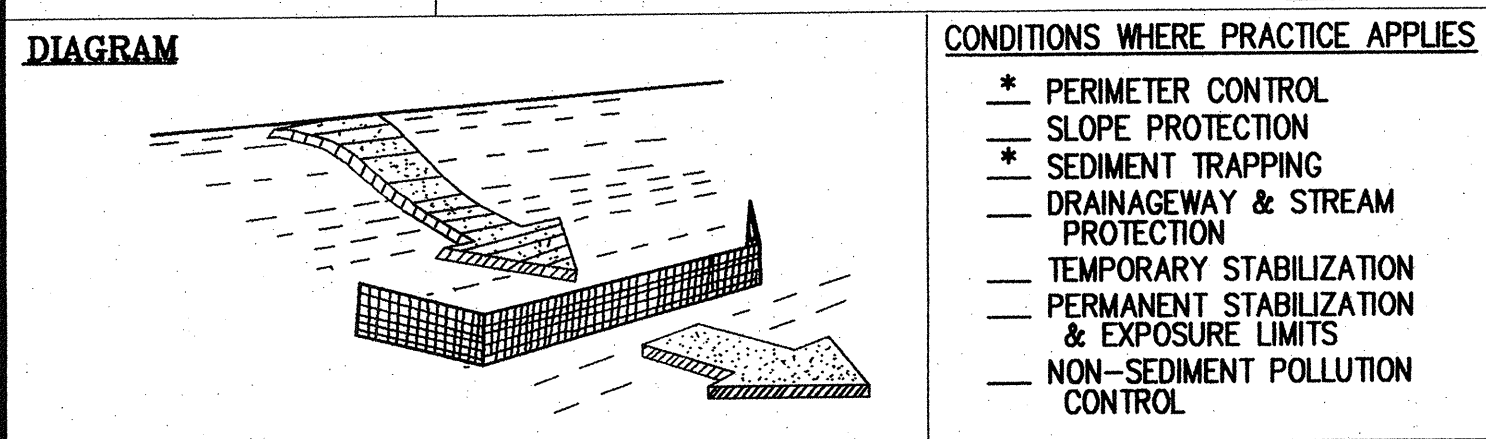
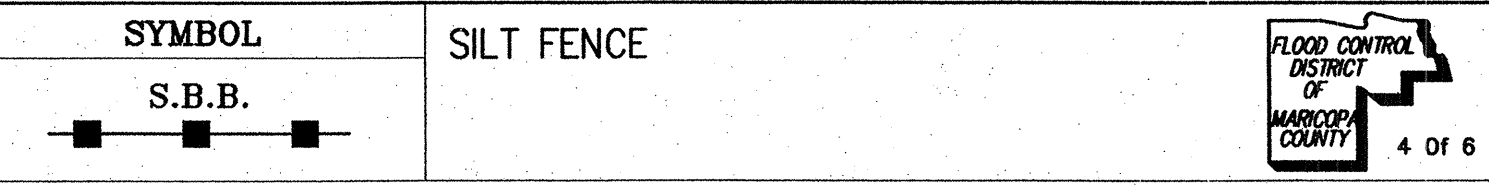
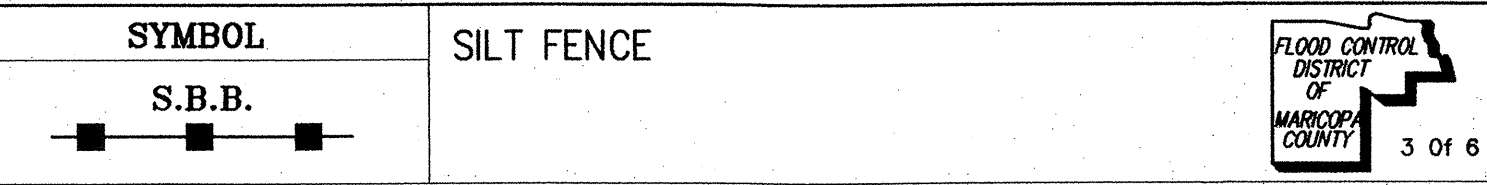
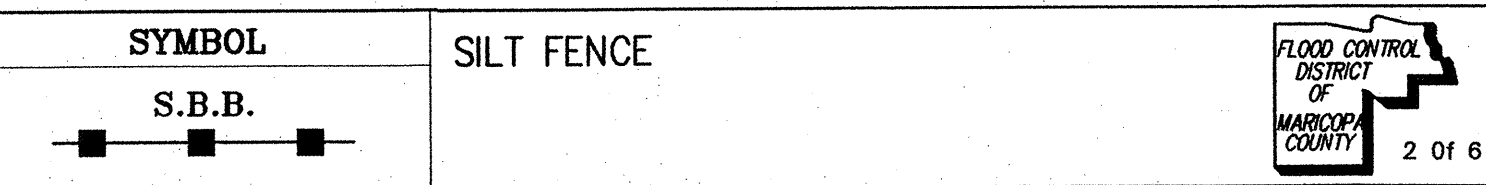
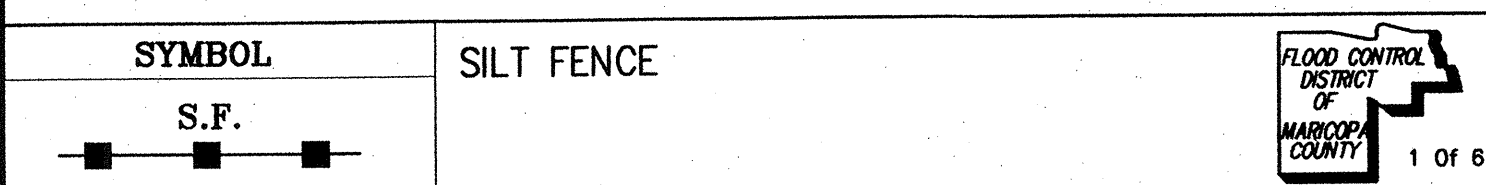


STORM WATER MANAGEMENT PLAN NATIONAL WATER WORKS NORTH PHOENIX BRANCH

NOTE: THIS MAP OR PLAN IS NOT TO BE USED, RELIED UPON, OR CONSIDERED COMPLETE OR READY FOR CONSTRUCTION, UNLESS STAMPED BY A PROFESSIONAL FROM LEMME ENGINEERING.

COPYRIGHT NOTICE: THIS DRAWING IS COPYRIGHTED AND ANY ELECTRONIC COPY PROVIDED, IS FOR THE SPECIFIC USE INTENDED OF THE PROJECT AND MAY NOT BE UTILIZED FOR ANY OTHER PROJECTS UNLESS WRITTEN AUTHORIZATION IS RECEIVED FROM LEMME ENGINEERING.



DEFINITION

A temporary sediment barrier consisting of a filter fabric stretched across and attached to supporting posts, entrenched, and, depending upon the strength of the fabric used, with wire fence for support.

PURPOSE

- To intercept and detain small amounts of sediment from disturbed areas during construction operations in order to prevent sediment from leaving the site.
- To decrease the velocity of sheet flows and low-to-moderate level channel flows.

APPROPRIATE APPLICATIONS

Filter fences must be provided just upstream of the point(s) of discharge of runoff from a site, before the flow becomes concentrated. They may also be used:

- Below disturbed areas where runoff may occur in the form of sheet and rill erosion; wherever runoff has the potential to impact downstream resources.
- Perpendicular to minor swales or ditch lines for up to one acre contributing drainage areas.

Not intended for use in detaining concentrated flows.

Synthetic fabric filter fences are only applicable for sheet or overland flows and not the volumes of water in concentrated flows.

LIMITATIONS

- Filter fences will create a temporary sedimentation pond on the upstream side of the fence which may cause temporary flooding. Fences not constructed on a level contour will be overtopped by concentrated flow resulting in failure of the filter fence.
- Filter fences are not practical where large flows of water are involved, hence the need to restrict their use to drainage areas of one acre or less, and flow rates of less than 0.5 cfs.
- Problems may arise from incorrect selection of pore size and/or improper installation.
- Do not allow water depth to exceed 1.5 feet at any point.
- Improperly installed fences are subject to failure from undercutting, overtopping, or collapsing.

PLANNING CONSIDERATIONS

Laboratory work at the Virginia Highway and Transportation Research Council has shown that silt fences can trap a much higher percentage of suspended sediments than can straw bales. Silt fences are preferable to straw barriers in many cases. However while the failure rate of silt fences is lower than that of straw barriers, there are many instances locally in which silt fences have been improperly installed. The installation methods outlined here can improve performance.

- Construct along a level contour.
- Silt fences should remain in place until the disturbed area is permanently stabilized.
- Provide sufficient room for sediment removal equipment between the silt fence and toes of slopes or other obstructions.
- The ends of the filter fabric should be turned uphill to prevent stormwater from flowing around the fence.
- Provide an undisturbed or stabilized outlet suitable for sheet flow.
- Do not construct in live streams or intermittently flowing channels.

DESIGN & SIZING CRITERIA

- Upstream drainage area limited to 1 acre or less when used alone or in combination with sediment basin in a larger site.
- Maximum slope steepness perpendicular to fence line, 1:1.
- Maximum sheet or overland flow path length to the fence < 100 feet.
- No concentrated flows greater than 0.5 cfs.

Selection of a filter fabric is based on soil conditions at the construction site (which affect the equivalent opening size (EOS) fabric specification) and characteristics of the support fence (which affect the choice of tensile strength). The designer shall specify a filter fabric that retains the soil found on the construction site yet will have openings large enough to permit drainage and prevent clogging. The following criteria is recommended for selection of the equivalent opening size:

- If 50 percent or less of the soil, by weight, will pass the U.S. standard sieve No. 200, select the EOS to retain 85 percent of the soil. The EOS should not be finer than EOS 70.
- For all other soil types, the EOS should be no larger than the openings in the U.S. Standard Sieve No. 70 [0.0083 in. (0.21 mm.)] except where direct discharge to a stream, lake, or wetland will occur, then the EOS shall be no larger than Standard Sieve No. 100.

To reduce the chance of clogging, it is preferable to specify a fabric with openings as large as allowed by the criteria. No fabric should be specified with an EOS smaller than U.S. Standard Sieve No. 100 [0.0059 in. (0.15 mm.)]. If 85 percent or more of a soil, by weight, passes through the openings in a No. 200 sieve [0.0029 in. (0.074 mm.)], filter fabric shall not be used. Most of the particles in such a soil would not be retained if the EOS was too large, and they would clog the fabric quickly if the EOS was small enough to capture the soil.

Selection of fabric tensile strength and bursting strength characteristics shall be supported with wire mesh in and as recommended by the fabric manufacturer. Filter fabric material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable life at a temperature range of 0° F. to 120° F.

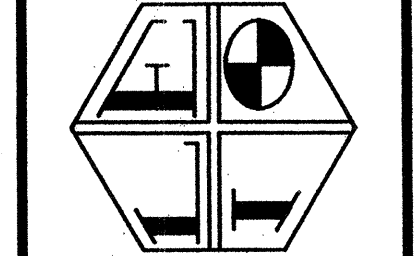
Typical Installation:

Filter fences are to be constructed on a level contour to maximize the available ponding area and prevent concentration of flow against the fence.

- Posts shall be spaced a maximum of 6 feet apart and driven securely into the ground a minimum of 30 inches.
- A trench shall be excavated approximately 8 inches wide and 12 inches deep along the line of posts and upslope from the barrier.
- When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy-duty wire staples at least 1 inch long, tie wires or hog rings. The wire shall extend into the trench a minimum of 4 inches.
- The standard strength filter fabric shall be stapled or wired to the fence, and 20 inches of the fabric shall extend into the trench. When extra-strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated and the filter fabric stapled or wired directly to the posts.
- The use of joints should be avoided. When joints are necessary, filter cloth shall be spliced together only at a support post, with a minimum 6-inch overlap and both ends securely fastened to the post.
- The trench shall be backfilled with 3/4-inch minimum diameter washed gravel or compacted native material.

PRELIMINARY
 APPROVED

PLANNING - CIVIL ENGINEERING - SURVEYING
LEMME ENGINEERING INC.
3608 WEST BETHANY HOME ROAD
PHOENIX, ARIZONA 85019
PHONE (602) 841-8804 FAX (602) 841-6351



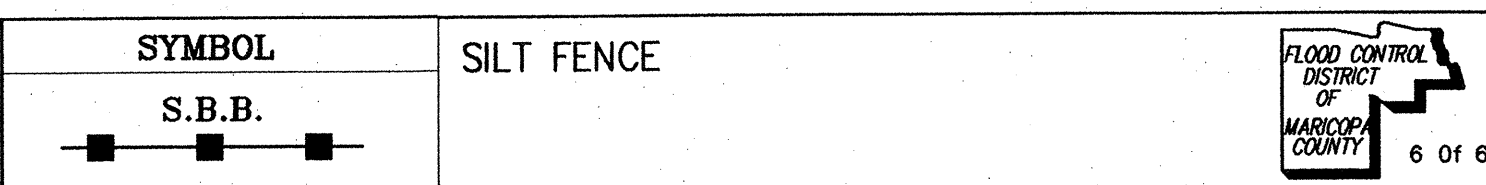
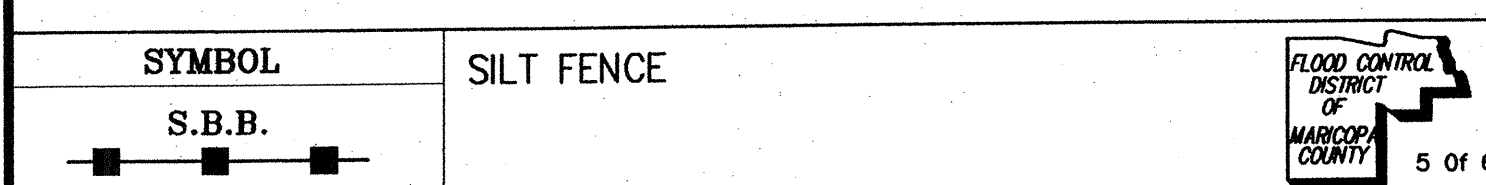
STORM WATER MANAGEMENT PLAN
NATIONAL WATER WORKS
2140 W Williams Drive, Phoenix, AZ

BMP-63

BMP-64

BMP-65

BMP-66

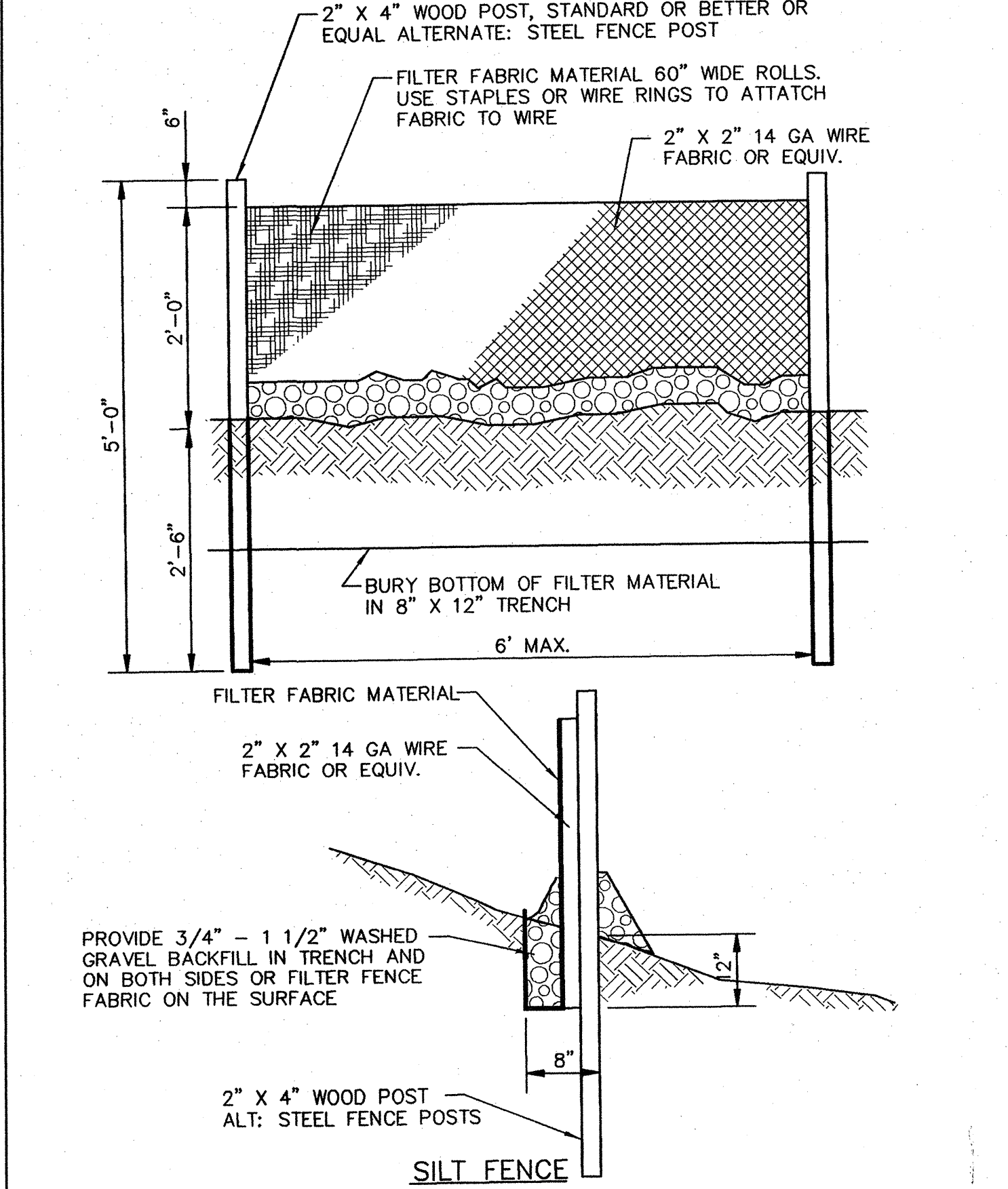


MAINTENANCE REQUIREMENTS

Inspect monthly during dry periods and immediately after each rainfall. Repair as necessary. Sediment must be removed when it reaches approximately one-third the height of the fence, especially if heavy rains are expected.

Filter fences should not be removed until the upslope area has been permanently stabilized.

References (1,2,14)



BMP-67

BMP-68

KIVA #06-4203
PRE-APP #0604020
QS # 44-24

CALL TWO WORKING DAYS BEFORE YOU DIG
602-263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)

DESIGNED BY: DB
DRAWN BY:
SCALE:
HORIZONTAL=1"=40'
VERTICAL= N/A
SHEET 2 OF 2
DATE 12-26-06
W.O. 06-735