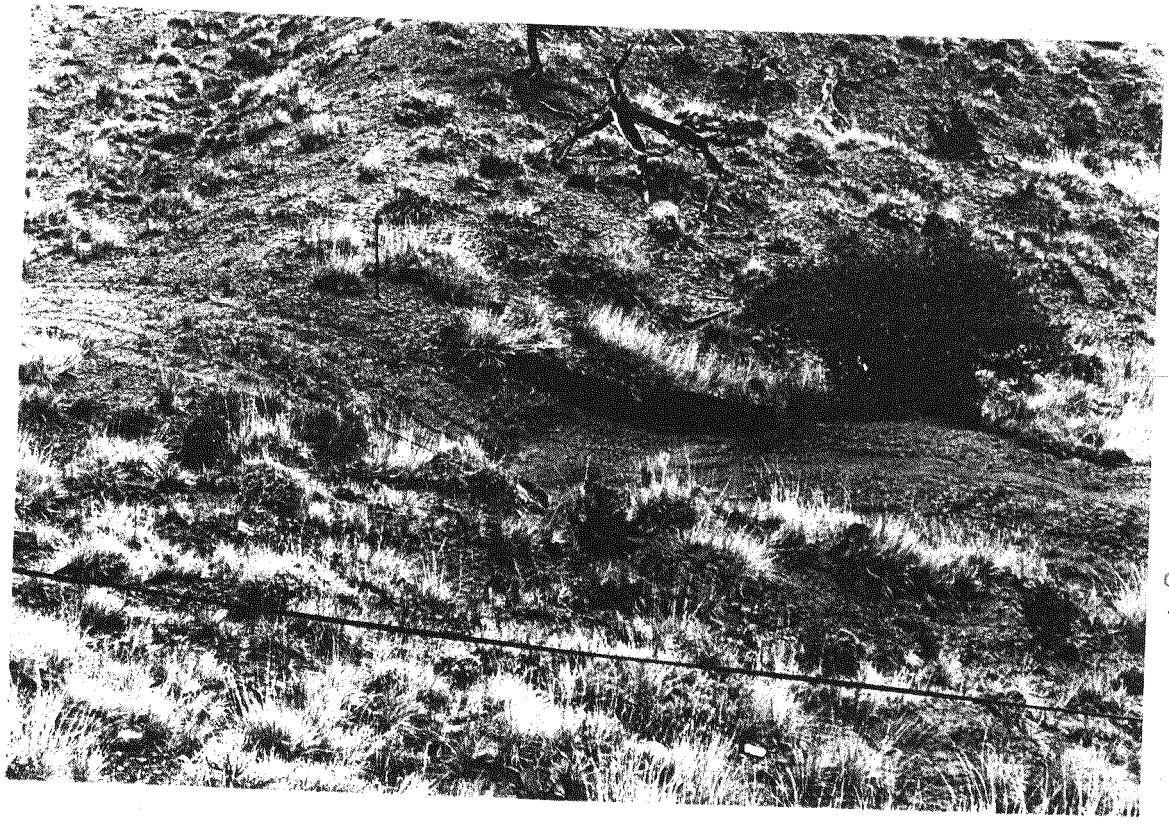
MESSAGES:

Vickey I hope these Help. If you need further clarification I can probably find more these were quick & easy to find.

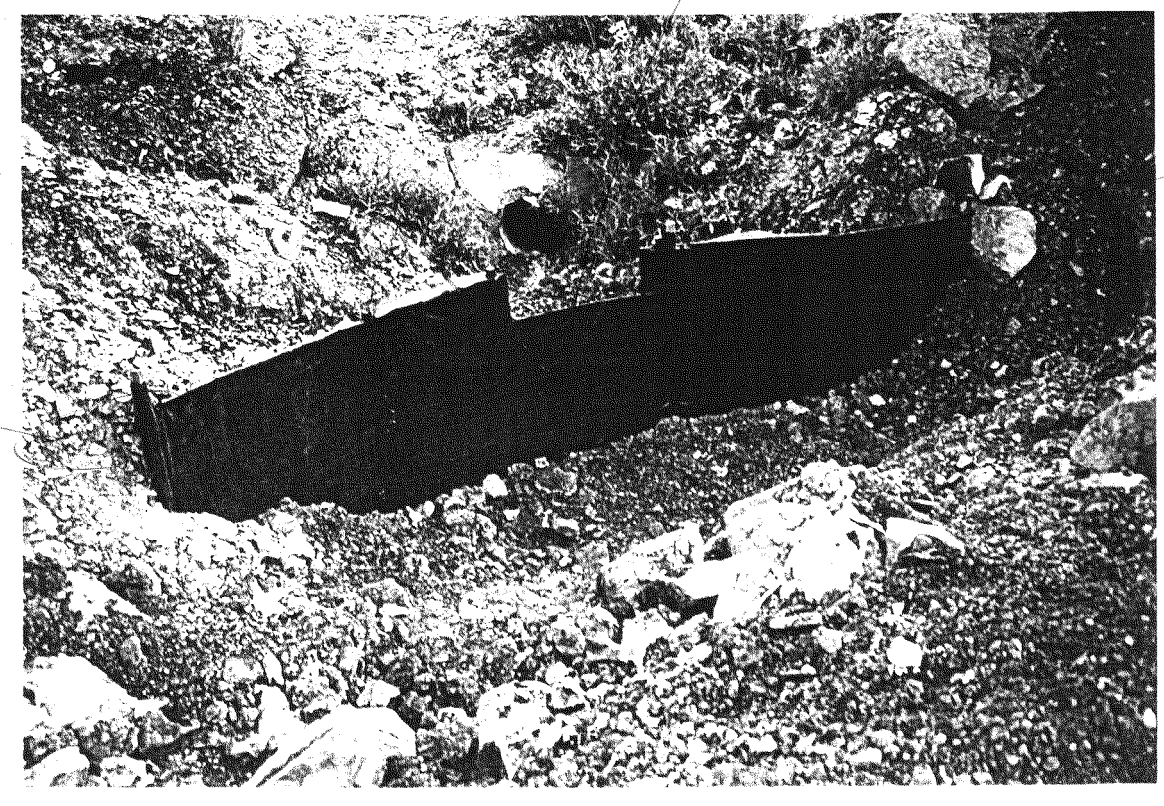
Installation in a drainage

[redacted] Vicky



Silt fence

ENDS Should NOT Be elevated above the Ditch embankment



Make sure Notch elevation is Below Lowest elevation of fence

Ends Elevated Above Notch

Properly Backfill this Area TO Elevation OF fencing

ENDS Elevated Above Notch

5.2. Filtering Structures

Filtering structures are often combined with other sediment control structures to improve the overall trapping efficiency of the system. Filter fence, brush barrier, and straw bale barrier are the filtering structures most commonly used.

5.2.1. Filter Fence

Description: A filter fence is a linear filter barrier constructed of filter fabric, posts, and depending on the strength of the fabric used, wire fence.

Applicability: The filter fabric structures are used where there is a need for temporary control of suspended solids in areas with low to moderate flows. It is the vertical barrier that intercepts surface runoff and sediment particles.

Design and Implementation Guidelines: The proper construction of the filter structure is critical as an improper installation can result in increased erosion and damage by sediment. Undercutting and end flow are the major resulting problems.

Filter fence is constructed of a fabric supported in an upright position by posts and support mesh. The bottom end of the structure is buried in the ground to prevent runoff flowing beneath the fabric. The posts and wire mesh are the support elements while the fabric provides retention.

Installation procedure as outlined by Simons et al., 1983, is

given below. Figures C.5.2. and C.5.3. give a pictorial of building a filter fence and filter fence application showing proper termination to prevent end flow (after Virginia Erosion and Sediment Control Handbook, 1980).

The filter fence building procedure is as follows:

1. Set wood or steel posts securely at intervals no greater than 10 feet apart. Wood posts should be at least 3 inches in diameter; with steel, only the T-shaped posts should be used.
2. Fasten fence wire securely to the upstream side of the posts. Wire should extend into the soil a minimum of 2 inches, and be a minimum of 36 inches in height.

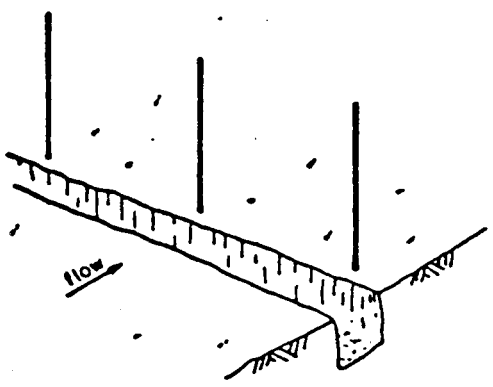
3. Excavate a trench 6 inches deep along the upstream base of the fence.

4. Staple or wire the filter to the fence, allowing the fabric to extend into the trench as shown in Figure C.5.2. The fabric should not extend over 36 inches above original ground on the wire fence.

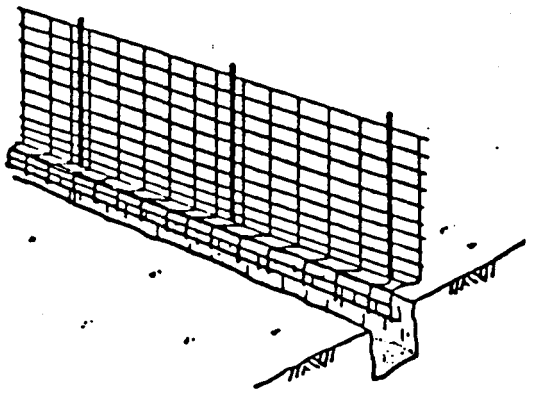
5. Backfill and compact the soil over the fabric extending into the trench.

6. If the filter fence is to be constructed across a ditch line or drainageway of low flow, the barrier should be of sufficient length to contain the design storm volume from the upland area.

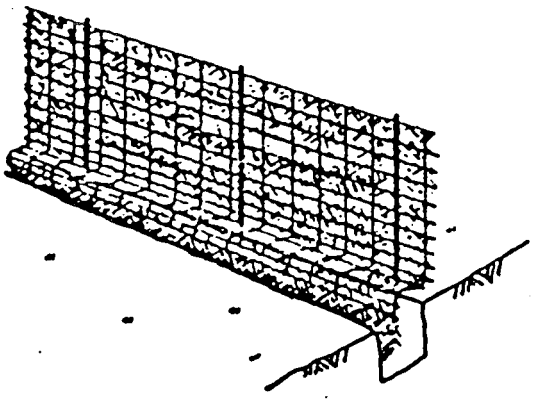
7. The fence should be constructed parallel to the contours of the slope. The ends of the fence should bend upslope a sufficient distance to eliminate end flow as shown in Figure 7.3.



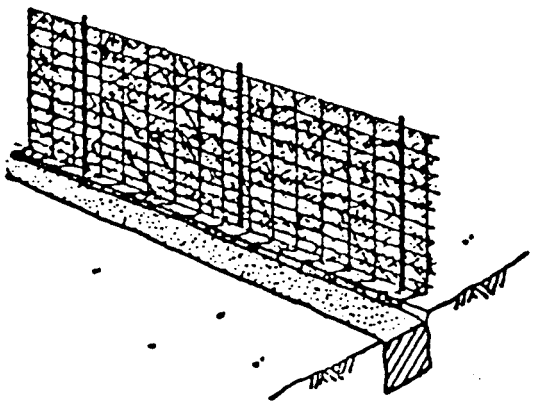
1. Set posts and excavate trench.



2. Tie wire fencing to posts



3. Attach filter fabric to wire fence, allowing extension into trench as shown.



4. Backfill and compact excavated soil.

Figure C.5.2. Building a Filter Fence (Virginia Soil and Water Conservation Commision, 1980).

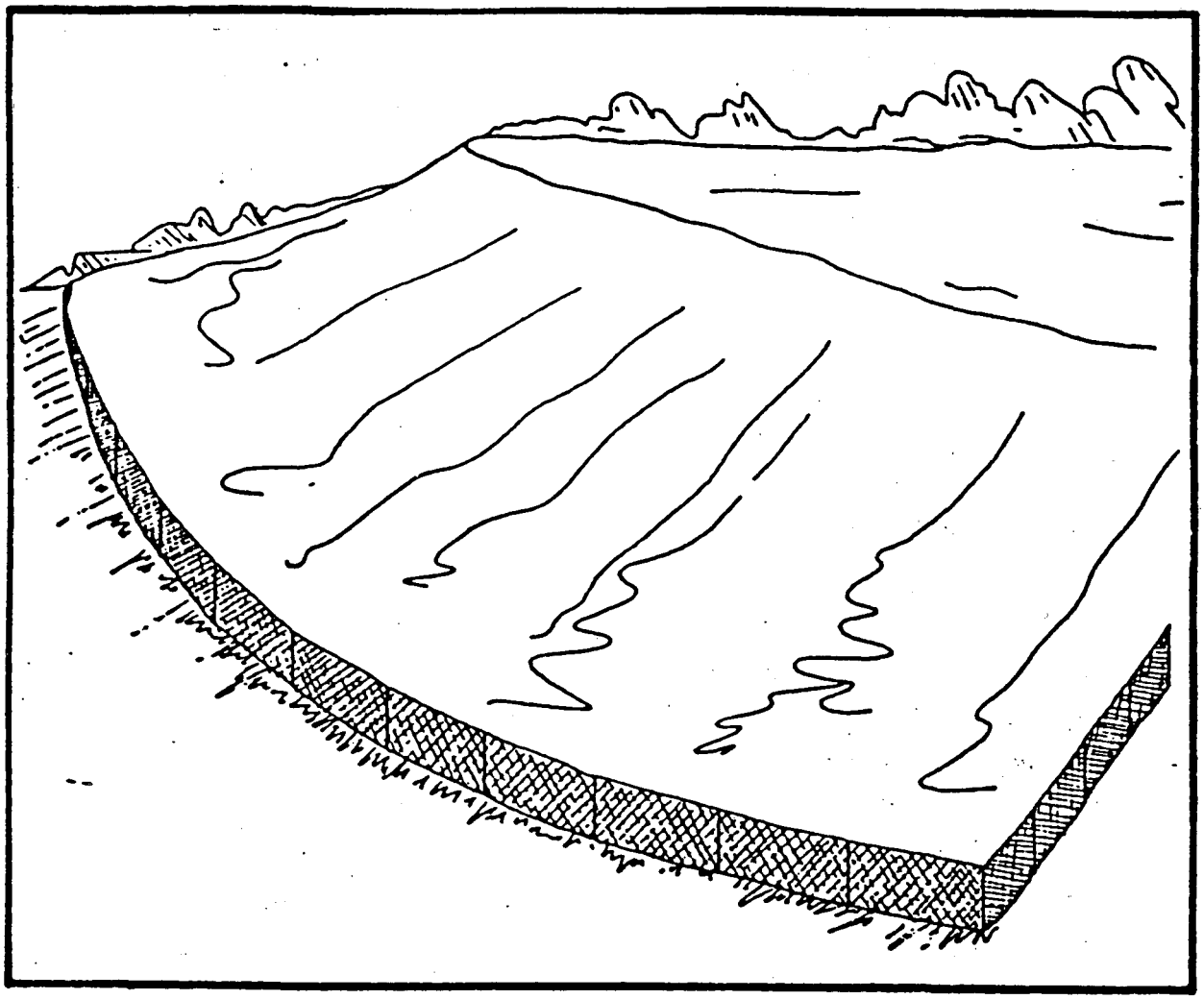


Figure C.5.3. Filter Fence Application Showing Proper Termination to Prevent End Flow (Virginia Soil and Water Conservation Commision, 1980).

Cost: $ 3.0 to 6.0 for 1 lineal foot

Special Considerations: Filter fabrics have low permeability and are limited to situations where unconcentrated , overland flows are expected. Filter structures should not be used in areas with high and concentrated channel flows.

The efficiency of the filter structure depends on its

storms or when one-third of the trapping volume has been reached. Filter fabric should be checked after each major storm for clogging and damage. If damage to the fabric occurs as a result of exposure or mechanical tearing, it should be repaired and the repaired sections of the fabric should be overlapped and bonded to existing sections to prevent leakage.

Other Considerations: It has been established that the silt fences when constructed and maintained properly are effective in controlling levels of suspended solids in the overland flow.

The "retention" efficiency of a silt fence was tested by Wyant(1980). The fabric retention efficiency of 75 percent measured during tests indicate that a large proportion of the sediment should be intercepted by the fence. The degree of the trapping potential of the fabric fence depends on the particle size groups in the overland flow.

In the situations where the required trapping efficiency of one fence is not achieved, the filter fence may be placed in series such that the cumulative retention efficiency will secure the needed water quality.

The selection of the filter fabric depends on the fabric property that should have sufficient strength to resist installation stresses and burst pressures when retaining sediment and water. The fabric should also be rotproof and resistant to sunlight (ultraviolet) degradation. Table C.5.2. gives a general guideline in the selection of suitable filter fabric.

Table C.5.2. Guide Specifications for Filter Fence Fabric
(R.G.Carroll,Jr., 1981

General Description: The fabric shall be a woven or nonwoven fabric consisting of synthetic filaments or yarns formed into a stable network such that the filaments or yarns retain their relative position to each other. The fabric shall be inert to commonly encountered chemicals and conform to the properties in the following table.

FABRIC PROPERTY	TEST METHOD*	FABRIC REQUIREMENTS
I. RESISTANCE TO INSTALLATION STRESSES		
a. Grab Tensile Strength, lbs	ASTM-D-1682	90
b. Grab Tensile Elongation, %	ASTM-D-1682	20
c. Mullen Burst Strength, psi	ASTM-D-751	180
d. Trapezoid Tear Strength, lbs	ASTM-D-2263	60
II. PERFORMANCE CRITERIA DURING SERVICE LIFE		
a. Slurry Flow Rate, gal/min/ft^2	VTM-51-79	0.3
b. Retention Efficiency,%	VTM-51-79	75
III. RESISTANCE TO ENVIRONMENT FACTORS		
a. Mildew, Rot Resistance, % Strength Retention	AATCC-30-74	100
b. Insect, Rodent Resistance, % Strength Resistance	AATCC-24-74	100
c. Ultraviolet Resistance, % Strength Retention	ASTM-D-1682 after 500 Xenon Weatherometer Hrs.	80

* TEST METHOD DESIGNATIONS:

ASTM: American Society of Testing and Materials

VTM: Virginia Dept. of Highways & Transportation test method per Reference (3).

AATCC: American Association of Textile Colorist and Chemists

5.2.2. Straw Bale Barrier

Description: Straw bale barrier used as a temporary sediment filter consist of a row of entrenched and anchored straw bales.

Applicability: Straw bale barriers are used as temporary sediment filters placed in areas of low overland flows, usually parallel to the contour. The bales are placed to reduce flow velocities resulting in sediment deposition. They may also be used as a barrier to divert or direct flow to a slope drain, sediment trap or other control measure.

Design and Implementation Guidelines: The proper installation of straw bale barriers is critical for the performance of this filtering structure. Straw bale barriers are best used in areas of low flow and are effective in reducing the levels of suspended solids when constructed properly.

The installation procedure as outlined below by Simons et al., (1983) is given below. Figure C.5.4. gives a pictorial of building a straw bale barrier (after Virginia Soil and Water Conservation Commision,1980).

The straw bale barrier construction procedure is as follows:

1. Excavate a trench the width of a bale and the lenght of the proposed barrier to a minimum depth of four inches.

2. Place bales tightly together in the trench. Drive two sturdy wooden stakes or steel rods through each bale and into the ground to a depth sufficient to securely anchor the bales.

3. Wedge loose straw tightly between the bales after staking.

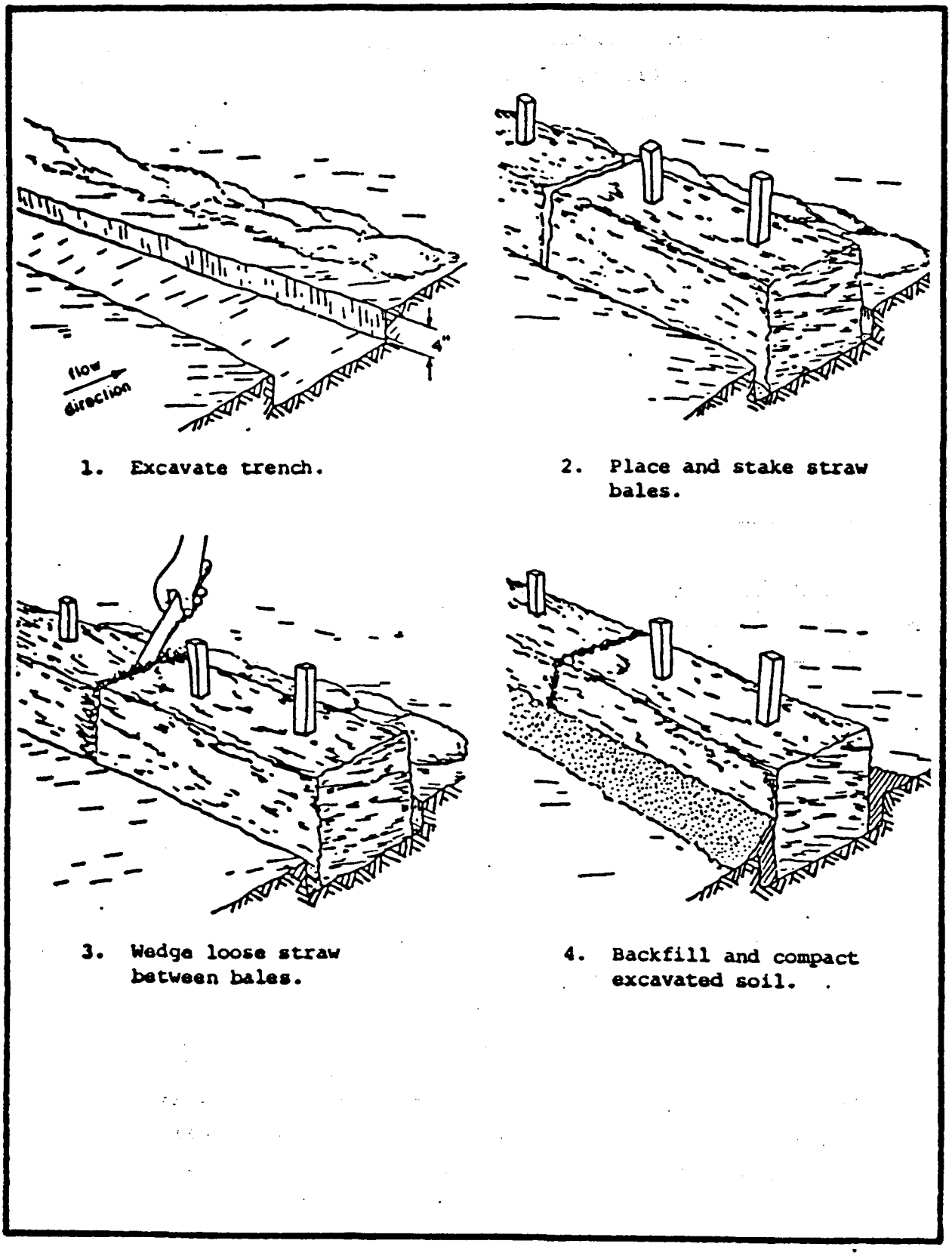


Figure C.5.4 . Installation of Straw Barrier (VSWCC, 1980)

4. Backfill and compact the excavated soil against the barrier. Backfilled soil should conform to ground level on the downstream side and should be built up to 4 inches against the upstream side of the barrier.

5. The straw bale barrier should be constructed parallel to the contour of the slope. The ends of the barrier should bend upslope a sufficient distance to eliminate end flow.

6. Straw bales should be removed when not needed or maintained.

Cost of material: $ 3.0 to 7.5 per lineal foot

Special Considerations: Straw bale barriers can be successfully used only in areas of unconcentrated flow. Straw bales used as check points in ditches have had high failure rates.

Deposited sediment should be removed from behind a straw bale barrier after major storm or after one-third of trapping volume has been reached. Since bales deteriorate quickly, they should be inspected periodically. Bales which have rotted or failed should be replaced.

5.2.3.Brush Barrier

Description: A brush barrier is a linear filter barrier constructed of vegetative residue materials available from clearing and grubbing operations. The residue materials are covered with synthetic filter fabric.