EXISTING SITE CONDITIONS

Hargraves Community Center Bioretention Retrofit

216 N. Roberson St.
Chapel Hill, NC 27514

Designed By: ARA
Reviewed By: RJW, WFH

Scale
1" = 10 ft

North Carolina State University
Biological and Agricultural Engineering
NCSU Box 7625 | Raleigh, N.C. 27695

Date: MAY 31, 2012

MITCHELL LN

[Diagram of existing site with annotations]

EXISTING SITE
Hargraves Community Center Bioretention Retrofit
216 N. Roberson St.
Chapel Hill, NC 27514
**Bioretention Cross Section**

- Common Bermuda sod on 3:1 slopes
- Fill mix: 85-88% sand, 6-12% fines, 3-5% organic matter
- 3" rifle-shoted hardwood mulch
- Washed 57 stone envelope

**Underdrain and Outlet Structure Detail**

- Trash guard (See specs. to right)
- Top of Berm (80.55)
- 12" ID PVC Overflow (80.3)
- Existing Storm Network

**Bioretention Profile**

- Exaggeration: H:V = 2:1
- Bioretention profile

**Bioretention Fill Media Specifications**

- 85-88% sand
- 6-12% fines (clay and silt)
- 3-5% organic matter
- F-index from 10-50

- The soil mix shall be uniform and free of stones, stumps, roots, or other aggregate materials greater than 2 inches diameter.

**Overflow Structure Specifications**

A 12" Bar Guard from Pond Dam Piping, Ltd. shall be used as a trash rack on the 12" PVC overflow pipe.

The invert of the 12" PVC overflow pipe shall be installed at 80.3' (1' above the mulch surface layer of the bioretention cell).
**Underdrain Installation and Specifications**

1. **CONSTRUCTION SEQUENCING**
   - **1.** The drainage area to the basin must be stabilized before construction begins in order to prevent loss of the bioretention area.
   - **2.** Install sediment fence around area outlined on proposed plan. Install sediment fence according to detail A. Sediment fence must be installed to prevent erosion. All sediment fence must be installed when work is not taking place.
   - **3.** The contractor shall call the call before you dig to ensure that all utilities are located and marked. The contractor shall be responsible for all damages incurred during construction. The contractor shall notify the engineer immediately if unexpected features are discovered that would necessitate modifications to the illustrated design.
   - **3.** It is very important to minimize compaction of in-situ soil at the base of the bioretention cell. Bottom of the excavation. Excessive compaction may result in structural failure. The contractor shall use the same track on which the equipment is placed. The contractor shall make every effort to avoid excessive compaction. Any compaction may result in structural failure. The contractor should use the same equipment on which the equipment is placed. Any compaction may result in structural failure.

2. **PLANTING SPECIFICATIONS**
   - **1.** Periodic top-dressing with two (2) inch washed stone is required to reduce the transport of fines from the bioretention area, and to test the condition of the stone. Stone should be compacted to ensure stability. Stone should be compacted to ensure stability. Stone should be compacted to ensure stability.
   - **2.** After each rainfall event, inspect the road. If stone has been displaced, repair by filling the gap with aggregate of the same size and shape. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.

3. **CONSTRUCTION ENTRANCE (N.T.S)**
   - **1.** Clear the area of vegetation. Remove all roots and debris that will cause excessive compaction. Any compaction may result in structural failure. The contractor should use the same equipment on which the equipment is placed. Any compaction may result in structural failure.
   - **2.** Place the gravel to the dimensions as shown in the detail. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.
   - **3.** After the gravel has been placed, compact the gravel to the desired height. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.
   - **4.** The contractor shall grade the bottom of the bioretention area. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.
   - **5.** Any bioretention fill material installed must be protected from the elements during construction. Whenever possible, allow time for natural compaction and selection to occur. No additional material compaction of soil is necessary. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.

**Detail A**

**Sediment Fence Details (N.T.S)**

ATTACH FILTER FABRIC SECURELY TO UPSTREAM SIDE OF POST

**Detail B**

**Construction Entrance (N.T.S)**

1. Clear the area of vegetation. Remove all roots and debris that will cause excessive compaction. Any compaction may result in structural failure. The contractor should use the same equipment on which the equipment is placed. Any compaction may result in structural failure.

2. Place the gravel to the dimensions as shown in the detail. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.

3. After the gravel has been placed, compact the gravel to the desired height. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.

4. The contractor shall grade the bottom of the bioretention area. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.

5. Any bioretention fill material installed must be protected from the elements during construction. Whenever possible, allow time for natural compaction and selection to occur. No additional material compaction of soil is necessary. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.

**Detail C**

**Forebay Installation Specifications**

1. Grade the forebay as shown on the proposed sheet. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.

2. Filter fabric cloth must be properly protected. Any damage by reaching the forebay and placing another piece of filter cloth. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.

3. Geotextile fabric must have an erosion resistance of 300,000 psi at 0.5% strain. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.

4. Subgrade for geotextile fabric should be cleaned and prepared to receive all roots, vegetation, and debris and prepared to the levels and grades shown on the plan. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.

5. Excavate deep enough for both filter and riprap. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.

6. Rock and/or gravel used for riprap shall conform to specified gradation. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.

7. Voids in the rock riprap should be filled with small and smaller rocks. The contractor shall use the same equipment on which the equipment is placed. Any compaction may result in structural failure.
Along Mitchell Lane before construction

The parking lot, where we closed off the existing stormdrain and rerouted the runoff
Pre-construction view from the parking lot

The path for the pipe is laid out and underground utilities are measured to make sure we can clear them
The new stormdrain inlet is installed and a trench dug for the pipe to the bioretention.

The parking lot was paved early so pool-users could park on the first day it opened.
Excavation of the bioretention basin

Shaping the basin
Filling in the soil media

Laying the underdrains and the overflow drain
Filling in over the drains

Getting ready to put the mulch in
The forebay and stepp slope beside the bioretention basin

Ready for plants!
Planting day

Figuring out plant layout
Planting is done!
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Hargraves (Mitchell Ln.)</th>
<th>Dickerson Ct.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage area (acre)</td>
<td>0.98</td>
<td>0.55</td>
</tr>
<tr>
<td>BMP size (sf)</td>
<td>600</td>
<td>1195</td>
</tr>
<tr>
<td>WQ Storage depth (ft)</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Media depth (ft)</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>IWS depth (ft)</td>
<td>1.4</td>
<td>2.0</td>
</tr>
<tr>
<td>Weir description</td>
<td>12” PVC stand pipe</td>
<td>Trapezoidal weir</td>
</tr>
<tr>
<td>Freeboard (ft)</td>
<td>0.25’</td>
<td>0.33’</td>
</tr>
<tr>
<td>TN load reduction (lb/yr)</td>
<td>1.88</td>
<td>4.42</td>
</tr>
<tr>
<td>TN post-BMP export (lb/yr)</td>
<td>3.48</td>
<td>8.19</td>
</tr>
<tr>
<td>TP load reduction (lb/yr)</td>
<td>0.25</td>
<td>0.60</td>
</tr>
<tr>
<td>TP post-BMP export (lb/yr)</td>
<td>0.31</td>
<td>0.74</td>
</tr>
</tbody>
</table>