Al Lang, *Mayor*
John Bickerman, *Vice Mayor*
Vicky Taplin, *Secretary*
Fred Cecere, *Treasurer*
Kathy Strom, *Community Liaison*

Notice of Water Drainage Plan Submission

To: **Residents Abutting and Confronting 7007 East Avenue**
Fr: **Dave Walton, Town of Chevy Chase**
Date: **February 12, 2016**
Re: **Water Drainage Plan Submission**

The Town of Chevy Chase has received a water drainage plan and report for the construction of a new house at 7007 East Avenue. Chapter 28 of the Town Code requires that a water drainage plan be submitted if new impervious surface created by a development activity and all other development activities within the 2 year period prior to filing an application exceeds 700 square feet. According to the application, the house and associated structures will result in 2,850 square feet of new impervious area.

If approved, the proposed on-site drainage facilities will consist of three drywells as shown on the attached site plan. The drywells are designed to collect water runoff from the downspouts or from a surface drain and retain it on site until it is absorbed into the ground. According to the application, the system will provide a total storage volume of 446 cubic feet. According to calculations provided with the application, the total volume required to be infiltrated is 276 cubic feet. The calculations are under review by the Town's consulting engineer.

Residents are free to submit comments regarding the proposed water drainage plan. Please submit any comments on the proposed plan by Friday, February 19. The Town will provide these comments to the Town engineer. The Town Attorney has advised that the engineer is not obligated to incorporate these comments into his review if the plan otherwise meets the requirements of the water drainage ordinance; however, staff has instructed the engineer to give due consideration to any comments received.

The plan and report are available for public inspection in the Town Office between 8:30 a.m. and 5:00 p.m. Monday through Friday (please call ahead if you would like to review them).

Attachment: Water Drainage Report, Water Drainage Site Plan

Sent To: 7005, 7009 East Avenue
4304 Thornapple Street
4330 Leland Street
4401 Walsh Street

CC: Town Council

4301 Willow Lane • Chevy Chase, Maryland 20815 • 301/654-7144 • Fax 301/718-9631 • townoffice@townofchevychase.org
www.townofchevychase.org

Town of Chevy Chase
4301 Willow Lane
Chevy Chase, MD 20815

301-654-7144 (phone)
301-718-9631 (fax)
townoffice@townofchevychase.org

Town Permit No.: _____

Water Drainage Plan Application

Street Address: 7007 East Avenue Date: 12/14/2015

Please ensure that you submit a complete application, as incomplete applications will not be reviewed. The Town has developed a guidance documents that should help explain the history, requirements, and methodology of the Town's Water Drainage Ordinance. Copies are available online and in the Town Office. If you have any questions about the Water Drainage Plan approval process, please call the Town Office at 301-654-7144,

Applicant Information:

Name: Paramount Construction, Inc. (Kevin Davis)
Phone: 301-330-9880 Ext 201
Address: 15809 Paramount Drive
Cellular Phone: 240-372-9776
City: Rockville State: MD Zip: 20855
E-Mail: kdavis@paramountconstruction.net

Contractor Information:

Same as above

Name
Phone
Address
Cellular Phone
City State Zip
E-Mail

Water Drainage Plan Submittal Requirements – **You must submit 2 paper copies and an electronic copy (.pdf)**

- ___ $500 Application Fee
- ___ Construction Drawings (including site plan, and detailed schematics)
- ___ Completed Water Drainage Plan Application
- ___ Results of soil infiltration tests, certified by a MD licensed geotechnical engineer
- ___ Hydrologic, hydraulic, and volumetric computations for a three-month storm event
- ___ Hydrologic, hydraulic, and volumetric computations for a ten-year storm event
- ___ Report on the potential impacts of the proposed development activity on adjacent and nearby properties, including the public right-of-way
- ___ Report on the effectiveness and acceptability of measures proposed for managing water drainage
- ___ Maintenance Schedule
- ___ Notarized Maintenance Agreement (attached)
- ___ Performance Bond equal to estimated construction costs of drainage system (Include notarized Surety or Cash Bond Documents (attached) or Letter of Credit (on Bank Letterhead, sample attached))

If overflow pipes from containment vessels discharge water into the street:

- ___ Right-of-Way usage agreement (available in office)

Estimated cost of installation of the proposed drainage system: $3,000

Please describe the project: 3 gravel drywells connected to downspouts.

KD (initial) I hereby certify that this water drainage plan was prepared by a licensed professional civil engineer or land surveyor, licensed in the State of Maryland.

KD (initial) I hereby certify that the development activity will be conducted in strict compliance with the approved water drainage plan.

KD (initial) I hereby certify that I have obtained easements or necessary property interests if the proposed water drainage plan involves development activity such as grading and piping on another private property. I understand that approval of a water drainage plan does not create or affect any right with respect to any adjacent or nearby property without that property owner's permission.

Infiltration System Location Worksheet

An infiltration system shall be located at least five (5) feet from any property line, ten (10) feet from any proposed building on the subject property with a basement or cellar foundation, twenty (20) feet from any existing building on any adjoining property with a basement or cellar foundation, and five (5) feet from any existing and proposed building that does not have a basement or cellar foundation.

Distance from:	Allowed	Proposed (at closest point)
Any property line:	5'	6.0'
Building on subject property with basement or cellar:	10'	13'
Building on adjoining property with basement or cellar:	20'	27'+
Building that does not have basement or cellar:	5'	NA

I understand that a condition for the issuance of this permit is that the proposed construction will comply at all times with the plans as approved by all applicable government agencies. I hereby declare and affirm, under penalty of perjury, that all matters and facts set forth in the permit application are true and correct to the best of my knowledge, information, and belief.

Applicant's Signature for PCI Print Name Kevin S. Davis Date 12/17/15

I. Hydrologic, Hydraulic, and Volumetric Computations

1. Calculate the 3-Month Storm Event Required Storage Volume for the New Impervious Surface

Enter the Total Square Foot AREA of the New Impervious Surface: Box 1 | 2850 |

Describe the Cover Type of the New Impervious Surface: Roof, Deck, Walk 2500, ex DW 350

(Rooftop, concrete or asphalt driveway, semi-pervious surfaces)

Determine Curve Number (CN) for New Impervious Surface: Box 2 | 98 |

(go to Sec. III (Methodology) in Water Drainage Users' Guide for CN values)

Calculate the Required Storage Volume to Retain; Do this calculation for each different cover type that comprises all of the New Impervious Area.

Solve for S (potential maximum retention after runoff begins, unit less value)

$$S = \frac{1000}{CN} - 10$$

S = Box 3 | 0.20 |

Now Solve for Q:

$$Q = \frac{(1.25 - 0.2S)^2}{(1.25 + 0.8S)}$$

Where:
Q = runoff (inches)
P = rainfall (1.25 inches for 3-Month Event)
S = potential maximum retention after runoff begins (inches)

Q = 1.0 Inches of Runoff

Convert the Inches of Runoff (Q) to Cubic Feet of Runoff by dividing Q by 12 and multiplying the result by the New Impervious Area (Box 1)

(Q (inches) ÷ 12) x Impervious area (square feet) = Required Storage Volume (cubic feet)

Required Storage Volume (cubic feet) = 237

If there is more than ONE type of New Impervious Surface, add up all the calculated values for the Total Required Storage Volume.

Area 1 237 + Area 2 _____ = 237 Total Required Storage Volume (Cubic Feet)

3-Month Storm Event Total Required Storage Volume (cubic feet) to Retain: | 237 |

2. Calculate the 10-Year Storm Event Required Storage Volume for the All Post Construction Impervious Surfaces

The Surface Cover Type and Curve Number (CN) are the SAME as for the 3-Month Calculation

S = Box 3 | 0.2 |

Solve for Q

$$Q = \frac{(5.1 - 0.2S)^2}{(5.1 + 0.8S)}$$

Where:
Q = runoff (inches)
P = rainfall (5.1 inches for 5-Year Event)
S = potential maximum retention after runoff begins (inches)

Q = 4.9 Inches of Runoff

Convert the Inches of Runoff (Q) to Cubic Feet of Runoff by dividing Q by 12 and multiplying the result by the New Impervious Area (Box 1)

Q (inches) ÷ 12) x Impervious area (square feet) = Required Storage Volume (cubic feet)

Required Storage Volume (cubic feet) = 1164

If there is more than ONE type of New Impervious Surface, add up all the calculated values for the Total Required Storage Volume.

Area 1 1164 + Area 2 _____(etc.) = 1164 Total Required Storage Volume (Cubic Feet)

10-Year Storm Event Total Required Storage Volume (cubic feet) to Retain: | 1164 |

3. Calculate the 10-Year Storm Event Runoff Volume for Pre-Existing Surfaces

This calculation is made using the same footprint used in the Proposed Conditions. These surfaces are to be removed, disturbed and/or altered during the proposed construction.

Describe the Cover Type of the Existing Surface(s) 1475 Roof, DW, Walk 1375 Green Space
(Rooftop, concrete or asphalt driveway, semi-pervious surfaces, green space)

Determine Curve Number (CN) for Existing Surfaces : CN 98 (IMPERV)
(go to Sec. 3 (methodology) for CN values) 75 Green

Calculate the Runoff Volume for the Existing Conditions; Do this calculation for each type of different cover type that comprises the same footprint as the New Impervious Area.

Solve for S (potential maximum retention after runoff begins, unit less value)

$$S = \frac{1000}{CN} - 10$$

$$S = \frac{0.2\ (imperv)}{3.3\ Green}$$

Now Solve for Q

$$Q = \frac{(5.1 - 0.2S)^2}{(5.1 + 0.8S)}$$

Where:
Q = runoff (inches)
P = rainfall (5.1 inches for 5-Year Event)
S = potential maximum retention after runoff begins (inches)

Q = Roof 4.9 / Green 2.5 Inches of Runoff

Convert the Inches of Runoff (Q) to Cubic Feet of Runoff by dividing Q by 12 and multiplying the result by the New Impervious Area (Box 1)

Q (inches) ÷12) x Impervious area (square feet) = Required Storage Volume (cubic feet)

Existing Conditions Runoff Volume (cubic feet) = Roof 602 / Green 286

If there is more than ONE type of Existing Surface, add up all the calculated values for the Total Existing Conditions Runoff Volume.

Area 1 602 cf + Area 2 286 cf = 888 Total Required Storage Volume (Cubic Feet)

10-Year Storm Event Total Runoff Volume for Existing Conditions (cubic feet):

Box 6 | 888 |

4. Calculate the Required Storage Volume to Retain for the Proposed Project

Determine the INCREASE in runoff for the 10-Year Storm event by Subtracting the Existing 10-Year Runoff (Box 6) from Proposed 10-Year Runoff (Box 5)

Increase in 10-Year Storm Event Runoff = Box 7 | 276 |

COMPARE the Values in Box 4 and Box 7. The LARGER value is the Required Storage Volume to Retain for the Proposed Project.

Box 8 | 276 |

II. Infiltration Test Results

All soil infiltration tests must be certified by a MD licensed geotechnical engineer. Infiltration testing data shall be documented, and include a description of the infiltration testing method. This is to ensure that the tester understands the procedure.

Test Pit/Boring Requirements

a. Excavate a test pit or dig a standard soil boring to a depth of 4 feet below the proposed facility bottom;
b. Determine depth to groundwater table (if within 4 feet of proposed bottom) upon initial digging or drilling, and again 24 hours later;
c. Conduct Standard Penetration Testing (SPT) every 2' to a depth of 4 feet below the facility bottom;

Infiltration Testing Requirements

a. Install casing (solid 5 inch diameter, 30" length) to 24" below proposed BMP bottom (see diagram).
b. Remove any smeared soiled surfaces and provide a natural soil interface into which water may percolate. Remove all loose material from the casing. Upon the tester's discretion, a two (2) inch layer of coarse sand or fine gravel may be placed to protect the bottom from scouring and sediment. Fill casing with clean water to a depth of 24" and allow to pre-soak for twenty-four hours.
c. Twenty-four hours later, refill casing with another 24" of clean water and monitor water level (measured drop from the top of the casing) for 1 hour. Repeat this procedure (filling the casing each time) three additional times, for a total of four observations. Upon the tester's discretion, the final field rate may either be the average of the four observations, or the value of the last observation. The final rate shall be reported in inches per hour.
d. May be done through a boring or open excavation.
e. The location of the test shall correspond to the BMP location.
f. Upon completion of the testing, the casings shall be immediately pulled, and the test pit shall be back-filled.

Laboratory Testing

Use grain-size sieve analysis and hydrometer tests (where appropriate) to determine USDA soils classification and textural analysis. Visual field inspection by a qualified professional may also be used, provided it is documented. The use of lab testing to establish infiltration rates is prohibited.

Results

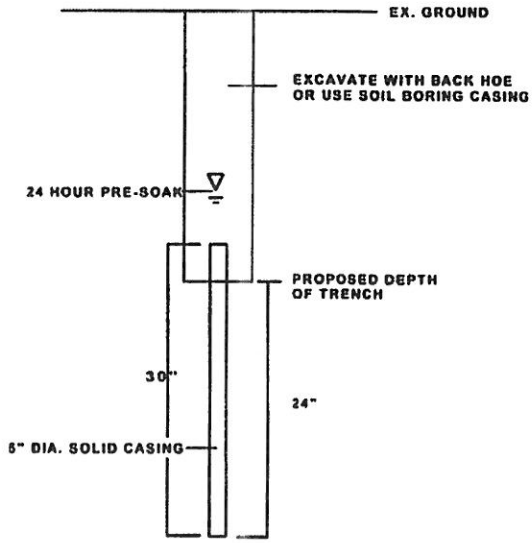
A site plan showing the location of all test pits and infiltration test locations shall be provided with an application.

USDA soils classification: B

Test Pit A Infiltration Rate: _____

Test Pit B Infiltration Rate (if any): _____

Test Pit C Infiltration Rate (if any): _____



III. Written Reports

Provide a written report on the potential impacts of the proposed development activity on adjacent and nearby properties.

Proposed development to replace existing house will result in 1375 additional square feet of impervious area. Drywells will eliminate 10 year storm of 602 CFT that is currently running from downspouts. Impact will reduce water runoff into adjacent properties. There is no runoff into street right of way. Site grading will maintain existing water flow direction.

(You may provide additional sheets if necessary)

Provide a written report on the effectiveness and acceptability of measures proposed for managing water drainage.

Proposed stormwater measures will exceed Town of Chevy Chase requirements by 55% for the 3 month storm.

(You may provide additional sheets if necessary)

IV. Maintenance Schedule

Provide a written maintenance schedule for each component of the proposed infiltration system (including gutter cleanout, proprietary infiltration systems, gravel drywells, and semi-permeable surfaces). See Section VIII "Maintenance Requirements" in Water Drainage Users' Guide.

Drywell Systems

Drywell systems require both periodic inspections and maintenance. The drywell is installed with an observation well that should be monitored twice a year and after every large storm event (>0.5 inches). The depth f water in the drywell should be checked each day at the same time for up to 4 days after major storm events. It is recommended that a logbook be maintained showing the depth of water in the drywell at the time of each observation in order to determine the rate at which the system dewaters after a runoff-producing storm event. Recording the depth of the drywell by measuring the distance from the top of the observation well to the bottom of the drywell will assist in determining if sediment is accumulating at the bottom. The Town Engineer will perform as-built and periodic measurements of the depth and record and keep this data at the Town office. During the measurement, it is possible to feel the consistency of the material at the bottom with a steel tape measure. At the initial installation (as-built), the bottom should have a solid and hard feel when the tape measure is contacting the bottom. Any soft or spongy feel with the tape measure indicates debris accumulation and the possibility of a failed system or poor maintenance practices. Once the performance characteristics of the system have been verified, the Town will perform annual inspections, unless the performance data suggests that a more frequent schedule is required. The goal is to have the drywell empty through infiltration within 72 hours after a major storm event. The Town keeps a record of all systems located in the Town and archives the results of all inspections. For maintenance, drywell systems should be devoid of sediment or excessive leaves and debris entering the system. Roof gutters and downspouts should be cleared of excess leaves and tree debris in the fall and in the late spring to prevent the accumulation of debris in the drywell.

a)Gravel Drywells Gravel drywells cannot be flushed and pumped like manufactured drywell systems due to the gravel media which represents 60% percent of the drywell by volume. Standing water, or algal growth on the top of a drywell may indicate failure due to sedimentation in the gravel media. Ponding on the surface above the drywell should generally not occur for long periods (at least 48 hours) following a storm event. Algal growth that is seen in the observation well may also indicate that the system is clogge d and not discharging back to the ground through infiltration. Sediment that accumulates at the bottom of the observation well, which can be felt by a steel tape measure, should not exceed 3 inches in depth. If any of these occurrences are observed, the gravel media should be excavated, cleaned and replaced.

(You may provide additional sheets if necessary)

F&H Consultants
Geotechnical & Construction Inspection *phone (301) 528-0024*
P.O.Box 10447, Silver Spring, MD.20914 ***fandhco@gmail.com***

January 18, 2016

Mr. Mike Maddox
Thomas A. Maddox, Professional Land Surveyor
8933 Shady Grove Court
Gaithersburg, MD 20877

Reference: Subsurface Exploration & Field Infiltration Testing,
7007 East Ave., Chevy Chase, MD.
Project No. 014416

Dear Mr. Maddox:

As authorized, F&H Consultants has completed the subsurface exploration of the above referenced project. The purpose of this exploration was to determine the subsurface condition in the general area of the proposed stormwater management facilities, and to perform an in-situ test for determining the infiltration rate to be used in the design of the facilities. The services were performed in accordance with our proposal dated January 8, 2016.

The property is located at 7007 East Ave., in Chevy Chase, Maryland. As per your instructions, at location B-1 in the rear yard of the proposed house, a field infiltration test was conducted. The approximate location of Boring B-1 is shown on The Approximate Boring and Test Location Plan provided in the Appendix.

Scope of Work

The scope of services consisted of performing a soil boring, conducting a field infiltration test at a close offset from the boring, and preparing a report outlining the boring and test results. This report is intended for use with regard to the specific project as described herein. Changes in proposed construction should be brought to our attention so that we may determine any effect on the recommendations given in this report. Recommendations contained in this report are based on data obtained from the boring performed at the specific location. This report does not reflect variations, which may occur from the boring. The nature and extent of variations between borings may not become evident until during the construction period.

It is essential for successful completion of this project that on-site observations of subgrade conditions are performed during construction to determine if any re-evaluation or additional design recommendations are necessary. F&H recommends that this report be made available to project bidders prior to submitting their budget and to the successful contractor and subcontractors for their information only. The opinions outlined in this report are those of the

geotechnical engineer based on his/her interpretation of the subsurface conditions, as indicated by the field and laboratory test. The data presented by this report may not be sufficient for the contractor's purposes, and therefore, it may be necessary for the contractors to do their own investigations prior to submitting bids. F&H has prepared this report for the use of the design professionals for design purposes in accordance with generally accepted geotechnical engineering practices. No warranties, expressed or implied, are made as to the professional advice included in this report. Please note that inspection is considered necessary to confirm the observed subsurface conditions and to verify that the soils related construction phases are implemented properly. It shall also be noted that Environmental assessments were not requested as part of this service.

Exploration Procedures

Boring B-1 was performed in accordance with ASTM D-1452, Soil Investigations by Auger Borings. The boring was extended to an approximate depth of 10 feet below the existing ground surface. The approximate locations of the boring is shown on the Approximate Boring and Test Location Plan provided in the Appendix.

The soil samples recovered were visually classified in the field in accordance with the Unified Soil Classification System (U.S.C.S.) and ASTM Specification D-2488. In addition, soil samples were collected in glass jars and subsequently transferred to the laboratory for confirmatory tests. The group symbols for each soil type are indicated in parenthesis following the soil description on the boring logs. It should be noted that soil transitions may be gradual.

The soil samples from the borings will be retained in our office for a period of 30 days after which they will be discarded unless written instructions are received by our office as to their disposition.

Boring Results

In general, at the boring location approximately 4 to 5 inches of topsoil was encountered.

Below the top soil layer in Boring B-1, natural residual soils, consistent with the soil mapping and geology of the area were observed. The residual soils consisted of Silt with some fine sand (ML), fine sandy Silt (ML), Silt and Sand mixtures (SM-ML), and Silty Sand (SM). Some weathered rock fragments were observed to be mixed in with the deeper SM layer (below 9 feet).

The representative soil samples from an approximate depth of 4 feet in B-1 were classified as Sandy Loam in accordance with USDA Textural Triangle Chart. The USDA Textural Triangle Chart is provided in the Appendix.

Observations for groundwater were made during sampling and upon completion of the augering operations at each location. Ground water was not encountered in the boring and the boring was dry. It should be noted however, that groundwater is significantly influenced by surface water runoff and rainfall, especially during high precipitation seasons.

Variations in the location of the long-term water table may occur as a result of changes in precipitation, evaporation, surface water runoff, and other factors not immediately apparent at the time of this exploration. Please note that perched water conditions are possible during the earthwork operations, and the contractor shall be prepared to handle the groundwater difficulties.

Engineering Recommendations

It shall be noted that these analyses and conclusions are, of necessity, based on the concepts made available to us at the time of the writing of this report and on-site conditions, surface and subsurface that existed at the time the exploratory boring was performed. Further assumption has been made that the exploratory boring, in relation both to the aerial extent of the site and to depth, are representative of conditions across the site.

If conditions are encountered at any other time which differ significantly from those reported herein, we request that F&H be notified immediately so our analyses and recommendations can be reviewed and revised as necessary. It is also recommended that we be given the opportunity to review the plans and specifications in order to comment on the interaction of soil conditions as described herein and the design requirements. This report, in its entirety, shall be made available to design professionals and the boring log shall not be separated from the report.

As discussed earlier, a field infiltration test was performed at an offset from Boring B-1 at an approximate depth of 4 feet below the existing ground surface. The field infiltration test was performed in accordance with the requirements of Montgomery County Department of Permitting Services outlined in the *"SOIL TESTING GUIDELINES FOR STORMWATER MANAGEMENT PRACTICES"* (effective October 6, 2012)
http://permittingservices.montgomerycountymd.gov/DPS/pdf/SoilTesting.pdf.

The field infiltration test at an offset location from Boring B-1 indicated an average infiltration rate of 0.8 inches per hour. **Therefore, it is our professional opinion that infiltration in the area of Boring B-1 is feasible, and based on the test results, a maximum infiltration rate of 0.8 inches per hour is recommended for sizing the facilities.**

Please note that the recommended infiltration rate is based on the assumption that the recommendations outlined in this report are followed.

The earthwork aspects of the project are very critical for the successful performance of the stormwater management facilities. We recommend that an F&H engineer be present onsite to observe, evaluate and approve the exposed subgrade in the bottom of the excavations and also observe the construction of the facilities and to verify that the approved plans are followed.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. All excavations should comply with applicable local,

state, and federal safety regulations including the current OSHA Excavation and Trench Safety Standards. Construction site safety generally is the sole responsibility of the contractor for the means, methods, and sequencing of construction operations.

We are providing this information solely as a service to our client. Under no circumstances should the information provided herein be interpreted to mean that F&H Consultants is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

Specifically, the current OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926 should be followed. Materials removed from the excavation should not be stockpiled immediately adjacent to the excavation, in as much as this load may cause a sudden collapse of the embankment. A slope stability analysis should be performed to determine the factor of safety for cut or fill slopes. The contractor's "responsible person" should establish a minimum lateral distance from the crest of the slope for all vehicles and spoil piles. Likewise, the contractor's "responsible person" should establish protective measures for exposed slope faces.

Closing

This report has been prepared for the exclusive use of Thomas A. Maddox, Professional Land Surveyor, to assist in the design of the stormwater management facilities at the above referenced property. Once the specifications are prepared, F& H Consultants should be retained to review them and revise the recommendations if deemed necessary.

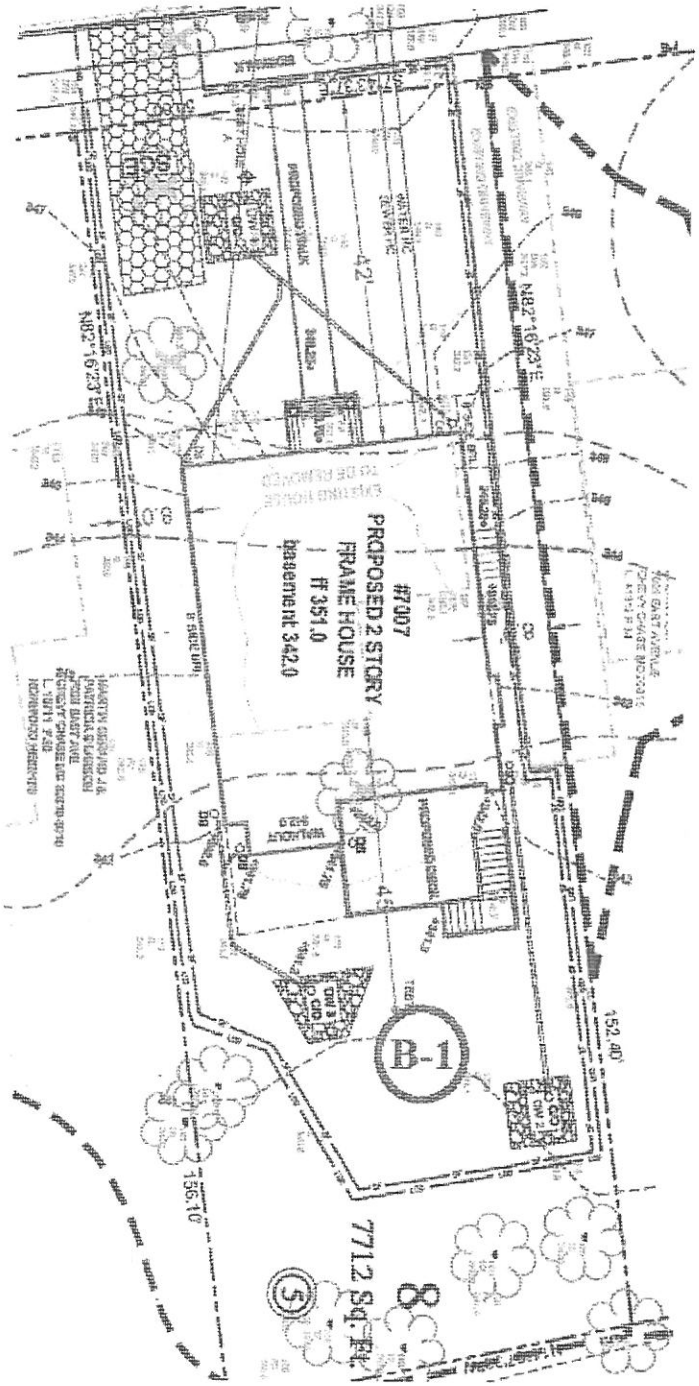
The subsurface conditions as outlined in this report are based on the limited number of auger borings performed and represents our interpretation of the data presented on the boring logs; other variations may occur on-site. In providing this limited exploration and general recommendations, our services were performed in accordance with generally accepted engineering principles and practices. F&H will not be responsible for interpretations made by others based on the data contained in this report.

As explained earlier in the report, inspection is considered necessary to confirm the observed subsurface conditions and to verify that the approved plans are followed.

This report is not adequate and shall not be used for evaluation of the site for support of the proposed house and pavement areas. We recommend that a detailed geotechnical evaluation report be prepared for the proposed construction.

We appreciate the opportunity to be of service to you. If you have any questions with regard to the information and recommendations contained in this report, please do not hesitate to contact us. Sincerely,
F&H Consultants

STATE OF MARYLAND
No. 21182
REGISTERED PROFESSIONAL ENGINEER



Approximate Boring & Test Location Plan

Project: *7007 East Ave.*
Location: *Chevy Chase, MD.*

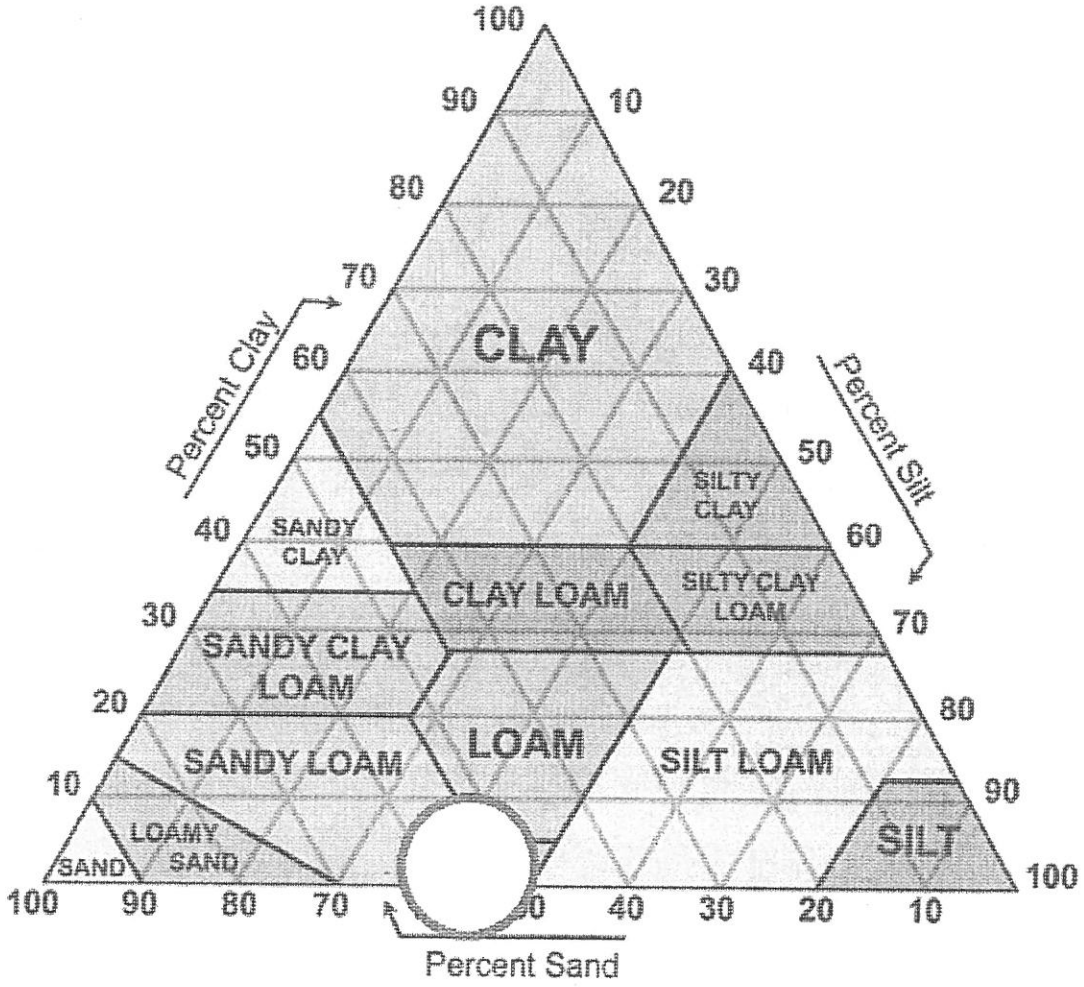
Location #B-1

Project: *7007 East Ave.*
Client: *Thomas A. Maddox, Professional Land Surveyor*
Location: *Chevy Chase, MD.*

Project No.: *014416*
Date: *01/15/2016*
Est. Elevation: *341 +/-*

App. Depth to Water first @ ▽: *dry* @ completion ▼: *dry*

App. Elevation & Est. Depth	Soil Symbols & Test Results	USCS	Description	NM	STANDARD PENETRATION TEST Depth	N	CURVE 10 30 50
0		OL	Topsoil				
340		ML	Brown, moist, Silt, some fine sand, trace roots				
2		ML	Brown, moist, fine Sandy Silt Sandy Loam (USDA)				
338		SM-ML	Brown, moist, Sandy Silt/Silty Sand. Sandy Loam (USDA)				
4							
336							
6							
334		SM	Brown, moist, fine silty Sand Sandy Loam (USDA)				
8							
332			some weathered rock fragments below 9'.				
10			Boring terminated @ 10'. Dry & caved-in @ 8'.				
330							
12							

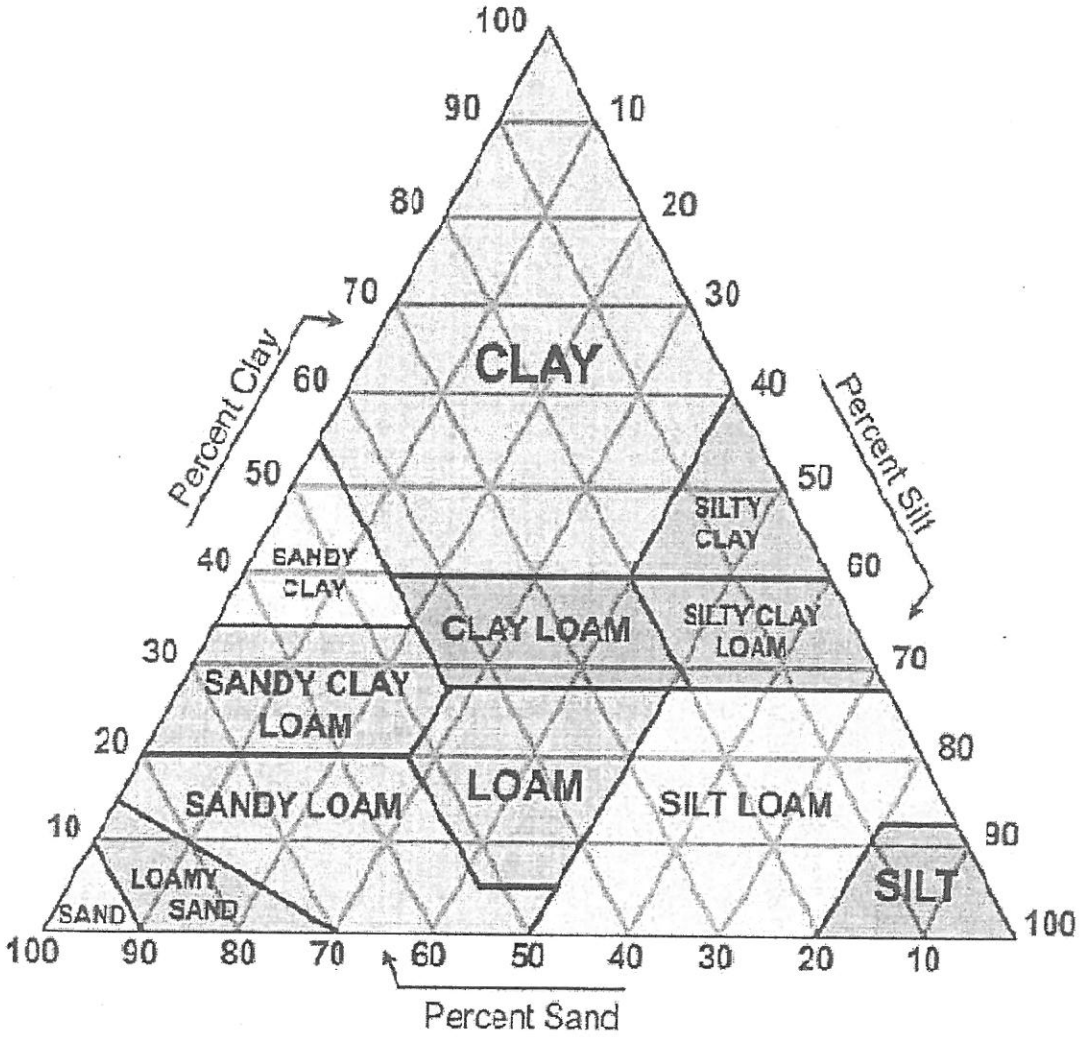


Sample Location: *B-1*
Sample Depth: *4'*
USDA Classification: *Sandy Loam*

USDA Textural Classification

Project: *7007 East Ave.*
Location: *Chevy Chase, MD.*

soil texture triangle



A **soil texture triangle** is used to classify the texture class of a soil. The sides of the soil texture triangle are scaled for the percentages of sand, silt, and clay. Clay percentages are read from left to right across the triangle (dashed lines). Silt is read from the upper right to lower left (light, dotted lines). Sand from lower right towards the upper left portion of the triangle (bold, solid lines). The boundaries of the soil texture classes are highlighted in blue. The intersection of the three sizes on the triangle give the texture class. For instance, if you have a soil with 20% clay, 60% silt, and 20% sand it falls in the "silt loam" class.

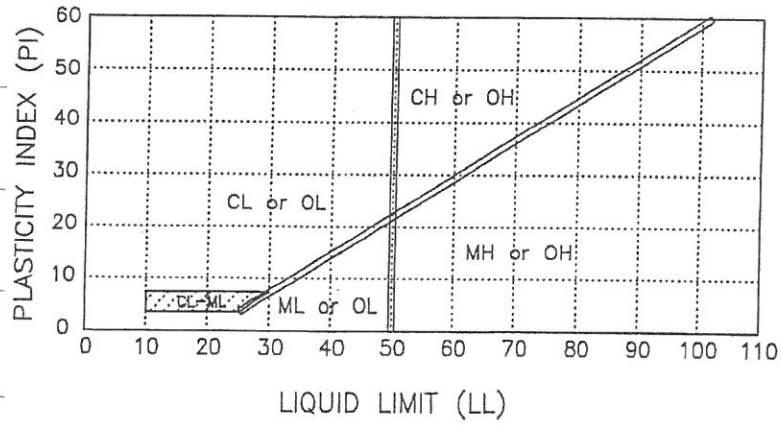
UNIFIED SOIL CLASSIFICATION SYSTEM

Soils are visually classified by the United Soil Classification System (USCS) on the boring logs presented in this report. Grain size analysis and Atterberg limits tests are often performed on selected samples to aid in classification. The classification system is briefly outlined on this chart. For a more detailed description of the system, see "The Unified Soil Classification System" Corps of Engineers, US Army Technical Memorandum No. 3–357 (Revised April 1960) or ASTM Designation: D2487–66T.

MAJOR DIVISIONS				GROUP SYMBOL	TYPICAL NAMES
COARSE – GRAINED SOILS (Less than 50% passes No. 200 sieve)	GRAVELS (50% or less of coarse fraction passes No. 4 sieve)	CLEAN GRAVELS (Less than 5% passes No. 200 sieve)		GW	Well graded gravels, gravel–sand mixtures, or sand–gravel–cobble mixtures.
				GP	Poorly graded gravels, gravel–sand mixtures, or sand–gravel–cobble mixtures.
		GRAVELS WITH FINES (More than 12% passes No. 200 sieve)	Limits plot below the "A" line & hatched zone on plasticity chart	GM	Silty gravels, gravel–sand–silt mixtures.
			Limits plot above the "A" line & hatched zone on plasticity chart	GC	Clayey gravels, gravel–sand–clay mixtures.
	SANDS (More than 50% of coarse fraction passes No. 4 sieve)	CLEAN SANDS (Less than 5% passes No. 200 sieve)		SW	Well graded sands, gravelly sands.
				SP	Poorly graded sands, gravelly sands.
		SANDS WITH FINES (More than 12% passes No. 200 sieve)	Limits plot below the "A" line & hatched zone on plasticity chart	SM	Silty sands, sand–silt mixtures.
			Limits plot above the "A" line & hatched zone on plasticity chart	SC	Clayey sands, sand–clay mixtures.
FINE – GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS (Limits Plot Below "A" Line & hatched Zone on Plasticity Chart)	SILTS OF LOW PLASTICITY (Liquid Limit Less Than 50)		ML	Inorganic silts, non–plastic or slightly plastic.
		SILTS OF HIGH PLASTICITY (Liquid Limit More Than 50)		MH	Inorganic silts, micaceous or diatomaceous silty soils, elastic silts.
	CLAYS (Limits Plot Above "A" Line & hatched Zone on Plasticity Chart)	CLAYS OF LOW PLASTICITY (Liquid Limit Less Than 50)		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		CLAYS OF HIGH PLASTICITY (Liquid Limit More Than 50)		CH	Inorganic clays of high plasticity, fat clays, sandy clays of high plasticity.

NOTE:
Coarse grained soils with between 5% & 12% passing the No. 200 sieve and fine grained soils with Atterberg limits plotting in the hatched zone on the plasticity chart shall have dual symbol. In Arizona, local streams contain sand, gravel & cobble type material, which are locally known as SGC or riverrun material. The USCS is not used to divide and symbolize this material.

PLASTICITY CHART



DEFINITIONS OF SOIL FRACTIONS

SOIL COMPONENT	PARTICLE SIZE RANGE
Cobbles	Above 3 in.
Gravel	3 in. to No. 4 sieve
Coarse gravel	3 in. to 3/4 in.
Fine gravel	3/4 in. to No. 4 sieve
Sand	No. 4 to No. 200
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Fines (silt & clay)	Below No. 200 sieve
Clay	Smaller than 2 microns
Colloid	Smaller than 5 microns

Some Useful Definitions

Terms

Fill	*Man placed material, often contains non-soil material.*
Possible Fill	*Soils without visual detectable foreign material, but suspect with respect to origin.*
Top Soil	*Soil with considerable amount of organic material that supports plant growth (organic surface layer).*

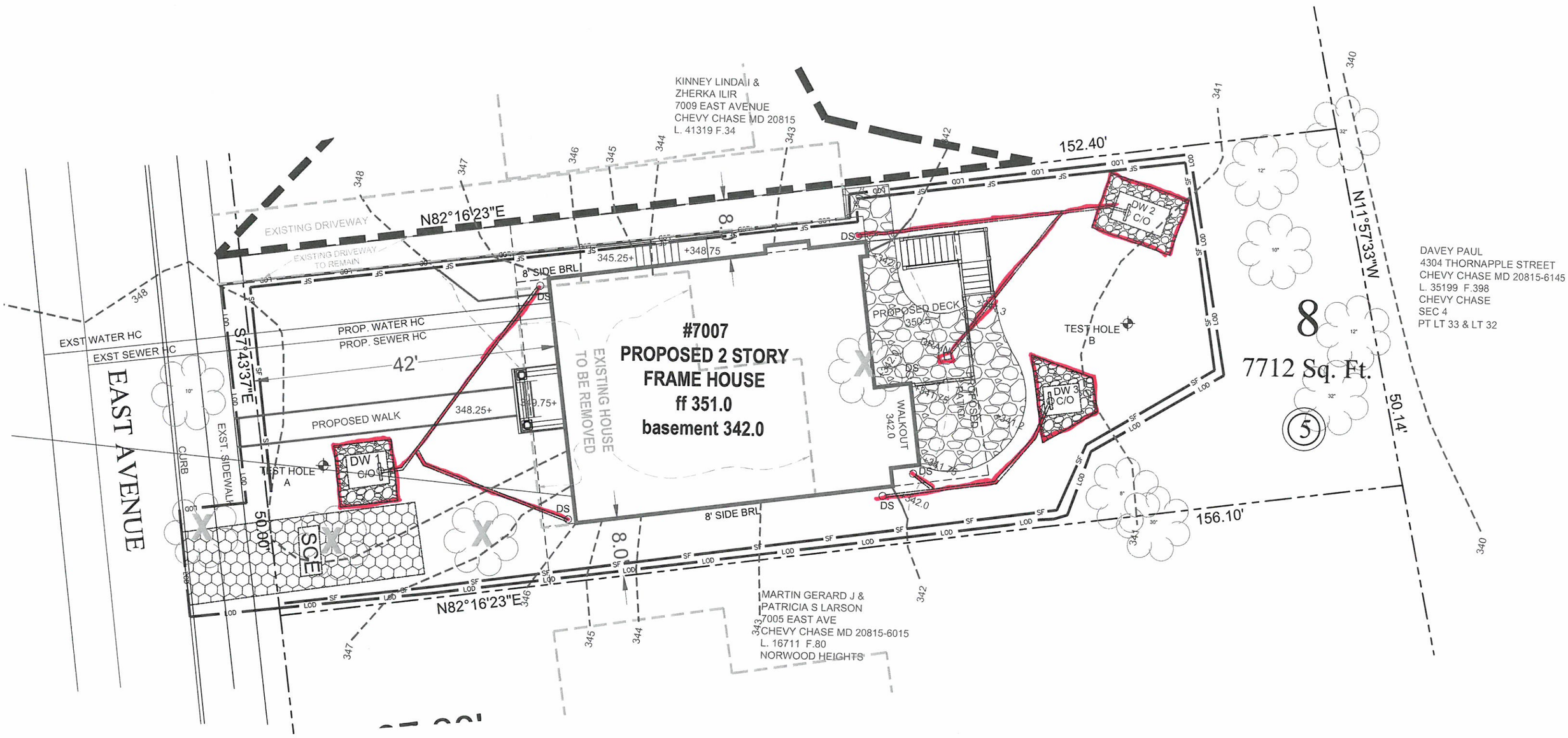
Plasticity

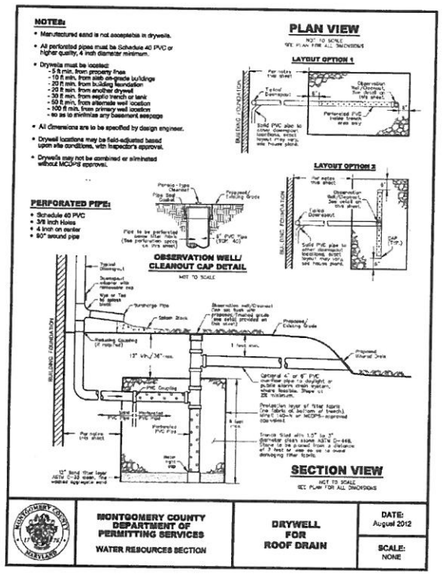
Non- plastic	*A 1/8-inch (3mm) thread cannot be rolled at any water content.*
Medium	*The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rolled after reaching the plastic limit.*
High	*It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.*

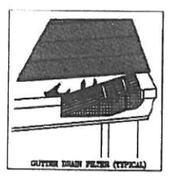
Moisture Condition

Dry	*Absence of moisture, dusty, dry to the touch.*
Moist	*Damp but no visible water.*
Wet	*Visible free water, usually soil is below water table.*

TOTAL ESDV REQUIRED = 276 CF
TOTAL ESDV PROVIDED = 440 CF







DRYWELL VOLUMES

GRAVEL LAYER: DEPTH = 4.0 FT
SAND LAYER: DEPTH = 1.0 FT

DRYWELL	DRAINAGE AREA	ESDV REQUIRED	ESDV PROVIDED	DIMENSIONS	TOP OF STONE
1	630	130.0	136	8X8.5X5	346.0
2	900	185	185	11.5X8X5	339.0
3	609	125.4	128	8X8X5	339.0

EXISTING CONDITIONS

TOTAL DRAINAGE AREA IN LOD = 6300 S.F.
SOIL TYPE SANDY LOAM
HYDROLOGICAL SOIL GROUP B
LAND USE RESIDENTIAL
LOT SIZE = 7712 S.F.
AREA of LOD = 6300 S.F.

PROPOSED CONDITIONS FOR PROPERTY AREA
TOTAL IMPERVIOUS COVER = 2850 SF

ESDV Required = 276 CFT (per #4 in Town of Chevy Chase Water Drainage Permit Application).

ESDv TARGET:

DRYWELL 1
PE = 2.6"
Rv = 0.05 + (0.009) (I) = 0.95, (I FOR ROOFTOP IS 100)
A = 630 S.F.

$$ESDv = \frac{PE \times Rv \times A}{12}$$

$$= \frac{2.6 \times 0.95 \times 630}{12} = 130 \text{ CF}$$

DRYWELL 2
PE = 2.6"
Rv = 0.05 + (0.009) (I) = 0.95, (I FOR ROOFTOP IS 100)
A = 900 S.F.

$$ESDv = \frac{PE \times Rv \times A}{12}$$

$$= \frac{2.6 \times 0.95 \times 900}{12} = 185 \text{ CF}$$

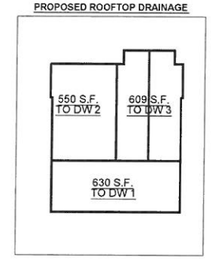
DRYWELL 3
PE = 2.6"
Rv = 0.05 + (0.009) (I) = 0.95, (I FOR ROOFTOP IS 100)
A = 609 S.F.

$$ESDv = \frac{PE \times Rv \times A}{12}$$

$$= \frac{2.6 \times 0.95 \times 609}{12} = 125.4 \text{ CF}$$

TOTAL ESDV REQUIRED = 276 CF
TOTAL ESDV PROVIDED = 440 CF

PROPOSED ROOFTOP DRAINAGE



VICINITY MAP
SCALE: 1" = 1,000'

0 5 10 15 20 30 40
1 INCH = 10 FEET

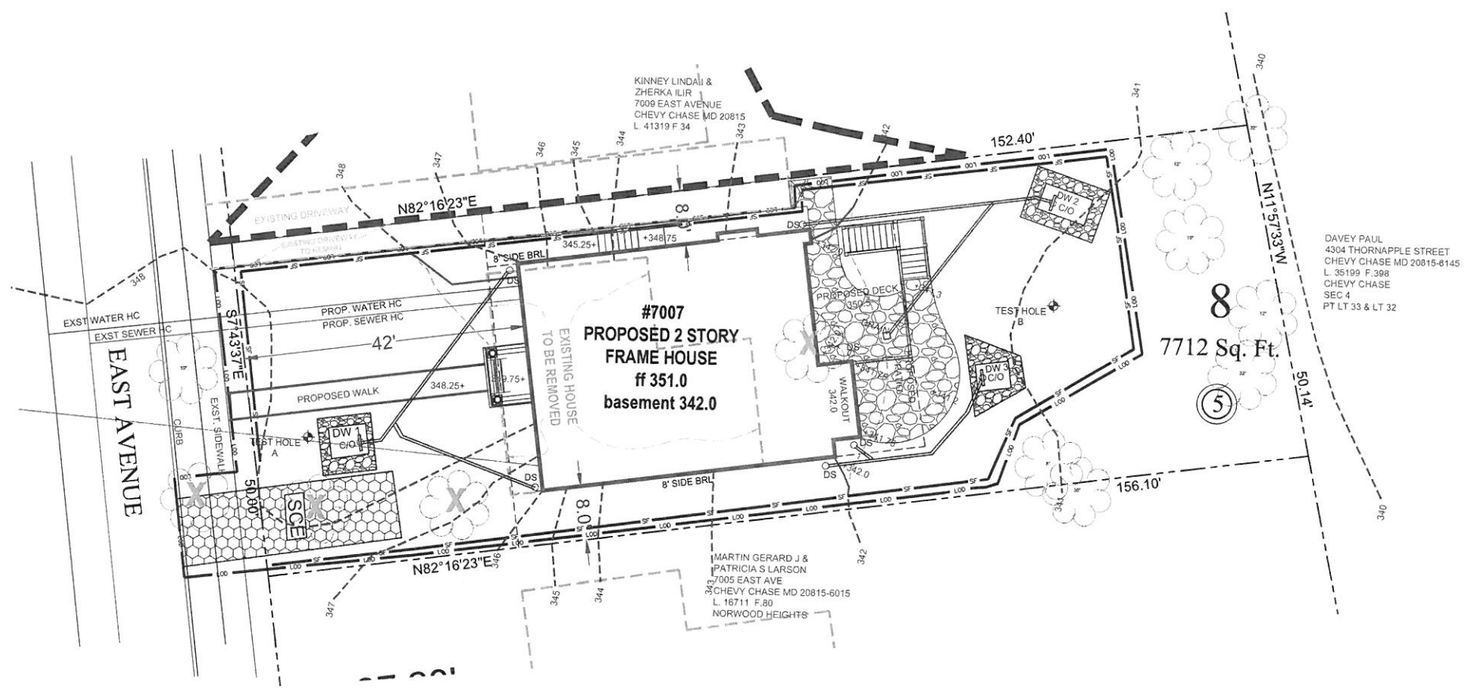
Sheet 1 of 1
Revisions

DATE: DEC 14, 2015
SCALE: 1" = 10'

OWNER OCCUPANTS
MICHAEL & EMILY KIMBERLY
7007 EAST AVE
CHEVY CHASE MD 20815
205-967-8348

SURVEYOR:
THOMAS A. MADDOX
PROFESSIONAL LAND SURVEYOR
8933 SHADY GROVE COURT
GAITHERSBURG, MARYLAND 20877
(301) 984-5804
TAMP5@YMAIL.COM

DRAINAGE PLAN
NORWOOD HEIGHTS LOT 8, BLOCK 5
TOWN OF CHEVY CHASE
7007 EAST AVENUE, CHEVY CHASE, MARYLAND 20815
Election District No. 7
Montgomery County, Maryland



DRYWELL MAINTENANCE SCHEDULE

Drywell Systems

Drywell systems require both periodic inspections and maintenance. The drywell is installed with an observation well that should be monitored twice a year and after every large storm event (>0.5 inches). The depth f water in the drywell should be checked each day at the same time for up to 4 days after major storm events. It is recommended that a logbook be maintained showing the depth of water in the drywell at the time of each observation in order to determine the rate at which the system dewaters after a runoff-producing storm event. Recording the depth of the drywell by measuring the distance from the top of the observation well to the bottom of the drywell will assist in determining if sediment is accumulating at the bottom. The Town Engineer will perform as-built and periodic measurements of the depth and record and keep this data at the Town office. During the measurement, it is possible to feel the consistency of the material at the bottom with a steel tape measure. At the initial installation (as-built), the bottom should have a solid and hard feel when the tape measure is contacting the bottom. Any soft or spongy feel with the tape measure indicates debris accumulation and the possibility of a failed system or poor maintenance practices. Once the performance characteristics of the system have been verified, the Town will perform annual inspections, unless the performance data suggests that a more frequent schedule is required. The goal is to have the drywell empty through infiltration within 72 hours after a major storm event. The Town keeps a record of all systems located in the Town and archives the results of all inspections. For maintenance, drywell systems should be devoid of sediment or excessive leaves and debris entering the system. Roof gutters and downspouts should be cleared of excess leaves and tree debris in the fall and in the late spring to prevent the accumulation of debris in the drywell.

a)Gravel Drywells Gravel drywells cannot be flushed and pumped like manufactured drywell systems due to the gravel media which represents 60% percent of the drywell by volume. Standing water, or algal growth on the top of a drywell may indicate failure due to sedimentation in the gravel media. Ponding on the surface above the drywell should generally not occur for long periods (at least 48 hours) following a storm event. Algal growth that is seen in the observation well may also indicate that the system is clogge d and not discharging back to the ground through infiltration. Sediment that accumulates at the bottom of the observation well, which can be felt by a steel tape measure, should not exceed 3 inches in depth. If any of these occurrences are observed, the gravel media should be excavated, cleaned and replaced

SAND SPECIFICATIONS:

Washed ASTM C33 Fine Aggregate Concrete Sand is utilized for stormwater management applications in Montgomery County. In addition to the ASTM C33 specification, sand must meet ALL of the following conditions:

1. Sand must meet gradation requirements for ASTM C33 Fine Aggregate Concrete Sand, AASHTO M6 gradation is also acceptable.
2. Sand must be silica based,...no limestone based products may be used. If the material is white or gray in color, it is probably not acceptable.
3. Sand must be clean, natural, unweathered sand deposits may not be used. Likewise, sand that has become contaminated by improper storage or installation practices will be rejected.
4. Manufactured sand or stone dust is not acceptable under any circumstance.

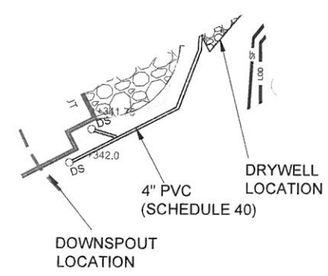
MISS UTILITY

Call "Miss Utility" at 1-800-257-7777, 48 hours prior to the start of work. The excavator must notify all public utility companies with underground facilities in the area of proposed excavation and have those facilities located by the utility companies prior to commencing excavation. The excavator is responsible for compliance with requirements of Chapter 36A of the Montgomery County Code.

STATE OF MARYLAND PROFESSIONAL LAND SURVEYOR

REG. EXP. 4/3/2016

NOTES:
ANY DIFFERENCES IN APPROVED SEDIMENT CONTROL PLAN 280615 AND THIS PLAN ARE SUPERCEDED BY THIS PLAN IN ACCORDANCE WITH TOWN OF CHEVY CHASE DRAINAGE ORDINANCE.



NOTE:
SOURCE OF TWO-FOOT CONTOUR INTERVAL TOPOGRAPHY:
THOMAS A. MADDOX
8933 SHADY GROVE COURT
GAITHERSBURG, MD 20877 (AUGUST 2015)
301-984-5804