SHEET INDEX

SHEET	DESCRIPTION
1	Cover Sheet
2	Existing Conditions
3	Site Plan
4	Sediment & Erosion Control Plan
5	Sediment & Erosion Control Details
6	Forest Conservation Plan
7	Landscape Plan
8	Stormwater Management Plan, Notes, Details & Borings
9	Details & Profiles
10	Pervious Concrete Pavement Details and Specifications

GENERAL NOTES

1. The Contractor shall notify the Department of Public Works / Bureau of Engineering/ Construction Inspection Division at (410) 313-1880 at least five (5) working days prior to the start of work.
2. The contractor shall notify 'Miss Utility' at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
3. The existing topography within the limit of disturbance is based on a field run survey by Shandeberger and Lane, dated April 2009. The courses and coordinates shown thereon are based upon the Howard County Geodetic Control which is based upon the Maryland State Plane Coordinate System. The topography uses the following Howard County monuments:

Point	Northing	Easting	Elevation
31BT8	576,015.374	1,375,770.465	378.575
31BT3	576,602.966	1,375,465.594	353.895

4. Storm water management is provided by Environmental Site Design, using Bio Retention, pervious concrete paving and rainwater harvesting privately maintained.
5. Approximate locations of existing utilities are based solely on available records and field surveys. Contractor shall verify the locations of any utilities which may be impacted by the work. The contractor shall take all necessary precautions to protect the existing utilities and maintain uninterrupted service. Any damage incurred due to contractor's operation shall be repaired immediately at the contractor's expense.
6. Any damage caused by the Contractor to existing public right-of-way, existing paving, existing curb, and gutter, existing utilities, etc. shall be repaired at the Contractor's expense.
7. The project site is located within the Metropolitan District.
8. On-site private sanitary service shall be utilized (septic).
9. On-site private water service shall be utilized (well). A variance from Section 26.04.02.05 of the Code of Maryland Regulations, to permit the sewage disposal area serving the proposed house on Parcel 262 to be located upgradient from the private water supply on Parcel 262, was approved by the Howard County Health Department, with approval also from the Maryland Dept of the Environment, on January 24, 2011.
10. The Perc Certification Plan, identifying septic reserve and well locations, was approved by the Howard County Health Department on ~~[illegible]~~ 4/26/2012.
11. Waiver Petition WP-11-171 was approved June 2, 2011 for the following:
    Section 16.115, to modify floodplain dedication requirements, and to allow certain structures in the floodplain,
    Section 16.116(b) to allow certain grading and vegetation removal on steep slopes,
    Section 16.117(a) to allow some clearing of woodland,
    Section 16.1205 (a)(1)(2)(4)(5)(7) to allow certain impacts to forest retention priorities
    Several conditions of approval were listed for WP-11-171:
    1) A Site Development Plan shall be required for development of a single family home on parcel 194 and for construction of a driveway across parcel 262.
    2) The uninhabitable dwelling located on the eastern section of Parcel 194 shall not be used for residential purposes. The property owner shall provide to this Division a copy of written approval from the Division of Public Service and Zoning Administration to allow the conversion of the uninhabitable dwelling to a "studio" with the submission of the site development plan.
    3) A Cemetery Boundary Documentation and Accomodation Plan shall be submitted to the Department of Planning and Zoning showing the boundaries of the existing cemetery, public access, and how the cemetery will be accomodated with the development. This information will be forwarded for review and approval by the Planning Board at a regularly scheduled meeting prior to final approval of the site development plan.
    4) Application for all permits as may be required by the Maryland Department of the Environment for the disturbance of wetlands, floodplains, and/or stream crossing for the construction of a new driveway or upgrades to the existing offsite driveway. In accordance with comments received from the Development Engineering Division , the owner should attempt to follow the previously existing driveway located across parcel 262 so as to limit the disturbance of the environmental features.
    5) Application of any design manual waivers from the Development Engineering Division, Department of Planning and Zoning, as may be necessary for the construction of a new driveway or upgrades to the existing offsite driveway with regards to width and driveway grade.
    6) Submission of an Environmental Concept Plan to the Development Engineering Division, Department of Planning and Zoning, for review and approval prior to the submission of a site development plan.
    7) Application of any waivers as required by the Bureau of Engineering, Bureau of Public Works, to utilize private well and septic for property located within the Metropolitan District.
    8) Approval from the Health Department for construction of a private well and septic system on Parcel 194.
    9) Deeds for the on-site Forest Conservation Easement(s) shall be submitted with the Site Development Plan submission and recorded by the Real Estate Services Division, Department of Public Works, prior to final approval of the Site Development Plan.
    10) Approval for the removal of specimen trees G, H, J, and K only as shown on plan sheet/exhibit C-2 of the Waiver Petition Application.
    11) All grading and tree clearing within the wetland, wetland buffer, stream bank buffer and steep slopes shall be minimized to the extent required to construction the proposed house and driveway.
    12) Compliance with all other County and State regulations and requirements as may be applicable for construction for the new dwelling and driveway.
12. A Letter of Authorization from the State of Maryland, Department of the Environment, Water Management Administration has been issued, permitting impacts to the intermittent stream channel, non-tidal wetlands, and reforested buffer, per Authorization number 2011WO2051/11-WT-0060. The authorization is effective May 3, 2011, with an expiration date May 3, 2014.
13. There is a 100-year floodplain on this site associated with the unnamed tributary to the Patapsco River a waiver was granted in accordance with WP-11-171. The tributary is classified as a Class I use waterway. Existing wetlands are shown with associated stream, stream buffer, and wetland buffer. Wetlands delineation was performed by Eco-Science Professionals, Inc. on Sept 21, 2010; the Wetland Report was issued November 1, 2010.
14. A Forest Stand Delineation Report was prepared by Eco-Science Professionals dated November 3, 2010.
15. There is a private cemetery/burial ground on this property. A cemetery report has been prepared by Tesseract Sites, Inc. Dated 9/20/11 for burial site 25-1.
16. The existing structure on Parcel 194 shall be renovated as a "studio" and shall not be used as a residence. 17. In accordance with Section 128 of the Howard County Zoning Regulations, bay windows, chimneys or exterior stairways not more than 16 feet in width may project not more than 4 feet into any setbacks. Porches or decks, open or enclosed may project not more than 10 feet into the front or rear yard setback.
18. No grading, removal of vegetative cover of trees, paving and new structures shall be permitted within the required wetlands, streams, or their buffers, forest conservation easement areas and 100 year floodplain, except as approved by Howard County in WP-11-171 and the Maryland Department of the Environment.
19. The landscape plan has been prepared in accordance with Section 16.124 of the Howard County Code and of the Howard County Landscape Manual. Proposed planting calculations can be found on sheet 7 of 10.
20. Financial Surety for landscaping for the required 3 trees in the amount of $400 is part of the builders grading permit application for this lot.
21. Forest Conservation: This project complies with the requirements of Section 16.1200 of the Howard County Code for Forest Conservation by retaining 3.0 Ac. of existing forest into retention easements. No surety is required.
22. College Avenue is a scenic road, however, there is no frontage on College Avenue and therefore the scenic road criteria does not apply or improvements.
23. All plan dimensions are to the face of curb unless otherwise noted. Numerically written dimensions take precedence over scale dimensions.
24. All fill areas shall be compacted to a minimum of 95% of the maximum dry density as determined and verified in accordance with AASHTO T-180.
25. All hydraulic data is for the 10-year storm unless otherwise noted.
26. Electric, gas, cable and telephone lines designed by others.
27. The subsurface exploration and geotechnical engineering analysis for this project is contained in reports prepared by GeoLab, dated June 7, 2011.
28. The proposed residence will have an automatic sprinkler system for fire protection.
29. Signage at the street identifying the address is required.
30. This SDP is subject to the Amended Fifth Edition of the Subdivision and Land Development Regulations per Council Bill No. 45-2003 and the Amended Zoning Regulations per Council Bill No. 75-2003. Development or construction on this property must comply with setback and buffer regulations in effect at the time of submission of the site development plan, or as approved by the Howard County Council.
31. In accordance with Section 128 of the Howard County Zoning Regulations, bay windows, chimneys or exterior stairways not more than 16 feet in width may project not more than 4 feet into any setbacks. Porches or decks, open or enclosed may project not more than 10 feet into the front or rear yard setback (applies for residential SDP's.
32. Driveways shall be provided prior to issuance of a use and occupancy permit for any new dwellings to insure safe access for fire and emergency vehicles per the following minimum requirements:
    - Width - 12' (16' serving more than one residence);
    - Surface - 6" of compacted crusher run base w/tar and chip coating (1-1/2" min.);
    - Geometry - Max. 14% grade, max. 10% grade change and min. 45' turning radius;
    - Structures (culverts/bridges) - capable of supporting 25 gross tons (H25 loading);
    - Drainage Elements - capable of safely passing 100-year flood with no more than 1 foot depth over driveway surface;
    - Maintenance - sufficient to insure all weather use.
33. Design Manual Waiver for Bio Retention Facility has been approved for having drainage area of 1.04 Ac. which exceeds the 0.5 Ac. requirement for Micro Bio Retention Facilities required by ESD in a letter dated February 13, 2012.
34. Trash and recycling collection will be at College Avenue within 5' of the county roadway.
35. Disturbance of environmental features for the driveway and storm drainage is considered essential disturbance by Department of Planning & Zoning.
36. Cemetery Report was approved by Planning Board on 12/2/11.
37. Forest Conservation Easement Plat No. 21849 was recorded on May 18, 2012, placing 3 acres of existing forest into easement areas. No surety is required for retention.

SITE ANALYSIS DATA CHART

1. General Data:
   a. The subject property is zoned RE-D (Residential: Environmental Development) per the 2006 Comprehensive zoning plan.
   (Development shall follow R-20 regulations per Howard Co Zoning Regulations Section 107.1.1.a(2) and b.)
   b. Applicable DPZ File References: ECP 11-065, WP-11-171
   c. Proposed Use of Site or Structure: Single Family detached residence
   d. Proposed Water and Sewer Systems: Private (well and septic)
   e. Number of units 1.
   Number of units proposed: 1
   f. Required parking: 2 spaces per du. = 2
   Parking provided = 2 spaces in garage
2. Area Tabulation:
   a. Total Area of Parcels (2) (Gross Area): 940,870 SF (21.61 Ac.)
   c. Limit of Disturbed Area: 2.16 AC (94,225 SF)
   d. Environmentally constrained areas:

Wetland (and buffer)	2156 st (93520 st)
100 yr. floodplain (and buffer)	(see note below)
Forest	7.6 Ac.
Slopes 15% and greater	7.8 Ac. (341200 sfs)
Erodible soils	NA

   d. Area of 25% & Greater Slopes: 3.9 Ac.
   e. Net Area: (excludes steep slopes >25%): 5 Ac.
   f. Area of 100 Year Floodplain: waived per WP-11-171.
   g. Open Space: not required
   h. Proposed Impervious: 0.62 ac.+ / 1% of site
   i. Building Coverage: 3,000 SF = 0.07 Ac. or 1%
   j. Building Height: 30'± Mean Height

APPROVED FOR PRIVATE WATER
APPROVED FOR PRIVATE SEWERAGE SYSTEM

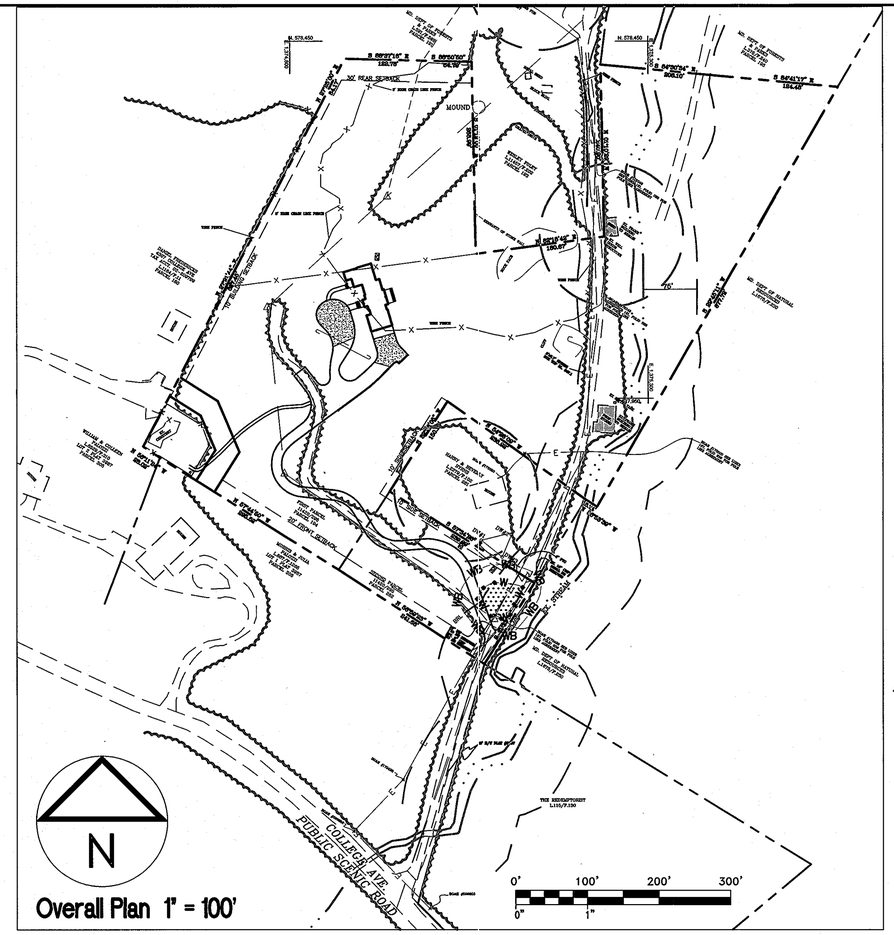
for Peter Zeilenson 7/3/2012
COUNTY HEALTH OFFICER DATE
HOWARD COUNTY HEALTH DEPARTMENT

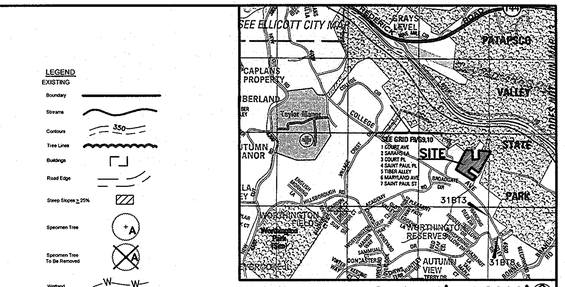
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

6/14/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

7/09/12
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

7/9/12
DIRECTOR DATE





Vicinity Map - Scale: 1' = 2000'
ADC Map 4816-F10
ADC The Map People - Permitted Use # 20612205

Benchmarks

HOWARD COUNTY TRAVERSE POINT NUMBERS
31BT8---N: 576,015.374 E: 1,375,770.465 ELEV: 378.575
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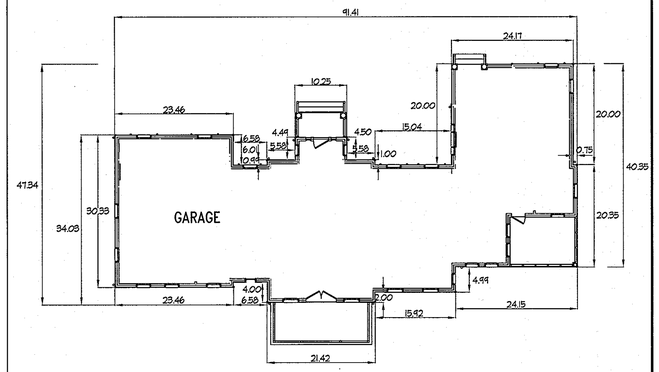
LEGEND
EXISTING
Boundary
Streams
Contours 350
Tree Line
Buildings
Road Edge
Steep Slopes > 25%
Specimen Tree
Specimen Tree To Be Removed
Wetland W
Wetland Buffer WB
PROPOSED
Contours
Houses
Road Edge
Septic Reserve Area
Line of Disturbance
Storm drain
Pervious Concrete

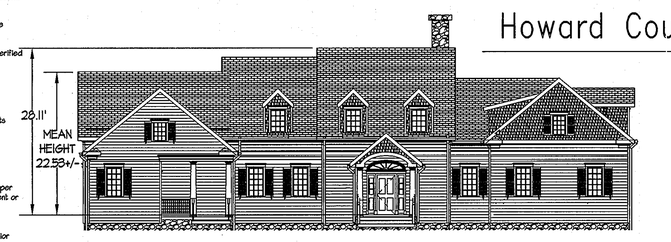


Building Plan View

ADDRESS CHART	
PARCEL	DESCRIPTION
194	4361 College Avenue

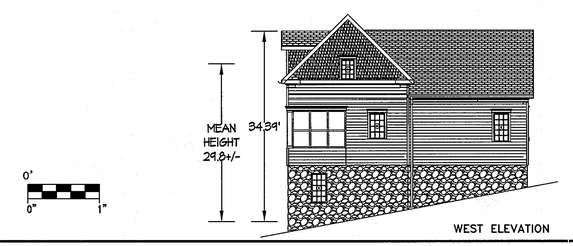
Site Development Plan for 4361 College Avenue

Howard County, Maryland

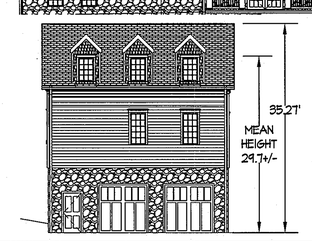


NORTH ELEVATION

SOUTH ELEVATION



WEST ELEVATION



EAST ELEVATION

Owner
Thomas E. & Lucinda T. Wahl
7110 Flint Court
Middletown, Maryland 21769
Ph. 410-379-6700

Contact
Jeffrey L. Schwab
Tesseract Sites
401 Washington Ave. Suite 303
Towson, Maryland 21204
Ph. 410-321-7600

Tesseract™
Jeffrey Schwab
TESSERACT SITES, INC
401 Washington Ave. Suite 303 p. 410.321.7600
Towson, Maryland, 21204 f. 410.321.7601

Cover Sheet
Wahl Property
Parcels 194 and 262
Single Family Detached Residence
Howard County, Maryland

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 14230, Expiration Date: 12/09/12.

LOT/PARCEL:		LIBER/FOLIO:	PLAT#:
194 & 262		11420/295	N/A
GRID#	ZONE	TAX/ZONE MAP	ELECT.DISTRICT	CENSUS TRACT:
21	R-ED	25	2ND	602800

STATE OF MARYLAND JEFFREY L. SCHWAB No. 14230 PROFESSIONAL ENGINEER

Date: 5/16/12
Proj. #: 10020
Scale: 1" = 50'

1 of 10

DESIGN: JLS | DRAWN: MAS | CHKED: JLS

SDP 12-016

LEGEND

EXISTING

- Boundary
- Setback Lines
- Streams
- Soils Lines
- Contours (350)
- Tree Lines
- Buildings
- Road Edge
- Well & 100' circle
- Septic Reserve Area
- Ex. Specimen Tree
- Steep Slopes ≥ 25%
- Steep Slopes ≥ 25% less than 20,000 sf of contiguous
- Steep Slopes ≥ 15% to <25%
- Hydric Soils
- Specimen Tree To Be Removed

NOTES:

1. TOPOGRAPHY SHOWN HEREON WAS FIELD RUN BY SHANABERGER & LANE IN APRIL 2009. REMAINING TOPOGRAPHY SHOWN ON PLAT IS FROM HOWARD COUNTY AERIAL PHOTOGRAMMETRY.

2. [hatched area] THIS AREA DESIGNATES A PRIVATE SEWAGE EASEMENT OF AT LEAST 10,000 SQUARE FEET AS REQUIRED BY THE MD. STATE DEPT. OF THE ENVIRONMENT FOR INDIVIDUAL SEWAGE DISPOSAL. FOR LOTS CREATED PRIOR TO MARCH 1972, IT PROVIDES AT LEAST ENOUGH AREA TO ACCOMMODATE AN INITIAL AND 2 REPLACEMENT SEPTIC SYSTEMS AS REQUIRED BY THE HOWARD COUNT HEALTH DEPT. IMPROVEMENTS OF ANY NATURE IN THIS AREA ARE RESTRICTED. THIS SEWAGE DISPOSAL AREA SHALL BECOME NULL AND VOID UPON CONNECTION TO A PUBLIC SEWERAGE SYSTEM. THE COUNTY HEALTH OFFICER SHALL HAVE THE AUTHORITY TO GRANT ADJUSTMENTS TO THE PRIVATE SEWAGE DISPOSAL AREA.

3. DESIGNATES SUCCESSFUL PERC TEST LOCATION
   - DESIGNATES FAILED PERC TEST LOCATION
   - DESIGNATES EXISTING WELL LOCATION
   - DESIGNATES PROPOSED WELL LOCATION
   - DESIGNATES EXISTING BUILDING LOCATION
   - DESIGNATES SLOPES > 25%
   - DESIGNATES FIELD-RUN CONTOURS
   - DESIGNATES CONTOURS DERIVED FROM HOWARD COUNTY TOPO MAP
   - DESIGNATES SOIL TYPE BOUNDARY
   - DESIGNATES WOODSLINE/TREES
   - DESIGNATES WETLANDS

4. ALL VISIBLE EXISTING WELLS AND SEWAGE DISPOSAL AREAS WITHIN 100' OF THE PROPERTY AND WELLS WITHIN 200' DOWNSLOPE OF THE PROPOSED SDA HAVE BEEN SHOWN.

5. SOIL TYPES: MoC--MOUNT LUCAS SILT LOAM, 8-15% SLOPES, STONY
   LrD--LEGORE-RELAY GRAVELLY LOAM, 15-25% SLOPES, VERY STONY
   LrF--LEGORE-RELAY GRAVELLY LOAM, 25-65% SLOPES, VERY STONY
   WcB--WATCHUNG SILT LOAM, 3-8% SLOPES, STONY
   LeC--LEGORE SILT LOAM, 3-8% SLOPES, STONY

6. BEARINGS AND DISTANCES SHOWN HEREON ARE A BOUNDARY SURVEY BY SHANABERGER & LANE.

7. ANY CHANGE TO A PRIVATE SEWAGE EASEMENT SHALL REQUIRE A REVISED PERC CERTIFICATION PLAN.

8. THE LOT SHOWN HEREON COMPLIES WITH THE MINIMUM OWNERSHIP AND LOT AREA REQUIREMENTS BY THE MD STATE DEPARTMENT OF THE ENVIRONMENT.

9. THE WELL MUST BE DRILLED AND THE WELL COMPLETION REPORT RECEIVED BY THE HEALTH DEPARTMENT AND APPROVED PRIOR TO BUILDING PERMIT APPROVAL.

The existing burial grounds have not and will not be disturbed except as permitted by State law.

Thomas E. Wahl 5-16-12

Thomas E. Wahl, Owner — DATE

APPROVED FOR PRIVATE WATER
APPROVED FOR PRIVATE SEWERAGE SYSTEM

B Wisner for Peter Beilenson 7/3/2012

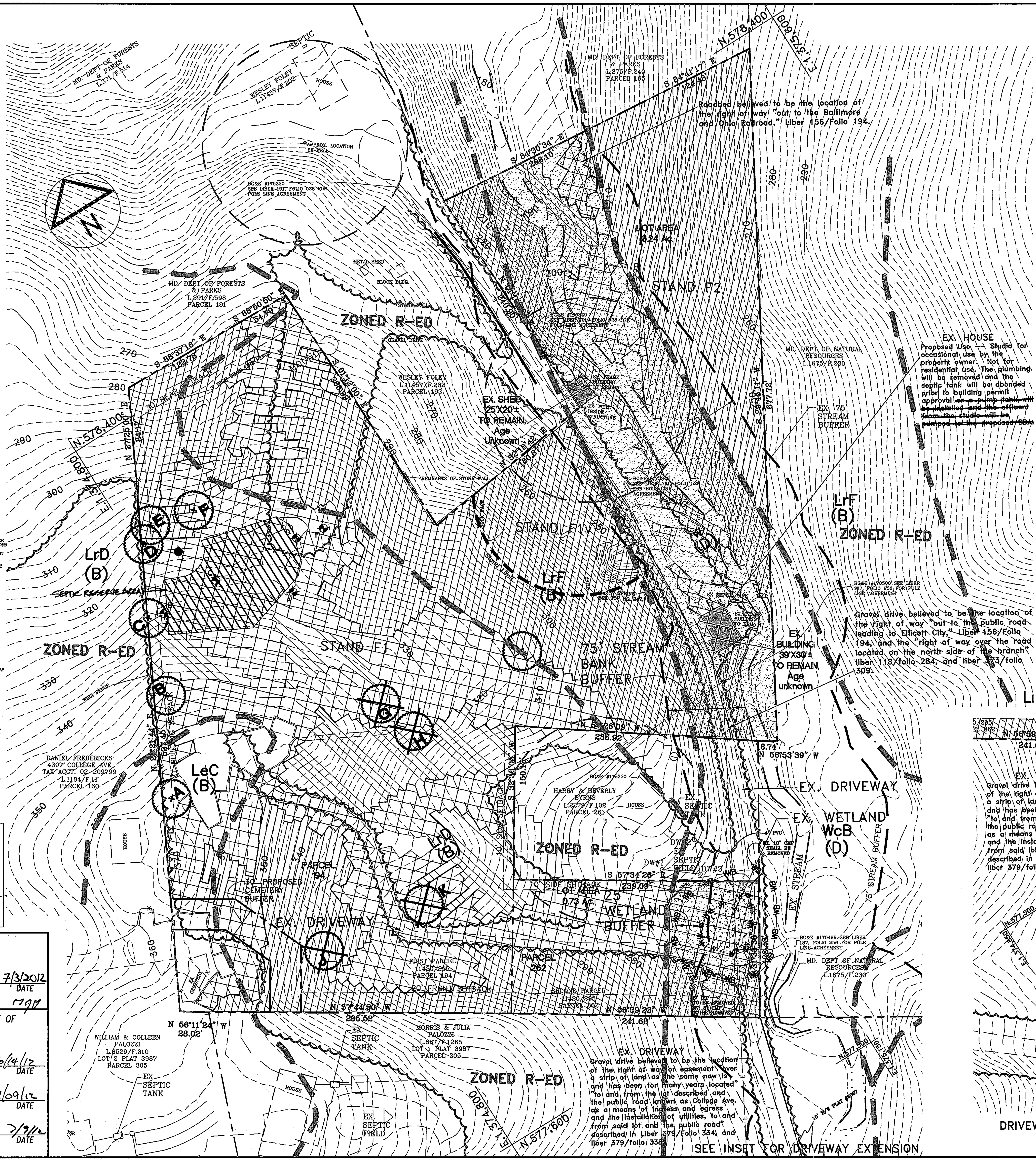
COUNTY HEALTH OFFICER — DATE
HOWARD COUNTY HEALTH DEPARTMENT

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

6/14/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

Kent Sheubrooks 7/09/12
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

7/9/12
DIRECTOR — DATE



Benchmarks

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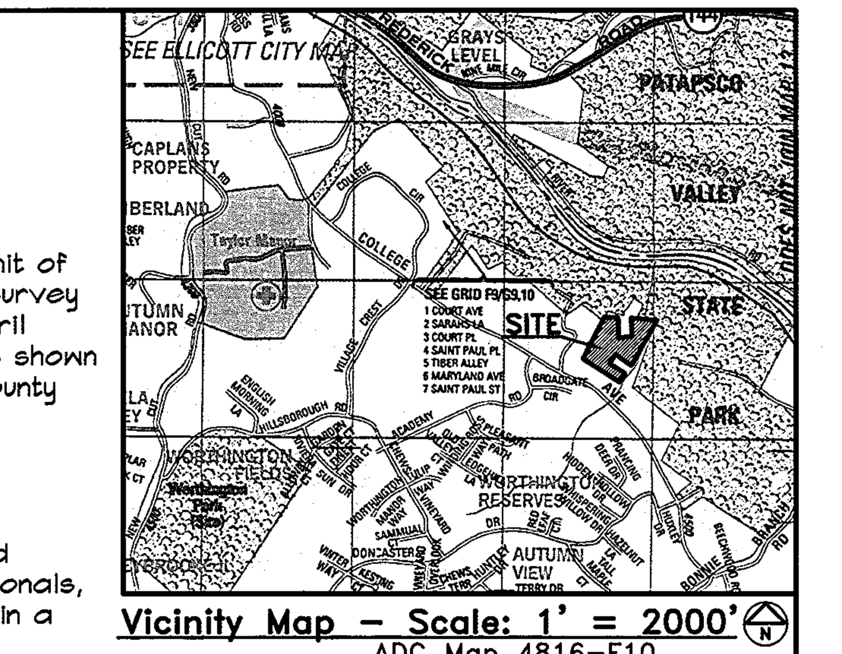
SURVEY INFORMATION AND DATUM

The existing topography within the limit of disturbance is based on a field run survey by Shanaberger and Lane, dated April 2009. The courses and coordinates shown hereon are based on the Howard County monuments as noted above.



Vicinity Map - Scale: 1' = 2000'
ADC Map 4816-F10
ADC The Map People - Permitted Use # 20612205

Notes:

1. Forest Stand Delineation - Forest stand field work was performed by Eco-Science Professionals, Inc in Sept 2010. The information is detailed in a report dated November 3, 2010.

2. Slope Calculations:
   Existing slopes 25% and greater on-site= 170,650sf± / 3.9 Ac.

SOILS INFORMATION
per NRCS/ USDA data, 2003:

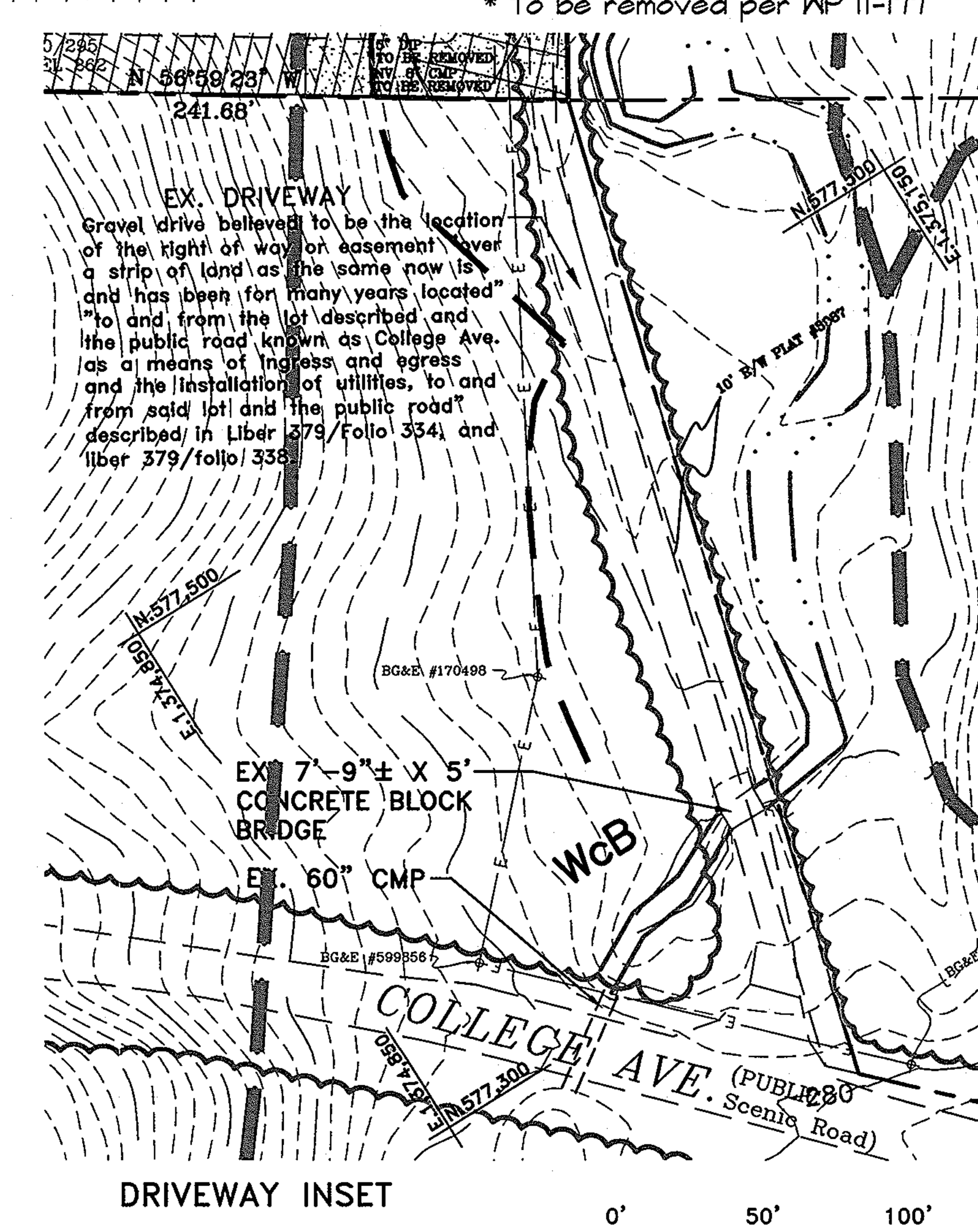
Soil Type	Desc	Hydric	Hydric Inclusions	<15% with signif erosion potential
LeC	Legore silt loam	N	N	N - low K value
LrD	Legore-Relay gravelly loam	N	N	N - low K value
LrF	Legore-Relay gravelly loam	N	N	N - low K value
WcB	Watchung silt loam	Y		N - Mod K value
W	Water	NA		NA

FOREST STAND DESCRIPTIONS

KEY	COMMUNITY	ACREAGE	DOMINANT VEG	CONDITION	AVE SIZE /AGE
F1	Disturbed Mesic	1.45±	Liriodendron tulipifera with Fraxinus americana, Ulmus rubra, Acer platanoides, Acer negundo, Rubus phoenicolasius, Vitis, Lonicera japonica. Polygonum perfoliatum, Eulalia viminea	Fair	18-24" CAL./ 65-80 YRS
F1v	Disturbed		Liriodendron tulipifera with Quercus rubra, Fagus grandifolia, Eulalia viminea	Fair	18-24" CAL./ 65-80 YRS
F2	Mixed Oak/ Beech/ Poplar	1.80±	Quercus prinus, Fagus grandifolia, Quercus, rubra, with Quercus alba, Liriodendron tulipifera, Acer rubrum, Nyssa sylvatica	Good	16-24" CAL./ 70-85 YRS

KEY	SPECIES	SIZE	CONDITION
A	Tulip poplar	40" cal	Good
B	Tulip poplar	42" cal	Good
C	Tulip poplar	34" cal	Poor
D	Tulip poplar	43" cal	Good
E	Tulip poplar	35" cal	F. Good
F	Tulip poplar	34" cal	Good
*G	Tulip poplar	30" cal	Good
*H	White Oak	35" cal	F. Good
I	Tulip poplar	39" cal	Poor
*J	Amer Sycamore	30" cal	Fair
*K	Amer Sycamore	36" cal	Fair

* To be removed per WP 11-177



DRIVEWAY INSET

0' 50' 100' 150'

Contact
Jeffrey L. Schwab
Tesseract Sites
401 Washington Ave. Suite 303
Towson, Maryland 21204
Ph. 410-321-7600

Owner
Thomas E. & Lucinda T. Wahl
7110 Flint Court
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Ph. 410-379-6700

Tesseract™
TESSERACT SITES, INC
401 Washington Ave. Suite 303
Towson, Maryland, 21204
Jeffrey Schwab
p. 410.321.7600
f. 410.321.7601

Existing Conditions
Wahl Property
Parcels 194 and 262
Howard County, Maryland

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 14230, Expiration Date: 12/09/12.

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GRID#	ZONE	TAX/ZONE MAP	ELECT.DISTRICT	CENSUS TRACT:
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Date: 5/16/12
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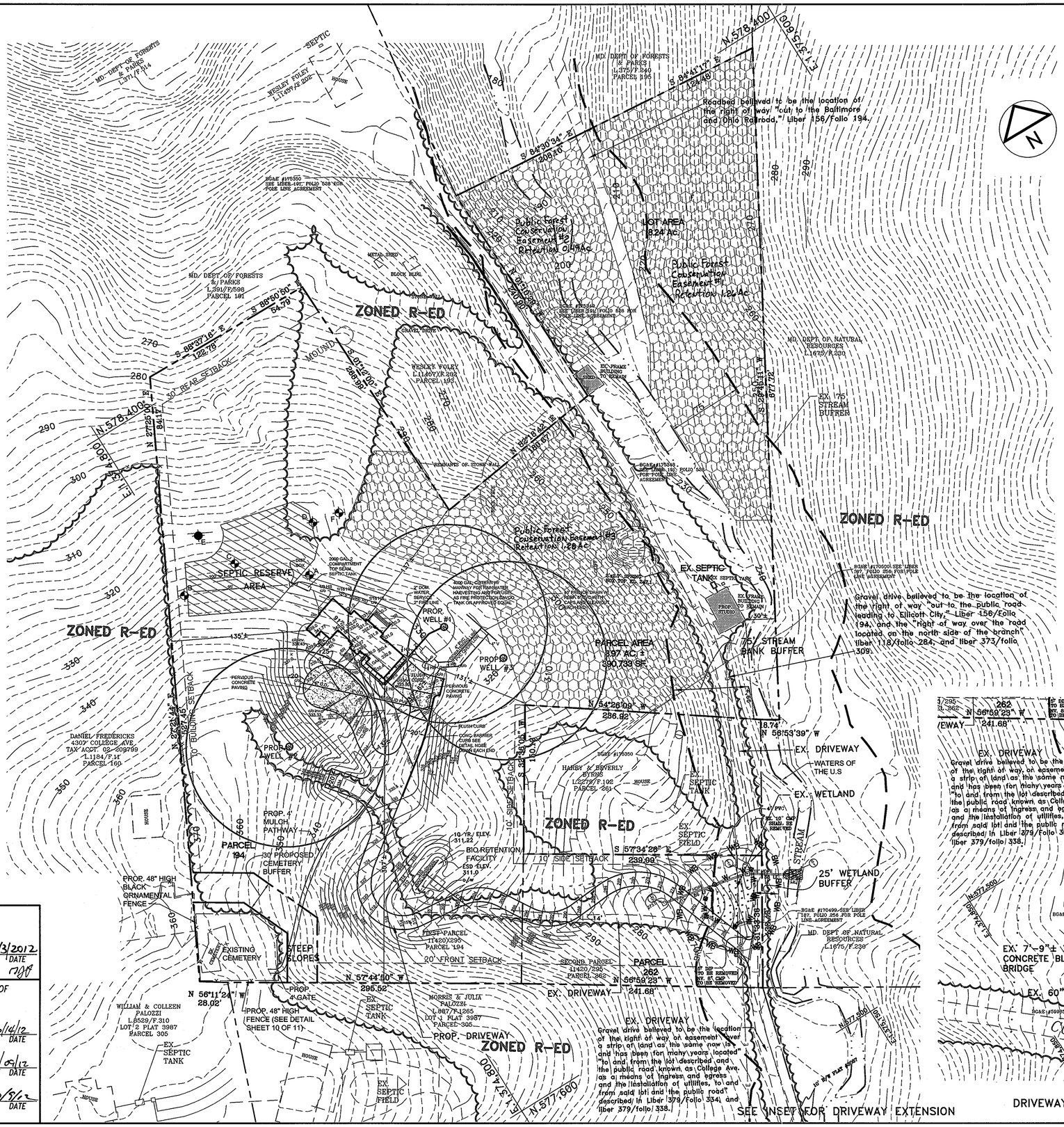
Scale: 1" = 50'

DESIGN: JLS DRAWN: MAS CHKED: JLS

SDP 12-016



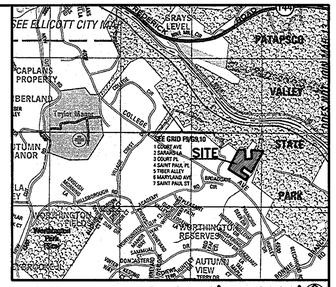
LEGEND

EXISTING

- Boundary
- Streams
- Contours (350)
- Tree Lines
- Buildings
- Road Edge
- Specimen Tree (A)
- Specimen Tree To Be Removed (A)
- Wetland (W)
- Wetland Buffer (WB)

PROPOSED

- Contours
- House
- Road Edge
- Septic Reserve Area
- Storm drain (15" HDPE)
- Pervious Concrete
- Spot Elevation (336.9)



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ADC The Map People – Permitted Use # 20612205

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Contact

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Ph. 410-321-7600

Owner

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7110 Flint Court

Middletown, Maryland 21769

Ph. 410-379-6700

APPROVED FOR PRIVATE WATER
APPROVED FOR PRIVATE SEWERAGE SYSTEM

B. Nixon for Peter Beilenson 7/3/2012
COUNTY HEALTH OFFICER DATE
HOWARD COUNTY HEALTH DEPARTMENT

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

6/14/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

7/05/12
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

7/5/12
DIRECTOR DATE

Tesseract TESSERACT SITES, INC

Jeffrey Schwab
401 Washington Ave. Suite 303
Towson, Maryland, 21204

p. 410.321.7600
f. 410.321.7601

Site Plan
Wahl Property
Parcels 194 and 262

Howard County, Maryland

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 14230, Expiration Date: 12/09/12.

TAX/PARCEL:		LIBER/FOLIO:		PLATS:
194 & 262		11420/295		N/A
GRID#	ZONE	TAX/ZONE MAP	ELECT.DISTRICT	CENSUS TRACT:
21	R-ED	25	2ND	602800

STATE OF MARYLAND JEFFREY LYNN SCHWAB No. 14230 REGISTERED PROFESSIONAL ENGINEER

Date: 5/16/12

Proj. #: 10020

Scale: 1" = 50'

3 of 10

DESIGN: JLS | DRAWN: MAS | CHKED: JLS

SDP 12-016

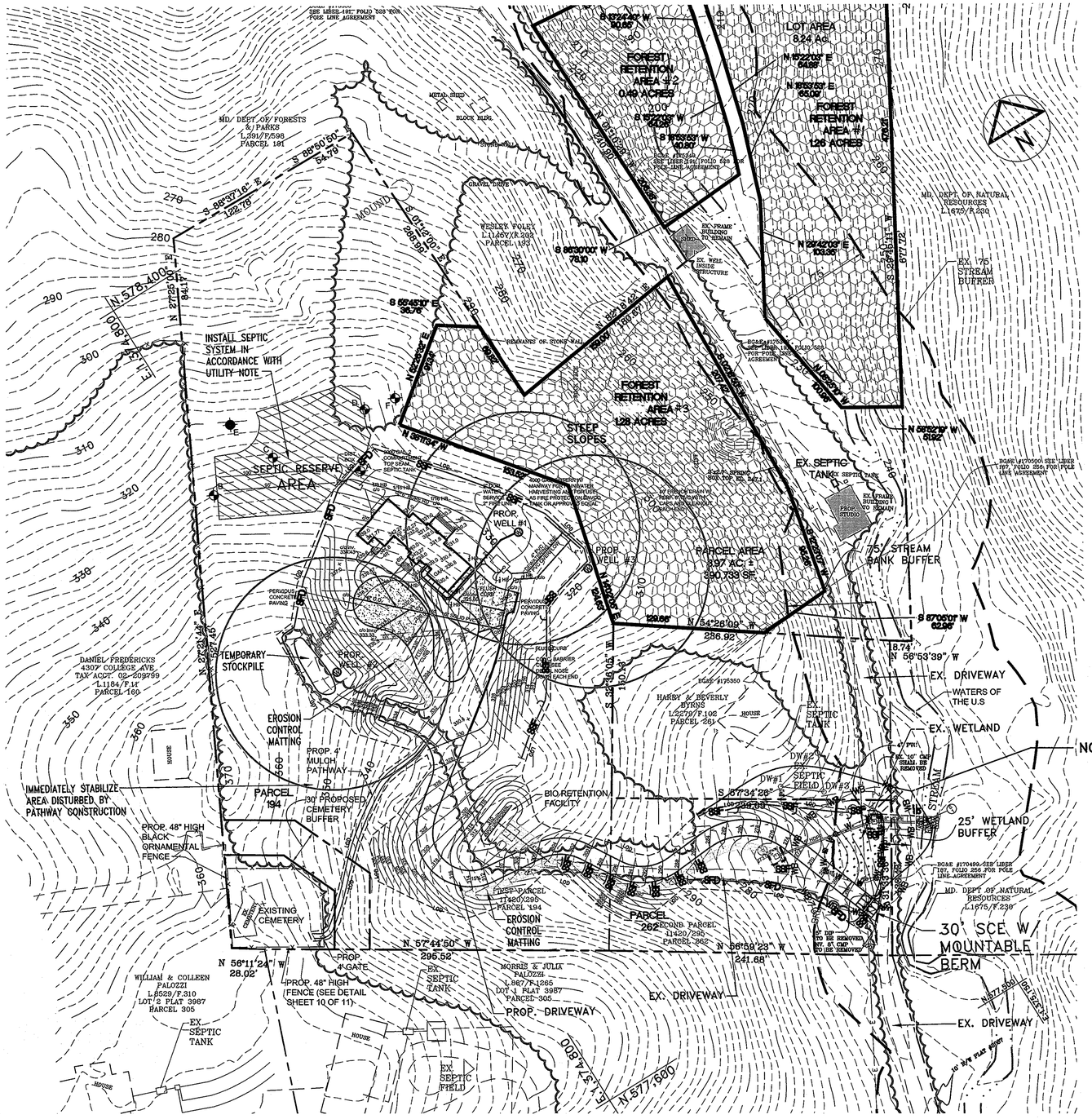
LEGEND

EXISTING

- Boundary
- Streams
- Contours
- Tree Lines
- Buildings
- Road Edge
- Steep Slopes ≥ 25%
- Specimen Tree
- Specimen Tree To Be Removed
- Wetland
- Wetland Buffer

PROPOSED

- Contours
- House
- Road Edge
- Septic Reserve Area
- Limit of Disturbance
- Storm drain — 15" HDPE
- Pervious Concrete
- Spot Elevation — 336.4
- Super Silt Fence — SSF
- Super Fence Diversion — SFD
- Stabilized Construction Entrance w/ Mountable Berm
- Super Silt Fence Inlet Protection — SSF



UTILITY NOTE:

A) CONTRACTOR SHOULD OPEN ONLY THAT SECTION OF TRENCH THAT CAN BE BACKFILLED AND STABILIZED EACH DAY. IF TRENCH MUST REMAIN OPEN LONGER THAN ONE DAY, SILT FENCE SHALL BE PLACED BELOW (DOWN SLOPE OF) THE TRENCH.

B) PLACE ALL EXCAVATED MATERIAL ON UPHILL SIDE OF TRENCH.

C) ANY SEDIMENT CONTROLS DISTURBED BY UTILITY CONSTRUCTION ARE TO BE REPAIRED IMMEDIATELY.

HOWARD SOIL CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

1. A minimum of 48 hours notice must be given to the Howard County Department of Inspections, Licenses and Permits, Sediment Control Division prior to the start of any construction (410-313-1855).
2. 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 EROSION AND SEDIMENT CONTROL and revisions thereto.
3. Following initial soil disturbance or re-disturbance, permanent or temporary stabilization shall be completed within: a) 7 calendar days for all perimeter sediment control structures, dikes, perimeter slopes and all slopes greater than 3:1, b) 14 days as to all other disturbed or graded areas on the project site.
4. All sediment traps/basins shown must be fenced and warning signs posted around their perimeter in accordance with Vol 1, Chapter 12 of the HOWARD COUNTY DESIGN MANUAL, Storm Drainage.
5. All disturbed areas must be stabilized within the time period specified above in accordance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding (Sec. 51), sod (Sec. 54), temporary seeding (Sec. 50) and mulching (Sec. 52). Temporary stabilization with mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
6. All sediment control structures are to remain in place and are to be maintained in operative condition until permission for their removal has been obtained from the Howard County Sediment Control Inspector.
7. Site Analysis:

Total Area of Site	8.97 Acres
Area Disturbed	2.16 Acres (LOD)
Area to be roofed or paved and walks	0.47 Acres
Area to be vegetatively stabilized	1.69 Acres
Total Cut	6,797 Cu. Yds.
Total Fill	2,733 Cu. Yds.
Offsite waste/borrow area location:	To Be Determined.

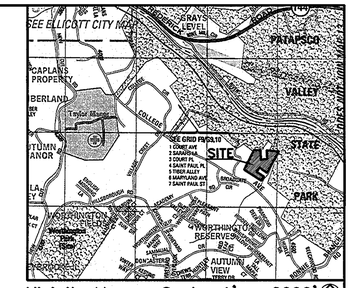
LF SF = 15, LF SSF = 740, LF SFD = 365

8. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
9. Additional sediment control must be provided, if deemed necessary by the Howard County Sediment Control Inspector.
10. On all sites with disturbed areas in excess of 2 acres, approval of the inspection agency shall be requested upon completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.
11. Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized by the end of each work day, whichever is shorter.

SEQUENCE OF OPERATIONS

1.) OBTAIN GRADING PERMIT.	1 DAY
2.) CLEAR & GRUB ONLY THAT AREA REQUIRED TO INSTALL PROPOSED SEDIMENT AND EROSION MEASURES.	7 DAYS
3.) INSTALL SEDIMENT & EROSION CONTROL MEASURES AND WITH PERMISSION OF THE SEDIMENT CONTROL INSPECTOR, CLEAR AND GRUB REMAINING AREA WITHIN L.O.D.	7 DAYS
4.) ROUGH GRADE SITE.	21 DAYS
5.) INSTALL STORM DRAIN I-3 TO S-1 AND WRAP INLETS WITH SSF.	14 DAYS
6.) CONSTRUCT DRIVEWAY EXCEPT AREAS OF PERVIOUS CONCRETE PAVING.	14 DAYS
7.) CONSTRUCT HOUSE, INSTALL UTILITIES, INSTALL ROOF DRAINAGE SYSTEM, CISTERN, FRENCH DRAIN AND WATER LINES.	90 DAYS
8.) INSTALL SEPTIC SYSTEM AND IMMEDIATELY STABILIZE AREA DISTURBED.	7 DAYS
9.) STABILIZE ALL DISTURBED AREAS WITHIN L.O.D. AND WITH THE PERMISSION OF THE INSPECTOR INSTALL PERVIOUS CONCRETE PAVING AND BIO RETENTION FACILITY WITH UNDERDRAIN TO SWALE AND STABILIZE AREAS DISTURBED BY THIS PROCESS.	14 DAYS
10.) UPON STABILIZATION OF THE SITE REMOVE SEDIMENT AND EROSION CONTROL MEASURES AND STABILIZE AREAS DISTURBED BY THIS PROCESS.	7 DAYS

LIMIT OF DISTURBANCE: 94,129 SF = 2.16 AC.



Vicinity Map – Scale: 1' = 2000'
ADC Map 4816-F10
ADC The Map People – Permitted Use # 20612205

Benchmarks

HOWARD COUNTY TRAVERSE POINT NUMBERS
31BT8---N: 576,015.374 E: 1,375,770.465 ELEV: 378.575
31BT3---N: 576,602.966 E: 1,375,465.594 ELEV: 353.895

Contact
Jeffrey L. Schwab
Tesseract Sites
401 Washington Ave. Suite 303
Towson, Maryland 21204
Ph. 410-321-7600

Owner
Thomas E. & Lucinda T. Wahl
7110 Flint Court
Middletown, Maryland 21769
Ph. 410-379-6700

Tesseract TESSERACT SITES, INC
Jeffrey Schwab
401 Washington Ave. Suite 303
Towson, Maryland, 21204
p. 410.321.7600
f. 410.321.7601

Sediment & Erosion Control Plan
Wahl Property
Parcels 194 and 262
Howard County, Maryland

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 14230, Expiration Date: 12/06/12.

LOT/PARCEL:		LIBER/FOLIO:		PLAT#:
194 & 262		11420/295		N/A
GRID#	ZONE	TAX/ZONE MAP	ELECT.DISTRICT	CENSUS TRACT:
21	R-ED	25	2ND	602800

Date: 5/16/12
Proj. #: 10020
Scale: 1" = 50'

4 of 10

DESIGN: JLS | DRAWN: MAS | CHKED: JLS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/14/12
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 7/09/12
DIRECTOR — DATE 7/9/12

BY THE DEVELOPER:

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

SIGNATURE OF THE DEVELOPER — DATE 5-16-12
Thomas Wahl

BY THE ENGINEER:

"I CERTIFY THAT HIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF THE ENGINEER — DATE 5/24/12
Jeffrey L. Schwab P.E.

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 6/12/12

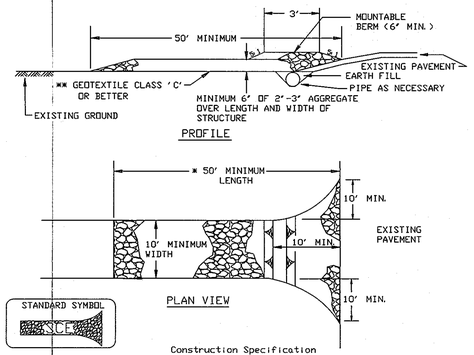
PRIVATE PRIVATE

APPROVED: FOR ~~PUBLIC~~ WATER AND ~~PUBLIC~~ SEWERAGE SYSTEMS

County Health Officer — DATE 7/3/2012
Howard County Health Department

SDP 12-016

DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



Construction Specification

1. Length - minimum of 50' (*30' for single residence lot).

2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.

3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single family residences to use geotextile.

4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.

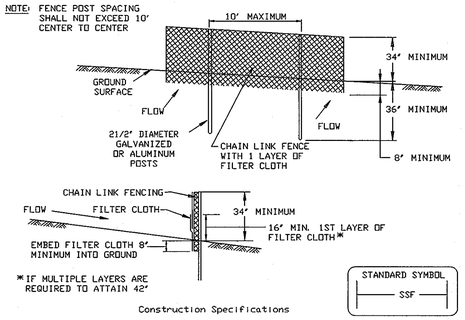
5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.

6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 17 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 33 - SUPER SILT FENCE

NOTE: FENCE POST SPACING SHALL NOT EXCEED 10' CENTER TO CENTER



Construction Specifications

1. Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 6' fence shall be used, substituting 42" fabric and 6' length posts.

2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence.

3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.

4. Filter cloth shall be embedded a minimum of 8" into the ground.

5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.

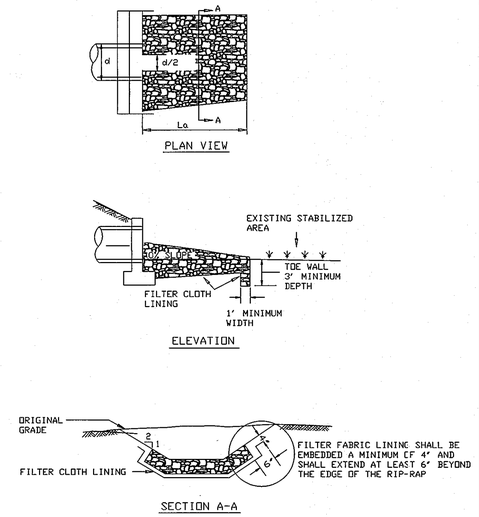
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height

7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal/ft²/minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE H - 26 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

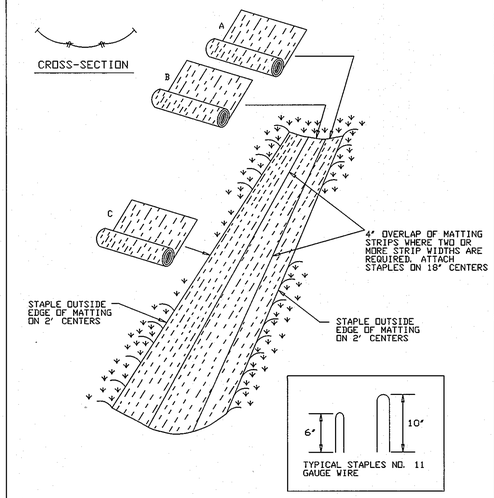
DETAIL 27 - ROCK OUTLET PROTECTION III



NOTE: FILTER CLOTH SHALL BE GEOTEXTILE CLASS C

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 18 - 10	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT AIMINISTRATION

DETAIL 30 - EROSION CONTROL MATTING



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE G - 22 - 2	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

EROSION CONTROL MATTING

Construction Specifications

1. Key-in the matting by placing the top ends of the matting in a narrow trench, 6" in depth. Backfill the trench and tamp firmly to conform to the channel cross-section. Secure with a row of staples about 4" down slope from the trench. Spacing between staples is 6".

2. Staple the 4" overlap in the channel center using an 18" spacing between staples.

3. Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil.

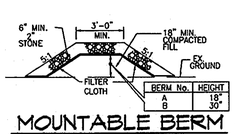
4. Staples shall be placed 2" apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.

5. Where one roll of matting ends and another begins, the end of the top strip shall overlap the upper end of the lower strip by 4", shiplap fashion. Reinforce the overlap with a double row of staples spaced 6" apart in a staggered pattern on either side.

6. The discharge end of the matting liner should be similarly secured with 2 double rows of staples.

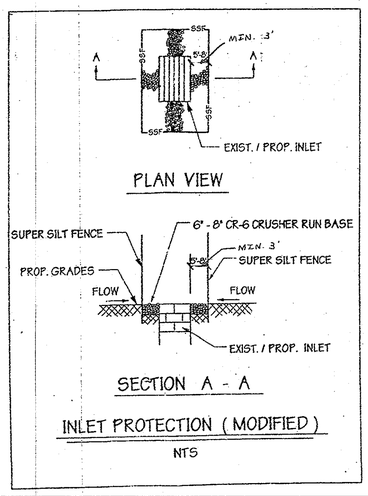
Note: If flow will enter from the edge of the matting then the area effected by the flow must be keyed-in.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE G - 22 - 2A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



MOUNTABLE BERM

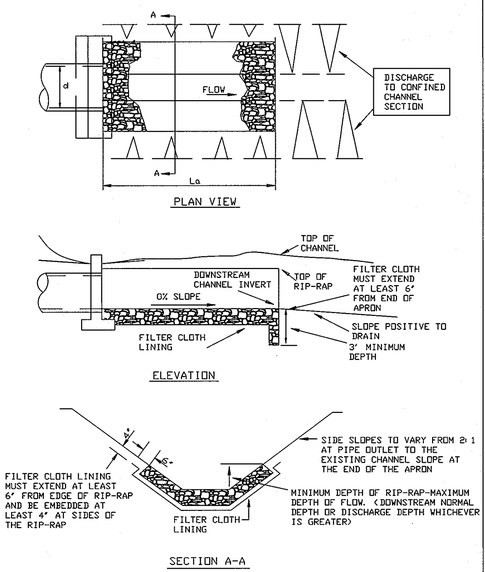
NOT TO SCALE



INLET PROTECTION (MODIFIED)

NTS

DETAIL 26 - ROCK OUTLET PROTECTION II



NOTE: FILTER CLOTH SHALL BE GEOTEXTILE CLASS C

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 18 - 9	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

ROCK OUTLET PROTECTION II

Construction Specifications

1. The subgrade for the filter, rip-rap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.

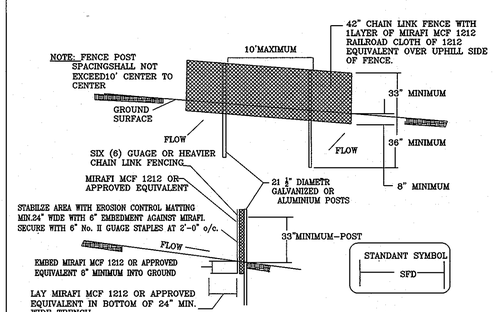
2. The rock or gravel shall conform to the specified grading limits when installed respectively in the rip-rap or filter.

3. Geotextile shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile over the damaged part or by completely replacing the geotextile. All overlaps whether for repairs or for joining two pieces of geotextile shall be a minimum of one foot.

4. Stone for the rip-rap or gabion outlets may be placed by equipment. They shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for rip-rap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogeneous with the smaller stones and spalls filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile. Hand placement will be required to the extent necessary to prevent damage to the permanent works.

5. The stone shall be placed so that it blends in with the existing ground. If the stone is placed too high then the flow will be forced out of the channel and scour adjacent to the stone will occur.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 18 - 8A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



CONSTRUCTION SPECIFICATIONS

1.FENCING SHALL BE42" IN HEIGHT AND CONSTRUCTED INACCORDANCE WITH THE LATEST MARYLAND STATE HIGWAY (SHA) DETAILS FOR CHAIN LINK FENCING, THE (SHA) SPECIFICATIONS FOR A 6' FENCE SHALL BE USED, SUBSTITUTING 42" FABRIC AND 6' LENGTH POSTS.
2. THE POSTS DO NOT NEED TO BE SET IN CONCRETE.
3. CHAIN LINK FENCE SHALL BE FASTENED SECURELYTO THE FENCE POSTS WITH WIRE TIES OR STAPLES, THE LOWER TENSION WIRE, BRACE AND TRUSS RODS, DRIVE ANCHORS AND POST CAPS ARE NOT REQUIRED EXEPT ON THE ENDS OF THE FENCE. THE CHAIN LINK FENCING SHALL BE SIX(6) GAUGE OR HEAVIER.
4.MIRAFI MCF 1212 OR OR APPROVED EQUIVALENT, SHALL BE FASTENED SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24" AT THE TOP AND MID SECTION.
5. MIRAFI MCF 1212 OR APPROVED EQUIVALENT SHALL BE EMBEDDED A MINIMUM OF 8" INTO THE GROUND.
6.WHEN TWO SECTIONS OF MIFAFI MCF 1212 OR APPROVED EQUIVALENT ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.
7. MAINTENANCE SHALL BE PERFORMED AS NEEDED.
8. MAXIMUM FLOW SLOPE 10.0%.
9.MAXIMUM DRAINAGE AREA 5 ACRES.

SUPER FENCE DIVERSION

NOT TO SCALE

Contact
Jeffrey L. Schwab
Tesseract Sites
401 Washington Ave. Suite 303
Towson, Maryland 21204
Ph. 410-321-7600
Owner
Thomas E. & Lucinda T. Wahl
7110 Flint Court
Middletown, Maryland 21769
Ph. 410-379-6700

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 6/14/12
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 7/09/12
DIRECTOR	DATE 7/9/12

BY THE DEVELOPER:

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

SIGNATURE OF THE DEVELOPER — DATE 5-16-12
Thomas Wahl

BY THE ENGINEER:

"I CERTIFY THAT HIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF THE ENGINEER — DATE 5/24/12
Jeffrey L. Schwab P.E.

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 6/12/12

APPROVED FOR PRIVATE WATER
APPROVED FOR PRIVATE SEWERAGE SYSTEM

COUNTY HEALTH OFFICER — DATE 7/3/2012
HOWARD COUNTY HEALTH DEPARTMENT

Tesseract™
TESSERACT SITES, INC
Jeffrey Schwab
401 Washington Ave. Suite 303
Towson, Maryland, 21204
p. 410.321.7600
f. 410.321.7601

Sediment & Erosion Control Details

Wahl Property

Parcels 194 and 262

Howard County, Maryland

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 14230, Expiration Date: 12/09/12.

LOT/PARCEL:		LIBER/FOLIO:		PLAT:
194 & 262		11420/295		N/A
GRID:	ZONE:	TAX/ZONE MAP:	ELECT.DISTRICT:	CENSUS TRACT:
21	R-ED	25	2ND	602800

STATE OF MARYLAND — JEFFREY LYNN SCHWAB — No. 14230 — REGISTERED PROFESSIONAL ENGINEER

Date: 5/16/12
Proj. #: 10020
Scale: 1" = 50'

5 of 10

DESIGN: JLS | DRAWN: MAS | CHKED: JLS

SDP 12-016

OPTION 5:	FOREST CONSERVATION DATA SUMMARY			
File Number: SDP 12-016	Project/Subdivision Name: Wahl Property			
Net Tract Area *Net tract area under review* 8.97 Ac.	Area of Floodplain unforested forested total 0 0 0	Existing Forest *Forest in net tract area minus floodplain* 7.6	Cleared Forest All forest cleared including floodplain 4.6	
Retained Forest *Retained forest minus floodplain* onsite offsite total 3.0 — 3.0	Planted Forest onsite offsite total — — —	Long Term Protection *Total amount of forest placed into LTP* 3.0	Surety Amount Posted *Total amount of surety posted* 0	
In-Lieu Fees Amount Collected N/A	Forested Stream Buffers Linear Length Acreage 0 0	Planted Stream Buffers Linear Length Acreage 0 0		

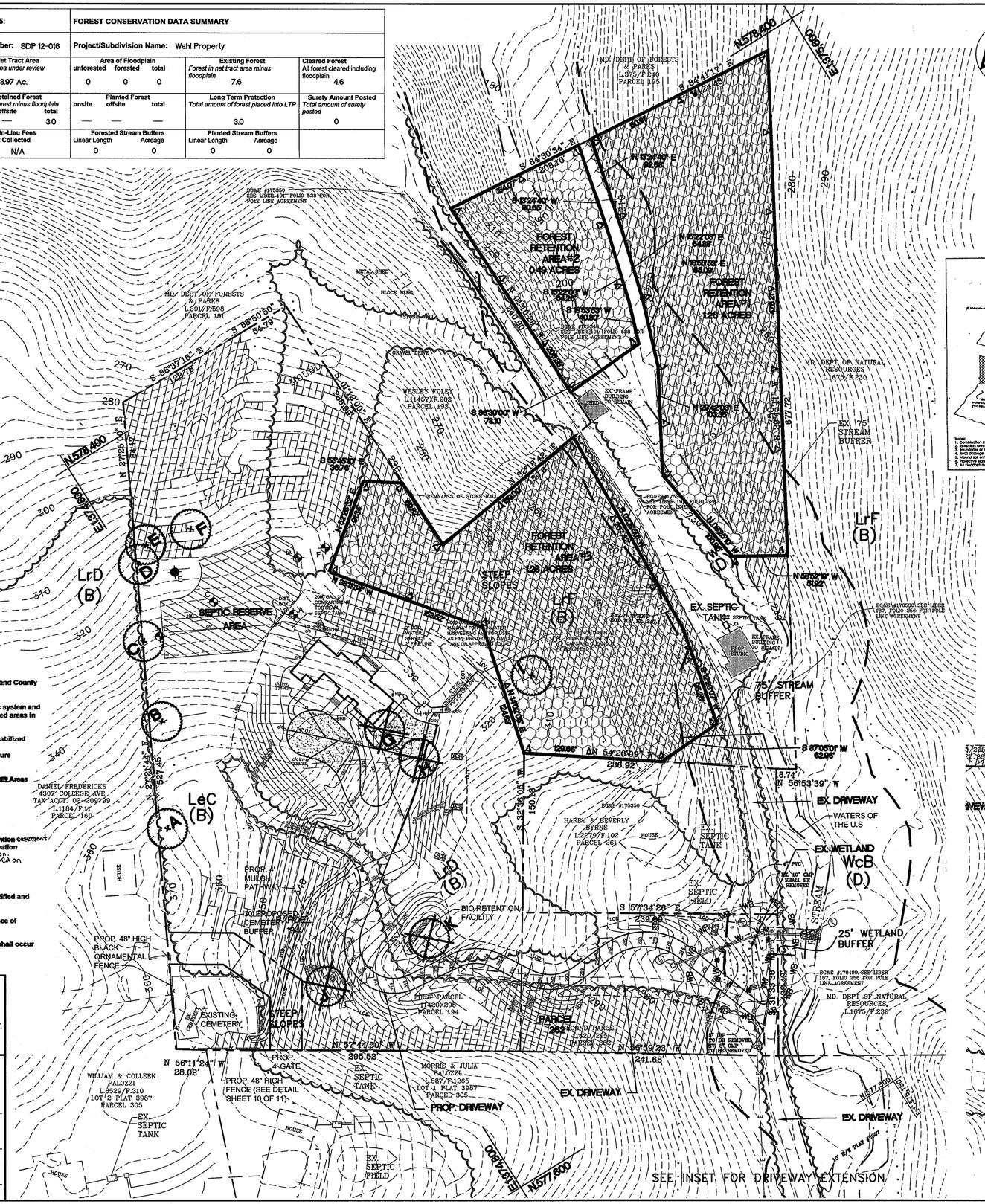
LEGEND

EXISTING

- Boundary
- Streams
- Contours (350)
- Tree Lines
- Buildings
- Road Edge
- Steep Slopes ≥ 25%
- Steep Slopes ≥ 25% less than 20,000 sf contiguous
- Steep Slopes ≥ 15% to <25%
- Specimen Tree (A)
- Specimen Tree To Be Removed (A)
- Wetland (W)
- Wetland Buffer (WB)

PROPOSED

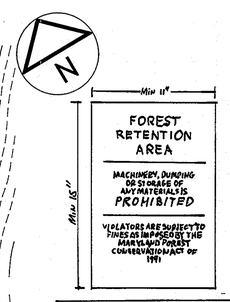
- Contours
- House
- Road Edge
- Septic Reserve Area
- Limit of Disturbance
- Storm drain (15" HDPE)
- Limit of Disturbance (limit of clearing) (LOD)
- △ FOREST CONSERVATION SIGN LOCATION



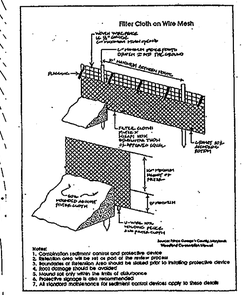
Specimen Trees

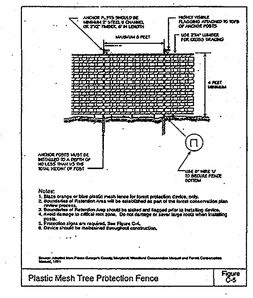
Key	Species Name	Size	Cond.
A	Tulip poplar	40"	Good
B	Tulip poplar	42"	Good
C	Tulip poplar	34"	Poor
D	Tulip poplar	43"	Good
E	Tulip poplar	35"	F. good
F	Tulip poplar	34"	Good
G	Tulip poplar	30"	Good
H	White oak	35"	F. good
I	Tulip poplar	39"	Poor
J	Am. sycamore	30"	Fair
K	Am. sycamore	36"	Fair

* EXISTING SHALL BE REMOVED PER WP-11-177



FOREST CONSERVATION SIGN





LONG TERM FOREST PROTECTION OF SINGLE RESIDENTIAL LOTS OR PARCELS

1. In accordance with Howard County Department of Planning and Zoning policy, an easement plat is not required for forest conservation on a single residential lot or parcel. The forested areas to be retained for forest conservation purposes shall be preserved by deed and identified as "Forest Retention Credit Areas".
2. Permanent signage is not required around forest designated as "Forest Retention Credit Areas".

Eco-Science Professionals, Inc.
CONSULTING ECOLOGISTS

FOREST CONSERVATION WORKSHEET

	BASIC SITE DATA	(acres)
A.	Gross Site Area	9.0
B.	Area within 100 Year Floodplain	0.0
	Area within Agricultural Use or Preservation Parcel	0.0
C.	Area previously developed	0.0
D.	Net Tract Area	9.0
	LAND USE CATEGORY - HDR	20%
E.	Afforestation Threshold (15%x9.0)	1.4
F.	Conservation Threshold (20%x9.0)	1.8
	EXISTING FOREST COVER	
G.	Existing Forest on Net Tract Area	7.6
H.	Area above Afforestation Threshold	6.2
I.	Area above Conservation Threshold	5.8
	BREAK EVEN POINT	
J.	Retention above threshold with no mitigation (0.2xI)	1.2
	Break Even Point (J+F)	3.0
K.	Clearing permitted w/o mitigation	4.6
	PROPOSED FOREST CLEARING	
L.	Forest Areas to be Cleared	4.6
M.	Forest Areas to be Retained	3.0
	PLANTING REQUIREMENTS	
N.	Reforestation for clearing above Threshold (0.2 x.25)	0.1
O.	Reforestation for clearing below Threshold	NA
P.	Credit for Retention above Conservation Threshold (M-F)	0.0
Q.	Total Reforestation Required	0.0
R.	Total Afforestation Required	
S.	Total Reforestation and Afforestation Required	0.0

GROSS TRACT AREA - 9.0 ACRES
NET TRACT AREA - 9.0 ACRES

FOREST CLEARING SUMMARY

EX. FOREST:	7.6 AC.
FOREST TO BE CLEARED:	4.6 AC.
FOREST RETAINED BUT NOT RESTRICTED BY DEED:	0 AC.
FOREST RETENTION	: 3.0 AC.

SEQUENCE OF CONSTRUCTION

1. Install temporary protective fencing/sediment control devices.
2. Hold pre-construction meeting between developer, contractor and County inspector.
3. Grade and construct access driveway, grade house site, septic system and other infrastructure, and construct house. Stabilize all disturbed areas in accordance with sediment control plan.
4. Remove sediment control devices once site is satisfactorily stabilized
5. Hold post-construction meeting with County inspectors to assure compliance with FCP.
6. Review with homeowners the location of Forest Retention ~~easement~~ Areas and explain activities which are permissible in these areas.

FOREST RETENTION ~~easement~~ AREA NOTE

1. The 3.0 acres of onsite forest to be designated as "forest retention ~~easement~~ area" equals the break even point therefore no forest conservation reforestation is required. No setback is required for retention. A Forest Conservation Plat or Easement has been recorded on this site as plat # 21699 on 5-15-12.

STANDARD NON-DISTURBANCE NOTES

1. Any Forest Retention ~~easement~~ Area shown hereon shall be identified and protected by deed restriction.
2. There shall be no clearing, grading, construction or disturbance of vegetation in any Forest Retention ~~easement~~ Area.
3. No stockpiles, parking areas, equipment cleaning areas, etc. shall occur within areas designated as Forest Retention ~~easement~~ Areas.

APPROVED FOR PRIVATE WATER
APPROVED FOR PRIVATE SEWERAGE SYSTEM

Brian for Peter Benson COUNTY HEALTH OFFICER HOWARD COUNTY HEALTH DEPARTMENT	7/3/2012 DATE

PLANNING & ZONING

COUNTY HEALTH OFFICER	DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	6/14/12 DATE
CHIEF, DIVISION OF LAND DEVELOPMENT	7/09/12 DATE
DIRECTOR	7/9/12 DATE

Contact
Jeffrey L. Schwab
Tesseract Sites
401 Washington Ave. Suite 303
Towson, Maryland 21204
Ph. 410-321-7600
Owner
Thomas E. & Lucinda T. Wahl
7110 Flint Court
Middletown, Maryland 21769
Ph. 410-379-6700

Tesseract
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Forest Conservation Plan
Wahl Property
Parcels 194 and 262
Howard County, Maryland

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 14230, Expiration Date: 12/09/12.

TAX MAP:		LIBER/FOLIO:		TOTAL:
194 & 262		11420/295		N/A
GRID	ZONE	TAX/ZONE MAP	ELECT.DISTRICT	CENSUS TRACT:
21	R-ED	25	2ND	603.00

STATE OF MARYLAND JEFFREY LYNN SCHWAB No. 14230 REGISTERED PROFESSIONAL ENGINEER 5/24/12

Date: 5/16/12
Proj. #: 10020
Scale: 1" = 50'

6 of 10

DESIGN: JLS | DRAWN: MAS | CHKED: JLS

SDP 12-016

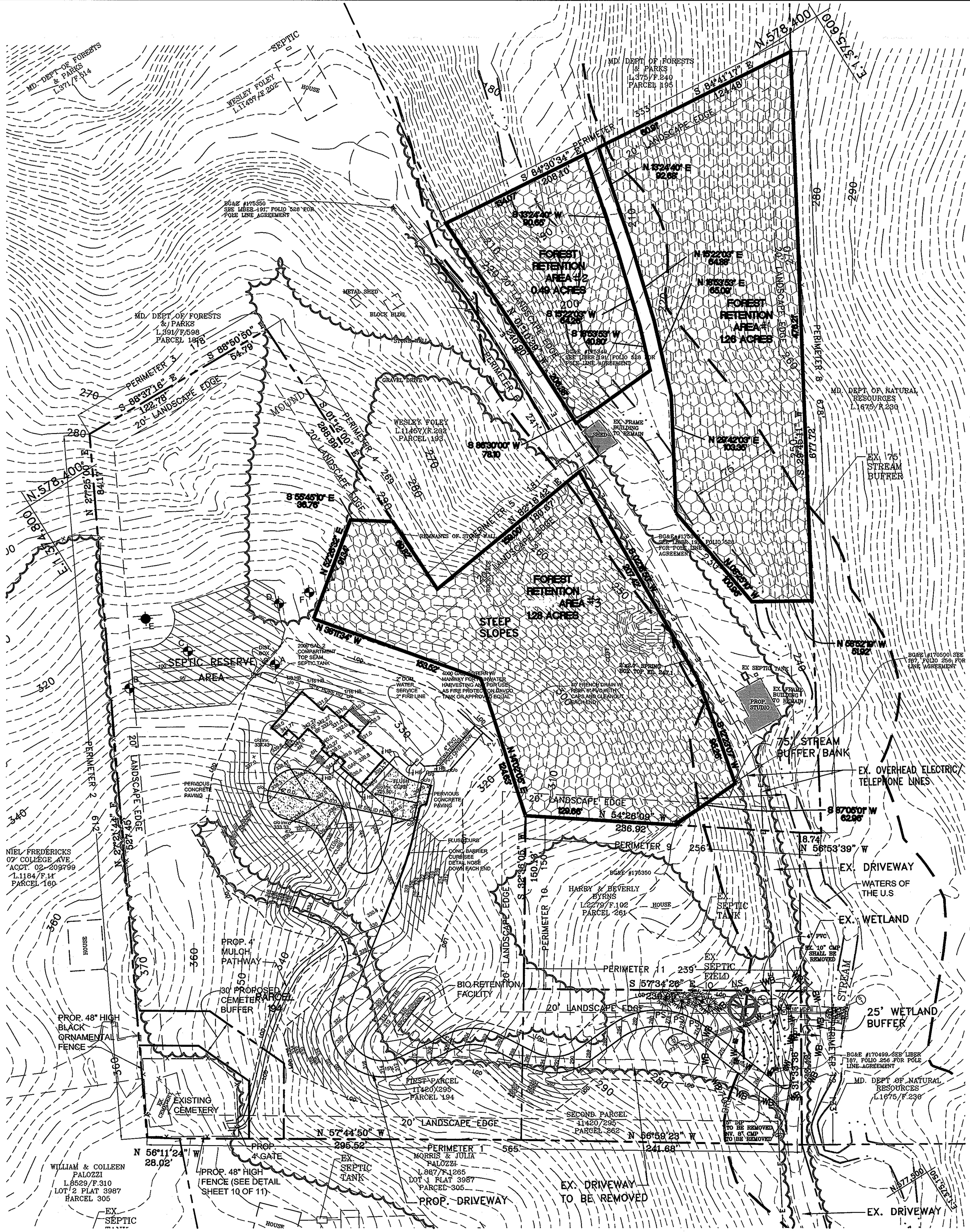
LEGEND

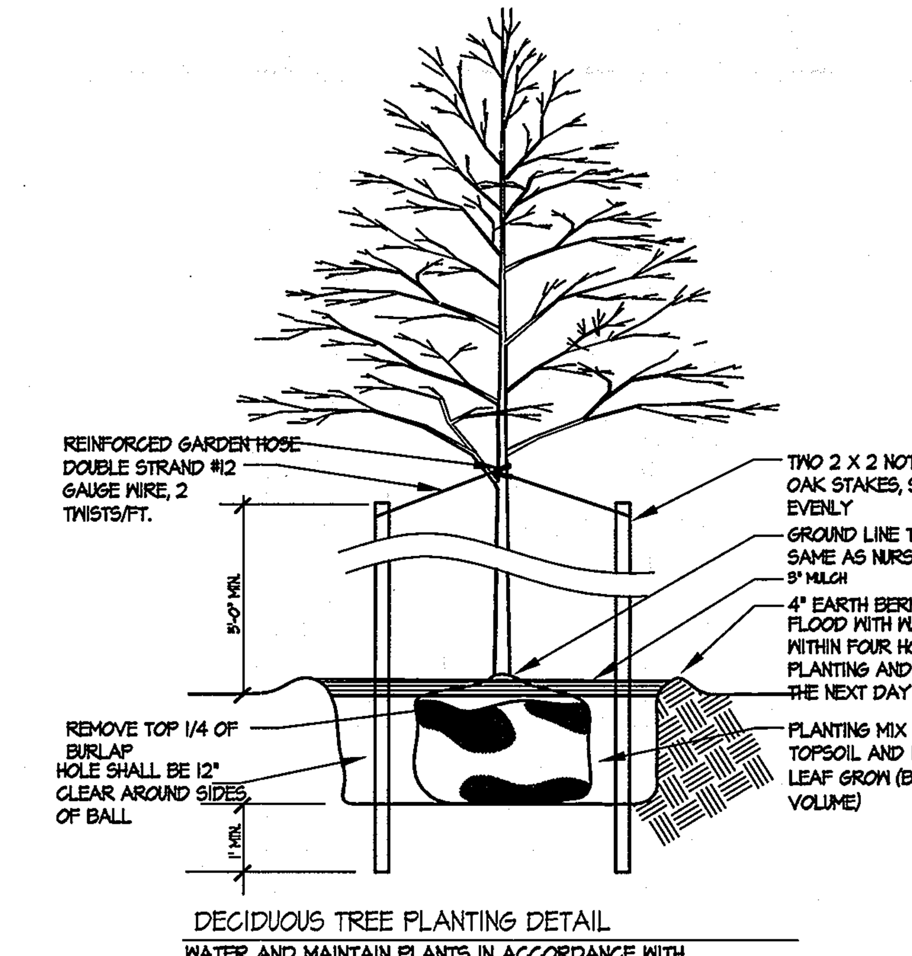
EXISTING

- Boundary
- Streams
- Contours
- Tree Lines
- Buildings
- Road Edge
- Steep Slopes ≥ 25%
- Specimen Tree
- Specimen Tree To Be Removed
- Wetland
- Wetland Buffer

PROPOSED

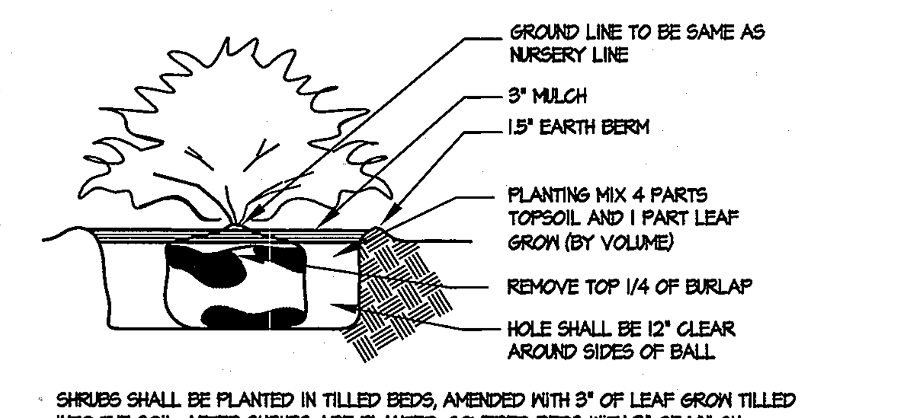
- Contours
- House
- Road Edge
- Septic Reserve Area
- Limit of Disturbance
- Storm drain
- Pervious Concrete
- Spot Elevation





DECIDUOUS TREE PLANTING DETAIL

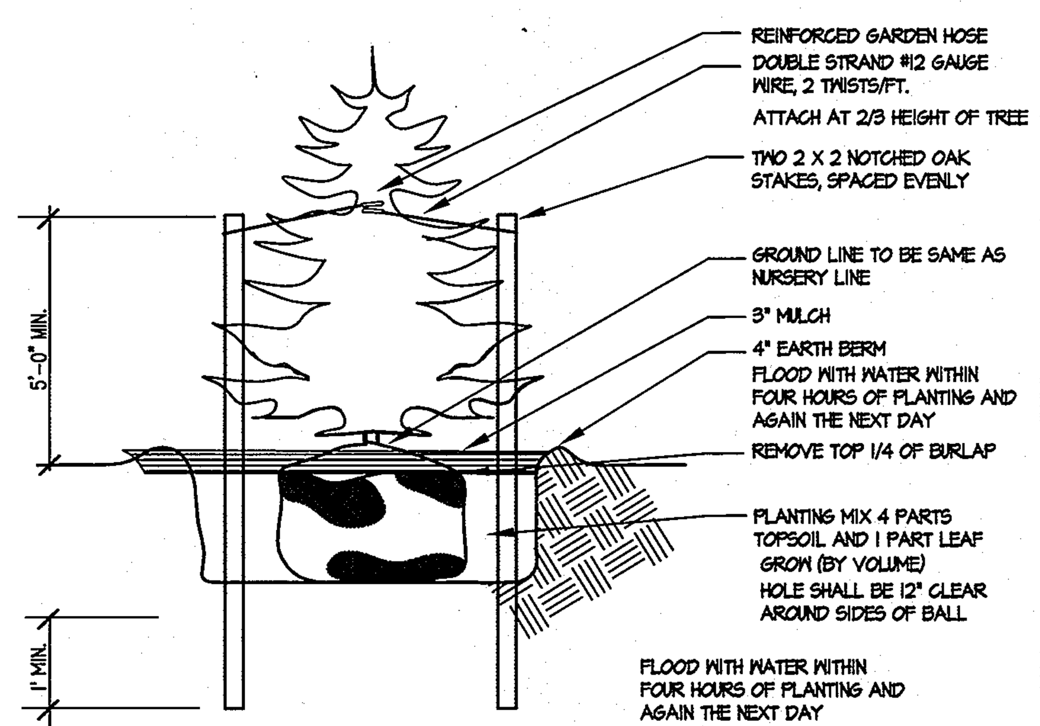
WATER AND MAINTAIN PLANTS IN ACCORDANCE WITH THE SPECIFICATIONS. NOT TO SCALE



SHRUBS SHALL BE PLANTED IN TILLED BEDS, AMENDED WITH 3" OF LEAF GROW TILLED INTO THE SOIL; AFTER SHRUBS ARE PLANTED, COVERED BEDS WITH 3" OF MULCH.

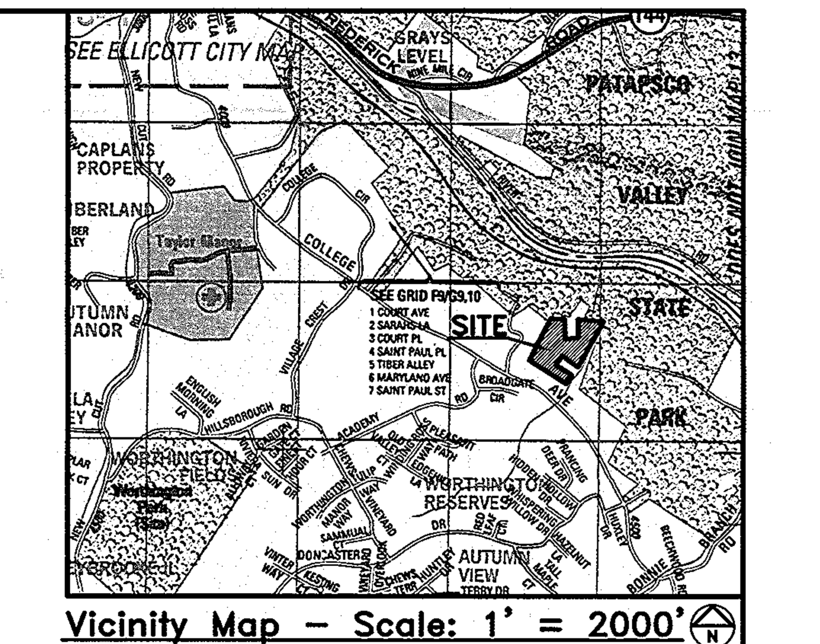
SHRUB PLANTING DETAIL

NOT TO SCALE



EVERGREEN TREE PLANTING DETAIL

WATER AND MAINTAIN PLANTS IN ACCORDANCE WITH THE SPECIFICATIONS.
NOT TO SCALE



Vicinity Map – Scale: 1' = 2000'

ADC Map 4816–F10

ADC The Map People – Permitted Use # 20612205

Benchmarks

HOWARD COUNTY TRAVERSE POINT NUMBERS
31BT8---N: 576,015.374 E: 1,375,770.465 ELEV: 378.575
31BT3---N: 576,602.966 E: 1,375,465.594 ELEV: 353.895

SCHEDULES

SCHEDULE A - PERIMETER LANDSCAPING
There is no perimeter adjacent to roadways. All perimeters are adjacent to perimeter properties.

Perimeter	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
Landscape Type	A	A	A	A	A	A	A	A	A	A	A	A	1 shade/60 lf
Linear ft Perimeter	565	612	178	269	181	241	333	678	256	150	239	133	
Credit (Ex Veg)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
# Ex Trees	9	10	3	5	3	4	6	11	4	3	2	1	
Credit (wall, fence, berm) - Linear ft	N	N	N	N	N	N	N	N	N	N	N	N	
Plants Required													
Shade	0	0	0	0	0	0	0	0	0	0	2	1	3 Shade
Ornamental	-	-	-	-	-	-	-	-	-	-	-	-	0 Ornamental
Evergreen	-	-	-	-	-	-	-	-	-	-	0	-	0 Evergreen
Shrubs	-	-	-	-	-	-	-	-	-	-	-	-	0 Shrubs
Plants Provided													
Shade	-	-	-	-	-	-	-	-	-	-	0	1	1 Shade
Ornamental	-	-	-	-	-	-	-	-	-	-	-	-	0 Ornamental
Evergreen	-	-	-	-	-	-	-	-	-	-	4*	-	4 Evergreen
Shrubs	-	-	-	-	-	-	-	-	-	-	-	-	0 Shrubs

FOOTNOTES:
*2:1 Substitution of evergreen trees for deciduous shade trees
Trees preserved in forest retention areas are presumed to meet 100% of the required planting for those perimeters.
Other forested perimeters, outside forest retention areas, are also presumed to fulfill perimeter planting requirements.

SCHEDULE B - PARKING LOT INTERNAL LANDSCAPING - *NOT APPLICABLE*
SCHEDULE C - RESIDENTIAL DEVELOPMENT INTERNAL LANDSCAPING - *NOT APPLICABLE*
SCHEDULE D - STORMWATER MANAGEMENT AREA LANDSCAPING - *NOT APPLICABLE*

LANDSCAPE SURETY
1 Proposed Shade Trees @ $300/tree =$300
4 Evergreen/Ornam. trees @ $150/tree =$600
Total Bond: $900.00

The surety for the landscaping shall be posted with grading permit for SDP 12-016.

PLANT LIST

Quan	Key	Scientific Name	Common Name	Size	Comments
	Major Deciduous Trees				
1	IO	Ilex opaca	American Holly	8-10' ht.	
1	NS	Nyssa sylvatica	Black Gum	2 1/2-3" Cal.	
3	PS	Pinus strobus	White Pine	8-10' ht.	

GENERAL NOTES

1. The Contractor shall be responsible for maintenance and care of required landscaping and landscape beds until Final Acceptance and completion of the one-year warranty period. Maintenance shall include weeding, refreshing mulch, watering, pest and disease control, and all other efforts related to maintaining healthy plant materials, and clean plant beds. Following Final Acceptance and completion of the warranty period, the owner, tenant and/or their agents shall be responsible for maintenance of the required landscaping, including both plant materials, berms, and screen wall. All plant materials shall be maintained in good growing condition, and when necessary, replaced with new materials to ensure continued compliance with applicable regulations. All other required landscaping shall be permanently maintained in good condition and when necessary, repaired or replaced.
2. At the time of installment, all shrubs and other plantings herewith listed and approved for this site, shall be of the proper height requirements in accordance with the Howard County landscaping Manual. In addition, no substitutions or relocation of required plantings may be made without prior review and approval from the Department of Planning and Zoning. Any deviation from this approved Landscape plan may result in denial or delay in the relase of landscape surety until such time as all required materials are planted and/or revisions are made to applicable plans and certificates.
3. Should any tree designated for preservation for which landscaping credit is given die prior to releace of bonds, the owner will be required to replace the tree with the equivalent species or with a tree which will obtain the same height, spread and growth characteristics. The replacement tree must be a minimum of three (3) inches in caliper and installed as required in the Howard Landscape Manual.
4. The landscape plan has been prepared in accordance with Section 16.124 of the Howard County Code and the Howard County Landscape Manual.

DEVELOPER'S/BUILDER'S CERTIFICATE

I/we certify that the landscaping shown on this plan will be done according to the plan, Section 16.124 of the Howard County Subdivision and Land Development Regulations and the Landscape Manual. I/we further certify that upon completion a Letter of Landscape Installation, accompanied by an executed one year guarantee of plant materials will be submitted to the Department of Planning and Zoning.

Thomas E. Wahl (signature) 5-23-12
Name Thomas E. Wahl Date

APPROVED FOR PRIVATE WATER
APPROVED FOR PRIVATE SEWERAGE SYSTEM

(signature) 7/3/2012
COUNTY HEALTH OFFICER DATE
HOWARD COUNTY HEALTH DEPARTMENT

PLANNING & ZONING

(signature) 6/14/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

(signature) 7/09/12
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

(signature) 7/9/12
DIRECTOR DATE

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LANDSCAPE PLAN
Wahl Property
Parcels 194 and 262
Howard County, Maryland

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 14230, Expiration Date: 12/09/12.

LOT/PARCEL:	LIBER/FOLIO:		PLATS:
194 & 262	11420/295		N/A
GRID# 21	ZONE R-ED	TAX/ZONE MAP 25	ELECT.DISTRICT 2ND

GRID#	ZONE	TAX/ZONE MAP	ELECT.DISTRICT	CENSUS TRACT:
21	R-ED	25	2ND	602800

Date: 5/16/12
Proj. #: 10020
Scale: 1" = 50'

DESIGN: JLS DRAWN: MAS CHKED: JLS

SDP 12-016

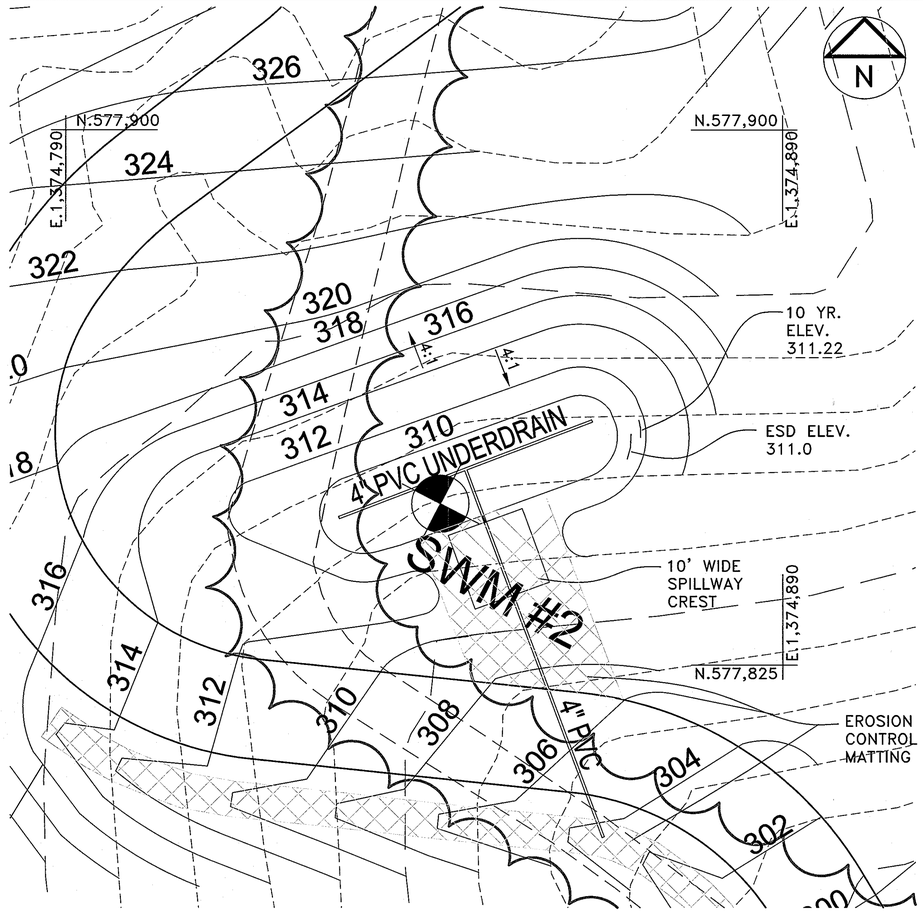
LEGEND

EXISTING

- Boundary
- Streams
- Contours (350)
- Tree Lines
- Buildings
- Road Edge
- Steep Slopes ≥ 25%
- Specimen Tree (A)
- Specimen Tree To Be Removed (A)
- Wetland (W)
- Wetland Buffer (WB)

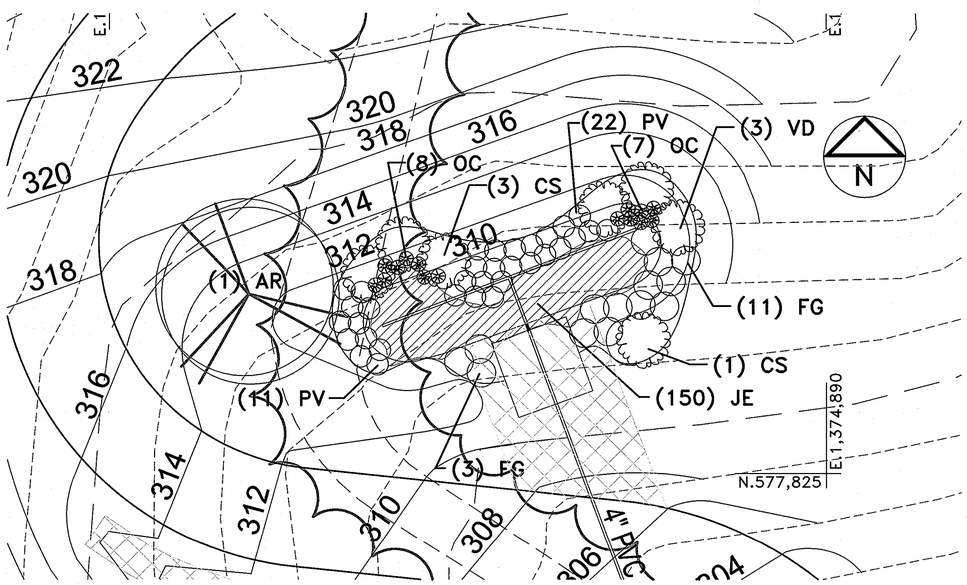
PROPOSED

- Contours
- House
- Road Edge
- Septic Reserve Area
- Limit of Disturbance (LOD)
- Storm drain (15" HDPE)
- Pervious Concrete
- Spot Elevation (336.4)



SWM PLAN

Scale: 1" = 10'



PLANTING PLAN

Scale: 1" = 10'

TABLE B.3.2 MATERIALS SPECIFICATIONS FOR BIORETENTION

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
planting soil [2.5' to 4' deep]	sand 35%-60%, silt 30-55%, clay 10-25%	n/a	USDA soil types loamy sand, sandy loam or loam
mulch	shredded hardwood		aged 6 months, minimum
geotextile	Class "C" - apparent opening size (ASTM-D-4751). grab tensile strengh (ASTM-D-4632), puncture resistance (ASTM-D-4833)	n/a	for use as necessare beneath underdrains only
underdrain gravel	AASHTO M-43	0.375" to 0.75"	
underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
poured in place concrete (if required)	MSHA Mix No. 3; f'c = 3500psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strengh and slump test; all concrete design (cast-in-place or pre-cast) not using previously approved State or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressure); and analysis of potential cracking
sand [1' deep]	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

B.3.B Specifications for Bioretention

1. Material Specifications

The allowable materials to be used in bioretention area detailed in Table B.3.2.

2. Planting Soil

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 area 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, or other noxious weeds as specified under COMAR 15.08.01.05.

The planting soil shall be tested and shall meet the following criteria:

pH range	5.2 - 7.0
organic matter	1.5 - 4% (by weight)
magnesium	35lb. /ac
phosphorus (phosphate - P2O5)	75 lb. /ac
potassium (potash - K2O)	85 lb. /ac
soluble salts	not to exceed 500 ppm

All bioretention areas shall have a minimum of one test. Each test shall consist of both the standard soil test for pH, phosphorus, and potassium and additional testes of organic matter, and soluble salts. A textural analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the top soil was excavated.

Since different labs calibrate their testing equipment differently, all testing results shall come from the same testing facility.

Should the pH fall out of the acceptable range, it may be modified (higher) with lime or (lower) with iron sulfate plus sulfur.

3. 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 rubber tires with large lugs or high pressure tires will cause excessive compaction resulting in reduced infiltration rates 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.

Rototill 2 to 3 inches of sand into the base of the bioretention facility backfilling the optional sand layer. Pump any ponded water before preparing (rototilling) base.

When backfilling the bioretention facility, place soil in lifts 12" to 18". 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.

4. Plant Material

Recommended plant material for bioretention areas can be found in Appendix A, Section A.2.3.

5. Plant Installation

Mulch should be placed to a uniform thickness of 2" to 3". Shredded hardwood mulch is the only accepted mulch. Pine mulch and wood chips will float and move to the perimeter of the bioretention areas during a storm event and are not acceptable. Shredded mulch must be well aged (6 to 12 months) for acceptance.

Root stock of the plant material shall be kept moist during transport and on-site storage. The plant root ball should be planted so 1/8th of the ball is above final grading surface. The diameter of the planting pit shall be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight during the entire planting process. Thoroughly water ground bed cover after installation.

Trees shall be braced using 2" by 2" stakes only as necessary and for the first growing season only. Stakes are to be easily spaced on the outside of the tree ball.

Grasses and legume seed should be drilled into the soil to a depth of at least one inch. Grass and legume plugs shall be planted following the non-grass ground cover planting specifications.

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 are used to amend soil. Rototill urea fertilizer at a rate of 2 pounds per 100 square feet.

6. Underdrains

Underdrains are to be placed on a 3'-0" wide section of filter cloth. Pipe is placed next, followed by the gravel bedding. The ends of underdrain pipes are not terminating in an observation well shall be capped.

The main collector pipe for underdrain systems shall be constructed at a minimum slope of 0.5%.

7. Miscellaneous

The bioretention facility may not be constructed until all contributing drainage area has been stabilized.

PLANT SCHEDULE

KEY	BOTANICAL NAME	COMMON NAME	SIZE	QUANTITY	SPACING	ROOT
TREES						
AR	ACER RUBRUM 'OCTOBER GLORY'	OCTOBER GLORY RED MAPLE	2-1/2"CAL	1	-	B&B
SHRUBS						
CS	CORNUS SERICEA	REDOSIER DOGWOOD	24" HT.	4	3'	B&B OR CONTAINER
FG	FOTHERGILLA GARDENII	DWARF WITCH-ALDER	24" HT.	14	30"	B&B OR CONTAINER
VD	VIBURNUM DENTATUM 'AUTUMN JAZZ'	ARROWWOOD VIBURNUM	30" HT.	3	4'	B&B OR CONTAINER
HERBACEOUS PLANTS						
JE	JUNCUS EFFUSUS	SOFT RUSH	PLUG	150	12" O.C.	10 per clump
PV	PANICUM VIRGATUM	SWITCH GRASS	1 GAL	33	30" O.C.	
OC	OSMUNDA CINNAMOMEA	CINNAMON FERN	1 GAL	15	18" O.C.	

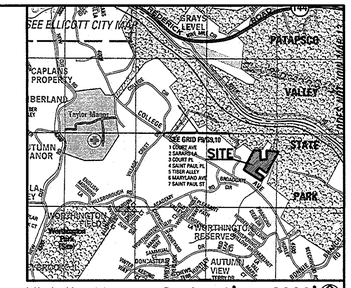
FACILITY SUMMARY

Facility	TC	DA	ESDv req	ESDv Prov	Pe req	Rec Prov
Bio Ret	0.1 hr	1.09 ac	714 cf	742 cf	1.5"	470 cf
Pervious Concrete	0.1 hr	0.39 ac	1085cf	1984 cf	1.5"	505 cf
Rainwater Harvesting	0.1 hr	0.036 ac	196 cf	326 cf	1.5"	250 cf*

- French drain storage.

PROJECT SUMMARY

DA	Imp area	Pe req	ESDv req	ESDv Prov	REc req	Rec Prov
2.16 ac	0.47 ac	1.5"	2904 cf	3052 cf	490 cf	490 cf



Vicinity Map - Scale: 1' = 2000'

ADC Map 4816-F10

ADC The Map People - Permitted Use # 20612205

Benchmarks

HOWARD COUNTY TRAVERSE POINT NUMBERS
31BT8---N: 576,015.374 E: 1,375,770.465 ELEV: 378.575
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APPROVED FOR PRIVATE WATER
APPROVED FOR PRIVATE SEWERAGE SYSTEM

BWilson for Peter Beilenson 7/3/2012
COUNTY HEALTH OFFICER DATE
HOWARD COUNTY HEALTH DEPARTMENT

PLANNING & ZONING

6/14/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

7/09/12
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

7/9/12
DIRECTOR DATE

Tesseract™
TESSERACT SITES, INC
Jeffrey Schwab
401 Washington Ave. Suite 303
Towson, Maryland, 21204
p. 410.321.7600
f. 410.321.7601

Stormwater Management Plan, Notes & Details
Wahl Property
Parcels 194 and 262
Howard County, Maryland

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 14230, Expiration Date: 12/09/12.

LOT/PARCEL:		LIBER/FOLIO:		PLATS:
194 & 262		11420/295		N/A
GRID	ZONE	TAX/ZONE MAP	ELECT.DISTRICT	CENSUS TRACT:
21	R-ED	25	2ND	6028.00

STATE OF MARYLAND JEFFREY LYNN SCHWAB 14230 REGISTERED PROFESSIONAL ENGINEER 5/16/12

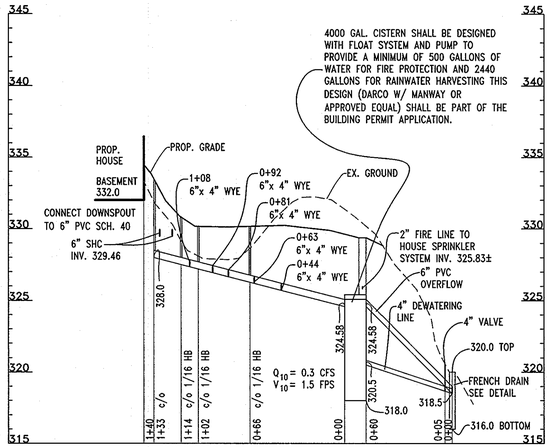
Date: 5/16/12
Proj. #: 10020
Scale: 1" = 10'

8 of 10

DESIGN: JLS | DRAWN: MAS | CHKED: JLS

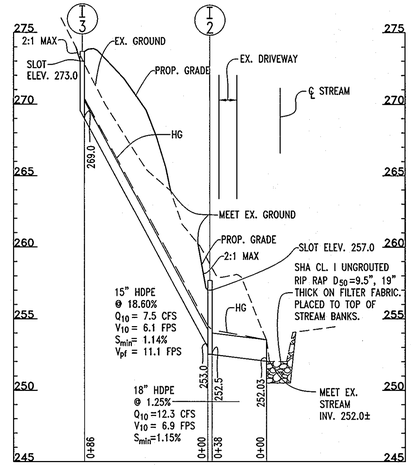
0' 10' 20' 30'

SDP 12-016



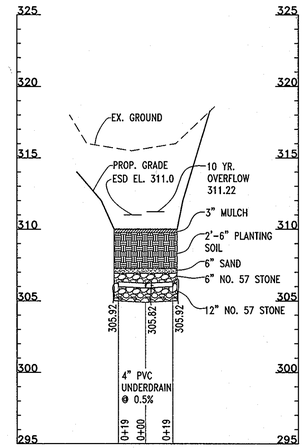
ROOF DRAIN PROFILE

SCALE: HORIZ. 1"=50'
VERT. 1"=5'



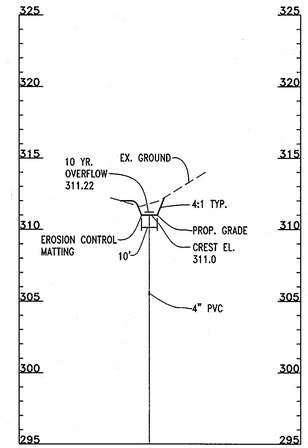
STORM DRAIN PROFILE

SCALE: HORIZ. 1"=50'
VERT. 1"=5'



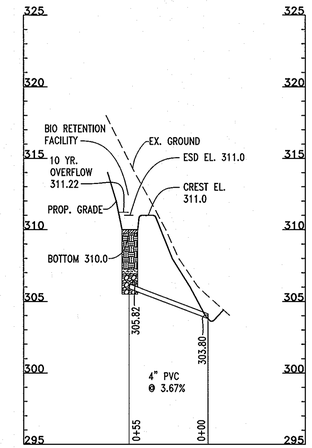
CROSS SECTION BIO RETENTION

SCALE: HORIZ. 1"=50'
VERT. 1"=5'



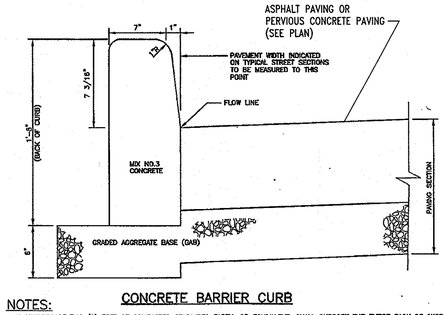
OVERFLOW SPILLWAY BIO RETENTION

SCALE: HORIZ. 1"=50'
VERT. 1"=5'



UNDERDRAIN PROFILE

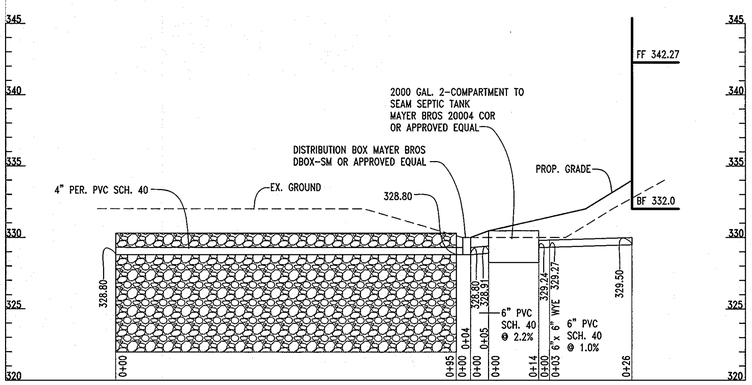
SCALE: HORIZ. 1"=50'
VERT. 1"=5'



NOTES:
1. A MINIMUM OF TWO (2) FEET OF COMPACTED STABILIZED EARTH, OR EQUIVALENT, SHALL SUPPORT THE ENTIRE BACK OF CURB.
2. POSITIVE DRAINAGE SHALL BE PROVIDED BOTH BEHIND THE CURB AND ALONG THE GUTTER AND FLOW LINE.

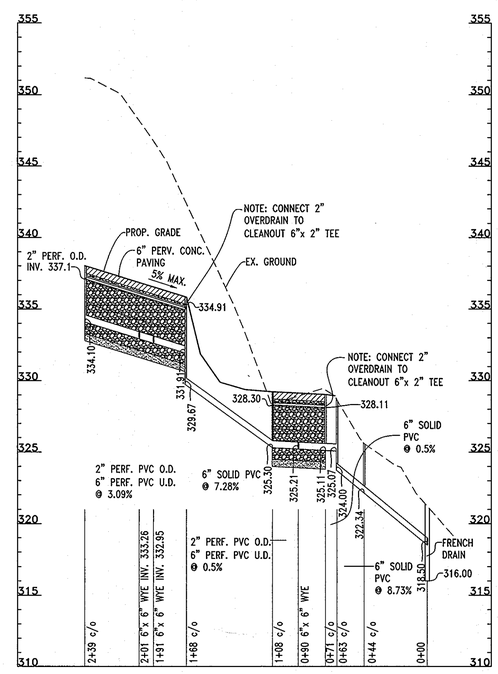
CONCRETE BARRIER CURB

R-3.03
NOT TO SCALE



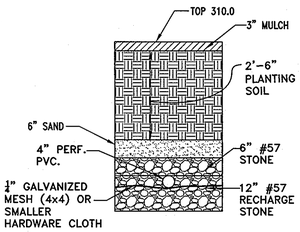
SANITARY PROFILE

SCALE: HORIZ. 1"=20'
VERT. 1"=5'



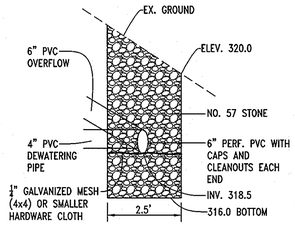
PERVIOUS CONCRETE PROFILE

SCALE: HORIZ. 1"=50'
VERT. 1"=5'



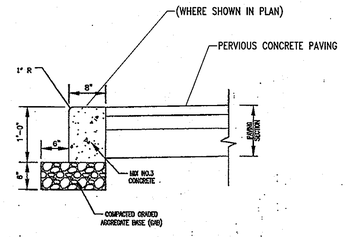
TYPICAL SECTION BIORETENTION

SCALE: 1" = 2'



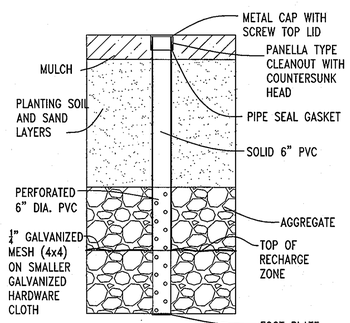
FRENCH DRAIN

NOT TO SCALE



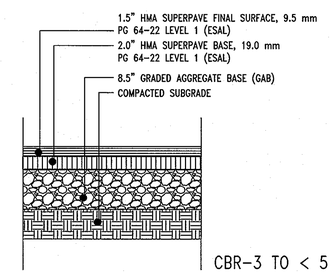
CURB FLUSH

R-3.07
NOT TO SCALE



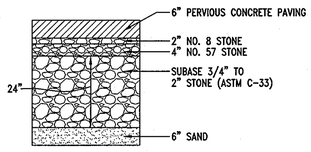
OBSERVATION WELL

NOT TO SCALE



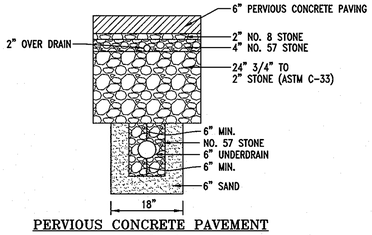
Typical Paving Section Driveway

NOT TO SCALE



TYPICAL SECTION THROUGH PERVIOUS CONCRETE PAVING

SCALE: 1" = 2'



PERVIOUS CONCRETE PAVEMENT

SCALE: 1" = 2'

APPROVED FOR PRIVATE WATER
APPROVED FOR PRIVATE SEWERAGE SYSTEM

B Newton for Peter Berlenson 7/3/2012
COUNTY HEALTH OFFICER — DATE
HOWARD COUNTY HEALTH DEPARTMENT

PLANNING & ZONING

6/14/12
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

7/09/12
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

7/5/12
DIRECTOR — DATE

PIPE SCHEDULE

SIZE	TYPE	LF
4"	PVC	60
6"	PVC	193
15"	HDPE	86
18"	HDPE	38

STRUCTURE SCHEDULE

NO.	TYPE	INV. IN	INV. OUT	TOP ELEV.	REMARKS	LOCATION
S-1	HDPE END SECTION	252.03	252.0	–	PER MAN. DETAILS	SEE PLAN
* I-2	PRECAST D INLET	253.0	252.5	257.83	HO. CO. STD. D4.10	SEE PLAN
* I-3	PRECAST D INLET	–	269.0	273.83	HO. CO. STD. D4.10	SEE PLAN

* PROVIDE SLOTS IN 3 SIDES N, S, & W.

Contact
Jeffrey L. Schwab
Tesseract Sites
401 Washington Ave. Suite 303
Towson, Maryland 21204
Ph. 410-321-7600
Owner
Thomas E. & Lucinda T. Wahl
7110 Flint Court
Middletown, Maryland 21769
Ph. 410-379-6700

Tesseract™
TESSERACT SITES, INC
Jeffrey Schwab
401 Washington Ave. Suite 303
Towson, Maryland, 21204
p. 410.321.7600
f. 410.321.7601

Details and Profiles
Wahl Property
Parcels 194 and 262
Howard County, Maryland

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 14230, Expiration Date: 12/08/12.

LOT/PARCEL:		LIBER/FOLIO:		PLATS:
194 & 262		11420/295		N/A
GRID	ZONE	TAX/ZONE MAP	ELECT.DISTRICT	CENSUS TRACT:
21	R-ED	25	2ND	602800

STATE OF MARYLAND — JEFFREY LYNN SCHWAB — No. 14230 — PROFESSIONAL ENGINEER — 5/16/12

Date: 5/16/12
Proj. #: 10020
Scale: AS SHOWN

DESIGN: JLS | DRAWN: MAS | CHKED: JLS

SDP 12-016

CONSTRUCTION SPECIFICATIONS

1. SCOPE: This specification provides the requirements for construction of pervious concrete pavement. All requirements of the Howard County Design Manual Volume IV Standard Specifications for Construction and Materials (HoCo) and the Maryland State Highway Administration Standard Specifications for Construction and Materials (MDSHA), latest edition, shall apply as modified herein. See Project Specifications for additional information.

2. SUBMITTALS
   - A. As required by HoCo and MDSHA and noted herein.
   - B. Contractor Qualifications, related to construction of pervious concrete pavement.
   - C. Concrete Manufacturer's qualifications, related to manufacture of pervious concrete product.
   - D. Design Mixture (proportions and density), for pervious concrete pavement.
   - E. Operation and Maintenance Data: For pervious concrete pavement.
   - F. Materials certificates: For cementitious materials and Admixtures.
   - G. Materials test reports:
     1) Provide separate reports for coarse and fine aggregates indicating type, source, grading, dry–rodded unit weight, and void content.
     2) Pervious concrete product, to verify compliance with specified performance criteria
   - H. Test panel results.
   - I. Joint plan; distinguish between different joints by color or labelling.
   - J. Field Quality Control Reports.

3. QUALITY ASSURANCE
   - A. Pervious Concrete Contractor:
     1) The installation crew shall have a minimum of two years of documented successful experience installing pervious concrete pavement for vehicular use, and
     2) The pervious concrete contractor shall submit evidence of a minimum of 2 successful pervious concrete projects for vehicular use, each greater than 1,000 sf. Submit project name, address, owner name and address and contact information.
     3) The installation crew shall have no less than one National Ready Mixed Concrete Association (NRMCA) certified Pervious Concrete Craftsman, who shall be on site, supervising all concrete placement and finishing, or
        The crew shall have no less than three NRMCA certified Pervious Concrete Installers, or
        The crew shall have no less than one NRMCA certified Installer and three NRMCA certified Pervious Concrete Technicians.
   - B. Concrete Manufacturer: A firm experienced in successfully manufacturing ready–mix pervious concrete products. Manufacturer shall be certified according to NRMCA's "Certification of Ready Mix Concrete Production Facilities," with a minimum of two years documented experience in providing pervious concrete products.
   - C. Testing Agency: Personnel conducting field tests for pervious concrete shall be qualified, at a minimum, as NRMCA certified Pervious Concrete Technician, or equivalent.
   - D. Test Panel: Provide minimum 10' x 20' test panel, full depth including concrete, stone base, and required subgrade condition, using the mixture proportions, materials, and equipment proposed for the project. Panel shall demonstrate typical joints, finish, color, curing, and standard of workmanship. Test panel for quality requirements.
     1) Test Fresh Density in accordance with ASTM 1688. Sample per ASTM 172.
        a. Fresh density shall be ±5 lb/cu ft. of specified fresh density.
     2) Test Hardened Density in accordance with ASTM C140, paragraph 9.3. Core per ASTM C42.
     3) Test Thickness in accordance with ASTM C174, using the average from three cores.
        a. Average compacted thickness shall not be more than 1/4 inch less than specified thickness, with no single core exceeding 1/2 inch less than specified thickness.
        b. Average compacted thickness shall not be more than 1 1/2 greater than specified thickness.
   - E. Preinstallation Conference: Conduct conference at project site a minimum of 2 weeks in advance of commencing pervious concrete installation and discuss issues relating to construction of pervious concrete, including but not limited to, materials, transport, placement, curing, and testing. At a minimum, the meeting shall include the design engineer, general contractor, the pervious concrete subcontractor, the pervious concrete foreman, the testing agency representative, the owner's representative.

4. PRODUCTS
   - A. Subbase Materials: uniformly graded, ASTM #57, rounded or crushed.
   - B. Concrete Materials:
     1) Aggregate:
        a. ASTM D448 and ASTM C33, uniformly graded. Provide aggregate from a single source.
        b. Single size coarse aggregate ASTM #8 or #67, rounded or crushed. There shall be little or no fine aggregate.
     2) Portland Cement: ASTM C 150, gray portland cement Type I or Type II. Cement may be supplemented with Fly Ash (per ASTM C 618), Ground Granulated Blast–Furnace Slag (per ASTM C989, Grade 100 or 120), or Silica Fuke (per ASTM C1240).
     3) Admixtures: shall be in accordance with ASTM C494. Admixtures may be used to facilitate production and placement of pervious concrete upon approval of the Engineer.
     4) Water: Potable.
   - C. Steel Reinforcement: shall not be used with pervious concrete.
   - D. Joint Material: Isolation joint material shall comply with ASMT D994, D1751, or D1752. Expansion joint material shall comply with specifications for standard concrete materials.
   - E. Curing Materials: Moisture retaining cover shall be clear or white opaque polyethylene film, 6 mil, ASTM C 171.
   - F. Concrete Mixture: Select design mix in accordance with ACI 211.3 "Guide for Selecting Proportions for No–Slump Concrete." Mix shall meet the following criteria,

1)	Density/Unit Weight (in place)	100–120 lb/cu ft.
2)	Portland Cement Content	600 lb/cu yd.
3)	Water/Cement Ratio	0.24–0.34 (by mass)
4)	Fine/Coarse Aggregate Ratio	There shall be little to no fine aggregate.
5)	Void Ratio	15–35%
6)	Air entrainment shall be used to improve resistance to freeze/thaw.	
7)	Hydration stabilizers are recommended.	

   - G. Concrete Mixing: Mixing and delivery time are very critical for pervious concrete materials. Begin mixing immediately after addition of cement to aggregate.

5. EXECUTION
   - H. SUBGRADE: Examine the subgrade and verify it's acceptability prior to proceeding with installation of subbase and pervious concrete pavement.
     1) Subgrade shall comply with requirements for dimensional, grading, and elevation tolerances.
     2) Subgrade shall be compacted to MAXIMUM 95% Standard Proctor (90–92% Modified Proctor).
     3) Test subgrade permeability in accordance with ASTM D3385 prior to placing concrete. Subgrade shall meet minimum percolation rate of 1/2 inch per hour.
     4) Subgrade shall not be muddy, saturated, or frozen.
   - B. SUBBASE
     1) Install aggregate in maximum 6 inch lifts. Place stone in a manner that does not disturb or compact the soil bed. Material shall be deposited within thirty feet of its final placement location. Movement (pushing) of material more than thirty feet from the location where it is deposited will not be permitted. Lightly compact with equipment, minimizing equipment movement over aggregate. Install to grades indicated.
     2) Keep clean from soil and other contaminants.
   - C. SETTING FORMWORK
     1) Formwork for pervious concrete may vary from formwork for conventional concrete.
     2) Set, align, and brace forms so that the hardened concrete meets the tolerances specified. Install forms to allow continuous progress of work so forms can remain in place at least 24 hours after concrete placement.
     3) Concrete placement width shall not exceed 20 feet unless otherwise specified.
     4) Riser strips are often uses on formwork for initial strike–off and removed to facilitate compaction.
   - D. BATCHING, MIXING, AND DELIVERY
     1) Place mixture in accordance with NRMCA Pervious Concrete Contractor Certification guildelines.
     2) Mixture proportioning shall be tightly controlled to meet specified criteria. Aggregate water content during mixing must be monitored carefully.
        a. Addition of water at the discharge point is permitted to bring workability up to a level that is acceptable to the contractor without causing paste drain.
     3) Mixture typically should be completely discharged withiin one hour of mixing. This timeframe may be increased slightly upon addition of hydration stabilizing admixtures. Placement shall be continuous. Pervious pavement mixtures typically cannot be pumped. Discharge is slowed due to its low slump and several mixers may be necessary working simultaneously.
   - E. CONCRETE PLACEMENT
     1) Before placing concrete, inspect formword installation and items to be embedded or cast–in.
     2) Remove snow, ice, or frost from subbase surface. Do not place concrete on frozen surfaces.
     3) Moisten subbase to provide a uniform dampened condition at the time concrete is placed.
        a. Moistness is more critical for pervious concrete than with conventional concrete construction. Failure to provide a moist subbase will result in a reduction in strength of the pavement. Subbase shall be in a wet condition immediately prior to placing concrete.
     4) Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
        a. Refer to NRMCA publications for recommended methods of spreading pervious concrete material. Deposit concrete as close to its final location as practical. Limit pulling and shoveling of concrete that may reduce voids.
        b. Do not allow foot traffic on the fresh concrete. Do not contaminate mix.
     6) Strike off must be performed quickly. Strike off between forms using a form–riding paving machine or vibrating screed. Other strike–off devices may be used upon prior approval of the engineer.
     7) Compact using a weighted steel pipe roller or motorized or hydraulically acturated rotating tube screed that spans the full width of the section placed and exerts a vertical pressure of 10 psi on the concrete. Do not use internal vibration. Compact along slab edges with hand tools.
        a. Finish Pavement shall comply with the following tolerances:
           Elevation: +3/4 in., –0 in.
           Thickness: + 1 1/2 in., – 1/4 in.
           Contraction Joint Depth: +1/4 in, –0 in.
   - F. FINISHING
     1) Finish pavement to the elevations and thicknesses specified.
        a. Do not use steel trowels or power finishing equipment.
     2) Edge top surface to a radius of not less than 1/4 inch.
   - G. JOINTING
     1) Construct joints as indicated in the Construction Documents.
        a. Spacing between Contraction joints shall not exceed 20 feet. Depth shall be 1/4 to 1/3 of pavement thickness.
        b. Contraction joints may be saw cut or tooled.
           Tool joints to specified depth and width immediately after concrete is compacted. Do not put weight on adjacent concrete surfaces during construction of joints. A specially designed weighted rolling jointer with a blade is frequently used.
           Saw cut joints 1/8" width after concrete has hardened sufficiently to prevent aggregate from being dislodged and soon enough to prevent pavement cracking. Only remove curing materials as necessary to construct joint and replace as quickly as possible.
        b. Construction joints be evenly spaced across the pavement width as generally indicated on the construction documents, unless otherwise approved in advance by the engineer. No additional joint locations shall be permitted.
     2) Use Isolation joints where pavement abuts fixed objects and adjacent to standard concrete products. Extend through the full depth of the pavement. Fill entire Isolation joint with joint material.
     3) Align joints of adjacent pavement panels. Align joints of curb within 1/4 inch of adjacent joints in pavement panel.
     4) Joints shall be perpendicular with edges of pavement panels, unless otherwise indicated.
   - G. CURING
     1) Begin curing within 20 minutes of concrete placement.
     2) Completely cover pavement surface with a 6 mil thick polyethylene sheet. Cut sheeting to extend approximately three feet beyond edges of pavement.
     3) Provide evaporation retarders, misting or other protection as needed during adverse weather conditions.
     4) Secure curing cover. If surface has lost its sheen, lightly mist prior to placing cover. Do not use dirt to secure sheeting on top of pavement.
     5) Cure pavement for a minimum of seven uninterrupted days.
     6) No traffic, material storage, or other use of fresh concrete surfaces shall be permitted during curing.
   - H. FIELD QUALITY CONTROL AND ACCEPTANCE
     4) Tests of samples of concrete shall be performed according to the following requirements:
        a. Fresh Density: ASTM C1688
           Obtain 1 cu ft. composite samples for testing in accordance with ASTM C172
           Measure a minimum of one fresh density test during each day's placement.
        b. Hardened Density: ASTM C140, para. 9.3
           Measure as an average from three cores from each lot of 5000 sf ft of pavement, obtained not less than seven days after placement of concrete. Remove cores in accordance with ASTM C42. Select core locations in accordance with ASTM D3665.
        c. Thickness: Use cores obtained for Hardened Density tests. Thickness shall be an average of the thickness of the 3 cores.
        d. Void: ASTM C 172.
           Test per each 100 cy of material.
     2) Pervious concrete finished product shall be in accordance with approved test panel results, within the following tolerances:

a. Fresh Concrete Density	±5 lb/cu ft. of specified fresh density
b. Hardened Concrete Density	within 5% of approved hardened density of test panel
c. Fresh Void Ratio	±2% of submitted fresh void content
d. Hardened Void Ratio	maximum 2% less than design void content
e. Hardened concrete compacted thickness:	no more than 1/4 inch less or 1 1/2 inch more than specified thickness

     3) Concrete paving shall be considered defective if it does not pass tests and inspections.
     4) Cores holes shall be filled with concrete or preblended grout.

Protection of Work

Completed pervious concrete work shall be protected from construction and other activities. No storage of materials, vehicular traffic or other use shall be permitted on the pervious concrete surface prior to Final Acceptance.

Operation and Maintenance Schedule Pervious Concrete Paving

Proper maintenance is critical to the continued function of pervious pavement. Clogging of pores and improper repairs will severely damage the ability of the product to perform its intended function. The following minimum maintenance schedule should be incorporated to maintain surface porousity and minimize potential problems:

- Ensure that paving is thoroughly cleaned of debris after each mowing of adjacent lawns and on a weekly basis in the Fall to remove leaf litter. Do not use a cleaning method that pushes material down into pores. Washing or compressed air units should not be used to perform surface cleaning.
- Vacuum cleaning is recommended for all cleaning and should be performed twice annually, at a minimum, using commercial cleaning units.
- Ensure that the paving is clear of sediments. Inspect monthly and stabilize adjacent eroded areas as they become evident.
- Inspect annually for raveling or surface damage and correct as needed.
- Drainage pipes, inlets, stone edge drains and other structures within or draining to the subbase should be cleaned out at regular intervals.
- Deicers should be used in moderation. Deicers should be non–toxic and should be applied as calcium magnesium acetate or as pretreated salt. Snow plowing should be done carefully with blades set one inch above the pavement surface. Plowed snow piles and snow melt should not be directed to permeable pavement.

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED Rainwater Harvesting (M–1)

a. The Owner shall empty barrels on a monthly basis and clean barrel with a hose.
b. The Owner shall verify integrity of leaf screens, gutters, downspouts, spigots, and mosquito screens, and clean and remove any debris.
c. The Owner shall replace damaged components as needed.
d. The Owner shall disconnect the barrel prior to winter, or allow the barrel to drain by bottom spigot during the winter season.

OPERATION AND MAINTENANCE SCHEDULE FOR LANDSCAPE INFILTRATION (M–3) MICRO–BIORETENTION (M–6), RAIN GARDENS (M–7), BIORETENTION SWALE (M–8), ENHANCED FILTERS (M–9)

a. The Owner shall maintain the plant material, mulch layer and soil layer annually. Maintenance of mulch and soil is limited to correcting areas of erosion or wash out. Any mulch replacement shall be done in the spring. Plant material shall be checked for disease and insect infestation and maintenance will address dead material and pruning. Acceptable replacement plant material is limited to the following: 2000 Maryland Stormwater Design Manual Volume II, Table A.4.1 and 2.
b. The Owner shall perform a plant in the spring and in the fall of each year. During the inspection, the Owner shall remove dead and diseased vegetation considered beyond treatment, replace dead plant material with acceptable replacement plant material, treat diseased trees and shrubs, and replace all deficient stakes and wires.
c. The Owner shall inspect the mulch each spring. The mulch shall be replaced every two to three years. The previous mulch layer shall be removed before the new layer is applied.
d. The Owner shall correct soil erosion on an as needed basis, with a minimum of once per month and after each heavy storm.

BORING LOG — GEOLAB, INC.

Report No.: Date:
Client: Hamel Builders
Project: Wahl Residence — Project No. 111-042
Boring No.: SWM-1 (1 of 1) Total Depth 20 Elev. 349.4 Location: See Boring Location Plan
Type of Boring: Hollow-stem Auger Started: 5/19/2011 Completed: 5/19/2011 Driller: Free State Drilling, Inc.

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
349.4	0.0	Sod with root (organic) matter and organic soil				Boring dry during drilling and at completion.
348.8	0.6	Tan silty fine to coarse SAND, moist, loose (SM)	3,3,3	1.0, 2.5		Cave-in depth recorded at 10.5 feet.
346.4	3.0	Light tan and pinkish-tan fine to coarse SAND with little rock fragments and trace silt, damp, medium dense (SW-SM)	14,16,13	3.5, 5		
			2,5,6	6.0, 7.5		
341.4	8.0	Olive brown with black micaceous fine to medium SAND with some silt, moist, medium dense (SM)	5,8,12	8.5, 10		
337.4	12.0	Brown silty fine to medium SAND, moist, medium dense (SM)	6,8,13	13.5, 15		
331.4	18.0	Grayish-tan fine to coarse SAND with some rock fragments and little silt, moist, very dense (SM)	50/5.5	18.5, 20		
329.4	20.0	End of Boring				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

BORING LOG — GEOLAB, INC.

Report No.: Date:
Client: Hamel Builders
Project: Wahl Residence — Project No. 111-042
Boring No.: SWM-2 (1 of 1) Total Depth 16 Elev. 330.6 Location: See Boring Location Plan
Type of Boring: Hollow-stem Auger Started: 5/19/2011 Completed: 5/19/2011 Driller: Free State Drilling, Inc.

Elevation	Depth	DESCRIPTIONS OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
330.6	0.0	Sod with root (organic) matter and organic soil				Boring dry during drilling and at completion.
330	0.6	Brown with black and off-white to gray with black and off-white silty fine to medium SAND, moist, medium dense to very dense (SM)	4,4,7	1.0, 2.5		Cave-in depth recorded at 7.5 feet.
			9,13,17	3.5, 5		
			12,21,23	6.0, 7.5		
			28,25,23	8.5, 10		
319.6	12.0	Light grayish-tan silty fine to medium SAND with trace rock fragments (weathered rock) (SM)		13.5, 15		
315.6	15.0	End of Boring				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

BORING LOG — GEOLAB, INC.

Report No.: Date:
Client: Hamel Builders
Project: Wahl Residence — Project No. 111-042
Boring No.: SWM-3 (1 of 1) Total Depth 16 Elev. 315.0 Location: See Boring Location Plan
Type of Boring: Hollow-stem Auger Started: 5/19/2011 Completed: 5/19/2011 Driller: Free State Drilling, Inc.

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
315	0.0	Sod with root (organic) matter and organic soil				Boring dry during drilling and at completion.
314.4	0.6	Brown silty CLAY with little fine sand, moist, medium stiff (CL)	3,3,4	1.0, 2.5		Cave-in depth recorded at 7.0 feet.
312	3.0	Dark olive-gray fine sandy SILT with trace medium sand, moist, dense (ML)	13,18,22	3.5, 5		
			7,13,18	6.0, 7.5		
307	8.0	Dark olive-gray with black and off-white silty fine to medium SAND, moist, medium dense (SM)	11,13,17	8.5, 10		
303	12.0	Bluish-gray with reddish-brown silty fine SAND with traces medium to coarse sand, moist, very dense (SM)	17,25,39	13.5, 15		
300	15.0	End of Boring				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

BORING LOG — GEOLAB, INC.

Report No.: Date:
Client: Hamel Builders
Project: Wahl Residence — Project No. 111-042
Boring No.: SWM-4 (1 of 1) Total Depth 10 Elev. 274.7 Location: See Boring Location Plan
Type of Boring: Hollow-stem Auger Started: 5/19/2011 Completed: 5/19/2011 Driller: Free State Drilling, Inc.

Elevation	Depth	DESCRIPTION OF MATERIALS (classification)	*Sample Blows	Sample Depth (Feet)	Moisture Content	REMARKS
274.7	0.0	Sod with root (organic) matter and organic soil				Boring dry during drilling and at completion.
274	0.7	Brown silty CLAY with little fine sand, moist, medium stiff (CL)	2,2,4	1.0, 2.5		Cave-in depth recorded at 6.2 feet.
271.7	3.0	Dark olive-gray with black and off-white fine sandy SILT with trace medium sand, moist, loose (ML)	3,4,6	3.5, 5		
268.7	6.0	Dark olive-gray fine to coarse SAND with little silt, moist, very dense (SM)	16,40,23	6.0, 7.5		
266.7	8.0	Dark olive-gray with black, off-white, and tan fine to coarse SAND with some silt and rock fragments, moist, very dense (weathered rock) (SM)	10,18,50/1	8.5, 10		
264.7	10.0	End of Boring				

*Number of blows required for a 140 lb hammer dropping 30" to drive 2" O.D., 1.375" I.D. sampler a total of 18 inches in three 6" increments. The sum of the last two increments of penetration is termed the standard penetration resistance, N.

Contact
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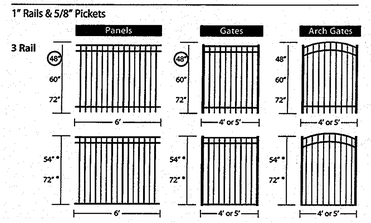
Ph. 410–321–7600
Owner
Thomas E. & Lucinda T. Wahl
7110 Flint Court
Middletown, Maryland 21769
Ph. 410–379–6700

Universal

1" Rails & 5/8" Pickets



Ornamental
Colonial Aluminum Fence
NOT TO SCALE

○ 48" BLACK POWDER COATED ALUMINUM FENCE MASTER HALCO OR APPROVED EQUAL SHALL BE INSTALLED AROUND CEMENTARY.

PLANNING & ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 10/14/12
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 7/09/12
DIRECTOR	DATE 7/9/12

APPROVED FOR PRIVATE WATER
APPROVED FOR PRIVATE SEWERAGE SYSTEM

COUNTY HEALTH OFFICER	DATE 7/3/2012
HOWARD COUNTY HEALTH DEPARTMENT	

Tesseract™
TESSERACT SITES, INC
Jeffrey Schwab
401 Washington Ave. Suite 303
Towson, Maryland, 21204
p. 410.321.7600
f. 410.321.7601

Pervious Concrete Pavement Details and Specifications
Wahl Property
Parcels 194 and 262
Howard County, Maryland

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 14230, Expiration Date: 12/09/12.

LOT/PARCEL:	LIBER/FOLIO:	PLAT#:
194 & 262	11420/295	N/A

GRID#	ZONE	TAX/ZONE MAP	ELECT.DISTRICT	CENSUS TRACT:
21	R–ED	25	2ND	602800

STATE OF MARYLAND JEFFREY LYNN SCHWAB No. 14230 REGISTERED PROFESSIONAL ENGINEER 5/16/12

Date: 5/16/12
Proj. #: 10020
Scale: AS SHOWN

10 of 10

DESIGN: JLS | DRAWN: MAS | CHKED: JLS

SDP 12–016