**Sand Filter Specifications**

1. A minimum of 30 percent of the total area of the filter shall be placed to a depth of 6 to 12 inches (150 to 300 mm) of clean, well-graded, natural sand or gravel to a minimum depth of 2 feet (600 mm). The sand or gravel shall be placed to a depth of 6 to 12 inches (150 to 300 mm) and shall be compacted using standard compaction methods.

2. The filter shall be constructed of durable materials that are resistant to weathering and erosion. The filter shall be constructed to prevent the entry of leaf litter, debris, and other materials that may contaminate the filter system.

3. The filter shall be designed and constructed to ensure that it will function effectively in the removal of particulate matter and the reduction of bacterial pathogens.

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**Table B.3.1 Material Specifications for Sand Filters**

<table>
<thead>
<tr>
<th>Material</th>
<th>Specifications/Text Method</th>
<th>Type</th>
<th>Notations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand</td>
<td>Clean, well-graded, natural sand or gravel to a minimum depth of 2 feet (600 mm)</td>
<td>ACRM - Concrete lid</td>
<td>N/A</td>
</tr>
<tr>
<td>Steel</td>
<td>Bar caging (1&quot;) galvanized iron or equivalent</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Reinforced Concrete (if required)</td>
<td>Concrete mix: 1 part cement : 2 parts sand : 6 parts aggregate by weight</td>
<td>10&quot; thick</td>
<td>N/A</td>
</tr>
</tbody>
</table>

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**Operation and Maintenance Schedule for Homeowners Association Owned & Maintained Surface Sand Filter**

1. The stormwater retention facility shall be designed, constructed, and maintained in accordance with the guidelines and standards set forth in this document.

2. The facility shall be monitored regularly to ensure that it is functioning properly.

3. The facility shall be cleaned and maintained as needed to ensure that it remains effective in achieving its intended purposes.

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**Stormwater Management Notes and Details**

**Farlane Farm**

**Phase Two**

**November 2014**

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**SCH 40 PVC PERFORATED UNDERGROUND PIPE DETAILED FOR HORIZONTAL DRAIN PIPE**

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**Section 0 Observation Well Location**

**NOT TO SCALE**

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**Typical Clean-Out Detail**
Bio-retention

Soil and Characterization

The characteristics of the soil in the construction area have been described in the previous section. The soil consists of a mixture of sandy loam, loam, and clay soils, with a high percentage of organic matter. The soil contains a variety of nutrients that support plant growth.

Filter characteristics are also included in the figure above. The figure shows the layout of the bio-retention area, including the location of the filter, the soil layers, and the drainageways.


1. Design Standards

- The soil must be at least 20% organic matter.
- The soil must be free of toxic materials.
- The soil must be able to support plant growth.

2. Soil Depth

- The depth of the soil must be at least 1.2 meters (4 feet).
- The soil must be at least 1.2 meters (4 feet) below the ground level.

3. Drainage

- The drainageway must be at least 0.6 meters (2 feet) wide and 0.3 meters (1 foot) deep.
- The drainageway must be connected to a stormwater management system.

4. Maintenance

- The area must be maintained at least once per month.
- The area must be inspected at least once per year.

Operation And Maintenance Schedule For Homeowners Association Owned & Maintained Bio-Retention Areas

1. Schedule

- The schedule for operation and maintenance is as follows:
  - Weekly: Inspect the area for any signs of damage or deterioration.
  - Monthly: Check the drainageway for clogging or blockage.
  - Annually: Conduct a comprehensive inspection of the area.

2. Maintenance

- The maintenance is performed by the homeowners association.
- The maintenance includes cleaning, inspection, and repair of the area.

3. Stormwater Management

- The stormwater management system includes a series of pipes and channels that direct the water to the drainageway.
- The system is designed to prevent flooding and to promote water quality.

4. Vegetation

- The vegetation is maintained to promote water quality and to provide a natural aesthetic.
- The vegetation includes a variety of plants that are native to the area.

Typical Clean-Out Detail

- The clean-out detail includes a series of pipes and channels that direct the water to the drainageway.
- The clean-out detail is designed to prevent flooding and to promote water quality.

Note: See Sheet 13 & 16 for ESD Planting Plans and Sheet 18 for ESD Plant Schedule.
FAIRLANE FARM
STREAM RESTORATION
HOWARD COUNTY, MD

DESIGN SPECIFICATION

In order to comply with the requirements of the Maryland Department of Natural Resources, Howard County, and other regulatory agencies, the following design specifications must be followed for the construction of the stream restoration project.

1. The project will be designed and constructed to meet all applicable regulations and guidelines as required by the regulatory agencies.

2. The project will be designed and constructed to ensure the long-term sustainability and health of the stream.

3. The project will be designed and constructed to improve the habitat for aquatic and terrestrial species.

4. The project will be designed and constructed to minimize negative impacts to the surrounding environment.

5. The project will be designed and constructed to comply with all applicable federal, state, and local regulations.

6. The project will be designed and constructed to comply with all applicable construction standards and guidelines.

7. The project will be designed and constructed to comply with all applicable quality control and quality assurance procedures.

8. The project will be designed and constructed to comply with all applicable environmental monitoring and reporting requirements.

9. The project will be designed and constructed to comply with all applicable record-keeping and documentation requirements.

10. The project will be designed and constructed to comply with all applicable safety and health regulations.

11. The project will be designed and constructed to comply with all applicable NDEA and CDA requirements.

12. The project will be designed and constructed to comply with all applicable Section 404 and 401 requirements.

13. The project will be designed and constructed to comply with all applicable wetland mitigation requirements.

14. The project will be designed and constructed to comply with all applicable stream bank stabilization requirements.

15. The project will be designed and constructed to comply with all applicable erosion and sediment control requirements.

16. The project will be designed and constructed to comply with all applicable construction best management practices.

17. The project will be designed and constructed to comply with all applicable construction safety and health regulations.

18. The project will be designed and constructed to comply with all applicable construction quality control and quality assurance procedures.

19. The project will be designed and constructed to comply with all applicable construction record-keeping and documentation requirements.

20. The project will be designed and constructed to comply with all applicable construction safety and health regulations.

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