

**Low Impact Development Strategy for  
The Village at Washington Gateway**

**Water Quality Control**

The soils on The Village at Washington Gateway site are of a highly variable nature and consist largely of uncontrolled fill underlain by highly plastic clays (see attached letter from GeoConcepts, dated 1/16/07). Due to this primary constraint, as well as topographic challenges related to grading, building siting and road layout, water quality control for this project is primarily provided by 2 large underground storm filter facilities, located at the downstream end of the project. These filter systems have integral sediment traps and provide water filtration through multiple media filled cartridges. Treated water is then discharged into the storm water system.

In addition to the storm filter facilities, and after considering carefully the site constraints, the most appropriate additional Low Impact Development strategy for this 23 acre site is to employ multiple bioretention facilities. These facilities will be spread throughout the site, strategically situated where site grading, sufficient drainage and planting space allow, and will create a reduction in peak flow rate, by increasing the site's overall time of concentration, as well as filter the storm water draining to them.

Bioretention filters are planted areas in local depressions that are subject to temporary ponding of water during storm events. The plants used are those that can tolerate this temporary inundation as well as wide fluctuation in soil moisture content. In addition to meeting these requirements, it is intended that the plant selection will result in an attractive enhancement of the overall landscape design (see sample plant list). Also included in these filters are a mulch layer, an engineered soil media, a gravel layer, an underdrain connected to the storm drain system, as well as an overflow drain to prevent localized flooding during very large storm events.

Water quality control in the bioretention filters occurs as the storm water filters through the various material layers, through biological and chemical reactions in the layers and at the plant rootzone, and through the natural process of nutrient uptake into the plants. In addition, where underlying soil quality will allow, there may be some infiltration into the "native" soil.

The bioretention facilities and their associated structures will be located in common areas (as shown) and will be privately maintained by the Homeowner's Association. The maintenance responsibility for these facilities is consistent with that expected for a townhouse community of this nature, and a maintenance checklist will be provided.

**Water Quantity Control**

Water quantity control for the Village at Washington Gateway will be provided off-site at the proposed stormwater management (SWM) regional pond #3, which is a dry pond (see enclosed pre- and post-development drainage area maps). After the 23-acre site is collected and filtered by the bioretention areas and storm filter structures, the stormwater is drained off-site via existing storm drain pipes to stormwater pond #3. SWM pond #3 will provide peak reduction requirements to meet D.C. regulations for this site, a portion of the shopping center site, and additional area as shown on the enclosed drainage area maps.



# GeoConcepts Engineering, Inc.

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January 16, 2007

Mr. Will Collins  
The Concordia Group  
1485 Chain Bridge Road, Suite 100  
McLean, Virginia 22101

**Subject:** *Feasibility of Using Infiltration Practices, The Village at Washington Gateway (formerly Fort Lincoln New Town), Fort Lincoln Drive and Commodore Joshua Barney Drive, N.E., Washington, D.C. (Our 25030)*

Dear Mr. Collins:

GeoConcepts Engineering, Inc. (GeoConcepts) is pleased to present this letter to address the feasibility of using infiltration practices at the above referenced site.

Our geotechnical engineering report for this site is dated March 08, 2006 and included the drilling of six test borings and the excavation of five test pits in order to evaluate the subsurface conditions at the site. Results of previous test borings were also utilized to evaluate the subsurface conditions. The results of our field investigation and the previous field investigation indicated the presence of up to 15 feet of uncontrolled existing fill over most of the site. The existing fill is highly variable in composition and gradation. The existing fill is underlain by highly plastic Potomac Group clays.

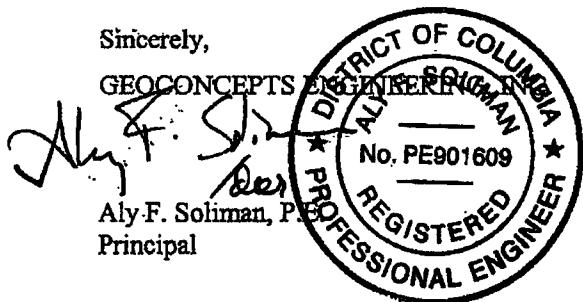
Although no specific in-situ testing and/or soil laboratory testing was conducted to directly measure the rate of infiltration of the on-site soils/existing fill, it is our professional opinion that it is not feasible to utilize conventional infiltration practices at the site due the highly variable and the fine-grained nature of the existing fill that caps most of the site. However, if alternative infiltration techniques, such as bio-retention areas/rain gardens, are utilized on the site for a portion of the water quality control, it is recommended that an underdrain be installed at the bottom of the filter medium to help facilitate the movement of water.

We appreciate the opportunity to be of service for this project. Please contact the undersigned if you require clarification of any aspect of this letter.

Sincerely,

GEOCONCEPTS ENGINEERING, INC.

Aly F. Soliman, P.E.  
Principal



## **Bioretention Facility Soil Mix**

The bioretention facility soil media will follow the mix currently accepted as most effective, as specified below.

- 50-60% washed/construction sand
- 20-30% organic compost (w/ high filtration/infiltration capacity)
- 20-30% topsoil (of uniform composition and with no more than 5% clay content)

Additional soil specifications will be provided during final engineering.

## **Bioretention Facility Sample Plant List**

Through careful selection of plants, the bioretention facilities can be designed not only meet the requirements for filtration, but also to serve as focal points for the community and enhancements of the overall public open space areas. Plant selection may include, but not be limited to, the following:

<b>Canopy Trees</b>	<b>Ornamental Trees</b>	<b>Shrubs</b>	<b>Perennials/Grasses</b>
Ash	Arborvitae	Bayberry	Alumroot
Honeylocust	Fringetree	Beautyberry	Asters
Sweetbay Magnolia	Golden-rain tree	Chokeberry	Black-eyed Susan
Oak spp.	Redbud	Inkberry	Butterflyweed
Red Maple	Serviceberry	Redosier Dogwood	Columbine
River Birch		Spicebush	Coreopsis
Sweetgum		Summersweet	Goldenrod
Sycamore		Viburnum	Leadwort
		Virginia Sweetspire	Little bluestem
		Winterberry	Red Fescue
			Switchgrass
			Willowleaf bluestem

## LEGEND

— STORM DRAIN ELEMENTS

POTENTIAL BIO-RETENTION FILTER  
FACILITY LOCATIONS (SEE  
ACCOMPANYING NARRATIVE, DETAILS  
& SPECIFICATIONS)  
EXACT SIZES AND LOCATIONS TO BE  
DETERMINED DURING FINAL SITE  
PLAN REVIEW

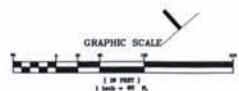


## LID IMPLEMENTATION PLAN FOR THE VILLAGE AT WASHINGTON GATEWAY

WASHINGTON, DISTRICT OF COLUMBIA

JANUARY 2007

FORT LINCOLN/GATEWAY VILLAGE, LLC

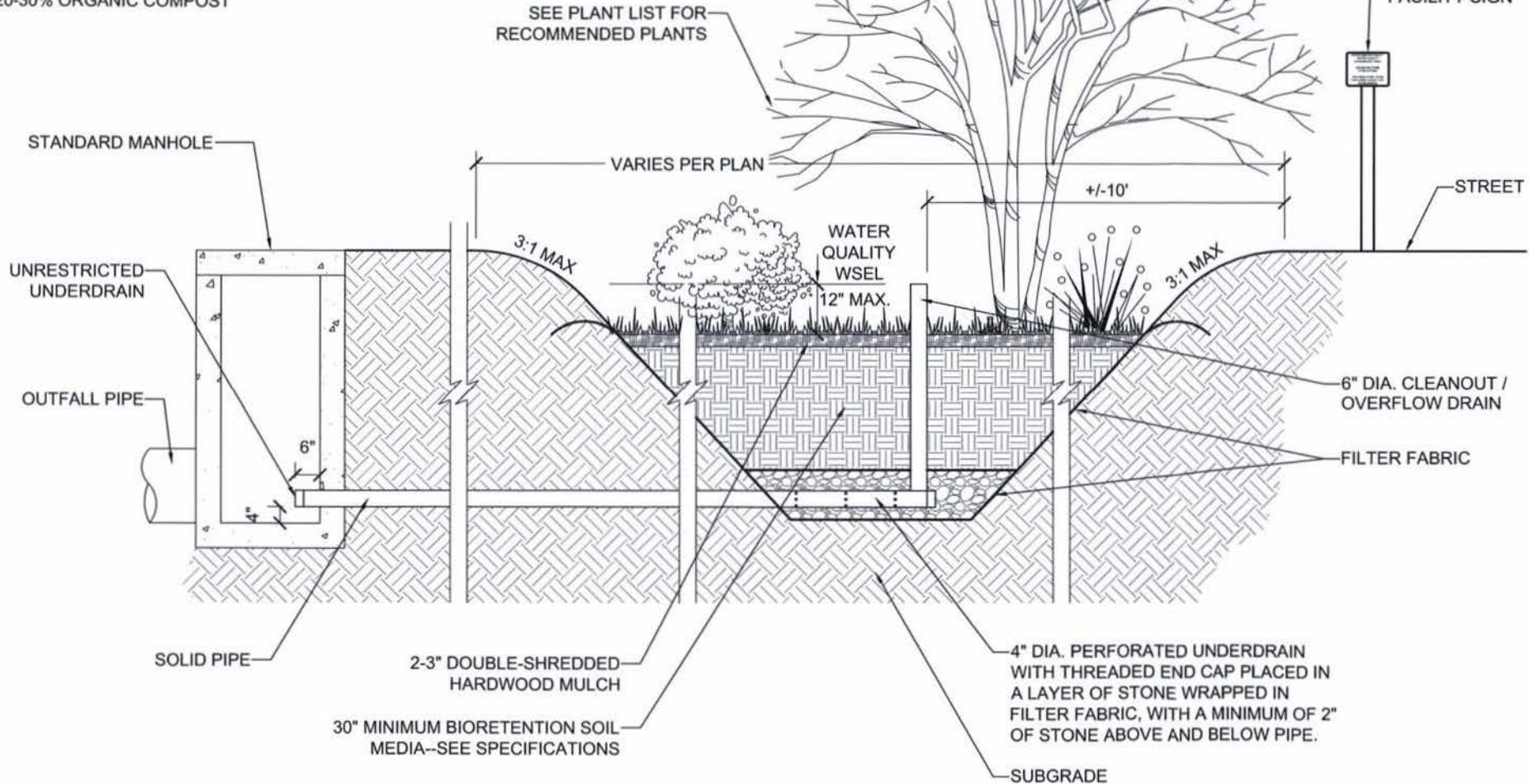


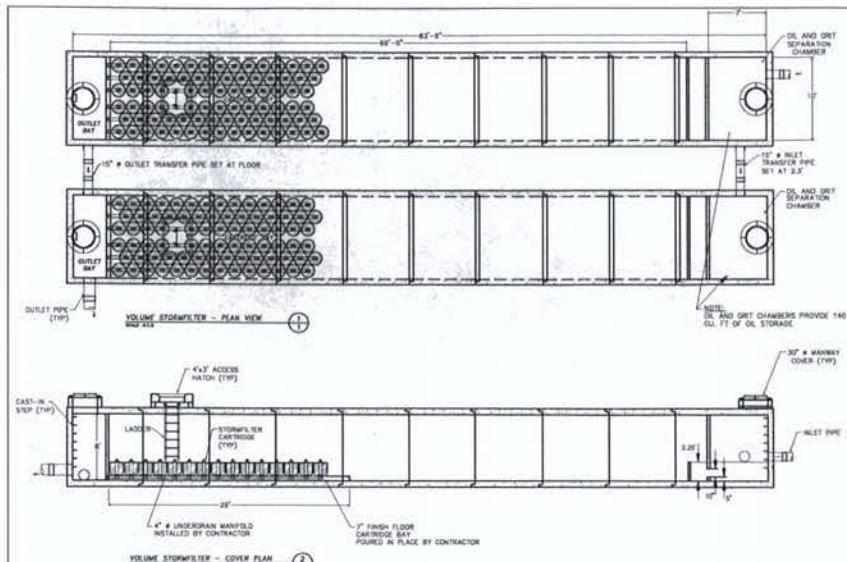
# BIORETENTION FILTER--SECTION

SCALE:  $\frac{1}{2}$ " = 1'-0"

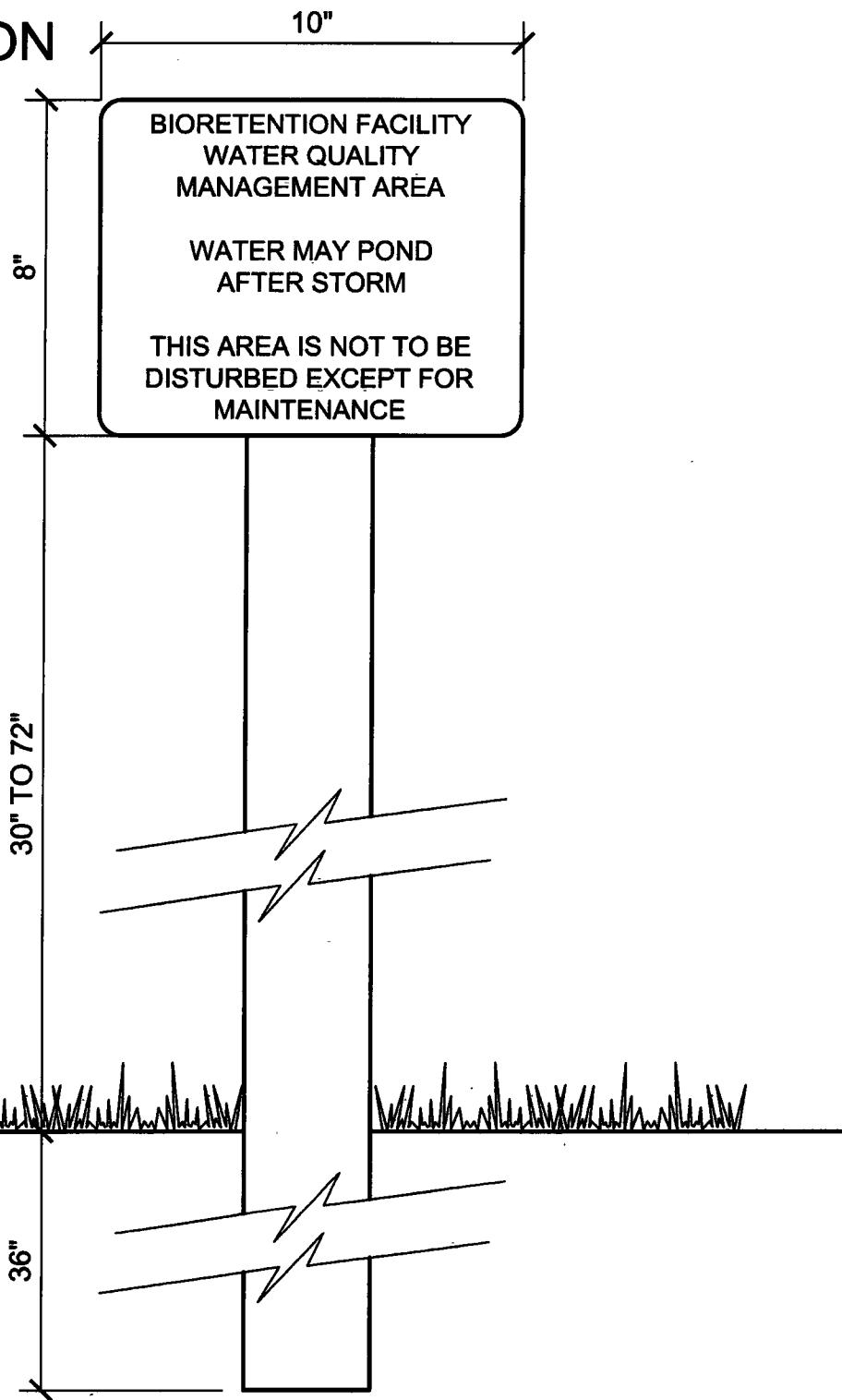
## SOIL MEDIA MIX:

50-60% SAND  
20-30% TOPSOIL  
20-30% ORGANIC COMPOST



 <p><b>GENERAL NOTES</b></p> <p>1. BOX CULVERT FILTRATION BY STORMWATER MANAGEMENT, PORTLAND, OREGON (BSCM-0017).    2. STORMWATER MANAGEMENT IS RESPONSIBLE FOR MAINTENANCE, RATHER TO OPERATION AND MAINTENANCE GUIDELINES FOR DETAILS.    3. PRECAST CONCRETE VAULT PANELS TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C317.    4. INLET AND OUTLET PIPE TO BE SPECIFIED BY ENGINEER AND PROVIDED BY CONTRACTOR.    5. CONTRACTOR TO PROVIDE AND INSTALL REINFORCING BARS AS SPECIFIED.    6. PRECAST CONCRETE VAULT PANELS TO BE PROVIDED BY PRECASTER.    7. THIS DETAIL REFLECTS DESIGN INTENT ONLY. ACTUAL VAULT DIMENSIONS AND CONSTRUCTION WILL BE SHOWN ON THE PRODUCTION SHOP DRAWINGS.</p>	<p><b>STORM FILTER MAINTENANCE SPECIFICATIONS</b></p> <p>1. STORMFILTER AND APPURTENANCES SHALL BE MAINTAINED IN GOOD WORKING CONDITION ACCEPTABLE TO THE COUNTY.    2. THE STORMFILTER AND APPURTENANCES SHALL BE PRIVATELY OWNED AND MAINTAINED.    3. THE LANDOWNER SHALL ENTER INTO AN AGREEMENT WITH A RESPONSIBLE THIRD PARTY TO CLEAN THE STORMFILTER IN ACCORDANCE WITH THE FOLLOWING SPECIFICATION:</p> <ol style="list-style-type: none"> <li>A) THE WATER LEVEL IN THE MAIN CHAMBER SHALL BE MONITORED BY THE OWNER ON A QUARTERLY BASIS AND AFTER EVERY LARGE SYSTEM RAINFALL. THE OWNER SHALL NOTIFY THE COUNTY OF THE WATER LEVEL AND THE DATE OF THE RAINFALL. THE COUNTY SHALL INVESTIGATE THE WATER LEVEL AND NOTIFY THE OWNER OF THE RESULTS. SINCE COUNTY STAFF INSPECTS THE FILTER ACTIVITY, PERFORMANCE OF THE FILTER IS NOT MONITORED BY THE COUNTY.</li> <li>B) THE STORMFILTER SHALL BE INSPECTED SEMIANNUALLY BY A REPRESENTATIVE OF THE OWNER AND THE CONTRACTOR.</li> <li>C) THE STORMFILTER MUST NOT PUMP OUT AFTER EACH SEMIANNUAL INSPECTION. IF THE CHAMBER CONTAINS AN OIL SLICK, IT SHOULD BE REMOVED AND RECALLED. THE CONTRACTOR IS RESPONSIBLE FOR RECALMING THE FILTER AND RECALLING THE FILTER MATERIAL. ANY FILTER THAT IS ROUGHED BY VACUUM PUMP AND DEPOSED IN AN APPROPRIATE LOCATION.</li> <li>D) WHEN THE CARTRIDGES WILL NO LONGER DRAW DOWN WITHIN THE REQUIRED 40-HOUR PERIOD, THE CARTRIDGES MUST BE RECALMED AND REPLACED WITH NEW MATERIALS CONFORMING TO THE MOST CURRENT SPECIFICATIONS.</li> <li>E) FLOW (PUMPING VEHICLE, ENERGY SAVERS, AND OTHER FACILITIES) SHALL BE KEPT CLEAN AND READY FOR USE.</li> <li>F. THE LANDOWNER SHALL MAINTAIN A COPY OF A VALID CURRENT AGREEMENT ON FILE WITH SPACES AT ALL TIMES.</li> <li>G. THE QUALIFICATIONS OF THE MAINTENANCE OPERATOR ARE SUBJECT TO REVIEW AND APPROVAL BY SP.</li> <li>H. STORMFILTER MAINTENANCE RECORDS SHALL BE KEPT ON-SITE AND SHALL BE MADE AVAILABLE TO COUNTY OFFICIALS UPON REQUEST.</li> </ol>		
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>PLANNED UNIT DEVELOPMENT</b> <b>THE VILLAGE AT WASHINGTON GATEWAY</b> WASHINGTON, DISTRICT OF COLUMBIA</p> </td> <td style="width: 50%; vertical-align: top;"> <p><b>STORM FILTER DETAILS AND NOTES</b> <b>VIKA REVISIONS</b></p> </td> </tr> </table>		<p><b>PLANNED UNIT DEVELOPMENT</b> <b>THE VILLAGE AT WASHINGTON GATEWAY</b> WASHINGTON, DISTRICT OF COLUMBIA</p>	<p><b>STORM FILTER DETAILS AND NOTES</b> <b>VIKA REVISIONS</b></p>
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<p><b>STORMWATER MANAGEMENT INC.</b> (800) 548-4667</p>			

# BIORETENTION SIGN



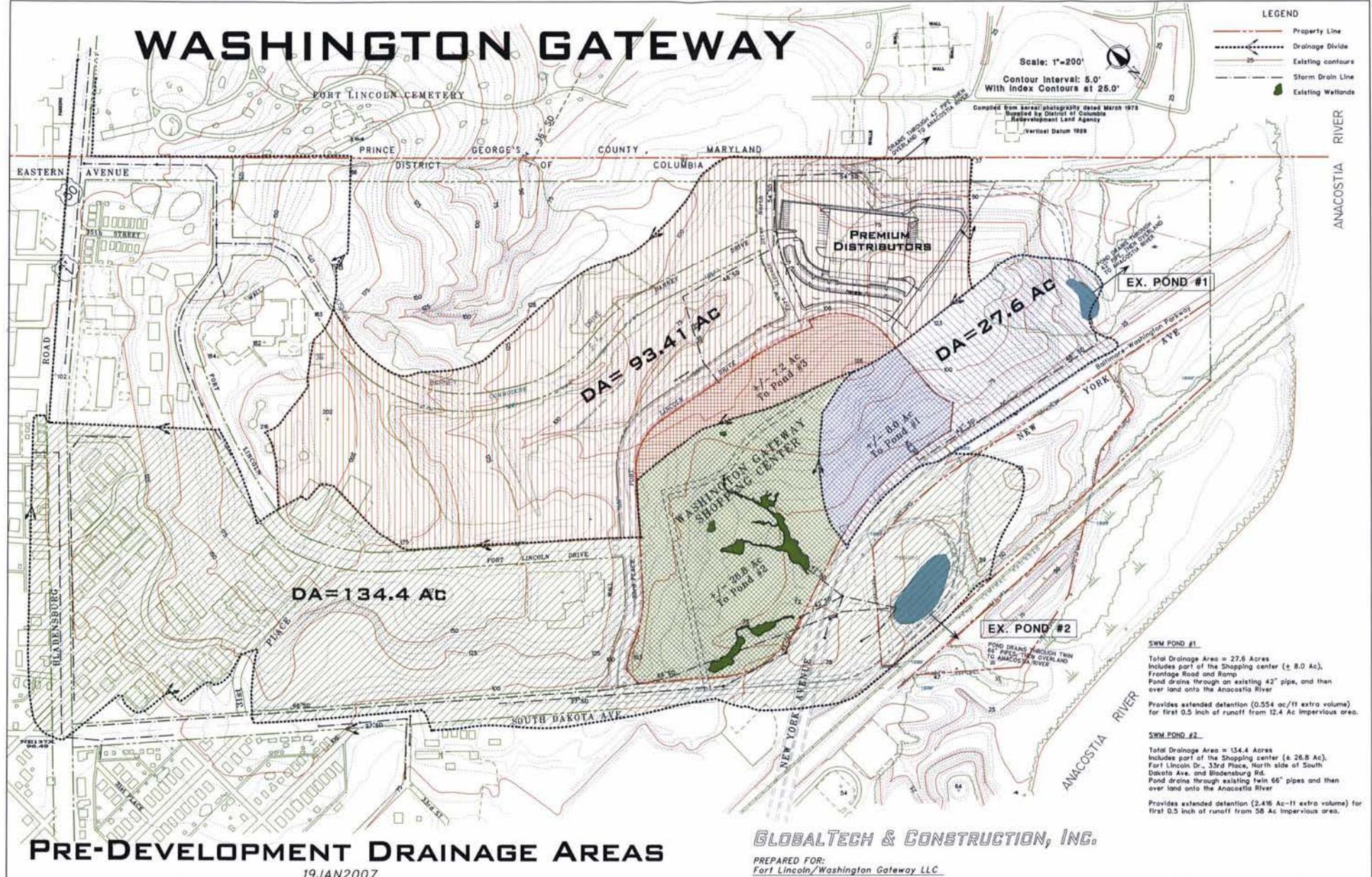
## GENERAL REQUIREMENTS:

1. THE SIGN IS TO BE PLACED ON A 3" "U-CHANNEL" POST.
2. THE SIGN IS TO BE PLACED AT APPROXIMATELY 100 FOOT INTERVALS AROUND THE PERIMETER OF THE BIORETENTION FACILITY. EACH FACILITY SHALL HAVE A MINIMUM OF 1 SIGN.
3. THE SIGN SHALL BE MADE WITH REFLECTIVE MATERIALS AND BE GREEN WITH A WHITE BORDER AND STANDARD  $\frac{1}{2}$ " LETTERS (OR AS SPECIFIED/APPROVED BY THE DISTRICT OF COLUMBIA DEPT. OF HEALTH).



EXAMPLE PHOTOS OF BIORETENTION FACILITIES

# WASHINGTON GATEWAY



# WASHINGTON GATEWAY

**WASHINGTON GATEWAY**

Scale: 1"=200'

Contour Interval: 5.0' With Index Contours at 25.0'

Compiled from aerial photography dated March 1973. Slipped by District of Columbia Board of Land Agency. Vertical Datum 1988

**LEGEND**

- Property Line
- Drainage Divide
- Existing contours
- Storm Drain Line
- RIVER ANACOSTIA

**POST-DEVELOPMENT DRAINAGE AREAS**

PREPARED FOR:  
Fort Lincoln/Washington Gateway LLC

19JAN2007

**GLOBALTECH & CONSTRUCTION, INC.**

## POST-DEVELOPMENT DRAINAGE AREAS

19JAN2007

## GLOBALTECH & CONSTRUCTION, INC.

*PREPARED FOR:*  
*Fort Lincoln/Washington Gateway LLC*