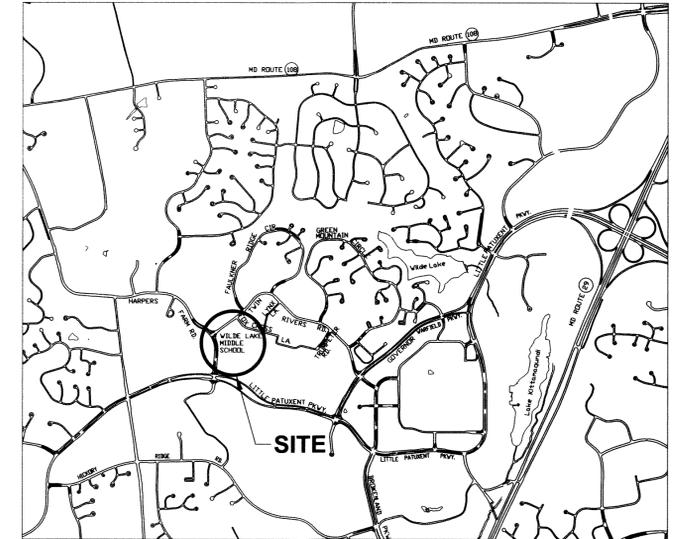
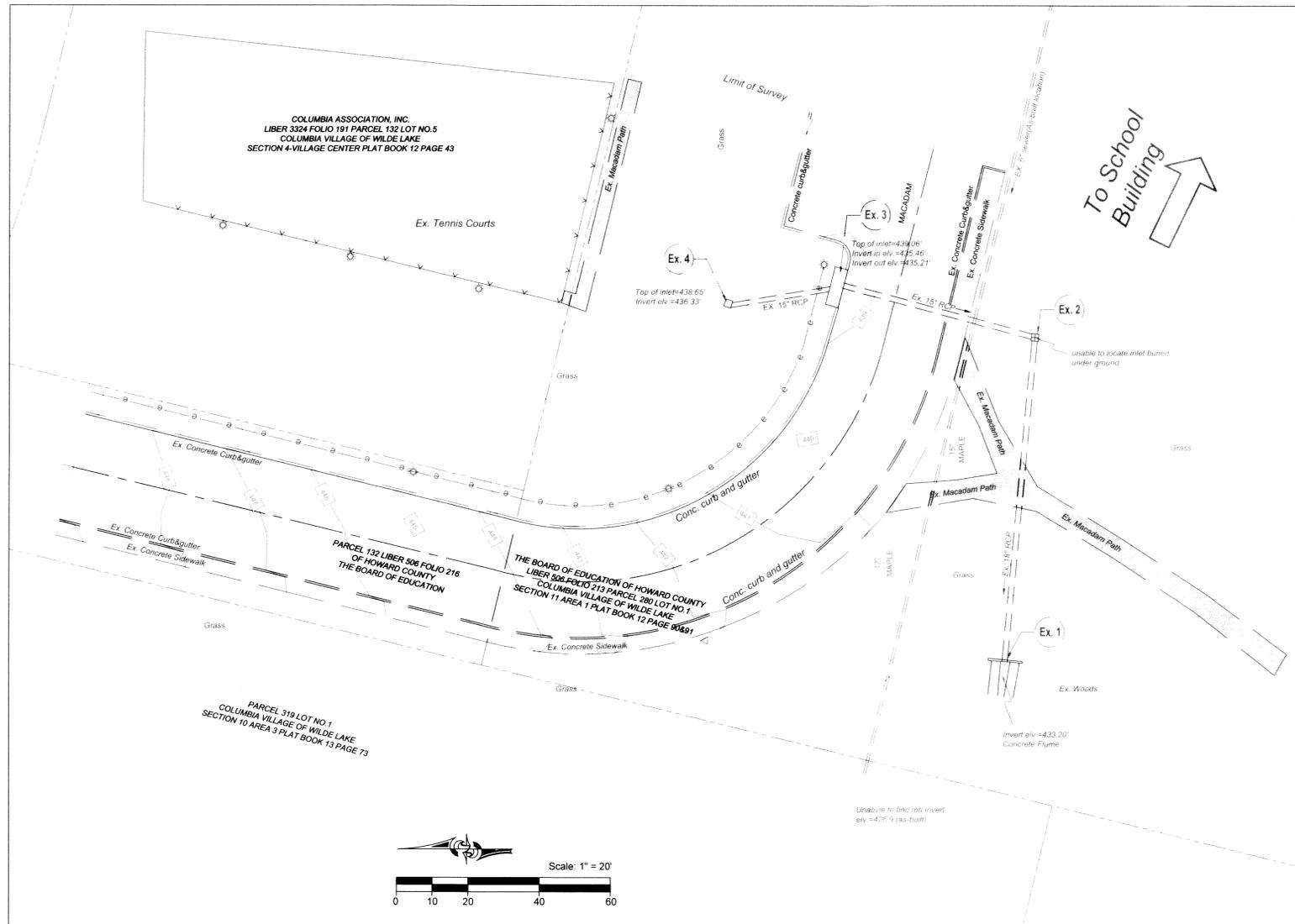


WILDE LAKE MIDDLE SCHOOL Bioretention Design



Vicinity Map
Scale 1"=2000'
Source: Howard County GIS 1998

Sequence of Construction

1. Obtain county grading permits. Conduct pre-construction meeting. (1 day)
 2. Clear and grub in preparation to install silt fence, pedestrian fence and inlet protection. (1day).
 3. Install sediment control items (1 day).
 4. Install de-watering sump pit and de-water basin area if permanent pool saturated soils exist (1 day).
 5. Install sand underdrain system and drainage/planting media as shown on plans (2 days).
 6. Install plantings (with assistance of Wilde Lake Middle School students) and permanent seeding (1 day).
 7. With sediment control inspectors permission remove remaining sediment control devices and stabilize areas disturbed by this process. (1 day).
- Total = 8 days**

General Notes

1. These plans were prepared with the field information at the time of project survey. It is possible that field conditions as of the date of construction vary from these plans and it is the contractor's responsibility to verify field conditions such as elevations, depths, etc. prior to proceeding with work. It is the contractor's responsibility to verify with the supplier / manufacturer of any proprietary product that their product will function per the design for the field conditions at time of construction. The design engineer should be notified immediately if any deviations from the design plan are found.
2. All specified and/or proprietary products shown hereon may be subject to substitution with other products recommended by the contractor, subject to written review and approval by the design engineer.
3. All construction shall be in accordance with the latest standards and specifications of Howard County.
4. The contractor shall notify the Department of Public Works / Bureau of Engineering / Construction Inspection Division at (410) 313-4900 at least five (5) working days prior to the start of work.
5. The contractor shall notify "Miss Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work.
6. The coordinates shown hereon are based upon the Howard County Geodetic control which is based upon the Maryland State Plane Coordinate System.
7. The contractor shall field visit and familiarize themselves with the site prior to bidding and construction.
8. All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the most current *Maryland Standards and Specifications for Soil and Erosion and Sediment Control* and any revisions thereto.
9. The appropriate federal/state and local permits must be obtained before work commences.
10. Source of existing topography is Howard County G.I.S. dated 1999 and J.A. Rice Inc. field survey dated Jan. 2006. Horizontal and Vertical Datum is based on Howard County Monuments 35C2 and 36AA.
11. Contractor shall not store any material and/ or equipment within 2 feet of private property.
12. Contractor shall take caution not to damage any existing trees, except those designated on the plan to be removed. Any damaged tree shall be replaced at contractor's expense.
13. All quantities are estimates only. The contractor is responsible for verifying quantities through a field visit and his own quantity takeoffs.

SHEET INDEX

1. Title Sheet
2. Design View
3. Sediment Control
4. Profiles
5. Sediment Control Notes and Details
6. Planting Plan
7. Planting Notes and Details

Summary of Environmental Impacts

	Tree Removal (each)	Stream Disturbance (lf)	Wetland Disturbance (sq.ft)	Limits of Disturbance (sq.ft)	Limits of Disturbance (ac)	Cut (cy)	Fill (cy)	Net (cy)
Total	0	0	0	5,000	0.11	250	10	240

MISS Utility

Call "Miss Utility" at 1-800-257-7777, 48 hours prior to the start of work. The excavator must notify all public utility companies with underground facilities in the area of proposed excavation and have those facilities located by the utility companies prior to commencing excavation.

HOWARD COUNTY DPW - ENVIRONMENTAL SERVICES
6751 COLUMBIA GATEWAY DRIVE, SUITE 514
COLUMBIA, MD 21046
PHONE: (410) 313-6413
ATTN: Mark Richmond

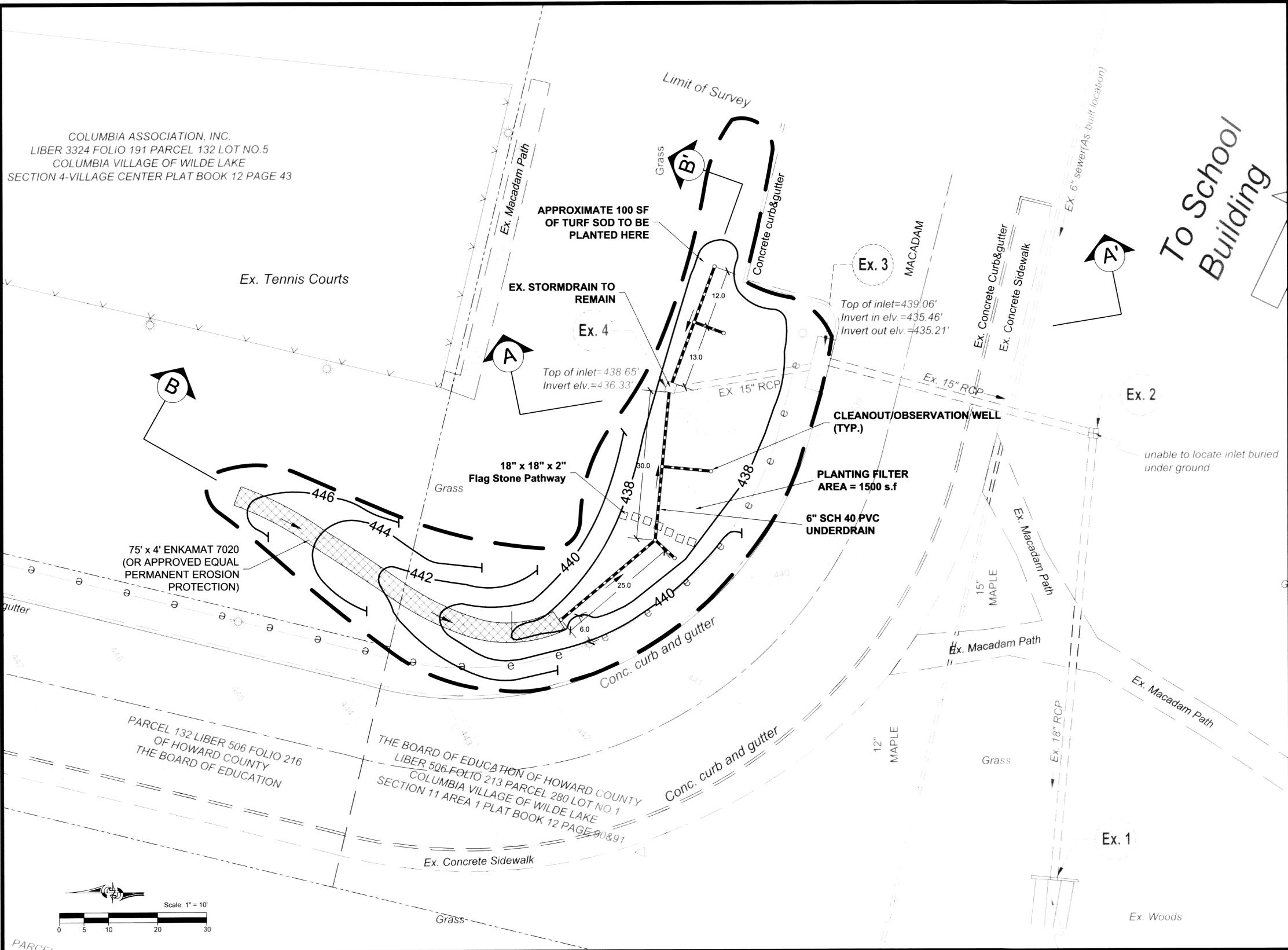
HOWARD COUNTY, MD
PARCEL 106
ELECTION DISTRICT # 4
MAP 14

BIORETENTION DESIGN WILDE LAKE MIDDLE SCHOOL TITLE SHEET

DATE:	05/06				
DESIGNED:	CW/HT				
DRAFTED:	HT				
CHECKED:	TCS				
BASE DATA:	J.A. RICE	NO.	REVISIONS	BY	DATE

CPJ Charles P. Johnson & Associates, Inc.
PLANNERS • ENGINEERS • LANDSCAPE ARCHITECTS • SURVEYORS
1751 ELTON ROAD SUITE 300 SILVER SPRING, MARYLAND 20903
Phone: (301) 434-7000 E-mail: info@cpja.com Fax: (301) 434-9394
FREDERICK, MD FAIRFAX, VA

SCALE AS SHOWN
SHEET 1 OF 7 SHEETS
JOB NO. 36-501



Legend

- Limits of Disturbance
- Existing Contours
- Proposed Contours
- Light pole
- Existing Fence
- Profile
- Property Line

COLUMBIA ASSOCIATION, INC.
 LIBER 3324 FOLIO 191 PARCEL 132 LOT NO.5
 COLUMBIA VILLAGE OF WILDE LAKE
 SECTION 4-VILLAGE CENTER PLAT BOOK 12 PAGE 43

PARCEL 132 LIBER 506 FOLIO 216 OF HOWARD COUNTY THE BOARD OF EDUCATION

THE BOARD OF EDUCATION OF HOWARD COUNTY LIBER 506 FOLIO 213 PARCEL 280 LOT NO.1 COLUMBIA VILLAGE OF WILDE LAKE SECTION 11 AREA 1 PLAT BOOK 12 PAGE 90&91

To School Building

BIORETENTION DESIGN WILDE LAKE MIDDLE SCHOOL DESIGN VIEW

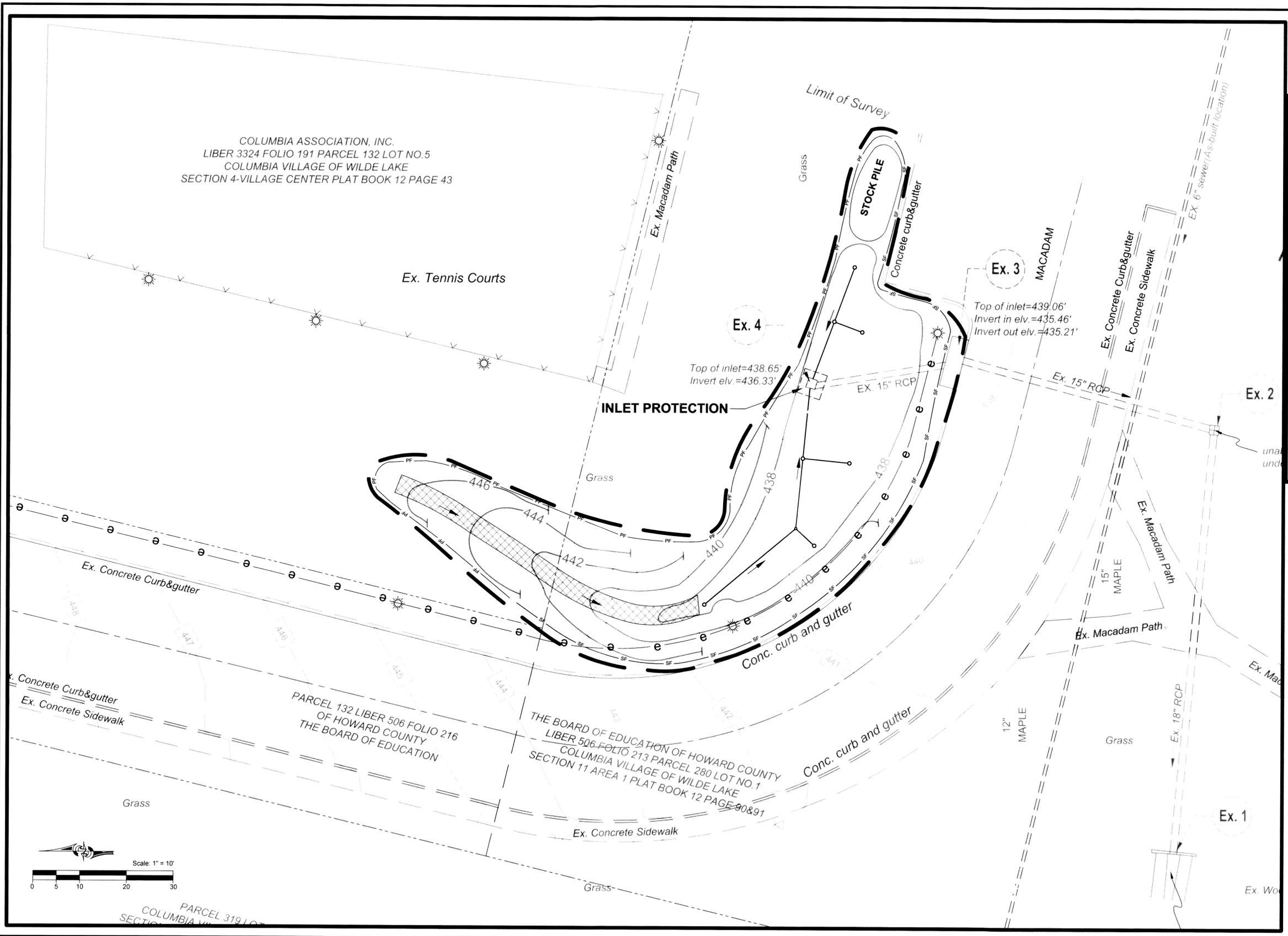
HOWARD COUNTY DPW - ENVIRONMENTAL SERVICES
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 COLUMBIA, MD 21046
 PHONE: (410) 313-6413
 ATTN: Mark Richmond

HOWARD COUNTY, MD
 PARCEL 106
 ELECTION DISTRICT # 4
 MAP 14

DATE:	05/06				
DESIGNED:	CW/HT				
DRAFTED:	HT				
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BASE DATA:	J.A. RICE	NO	REVISIONS	BY	DATE

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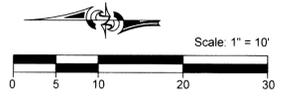
SCALE AS SHOWN
SHEET 2
OF 7 SHEETS
JOB NO. 36-501



COLUMBIA ASSOCIATION, INC.
 LIBER 3324 FOLIO 191 PARCEL 132 LOT NO.5
 COLUMBIA VILLAGE OF WILDE LAKE
 SECTION 4-VILLAGE CENTER PLAT BOOK 12 PAGE 43

PARCEL 132 LIBER 506 FOLIO 216
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 THE BOARD OF EDUCATION

THE BOARD OF EDUCATION OF HOWARD COUNTY
 LIBER 506 FOLIO 213 PARCEL 280 LOT NO.1
 COLUMBIA VILLAGE OF WILDE LAKE
 SECTION 11 AREA 1 PLAT BOOK 12 PAGE 90&91



Legend

	Limits of Disturbance
	Existing Contours
	Proposed Contours
	Light pole
	Existing Fence
	Silt Fence
	Pedestrian Fence
	Property Line

HOWARD COUNTY DPW - ENVIRONMENTAL SERVICES
 6751 COLUMBIA GATEWAY DRIVE, SUITE 514
 COLUMBIA, MD 21046
 PHONE: (410) 313-6413
 ATTN: Mark Richmond

HOWARD COUNTY, MD
 PARCEL 106
 ELECTION DISTRICT # 4
 MAP 14

BIORETENTION DESIGN WILDE LAKE MIDDLE SCHOOL SEDIMENT CONTROL

DATE:	05/06				
DESIGNED:	CW/HT				
DRAFTED:	HT				
CHECKED:	TCS				
BASE DATA:	J.A. RICE	NO.	REVISIONS	BY	DATE

Mark Richmond
5.25.06

CPI Charles P. Johnson & Associates, Inc.
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SCALE AS SHOWN
SHEET 3
OF 7 SHEETS
JOB NO. 36-501

GENERAL BIORETENTION INSTALLATION NOTES

- Contractor to strictly follow the approved design and construction specifications. Any substitutions are to be pre-approved by the inspector and design engineer in writing prior to placement of materials.
- The bioretention facility may not be constructed until all contributing drainage areas to each facility are stabilized. Construction of the facility shall not proceed without prior authorization of the inspector.
- No "rock dust" can be used for sand.
- Unless otherwise noted, all poured in place concrete shall be 3500 psi at 28 days.
- Contact "Miss Utility" at 1-800-257-7777 at least 48 hours prior to the start of construction.

UNDERDRAIN INSTALLATION SPECIFICATIONS

- Pipe shall be 6" diameter perforated SDR 35 PVC with 3/8" diameter holes, or approved equivalent.
- Perforations are to be 3/8-inch diameter, located 90 degrees on center, every four inches on center along the underdrain pipe. More rows may be used, if desired.
- Pipe shall be surrounded by a bed of 3/4" diameter clean gravel.
- Under drains to be placed on a 3'-0" wide section of filter cloth (Mirafi 140 N, or approved equivalent). Pipe is placed next, followed by the gravel bedding.
- The ends of under drain pipes not terminating in an observation well shall be capped.

BIORETENTION AREA SOIL SPECIFICATIONS

1. Soil Texture and Structure

Topsil for bioretention shall have a sandy loam, loamy sand, or loam texture per USDA textural triangle. Maximum clay content is 5%; soil mixture shall be 50-60% sand; 20-30% leaf mulch; and 20-30% topsoil. The soil shall be a uniform mix, free of stones, stumps, roots, or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the bioretention that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda Grass, Quackgrass, Johnson Grass, Mugwort, Nutsedge, Poison Ivy, Canadian Thistle, Tearthumb, or other noxious weeds.

2. Soil Testing:

Planting soil for bioretention areas must be tested prior to installation for pH and organic matter. The soil should meet the following criteria (Landscape Contractors Association, 1986).

pH Range: 5.5-6.5
Organic Matter: 1.5-3.0%

It is required that a sieve analysis, pH, and organic matter test be performed per each bioretention area.

3. Soil Placement:

Placement of the planting soil in the bioretention area should be in lifts of 12 to 18 inches and lightly compacted. Minimal compaction effort can be applied to the soil by tamping with a bucket from a dozer or backhoe. Refer also to Section 6 - Compaction.

4. Mulch Specifications:

Individual planting shall be mulched (refer to landscaping details, this sheet). Acceptable mulch shall be shredded hardwood only. Mulch must be well aged, uniform in color, and free of foreign material including plant material. Well aged mulch is defined as mulch that has been stockpiled or stored for at least twelve (12) months.

5. Sand Specifications:

Provide clean sand, free of deleterious materials. Sand shall meet AASHTP M-6 or ASTM C-33 with grain size of 0.02"-0.04".

6. Compaction:

It is very important to minimize compaction of both the base of the bioretention area and the required backfill. When possible, use excavation hoes to remove original soil. If bioretention areas is excavated using a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf type tires.

Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high pressure tires will cause excessive compaction resulting in reduced infiltration rates and storage volumes and is not acceptable. Compaction will significantly contribute to design failure. Compaction can be alleviated at the base of the bioretention facility by using a primary tilling operation such as a chisel plow, ripper, or subsoiler. These tilling operations are to refracture the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment.

When back filling the bioretention facility, place soil in lifts 12" or greater. Do not use heavy equipment within the bioretention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grade bioretention materials with light equipment such as a compact loader or a dozer/loader with marsh tracks.

7. Geotextile Specifications:

Geotextile fabric shall meet ASTM D-751 (puncture strength - 125 lb)
ASTM D-1117 (Mullen burst strength - 400 PSI)
ASTM D-1682 (Tensile strength - 300 lb)
Fabric shall have 0.08" thick E.O.S. of #80 sieve, and maintain 125 GPM per sq. ft. flow rate.

8. Gravel Filter Specifications:

Underdrain gravel blanket shall be double washed, #57 stone, 1-1/2" in size. Pea Gravel shall be washed, river-run, round diameter, 1/2"-3/4" in size.

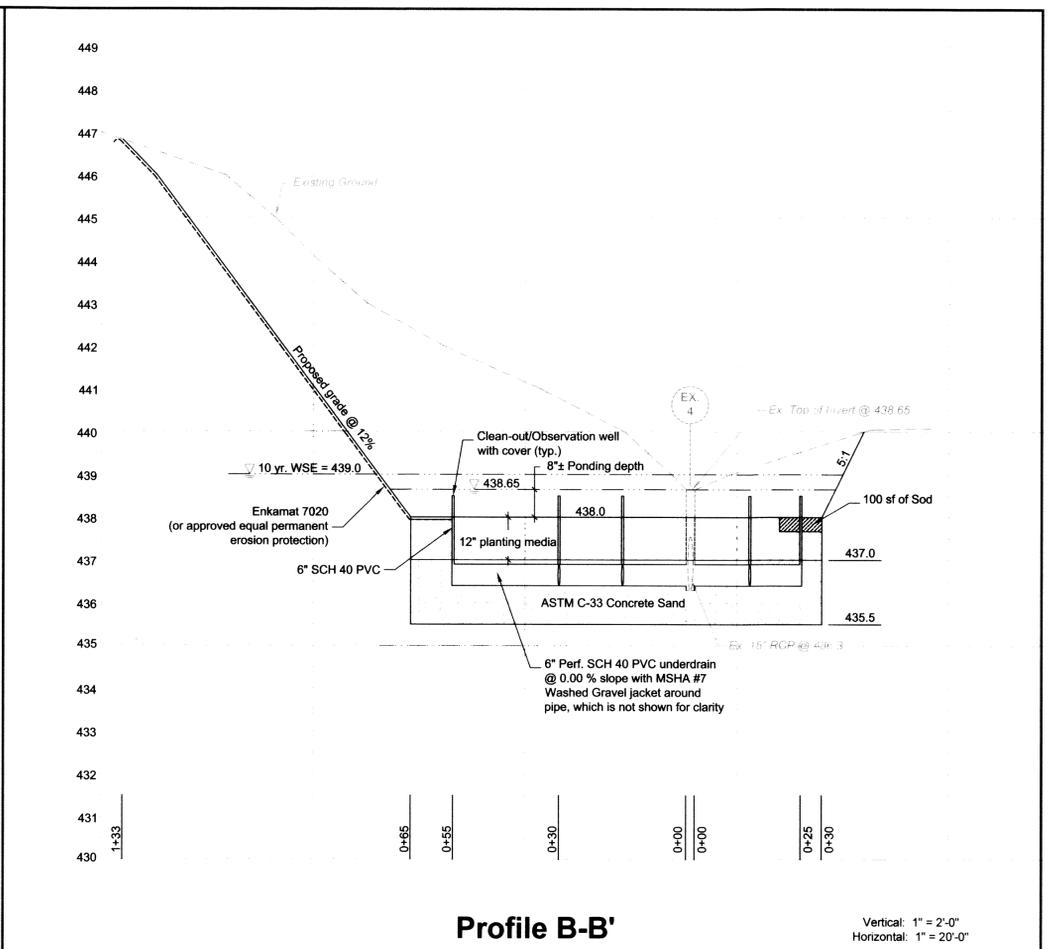
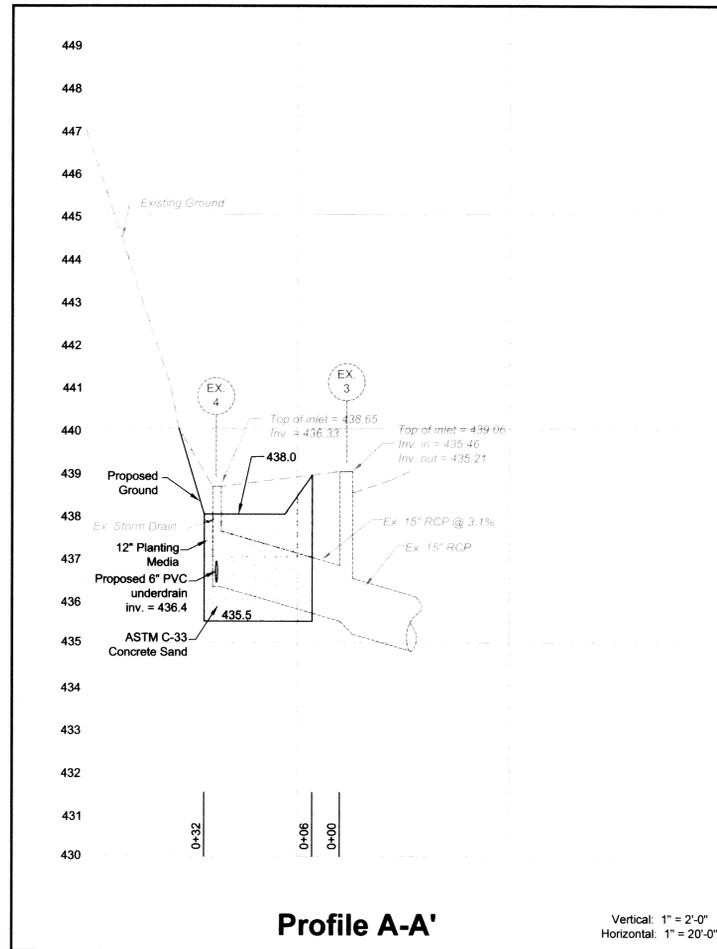
9. Inspection Requirements:

- The contractor shall arrange a "preconstruction meeting" with the owner and architect/engineer prior to beginning work on the bioretention facility.
- At the completion of excavation to inspect subgrade preparation.
- During underdrain and filter installation.
- Back fill of soil into the bioretention areas. Soil certifications for back fill are required.
- The final topsoil layers should be thoroughly wetted achieve settlement of the soil/sand backfill mix.
- Additional soil backfill should be placed as required to achieve the design top surface elevations.
- The work shall be inspected by the owner/architect prior to final stabilization and planting.
- Sediment & erosion control practices may be removed upon approval by the County inspector.

GENERAL PLANTING SPECIFICATIONS

The plant root ball should be planted so 1/8th of the ball is above final grade surface.

- Fertilization:** The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the bioretention structure is to improve water quality. Adding fertilizers defeats, or at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch is used to amend the soil. Rototill urea fertilizer at a rate of 2 pounds per 1000 square feet.
- Grass Seeding (slopes adjacent to bioretention area):** Seed areas according to the following schedule: Panicum virgatum (Switchgrass) 0.25 lb. per 1000 sq. ft. Poa trivialis (Rough-stalked bluegrass) 1.00 lb. per 1000 sq. ft. Festuca ovina var. duriuscula (Hard fescue) 1.00 lb. per 1000 sq. ft.



PIPE SCHEDULE

Location	Material	Length	Specification
Wells	Solid 6" PVC	13'	Schedule 40
Underdrain	Perforated 6" PVC	100'	Schedule 40

Plot: 11x17 Title.dwg
 CPJ.dwg
 24/36 Title.dwg
 Plot: 11x17 Title.dwg
 CPJ.dwg
 24/36 Title.dwg

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**BIORETENTION DESIGN
WILDE LAKE MIDDLE SCHOOL
PROFILES**

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