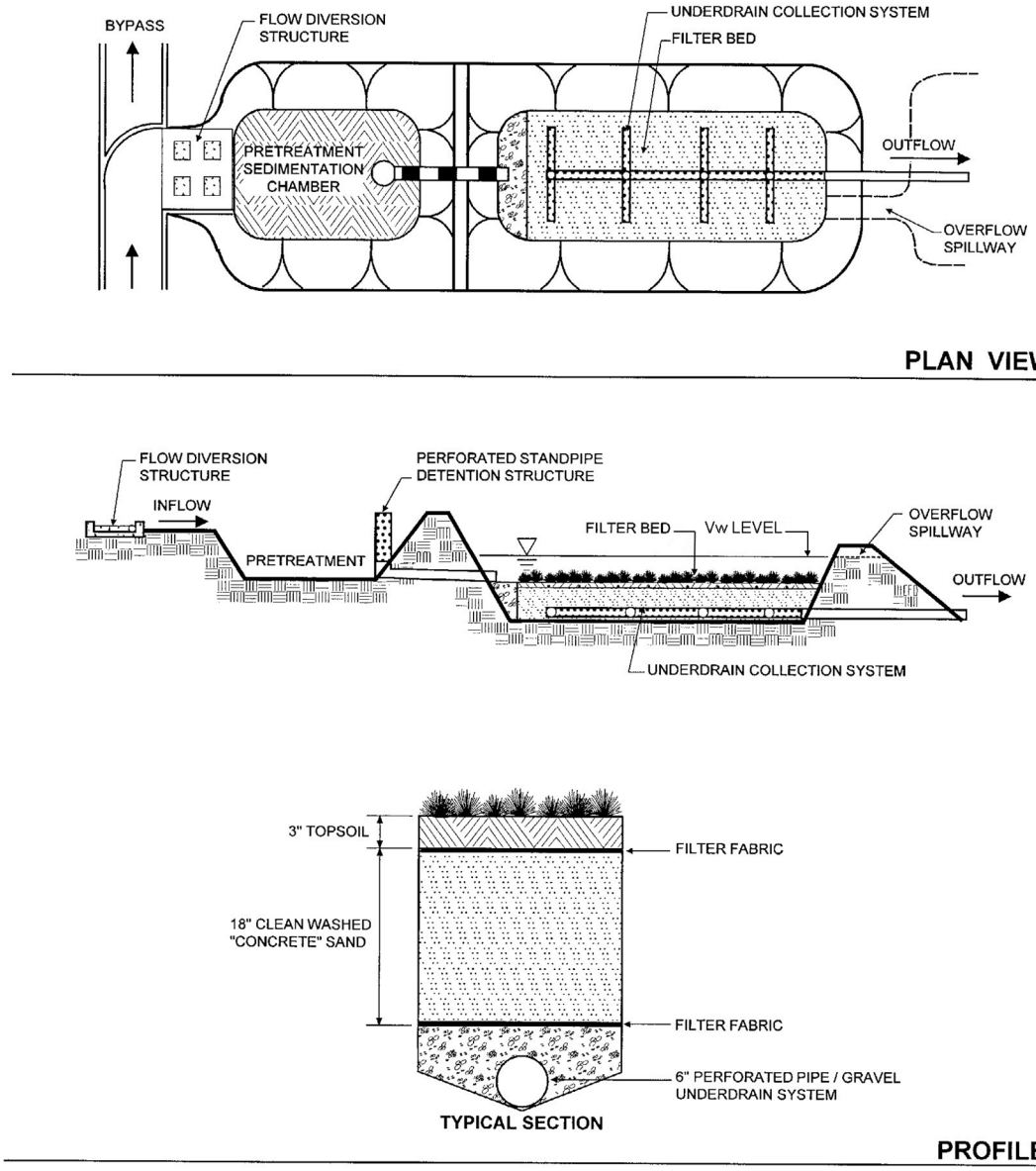
Section 3.1 Storm Water Filtering Systems

Definition: Practices that capture and temporarily store the V_w and pass it through a filter bed of sand, organic matter, soil or other media. Filtered runoff may be collected and returned to the conveyance system, or allowed to partially exfiltrate into the soil. Design variants include:

- F-1 surface sand filter
- F-2 one-chamber underground sand filter
- F-3 three-chamber underground sand filter
- F-4 perimeter sand filter
- F-5 vertical sand filter
- F-6 organic filter
- F-7 bioretention
- F-8 roof downspout system

Filtering systems are typically not to be designed to provide storm water detention (Qp_2, Qp_{15}, and / or Q_f), but they may be in some circumstances. Filtering practices shall generally be combined with a separate facility to provide those controls. However, in combined sewer areas, the three-chamber underground sand filter can be modified by expanding the first or settling chamber, or adding an extra chamber between the filter chamber and the clear well chamber to handle the detention volume, which is subsequently discharged at a pre-determined rate through an orifice and weir combination.

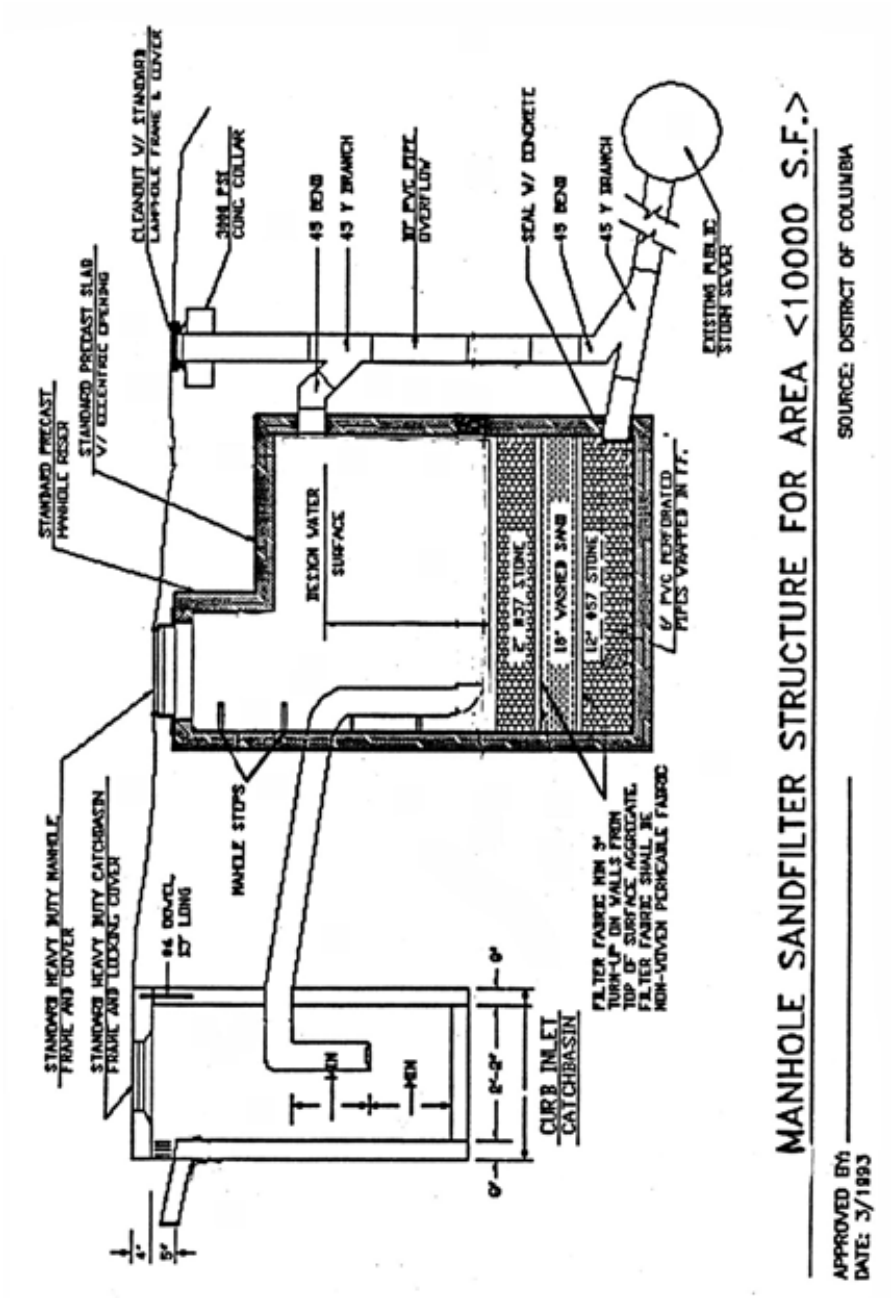
F-1	**Figure 3.1** Example of Surface Sand Filter	F-1



Source: Adapted from MDE, 2000

Surface sand filters can serve the largest drainage area of all the filtering systems.

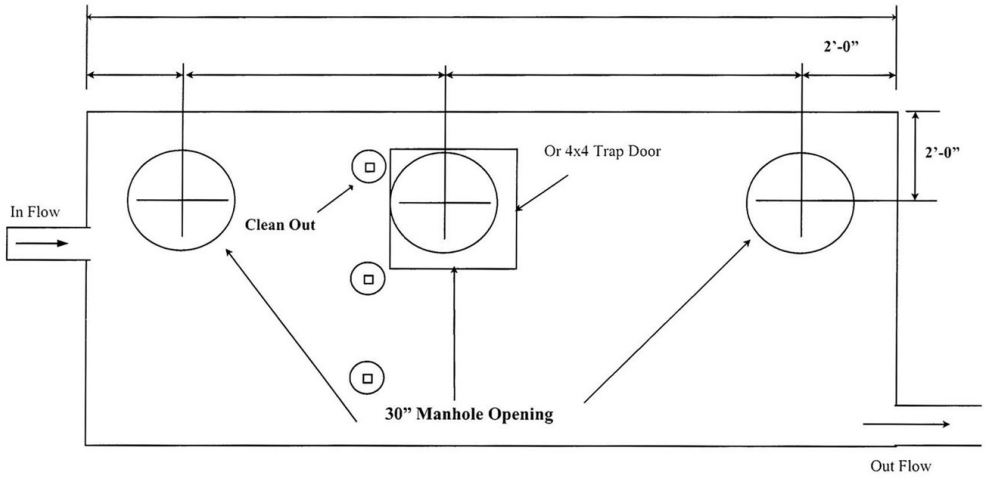
F-2	**Figure 3.2** Example of One-Chamber Underground SF	F-2



The one-chamber underground sand filter is an option for providing V_w on sites with less than 10,000 ft^2 of impervious area where space or land prices are at a premium.

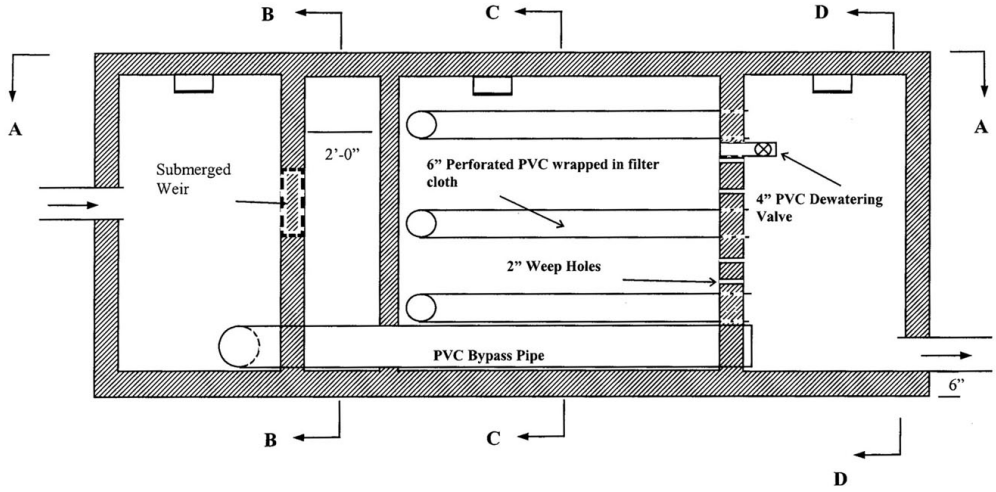
F-3	**Figure 3.3a** Example of Three-Chamber Underground Sand Filter for Separate Sewer Areas	F-3

Note: Over Filtering Chamber Trap Door is Optional.



Plan View (Top Slab)
NTS

Note: Dimensions may vary from design to design.



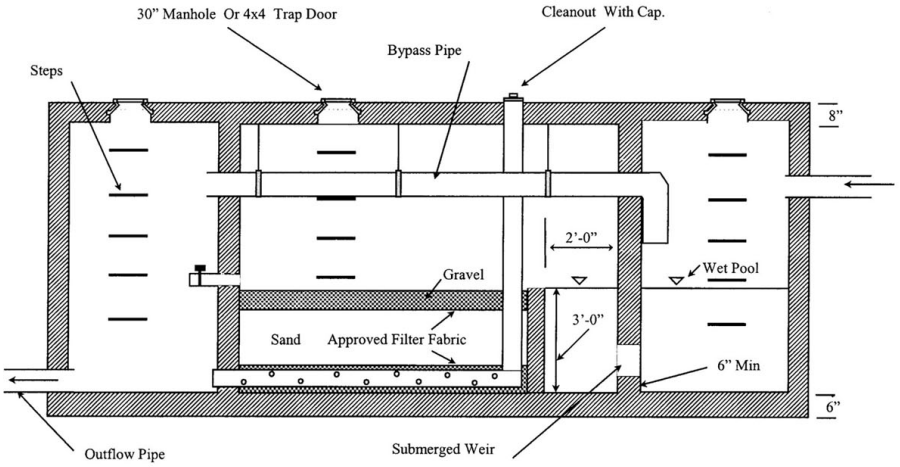
Plan View (Top Slab Removed)
NTS

Source: District of Columbia, 2001

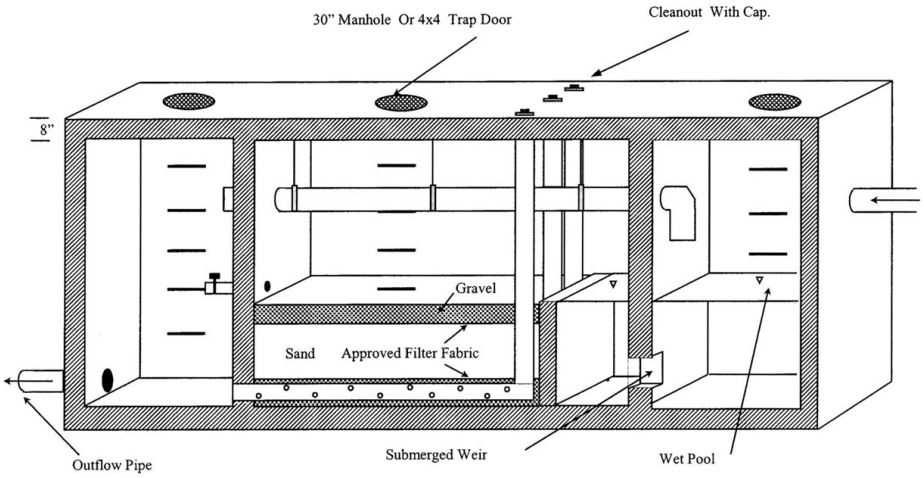
The three-chamber underground sand filter is an option for providing V_w where space or land prices are at a premium.

F-3	**Figure 3.3b** Example of Three-Chamber Underground Sand Filter for Separate Sewer Areas	F-3

Note: Dimensions may vary from design to design.



Section A-A
NTS

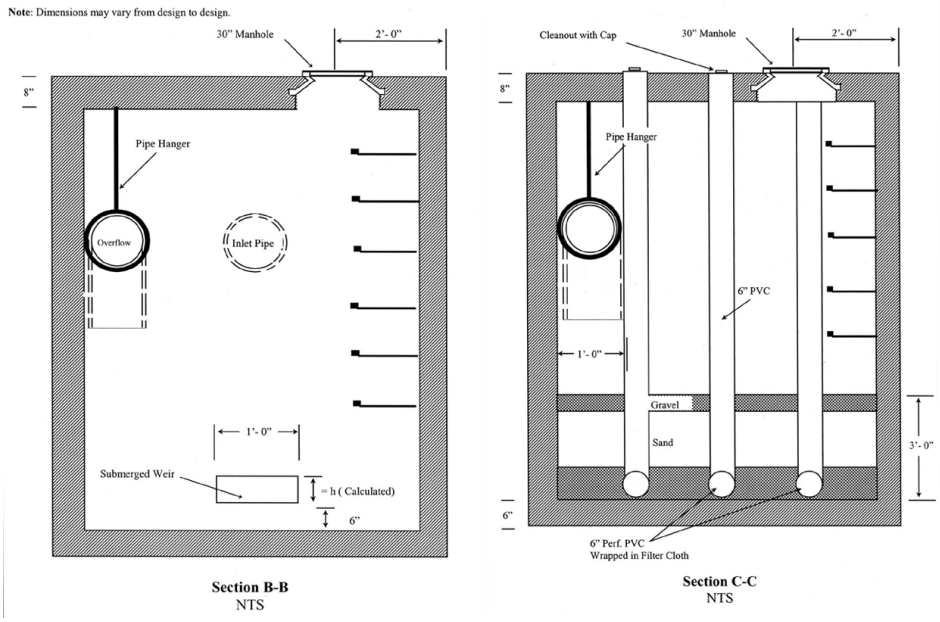


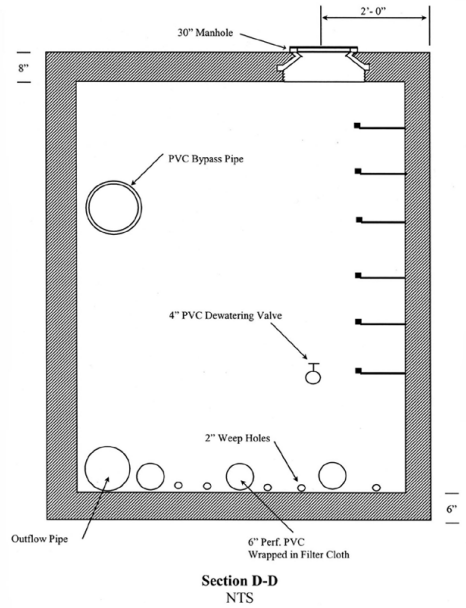
Section A-A (3D)
NTS

Source: District of Columbia, 2001

The three-chamber underground sand filter is an option for providing V_w where space or land prices are at a premium.

F-3	**Figure 3.3c** Example of Three-Chamber Underground Sand Filter for Separate Sewer Areas	F-3





The three-chamber underground sand filter is an option for providing V_w where space or land prices are at a premium.