APPENDIX

Recommended Facility Plan

ATTACHMENT #1

Carroll Knolls Local Park Facility Plan

Montgomery County Planning Board Meeting
May 14, 2020

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Land Acquisition - Carroll Knolls Local Park

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RECOMMENDED FACILITY PLAN

PLAN LEGEND*

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***PROPOSED PARK AMENITIES NOT SHOWN ON PLAN: PLAYGROUND EQUIPMENT, BENCHES, SIGNAGE, WATER CONNECTION, ELECTRICAL CONNECTION**

RECOMMENDED FACILITY PLAN

CARROLL KNOLLS LOCAL PARK
FACILITY PLAN
M-NCPPC MONTGOMERY PARKS

12/11/19

Detailed Cost Estimate

CARROLL KNOLLS PARK FACILITY PLAN

COST ESTIMATE

Last revised: 3/22/20

All prices assume supply and installation of materials

ITEM	QUANTITY	UNIT	UNIT COST Materials &	TOTAL COST
SITE PREPARATION & DEMOLITION			SUBTOTAL	**$183,000**
Demolition - concrete curb (assumes all of existing)	80	TON	$140.00	$11,200.00
Demolition - concrete sidewalk	88	TON	$140.00	$12,320.00
Demolition - asphalt paving (future greenspace)	544	TON	$140.00	$76,160.00
Demolition - asphalt paving (future paving)	308	TON	$140.00	$43,120.00
Demolition - storm drain	1	EA	$5,000.00	$5,000.00
Demolition - storm drain piping (abandoned)	1	LS	$3,000.00	$3,000.00
Demolition - existing fence and concrete mow strip	1	LS	$3,000.00	$3,000.00
Site grubbing, and removal of designated trees with the LOD	1	LS	$7,000.00	$7,000.00
Temporary construction chain link fencing (6 foot min. height)	1,310	LF	$7.00	$9,170.00
Furnish SWM As-Built Plans; submit and obtain permit approval, including final on-site inspection, signoff, and permit release	1	LS		$10,000.00
Furnish Electronic Submission and Approvals of all Required Submittals	1	LS		$2,500.00
EROSION & SEDIMENT CONTROL			SUBTOTAL	**$107,000**
Super Sonic Air Tool (SSAT) Root pruning	500	LF	$14.00	$7,000.00
Tree protection fencing, 48-inch high welded wire	650	LF	$8.00	$5,200.00
Stabilized Construction Entrance (SCE)	100	SY	$65.00	$6,500.00
Silt Fencing	400	LF	$7.00	$2,800.00
Super Silt Fencing (SSF)	300	LF	$9.00	$2,700.00
Filter Log	350	LF	$22.00	$7,700.00
Standard Inlet Protection	15	EA	$330.00	$4,950.00
Earth Dike (Type A-2)	70	LF	$12.00	$840.00
Concrete washout structure	3	EA	$350.00	$1,050.00
Fine grading, installation and establishment of sod	47,000	SF	$1.25	$58,750.00
Fine grading, installation and establishment of seeded lawn	12,000	SF	$0.75	$9,000.00
GRADING / EARTHWORK			SUBTOTAL	**$204,000**
Strip, stockpile, and spread topsoil to a depth of approximately 3-inches and regrade within LOD, including screening, testing, and amendments	300	CY	$40.00	$12,000.00
Unsuitable material removal and off-site disposal, including disposal of unanticipated unsuitable materials including soil, stone, and building materials.	800	CY	$50.00	$40,000.00
Import suitable fill (select borrow), spread, and compact	1,500	CY	$50.00	$75,000.00
Import topsoil for new lawn areas (6" depth) and spread	1,100	CY	$70.00	$77,000.00
STORMWATER MANAGEMENT / SITE DRAINAGE			SUBTOTAL	**$106,000**
Micro-bioretention facility "A" (4 foot depth of material)	140	CY	$170.00	$23,800.00
Micro-bioretention facility "B" (4 foot depth of material)	120	CY	$170.00	$20,400.00
18" Nyloplast inlet with grade top	5	EA	$2,500.00	$12,500.00
24" Nyloplast inlet with grade top	2	EA	$3,500.00	$7,000.00
A-10 Inlet for Roadway	1	EA	$4,500.00	$4,500.00
6'x10' flow-thru inlet top (MD-xxx.xxx)	1	EA	$3,000.00	$3,000.00
15" RCP for roadway inlet connection	15	LF	$75.00	$1,125.00
Drainage Structure Modification	5	EA	$1,125.00	$5,625.00
Drain Pipe (10" HDPE)	90	LF	$40.00	$3,600.00
Drain Pipe (12" HDPE)	290	LF	$45.00	$13,050.00
Manhole structure, supply and installation	2	EA	$4,000.00	$8,000.00
Concrete endwall for 12-inch pipe (at Micro-bio Facility "A")	1	EA	$1,125.00	$1,125.00
Concrete headwall for ex.18-inch pipe opening	1	EA	$2,500.00	$2,500.00
HARDSCAPE MATERIALS			SUBTOTAL	**$178,000**
Flush Concrete Curb (Parking Lot)	100	LF	$30.00	$3,000.00
Concrete Curb & Gutter (Parking Lot)	160	LF	$30.00	$4,800.00
Concrete Curb & Gutter (Roadway)	90	LF	$30.00	$2,700.00
Asphalt Paving (Roadway and Parking)	800	SY	$50.00	$40,000.00
Concrete Paving, Roadway-ADA Parking spaces	350	SF	$15.00	$5,250.00
Thermoplastic pavement markings including striping and symbols	1	LS	$2,500.00	$2,500.00
Concrete Paving, Path (5-inch thinckness, welded wire mesh)	10,350	SF	$11.00	$113,850.00
Concrete mow-strip for perimeter fencing	300	SF	$11.00	$3,300.00
Concrete Wheel Stops	12	EA	$125.00	$1,500.00
Concrete Steps (3 risers)	1	LS	$1,500.00	$1,500.00
PLAYGROUND			SUBTOTAL	**$356,000**
Playground Equipment, Supply	1	LS	$ 225,000.00	$225,000.00
Playground Equipment, Installation (assumes 30% upcharge)	1	LS	$75,000.00	$75,000.00
Playground benches	8	EA	$ 600.00	$4,800.00
Swing Kick Mats	10	EA	$ 500.00	$5,000.00
Engineered Wood Fiber (EWF) Surfacing	190	CY	$45.00	$8,550.00
SWM recharge under safety surfacing (includes 4-inches sand and 2-inches #7 washed stone)	93	CY	$70.00	$6,510.00
Underground drainage system (includes filter fabric and Fibar-type drain)	5,000	SF	$1.20	$6,000.00
Heavy duty HDPE net 1/2" x 1/2" openings - installed between stone layer and EWF	5,000	SF	$1.25	$6,250.00
Underground drainage system assembly (clean out structure)	6	EA	$400.00	$2,400.00
Concrete edging at playground	290	LF	$30.00	$8,700.00
Concrete ramp in playground	2	EA	$800.00	$1,600.00
6-inch diameter Perforated PVC schedule 40 overflow pipe in stone reservoir	180	LF	$20.00	$3,600.00
6-inch diameter PVC schedule 40 solid pipe	10	LF	$15.00	$150.00
Large boulders along sidewalk at abandoned Douglas Ave spur (to deter public dumping)	1	LS	$2,000.00	$2,000.00

PUMPTRACK			SUBTOTAL	**$280,000**
Asphalt Pumptrack (Design-build, includes installation/materials)	1	LS	$ 200,000.00	$200,000.00
Synthetic Turf (inside center areas of pumptrack)	1,700	SF	$ 30.00	$51,000.00
CR-6 Sub-base (6-inch depth) for synthetic turf surfacing	35	CY	$ 45.00	$1,575.00
18" Nyloplast inlet with grade top	7	EA	$2,500.00	$17,500.00
Drain Pipe (10" HDPE)	150	LF	$40.00	$6,000.00
Drain Pipe (12" HDPE)	85	LF	$45.00	$3,825.00
STRUCTURES, FURNISHINGS, SITE AMENITIES			SUBTOTAL	**$166,000**
Picnic Shelter (pre-fabricated) - 14' x 20'	1	LS	$ 50,000.00	$50,000.00
Perimeter fencing along Georgia Avenue (6-foot height)	300	LF	$ 125.00	$37,500.00
Wooden Fence Enclosure for Porta-john	1	LS	$ 6,000.00	$6,000.00
Drinking fountain (Parks Standard, Accessible) - including Fixture, Vault, Drainage stucture, and Concrete Pad	1	LS	$ 18,000.00	$18,000.00
ADA Parking / wayfinding / rules - Signage	1	LS	$ 2,000.00	$2,000.00
Bollards - Collapsible	2	EA	$ 1,000.00	$2,000.00
Bollards - Fixed	8	EA	$ 800.00	$6,400.00
Benches (surface mount, not including concrete pad)	10	EA	$ 2,000.00	$20,000.00
Picnic Table	4	EA	$ 3,000.00	$12,000.00
Picnic Table (Accessible)	2	EA	$ 3,500.00	$7,000.00
Bicycle Rack (including concrete pad)	1	EA	$ 2,500.00	$2,500.00
General Park Standard Signage (M-NCPPC)	1	LS	$ 2,000.00	$2,000.00
Handrail for concrete steps	1	LS	$ 1,000.00	$1,000.00
UTILITIES			SUBTOTAL	**$40,000**
New WSSC 1.5-inch water connection for drinking fountain and hose bibs (includes all incidentals with WSSC Bonds and misc. fees; materials & installation; 1-inch meter vault, shop drawings;	1	AL	$30,000.00	$30,000.00
Abandonment of existing waterline	1	LS	$3,000.00	$3,000.00
New connection to WSSC waterline	1	LS	$3,000.00	$3,000.00
WSSC's System Development Charge (SDC) - one time payment	1	LS	$1,000.00	$1,000.00
Electrical connection to picnic shelter-playground area (including permit)	1	AL	$3,000.00	$3,000.00
PLANTING, MICRO-BIORETENTION PLANTS, MAINTENANCE			SUBTOTAL	**$64,000**
Pope Farm Large Deciduous Shade trees (2"-3" CAL)	20	EA	$65.00	$1,300.00
Pope Farm Large Deciduous Shade trees (1"-1.5" CAL) - wooded area	20	EA	$65.00	$1,300.00
Pope Farm Medium Deciduous Shade / Ornamental trees (2" CAL)	20	EA	$65.00	$1,300.00
Pope Farm Micro-Bioretention Plants (installed by Javier Moreno)	3,000	EA	$3.50	$10,500.00
Tree Installation plus Two-Year Plant Aftercare and Extended Warranty	1	LS	$50,000.00	$50,000.00
WOODED AREA IMPROVEMENTS			SUBTOTAL	**$92,000**
Natural Surface Trail - 4 foot width (800 LF)	1,000	LF	$2.00	$2,000.00
Pedestrian wooden foot bridge (2 natural surface trail crossings)	2	EA	$5,000.00	$10,000.00
Non-Native Invasive (NNI) Plant Removals / Herbicide Treatment	1	LS	$35,000.00	$35,000.00
Environmental Enhancements - SEE SUMMARY PLAN	1	LS	$40,000.00	$40,000.00
Remove woody debris in wooded area	1	LS	$5,000.00	$5,000.00
CONSTRUCTION SUBTOTAL				**$1,776,000**
CONSTRUCTION CONTINGENCY (30% of Construction Subtotal)				**$524,000**
CONSTRUCTION TOTAL				**$2,300,000**
DESIGN CONTRACT WITH CONTINGENCY (15% of Construction Total plus Construction Contingency)				**$350,000**
STAFF CHARGEBACKS FOR DESIGN & CONSTRUCTION - 20%				**$70,000**
CONSTRUCTION MANAGEMENT & INSPECTIONS - 3%				**$70,000**
TOTAL COST				**$2,790,000**

Operating Budget Impact (OBI)

Operating Budget Impact (OBI) Cost Estimate

Year 1 = 2021

Park or Project Name	Carroll Knolls Local Park Facility Plan		
Prepared by (Name & Phone#)	Carl Weber (Park Manager, Wheaton), Javier Moreno Water Quality Manager (Southern Region), Colter Burkes (HFEE Division, Arboriculture Section), Mike Moxley (Facilities Management)		
Your Assumptions	Please include whatever assumptions you make to arrive at your estimates.		
	The park is going from a passive local park to a destination local park. Usage will significantly increase and will therefore require a major increase in maintenance costs. The installation of a new pump track, walking path, shelter and playground will require support. The playground will need wood fiber, inspections, and repairs. No snow removal on the hard surface trail. Assumes the open space/ terrace is grass. Assumes SWM facility is 1,776 s/f. Additional assumptions are provided below at the end of the OBI cost calculations (HFEE Division, Arboriculture Section). Park Police responded that the proposed park improvements would not affect their operating budget.		
MC	**MAINTENANCE COSTS - Supplies & Materials (specify)**	**FY21**	**FY22**
MC 1	SWM Supplies	300	300
MC 2	SWM Mulch	800	800
MC 3	Playground repair supplies	800	800
MC 4	Playground EWCF (Wood Fiber)	3,360	3,360
MC 5	Bench Board replacements	250	250
MC 6	Porta John Fence Repair	250	250
MC 7	Seeding open lawn areas	650	650
MC 8	Tree Crew Supplies	80	80
MC 9	Facilities Management Supplies (general unforseen repairs)	500	500
Total MC	Total Maintenance Costs	6990	6990
OS	**OTHER SERVICES & CHARGES - Contracts (trash collection, recycling, portable toilets); Rentals; Uniforms; etc. (Specify)**	Year 1	Year 2
OS 1	Addition of Portable Toilets	1,500	1,500
OS 2	Non-Native Invasive (NNI) vegetation treatment contract (two-person crew 2 times per year)	3,000	3,000
Total OS	Total Other Services & Charges	4,500	4,500
CO	**CAPITAL OUTLAY - Durable goods over $10,000. See definition in General Info tab.**	Year 1	Year 2
CO 1			
Total CO	Total Capital Outlay	0	0
SC-C	**STAFF COSTS - CAREER POSITIONS. Use $35/hour blended rate for PMW; others use mid-point plus 30%**	Year 1	Year 2
SC-C1	SWM PMW 2 and PMW 3. 6 Hours X 2 People per month x 10 Months	4,200	4,200
SC-C2	Playground Inspector for inspections 1.5 hours a month x12 months at rate of $44.45 per hour	800	800
SC-C3	Playground repairs 10 hours per repair with 2 repairs per year at a rate of $44.45 per hour	889	889
SC-C4	Installing 160 yards of EWCF. Will install 40 yards 4 times a year with a labor of 24 hrs per time	3,360	3,360
SC-C5	Replacing Bench boards 4 hours once a year	140	140
SC-C6	Replacing boards on Porta John Fence 2 hours once a year	70	70
SC-C7	Seeding open lawn areas once a year 8 hours	280	280
SC-C8	additional increase in frequency of mowing 18 more times at 4 hour per visit	2,520	2,520
SC-C9	Additional (2) Trash cans to service with 3 additional visits per week	9,345	9,345
SC-C10	additional Hard Surface edging 9 additional time per year at 2 hours per visit	630	630
SC-C11	Pump Track Surface blowing 3 times a week for 42 weeks at 2 hours per visit	8,820	8,820
SC-C12	Pump Track Turf maintenance 1 time a week for 42 weeks at 2 hours per visit	5,880	5,880
SC-C13	Ground Litter removal 42 time a year at 1 hour per visit	1,470	1,470
SC-C14	Playground Fiber raking 42 times a year at .5 hours per visit	735	735
SC-C15	Clearing/blowing new walking path 42 times a year at .5 hours per visit	735	735
SC-C16	Tree pruning 4 times a year at 4 hours per visit	560	560
SC-C17	Labyrinth Maintenance 4 times a year at 6 hours per visit	840	840
SC-C18	Additional leaf removal, 3 additional times per year at 18 hours per visit	1,890	1,890
SC-C19	Mulch Trees 1 time a year at 48 hours per visit	1,680	1,680
SC-C20	Power wash hard surface/shelter 3 times a year at 8 hours per visit	840	840
SC-C21	Natural Surface Trail maintenance 2 times a year at 4 hours per visit	280	280
SC-C22	Urban Forester (Inspector), 1/2 day	183	183
SC-C23	Urban Forester (Supervisor), 1/2 day	183	183

SC-C24	Tree Climber 1, 1 day	253	253
SC-C25	Tree Climber 2, 1 day	284	284
SC-C26	PMW 3 CDL, 1 day	280	280
SC-C27	Plumber (Facilities Management),drinking fountain inspection two times per year	240	240
SC-C28	Electrician (Facilities Management), electrical components inspection two times per year	240	240
SC-C29	Facilities Management inspection of picnic shelter structure/roof and site fencing	240	240
SC-C30	Parking lot inspection (Facilities Management) - one time per year	120	120
SC-C31	Parking lot paint lines maintenance (one time every three years)	250	250
SC-C	Total Program Costs - STAFF	48,237	48,237
WY-C	**WORK YEARS - CAREER POSITIONS. Must correlate with Career Staff costs above.**	Year 1	Year 2
WY-C1	SWM PMW 2 and PMW 3: 120 hrs = 0.06	0.06	0.06
WY-C2	Playground Monthly Inspection, 12 inspections	0.01	0.01
WY-C3	Playground Repairs	0.01	0.01
WY-C4	Installing 160 yards of EWCF. Will install 40 yards 4 times a year with a labor of 24 hrs per time	0.05	0.05
WY-C5	Replacing Bench boards 4 hours once a year	0.01	0.01
WY-C6	Replacing boards on Porta John Fence 2 hours once a year	0.01	0.01
WY-C7	Seeding open lawn areas once a year 8 hours	0.01	0.01
WY-C8	additional increase in frequency of mowing 18 more times at 4 hour per visit	0.04	0.04
WY-C9	Additional (2) Trash cans to service with 3 additional visits per week	0.13	0.13
WY-C10	additional Hard Surface edging 9 additional time per year at 2 hours per visit	0.01	0.01
WY-C11	Pump Track Surface blowing 3 times a week for 42 weeks at 2 hours per visit	0.12	0.12
WY-C12	Pump Track Turf maintenance 1 time a week for 42 weeks at 2 hours per visit	0.08	0.08
WY-C13	Ground Litter removal 42 time a year at 1 hour per visit	0.02	0.02
WY-C14	Playground Fiber raking 42 times a year at .5 hours per visit	0.01	0.01
WY-C15	Clearing/blowing new walking path 42 times a year at .5 hours per visit	0.01	0.01
WY-C16	Tree pruning 4 times a year at 4 hours per visit	0.01	0.01
WY-C17	Labyrinth Maintenance 4 times a year at 6 hours per visit	0.01	0.01
WY-C18	Additional leaf removal, 3 additional times per year at 18 hours per visit	0.03	0.03
WY-C19	Mulch Trees 1 time a year at 48 hours per visit	0.03	0.03
WY-C20	Power wash hard surface/shelter 3 times a year at 8 hours per visit	0.01	0.01
WY-C21	Natural Surface Trail maintenance 2 times a year at 4 hours per visit	0.01	0.01
WY-C22	Urban Forester, 1/2 day	0.001	0.001
WY-C23	Tree Crew Supervisor, 1/2 day	0.001	0.001
WY-C24	Tree Climber 1, 1 day	0.001	0.001
WY-C25	Tree Climber 2, 1 day	0.001	0.001
WY-C26	PMW 3 CDL, 1 day	0.001	0.001
WY-C27	Plumber (Facilities Management),drinking fountain inspection two times per year	0.001	0.001
WY-C28	Electrician (Facilities Management), electrical components inspection two times per year	0.001	0.001
WY-C29	Facilities Management inspection of picnic shelter structure/roof and site fencing	0.001	0.001
WY-C30	Parking lot inspection (Facilities Management) - one time per year	0.001	0.001
WY-C31	Parking lot paint lines maintenance (one time every three years)	0.001	0.001
WY-C	Total Workyears	0.69	0.69
SC-S	**STAFF COSTS - SEASONAL POSITIONS. Use $15/hour blended rate. For SWM, use $16.15.**	Year 1	Year 2
SC-S1	SWM one (1) Seasonal Staff 6 hrs X 10 months	840	840
SC-S2	Tree Crew Seasonal	80	80
SC-S	Total Program Costs - STAFF	920	920
WY-S	**WORK YEARS - SEASONAL POSITIONS. Must correlate with Seasonal Staff costs above.**	Year 1	Year 2
WY-S1	SWM One (1) Seasonal Staff 60 hrs = 0.03	0.03	0.03
WY-S2	Tree Crew Seasonal	0.001	0.001
WY-S	Total Workyears	0.03	0.03
CS	**COST SAVINGS: *Enter as NEGATIVE Numbers***	Year 1	Year 2
CS1			
Cost Savings	Total Cost Savings	0	0
OR	**OFFSETTING REVENUES: Enter as *NEGATIVE* Numbers**	Year 1	Year 2
OR1			
Offset Rev.	Total Offsetting Revenues	0	0

UT	UTILITIES. *For Management Services or Consultant Only.*	Year 1	Year 2
UT1	Annual water supply-service for new drinking fountain	800	800
Utilities	Total Utilities	800	800
Total Costs	Total Costs	61,447	61,447
Total Cost Savings	Total Cost Savings	0	0
Total Offsetting Revenue	Total Offsetting Revenues	0	0
Net Impact	TOTAL NET IMPACT	61,447	61,447
WY Total	TOTAL WY	0.72	0.72

Assumptions (Continued from above)

HFEE Division, Arboriculture Section

STAFF

• Urban Forester (grade 22) in charge of annual tree inspection program will inspect park each year for tree hazards If the park is new or an amenity has been added, it will get an inspection added. Rate per 8 hour day: $366

• Urban Forester (grade 22) will spend a ½ day for every day the tree crew works on a site inspecting the work to be done, setting up the crew and overseeing work. Rate per 8 hour day: $366

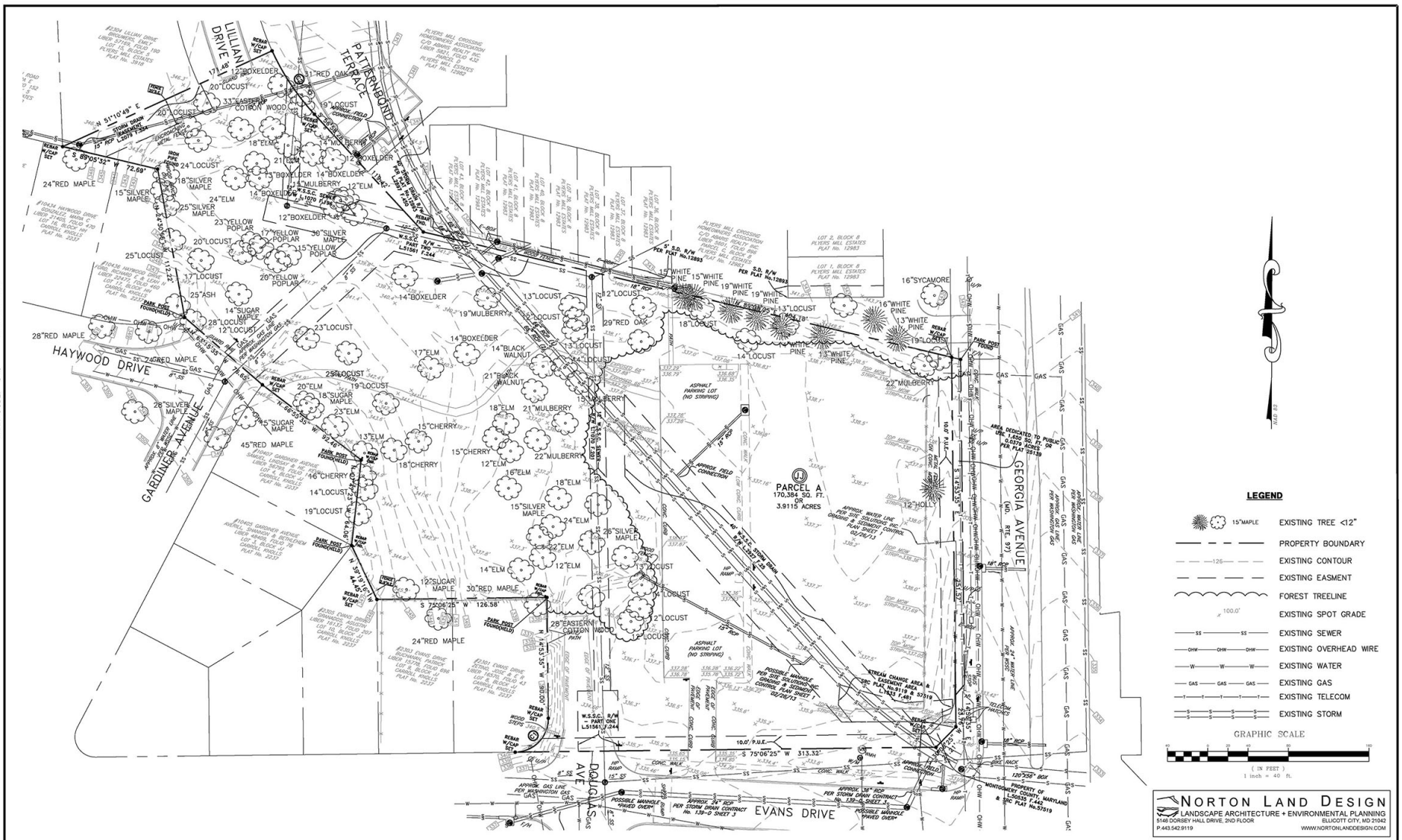
• HSC Leader (Grade F): $285

Standard Tree Crew includes the following staff:
• Climber 2, grade L07, $284 per 8 hours
• Climber 1, grade L06, $253 per 8 hours
• Park Maintenance Worker III/CDL,grade L05, $280 per 8 hours
• Tree crew seasonal, $80 per 8 hours

Trail Tree Work Crew includes the following staff:
• Climber 2, grade L07, $284 per 8 hours
• Climber 2, grade L07, $284 per 8 hours
• Climber 1, grade L06, $253 per 8 hours
• Park Maintenance Worker III/CDL,grade L05, $280 per 8 hours
• Tree crew seasonal, $80 per 8 hours

Supplies and Materials: Average daily cost based on the enitre budget of supplies and materials in Arboriculture Section is $80

Existing Conditions
Topographic Survey



FINAL SCANNED:

PLAN SCANNED:

PARK CODE: C10

K:\VLD PROJECTS\19-001\Drawings\19-001 ex-dwg L-0.1 Plotted By: Cod 3, 10/21/2019 12:58 PM, -----

Designer's Name	DESIGN			Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional landscape architect under the laws of the State of Maryland.	The Maryland-National Capital Park and Planning Commission Montgomery County Department of Parks 9500 Brunett Avenue Silver Spring, Maryland 20901 (301) 495-2535
Address	Landscape Architect	Date	Checked By:	License No. LA 3310	
City/State/Zip	Architect	Date	Checked By:	Expiration Date 9.7.2019	
Telephone Number	Engineer	Date	Checked By:		
	Drawn by	Date	Checked By:		

REVIEW AND APPROVAL		ISSUED FOR PROCUREMENT ON _____		
		REVISIONS		
Project Manager	Date	Rev. No.	Date	Description
Construction Manager	Date			
Park Manager	Date			

CARROLL KNOLLS LOCAL PARK
10500 Georgia Ave
Forest Glen, Maryland 20902

SCALE: AS SHOWN Parcel 495

SHT. # 2 of 9

L-0.1

EXISITNG CONDITIONS SURVEY

Simplified Natural Resource Inventory/ Forest Stand Delineation (NRI-FSD) and forest conservation exemption

MONTGOMERY COUNTY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

August 20, 2019

Mr. Lucas Bonney
M-NCPPC, Montgomery County Department of Parks, Park Development Division
9500 Brunett Avenue
Silver Spring, MD. 20910

Re: Forest Conservation Exemption 42020012E; Carroll Knolls Local Park

Dear Mr. Bonney:

Based on the review by staff of the Montgomery County Planning Department, the Forest Conservation Exemption Request submitted on August 14, 2019 for the plan identified above, is confirmed. The project site is exempt from Article II of the Montgomery County Code, Chapter 22A (Forest Conservation Law), Section 22A-5(s)(1) because this activity is being conducted on a tract less than 1.5 acres with no existing forest, or existing specimen or champion tree, and the afforestation requirements would not exceed 10,000 square feet.

An on-site pre-construction meeting is required after the limits of disturbance have been staked and flagged, but before any clearing or grading begins. The Parks Department project manager, Parks arborist, construction superintendent, this forest conservation inspector, and the Montgomery County Department of Permitting Services (DPS) sediment control inspector should attend this pre-construction meeting.

You may contact me at david.wigglesworth@montgomeryplanning.org or at (301) 495-4581.

Sincerely,
David W. Wigglesworth
David Wigglesworth
Sr. Planner
Development Applications & Regulatory Coordination

CC:42020012E
Holly Thomas (Parks Dept.)
Andrew Driscoll (Parks Dept.)

8787 Georgia Avenue, Silver Spring, Maryland 20910
Development Application and Regulatory Coordination Division: 301.495.4550 Fax: 301.495.1306
www.MongtomeryPlanning.org

MONTGOMERY COUNTY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

April 16, 2020

Mr. Lucas Bonney
M-NCPPC, Montgomery County Department of Parks
Park Development Division
9500 Brunett Avenue
Silver Spring, MD. 20910

Re: Forest Conservation Exemption 42020012E; Carroll Knolls Local Park

Dear Mr. Bonney,

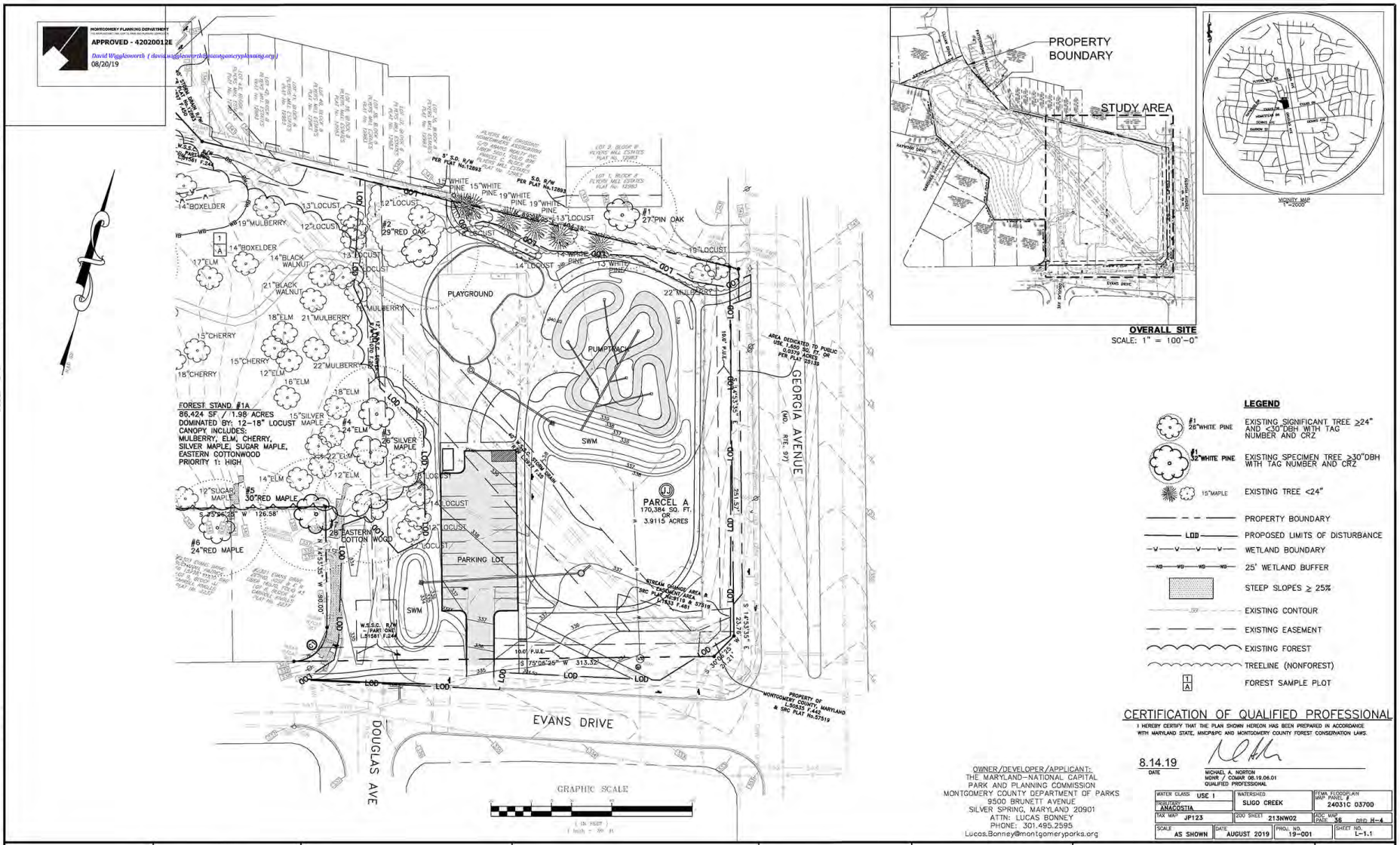
This correspondence concerns compliance with the Montgomery County Forest Conservation law (Chapter 22A) for Carroll Knolls Local Park located at 10500 Georgia Avenue. Forest Conservation Exemption 42020012E was confirmed (8-20-2200) under Section 22A-5(s)(1) however this was an error because the property is 3.91 acres in size, which is over the allowable tract size (1.5 acres) for this exemption category. Therefore, the exemption is not valid and is rescinded. Exemption 42013107E was previously confirmed for demolition of the Arts building and sidewalks in 2013. Since the previous development no longer exists this site is now a redevelopment and cannot qualify for an exemption confirmation under 22A-5 (t) modification to an existing developed property.

Please submit an NRI/FSD and a Forest Conservation plan for the proposed redevelopment for Carroll Knolls Local Park located at 10500 Georgia Avenue. I regret that I have caused you inconvenience for the error in the finding of exemption 42020012E. You may contact me at 301-495-4581 if you have any questions.

Sincerely,
David Wigglesworth
Sr. Planner
Development Applications & Regulatory Coordination

CC: Mark Pfefferle, Chief DARC
Josh Kaye, Inspections Supervisor

8787 Georgia Avenue, Silver Spring, Maryland 20910 Environmental Planning: 301.495.4540 Fax: 301.495.1310
www.MontgomeryPlanning.org


MONTGOMERY PLANNING DEPARTMENT
APPROVED - 42020012E
David Wigglesworth (david.wigglesworth@montgomeryplanning.org)
08/20/19
PROPERTY BOUNDARY
STUDY AREA
OVERALL SITE
SCALE: 1" = 100'-0"
VICINITY MAP
1"=2000'
PLAYGROUND
PUMPTRACK
PARKING LOT
SWM
PARCEL A
170,384 SQ. FT. OR
3.9115 ACRES
GEORGIA AVENUE (MD. RTE. 97)
EVANS DRIVE
DOUGLAS AVE
FOREST STAND #1A
86,424 SF / 1.98 ACRES
DOMINATED BY: 12-18" LOCUST
CANOPY INCLUDES:
MULBERRY, ELM, CHERRY,
SILVER MAPLE, SUGAR MAPLE,
EASTERN COTTONWOOD
PRIORITY 1: HIGH
#1 27"PIN OAK
#2 29"RED OAK
#3 26"SILVER MAPLE
#4 24"ELM
#5 30"RED MAPLE
#6 24"RED MAPLE
#7 28"EASTERN COTTON WOOD
GRAPHIC SCALE
LEGEND
#1 26"WHITE PINE EXISTING SIGNIFICANT TREE ≥24" AND <30"DBH WITH TAG NUMBER AND CRZ
#1 32"WHITE PINE EXISTING SPECIMEN TREE ≥30"DBH WITH TAG NUMBER AND CRZ
15"MAPLE EXISTING TREE <24"
PROPERTY BOUNDARY
LOD PROPOSED LIMITS OF DISTURBANCE
WETLAND BOUNDARY
25' WETLAND BUFFER
STEEP SLOPES ≥ 25%
EXISTING CONTOUR
EXISTING EASEMENT
EXISTING FOREST
TREELINE (NONFOREST)
FOREST SAMPLE PLOT
CERTIFICATION OF QUALIFIED PROFESSIONAL
I HEREBY CERTIFY THAT THE PLAN SHOWN HEREON HAS BEEN PREPARED IN ACCORDANCE WITH MARYLAND STATE, MNCP&PC AND MONTGOMERY COUNTY FOREST CONSERVATION LAWS.
8.14.19
DATE
MICHAEL A. NORTON
MDNR / COMAR 08.19.06.01
QUALIFIED PROFESSIONAL
OWNER/DEVELOPER/APPLICANT:
THE MARYLAND-NATIONAL CAPITAL
PARK AND PLANNING COMMISSION
MONTGOMERY COUNTY DEPARTMENT OF PARKS
9500 BRUNETT AVENUE
SILVER SPRING, MARYLAND 20901
ATTN: LUCAS BONNEY
PHONE: 301.495.2595
Lucas.Bonney@montgomeryparks.org
WATER CLASS USE I
WATERSHED SLIGO CREEK
FEMA FLOODPLAIN MAP PANEL # 24031C 0370D
TAX MAP JP123
200 SHEET 213NW02
ADC MAP PAGE 36 GRID H-4
SCALE AS SHOWN
DATE AUGUST 2019
PROJ. NO. 19-001
SHEET NO. L-1.1
DESIGN
Designer's Name
Address
City/State/Zip
Telephone Number
Landscape Architect
Architect
Engineer
Drawn by
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional landscape architect under the laws of the State of Maryland.
License No:
Expiration Date
The Maryland-National Capital Park and Planning Commission
Montgomery County Department of Parks
9500 Brunett Avenue
Silver Spring, Maryland 20901
(301) 495-2535
REVIEW AND APPROVAL
Project Manager
Construction Manager
Park Manager
ISSUED FOR PROCUREMENT ON
REVISIONS
Rev. No. Date Description
CARROLL KNOLLS LOCAL PARK
10500 Georgia Ave
Forest Glen, Maryland 20902
SCALE: AS SHOWN
Parcel 495
SHT. # ___ of ___
L-1.1
NATURAL RESOURCE INVENTORY/ FOREST STAND DELINEATION
NO.42020012E

MONTGOMERY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

APPROVED - 42020012E

David Wigglesworth (davidwigglesworth@montgomeryparksmd.org)
08/20/19

NRI/FSD TABULATION TABLE

ACREAGE OF TRACT:	3.91
ACREAGE OF EX. FOREST:	1.98
ACREAGE OF EXISTING WETLANDS	0.10
ACREAGE OF FORESTED WETLANDS	0.10
ACREAGE OF WETLAND BUFFERS	0.42
ACREAGE OF STREAM BUFFERS	0.00
ACREAGE OF FORESTED STREAM BUFFER	0.00
ACREAGE OF 100 YEAR FLOODPLAIN	0.00
LINEAR EXTENT OF STREAMS	0'
AVERAGE WIDTH OF STREAM BUFFER	0'

GENERAL NRI/FSD NOTES

1. THIS PROPERTY IS ZONED R-60.
2. THE TOTAL TRACT AREA IS 3.91 ACRES.
3. SITE FIELD WORK WAS PERFORMED APRIL, 2019 BY MICHAEL NORTON, NORTON LAND DESIGN LLC.
4. THIS PROPERTY IS NOT WITHIN AN SPA OR PMA.
5. THIS SITE IS WITHIN THE SLIGO CREEK WHEATON BRANCH, USE I.
6. THERE ARE WETLANDS AND WETLAND BUFFERS WITHIN THE PROPERTY. THE WETLANDS AND BUFFER LINES WERE SOURCED FROM PREVIOUS APPROVED NRI/FSD #420062480
7. 2' TOPOGRAPHY & BOUNDARY SURVEY WAS PROVIDED POTOMAC VALLEY SURVEYS IN APRIL 2019.
8. THERE IS PRIME AGRICULTURAL SOILS ON THE PROPERTY (SEE SOIL TABLE).
9. THERE ARE NO ERODIBLE SOIL ON THE PROPERTY (SEE SOIL TABLE).
10. ALL TREES 24" AND GREATER ON THE PROPERTY ARE SURVEY LOCATED AND MEASURED WITH A FORESTERS DIAMETER TAPE MEASURE.
11. ALL TREES LESS THAN 24" ARE LOCATED ON THE PROPERTY ARE SURVEY LOACATED AND MEASURED WITH A FORESTERS DIAMETER TAPE MEASURE.
12. ALL TREES 24" AND GREATER OUTSIDE OF PROPERTY ARE MEASURED BY OCCULAR ESTIMATE ONLY.
13. NO RARE, THREATENED OR ENDANGERED SPECIES WERE OBSERVED ON OR OFFSITE AT THE TIME OF THE FIELD INVESTIGATION.
14. NO TREES OCCUR WITHIN THE STUDY AREA WHICH ARE RECOGNIZED AS CURRENT STATE CHAMPION TREES.

THE SUBJECT PROPERTY IS NOT LISTED AS INDIVIDUAL HISTORIC SITES AS FOUND IN THE MNCPPC HISTORIC PROPERTIES INTERACTIVE MAP.

SITE NARRATIVE AND FOREST SUMMARY

INTRODUCTION

Norton Land Design completed a Simplified Natural Resource Inventory & Forest Stand Delineation for the project known as Carroll Knolls Local Park located in Wheaton, Montgomery County, MD in April, 2019. The delineation was conducted using the guidelines set forth in the MDNR *State Forest Conservation Technical Manual* and MNCPPC *Trees, Approved Technical Manual*.

GENERAL INFORMATION

This is a 3.91-acre site that consist of Parcel No. 495 owned by Maryland-National Capital Park and Planning Commission . The site currently hosts the existing Carroll Knolls Park and associated parking and circulation. The site has vehicular access from Evans Dr. The site lies within the Sligo Creek Watershed, Use I.

ENVIRONMENTAL FEATURES

100 YEAR FLOOD PLAIN

The FEMA flood map Community-Panel # 24031C 0370D indicates there is no floodplain on the property.

SOILS

The *Soil Survey of Montgomery County, Maryland* describes the soil types that are present on the property as follows: The general soil association for this part of the county is Urban Land-Wheaton-Glenelg.

Soil type 2UB – Glenelg Urban Land Complex, 0 to 8 percent slopes. Very deep, well drained Glenelg soil intermingled with urban land. At least fifty percent of the soil is covered with buildings, concrete, asphalt, or other structures. This soil has only fair potential because of limited open space. Areas where it has been deeply excavated are generally droughty. Onsite investigation is needed to determine the potential for any land use.

NONTIDAL WETLANDS

There were wetlands and wetland buffers observed within property during field investigation. Wetlands and 25' state regulated buffers were provided by previously approved NRI/FSD No. 420062480.

STREAMS AND DRAINAGEWAYS

There were no streams observed onsite and within 100' of the property. The site is within the Sligo Creek, Use I.

TOPOGRAPHY AND STEEP SLOPES

The site slopes generally from West to East. The small pocket of steep slopes presents towards the south west end of the property.

CRITICAL HABITATS

The MDNR has been notified of the project area and description. There appears to be no critical wildlife habitats from the field inspection. Copies of correspondence will be provided.

CULTURAL FEATURES

The site does not appear in close proximity to individual historic sites found in MNCPPC Historic Properties Interactive Map. It appears the development of the subject site will not impact any historic sites.

FOREST STAND INFORMATION

The forest stand plot sample was done in a random method as outlined in *Natural Resources Measurement*, Avery, T. E., 1975, and *Simplified Point Sample Cruising*, Ashley, B.D., 1991. The plot size was 1/10 acre. The Forest Stand #1 contains (1) one forest sample plot. This plot was conducted to inventory the most representative area of the forest stand.

The site contains forests with a total of 1.98 acres of forest onsite. There are significant and specimen trees located within the forest stand. A list of the significant and specimen trees in the study area along with the visual health is within shown on this drawing. The forest area are summarized below.

FOREST STAND #1

Forest Stand 1A (86,424 sq. ft. / 1.98 ac) is a bottomland forest located on the northwestern portion of the site. The canopy includes 8"-20" range locust, elm, mulberry, and cherry. Other canopy trees within the forest include black walnut, silver maple, sugar maple, yellow poplar and eastern cottonwood. There do not appear to be any problems associated with the forest. The forest has been given a Priority Area 1. High rating.

Significant/Specimen Tree Summary 24" +

Tree #	Species (Scientific Name)	Species (Common Name)	D.B.H (inches)	Tree Condition	Comments
1	QUERCUS PALUSTRIS	PIN OAK	27	GOOD	
2	QUERCUS RUBRA	RED OAK	29	GOOD	
3	ACER SACCHARINUM	SILVER MAPLE	26	GOOD	VINE
4	ULMUS SP	ELM	24	GOOD	
5	ACER RUBRUM	RED MAPLE	36	GOOD	OFFSITE
6	ACER RUBRUM	RED MAPLE	24	GOOD	OFFSITE
7	POPULUS DELTOIDES	EASTERN COTTONWOOD	28.16	GOOD	CAVITY/VINE

* BOLD TYPE DENOTES SPECIMEN TREES

Condition Scoring System	
No Apparent Problems	Excellent
Minor Problems	Good
Major Problems	Fair
Extreme Problems	Poor

SOIL TABLE

SOILS	ERODIBLE	HYDRIC	CONTAINS 15-25% SLOPES	CONTAINS > 25% SLOPES	CAPABILITY SUBCLASS SYMBOL	PRIME AGRICULTURAL SOIL
2UB GLENELG-URBAN LAND COMPLEX 0-8% SLOPES	NO	NO	N/A	YES	IIe	YES

OWNER/DEVELOPER/APPLICANT:
THE MARYLAND-NATIONAL CAPITAL
PARK AND PLANNING COMMISSION
MONTGOMERY COUNTY DEPARTMENT OF PARKS
9500 BRUNETT AVENUE
SILVER SPRING, MARYLAND 20901
ATTN: LUCAS BONNEY
PHONE: 301.495.2595
Lucas.Bonney@montgomeryparks.org

CERTIFICATION OF QUALIFIED PROFESSIONAL

I HEREBY CERTIFY THAT THE PLAN SHOWN HEREON HAS BEEN PREPARED IN ACCORDANCE WITH MARYLAND STATE, MNCP&PC AND MONTGOMERY COUNTY FOREST CONSERVATION LAWS.

7.24.19
DATE

MICHAEL A. NORTON
MDNR / COMAR 08.19.06.01
QUALIFIED PROFESSIONAL

WATER CLASS: USE I	WATERSHED: SLIGO CREEK	FEMA FLOODPLAIN MAP PANEL #: 24031C 0370D	
TRIBUTARY: ANACOSTIA			
TAX MAP: JP123	200' SHEET: 213NW02	ADC MAP PAGE: 36 GRID: H-4	
SCALE: AS SHOWN	DATE: JULY 2019	PROJ. NO.: 19-001	SHEET NO.: L-1.2

DESIGN			
Designer's Name			
Address	Landscape Architect	Date	Checked By:
City/State/Zip	Architect	Date	Checked By:
Telephone Number	Engineer	Date	Checked By:
	Drawn by	Date	Checked By:

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional landscape architect under the laws of the State of Maryland.

License No. LA-3310

Expiration Date 9.30.19

The Maryland-National Capital Park and Planning Commission
Montgomery County Department of Parks
9500 Brunett Avenue
Silver Spring, Maryland 20901
(301) 495-2535

REVIEW AND APPROVAL	
Project Manager	Date
Construction Manager	Date
Park Manager	Date

ISSUED FOR PROCUREMENT ON

REVISIONS		
Rev. No.	Date	Description

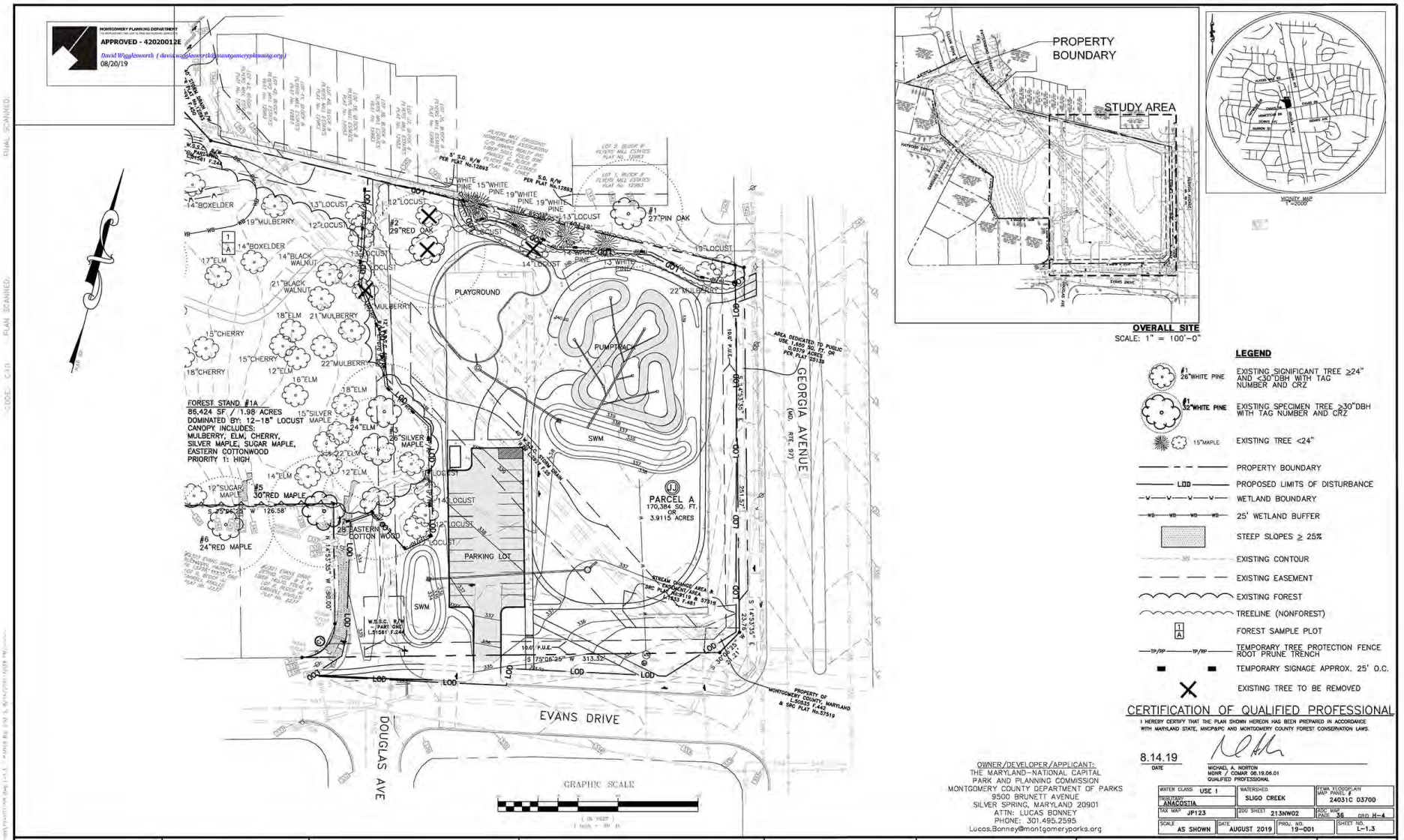
CARROLL KNOLLS LOCAL PARK
10500 Georgia Ave
Forest Glen, Maryland 20902

SCALE: AS SHOWN Parcel 495

SHT. # ___ of ___

L-1.2

NATURAL RESOURCE INVENTORY/ FOREST STAND DELINEATION NO.42020012E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APPROVED - 42020012E
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08/20/19
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SCALE: 1" = 100'-0"
VICINITY MAP
1"=2000
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EXISTING SIGNIFICANT TREE ≥24" AND <30"DBH WITH TAG NUMBER AND CRZ
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PROPOSED LIMITS OF DISTURBANCE
WETLAND BOUNDARY
25' WETLAND BUFFER
STEEP SLOPES ≥ 25%
EXISTING CONTOUR
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EXISTING FOREST
TREELINE (NONFOREST)
FOREST SAMPLE PLOT
TEMPORARY TREE PROTECTION FENCE ROOT PRUNE TRENCH
TEMPORARY SIGNAGE APPROX. 25' O.C.
EXISTING TREE TO BE REMOVED
FOREST STAND #1A
86,424 SF / 1.98 ACRES
DOMINATED BY: 12-18" LOCUST
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OR
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PARKING LOT
SWM
GEORGIA AVENUE
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DOUGLAS AVE
GRAPHIC SCALE
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MICHAEL A. MORTON
MDNR / COMAR 08.19.06.01
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PRIORITY ANACOSTIA
TAX MAP JP123
200 SHEET 213NW02
ADC MAP PAGE 38 GRID H-4
SCALE AS SHOWN
DATE AUGUST 2019
PROJ. NO. 19-001
SHEET NO. L-1.3
DESIGN
Designer's Name
Address
City/State/Zip
Telephone Number
Landscape Architect
Architect
Engineer
Drawn by
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional landscape architect under the laws of the State of Maryland.
License No: LA 2319
Expiration Date: 3/7/2020
The Maryland-National Capital Park and Planning Commission
Montgomery County Department of Parks
9500 Brunett Avenue
Silver Spring, Maryland 20901
(301) 495-2535
REVIEW AND APPROVAL
Project Manager
Construction Manager
Park Manager
ISSUED FOR PROCUREMENT ON
REVISIONS
Rev. No. Date Description
CARROLL KNOLLS LOCAL PARK
10500 Georgia Ave
Forest Glen, Maryland 20902
SCALE: AS SHOWN
Parcel 495
SHT. # ___ of ___
L-1.3
TREE SAVE PLAN
NO. 42020012E

MONTGOMERY PLANNING DEPARTMENT

APPROVED - 42020012E

David Wigglesworth (davidwigglesworth@montgomeryplanning.org)
08/20/19

STANDARD TREE SAVE NOTES

INSPECTIONS
All field inspections must be requested by the applicant.
Field inspections must be conducted as follows:
Plans without Planting Requirements
1. After the limits of disturbance have been staked and flagged, but before any clearing or grading begins.
2. After necessary stress reduction measures have been completed and protection measures have been installed, but before any clearing and grading begin and before release of the building permit.
3. After completion of all construction activities, but before removal of tree protection fencing, to determine the level of compliance with the provision of the forest conservation.
Additional Requirements for Plans with Planting Requirements
4. Before the start of any required reforestation and afforestation planting.
5. After the required reforestation and afforestation planting has been completed to verify that the planting is acceptable and prior to the start the maintenance period.
6. At the end of the maintenance period to determine the level of compliance with the provisions of the planting plan, and if appropriate, release of the performance bond.

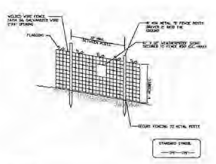
Significant/SpecimenTree Summary 24" +

Tree #	Species (Scientific Name)	Species (Common Name)	D.B.H (inches)	Tree Condition	Comments	Disposition
1	QUERCUS PALUSTRIS	PIN OAK	27	GOOD		SAVE AND PROTECT
2	QUERCUS RUBRA	RED OAK	29	GOOD		TO BE REMOVED
3	ACER SACCHARINUM	SILVER MAPLE	36	GOOD	VINE	SAVE AND PROTECT
4	ULMUS SP.	ELM	24	GOOD		SAVE AND PROTECT
5	**ACER RUBRUM**	**RED MAPLE**	**30**	**GOOD**	**OFFSITE**	**SAVE AND PROTECT**
6	ACER RUBRUM	RED MAPLE	24	GOOD	OFFSITE	SAVE AND PROTECT
7	POPULUS DELTOIDES	EASTERN COTTONWOOD	28,18	GOOD	CAVITY/ VINE	SAVE AND PROTECT
8	**ACER RUBRUM**	**RED MAPLE**	**45**	**GOOD**	**EXPOSED ROOTS/OFFSITE**	**SAVE AND PROTECT**
9	ACER SACCHARINUM	SILVER MAPLE	25	GOOD		SAVE AND PROTECT
10	ACER RUBRUM	RED MAPLE	28	FAIR	WATER SPROUT/BROKEN BRANCH	SAVE AND PROTECT
11	ACER RUBRUM	RED MAPLE	24	GOOD	DEAD LIMB	SAVE AND PROTECT
12	FRAXINUS SP.	ASH	25	GOOD		SAVE AND PROTECT
13	ACER RUBRUM	RED MAPLE	24	GOOD		SAVE AND PROTECT
14	ULMUS SP.	ELM	24	GOOD		SAVE AND PROTECT
15	ROBINIA PSEUDOACACIA	LOCUST	24	GOOD		SAVE AND PROTECT
16	**ACER SACCHARINUM**	**SILVER MAPLE**	**36**	**GOOD**		**SAVE AND PROTECT**
17	**QUERCUS RUBRA**	**RED OAK**	**31**	**GOOD**	**OFFSITE**	**SAVE AND PROTECT**
18	**POPULUS DELTOIDES**	**EASTERN COTTONWOOD**	**33**	**GOOD**	**VINE**	**SAVE AND PROTECT**

FOREST RETENTION AREA SIGNAGE

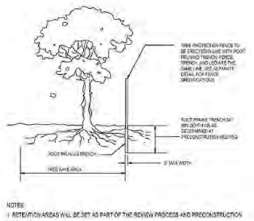
NOTE:
SIGNAGE FOR FOREST RETENTION AREA
TO BE PLACED 30' O.C. WHEN PLACED ON FENCE
1. Attachment of signs to trees is prohibited.
2. Signs should be properly maintained.
3. Avoid injury to roots when placing posts for the signs.

Tree Protection Fence Detail
Not to scale



NOTES
1. Practice may be combined with sediment control fencing.
2. Location and limits of fencing should be coordinated in field with engineer.
3. Boundaries of protection area should be clearly marked prior to installing protective devices.
4. Root damage should be avoided.
5. Protection signage is required.
6. Fencing shall be maintained throughout construction.

Montgomery County Planning Department • 8787 Georgia Ave, Silver Spring, MD 20910 • montgomeryplanning.org



NOTES:
1. RETENTION AREAS WILL BE SET AS PART OF THE REVIEW PROCESS AND PRECONSTRUCTION MEETING.
2. BOUNDARIES OF RETENTION AREAS MUST BE STAKED AT THE PRECONSTRUCTION MEETING AND FLAGGED PRIOR TO TRENCHING.
3. EXACT LOCATION OF TRENCH SHALL BE DETERMINED IN THE FIELD IN COORDINATION WITH THE FOREST CONSERVATION (FC) INSPECTOR.
4. TRENCH SHOULD BE IMMEDIATELY BACKFILLED WITH EXCAVATED SOIL OR OTHER ORGANIC SOIL AS SPECIFIED FOR PLAN OR BY THE FC INSPECTOR.
5. ROOTS SHALL BE CLEANLY CUT USING VIBRATORY KNIFE OR OTHER ACCEPTABLE EQUIPMENT.
6. ALL PRUNING MUST BE CONDUCTED WITH LOD SHOWN ON PLANS OR AS AUTHORIZED IN WRITING BY THE FC INSPECTOR.

ROOT PRUNING DETAIL
NTS

CERTIFICATION OF QUALIFIED PROFESSIONAL

I HEREBY CERTIFY THAT THE PLAN SHOWN HEREON HAS BEEN PREPARED IN ACCORDANCE WITH MARYLAND STATE, MNCP&PC AND MONTGOMERY COUNTY FOREST CONSERVATION LAWS.

7.24.19
DATE

MICHAEL A. NORTON
MDNR / COMAR 08.19.06.01
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WATER CLASS USE I	WATERSHED SLIGO CREEK	FEMA FLOODPLAIN MAP PANEL # 24031C 0370D	
TRESTLES ANACOSTIA			
TAX MAP JP123	200' SHEET 213NW02	ADC MAP PAGE 36 GRID H-4	
SCALE AS SHOWN	DATE JULY 2019	PROJ. NO. 19-001	SHEET NO. L-1.4

Designer's Name	DESIGN		
Address	Landscape Architect	Date	Checked By:
City/State/Zip	Architect	Date	Checked By:
Telephone Number	Engineer	Date	Checked By:
	Drawn by	Date	Checked By:

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional landscape architect under the laws of the State of Maryland.
License No. LA 3310
Expiration Date 9.7.2019

The Maryland-National Capital Park and Planning Commission
Montgomery County Department of Parks
9500 Brunett Avenue
Silver Spring, Maryland 20901
(301) 495-2535

REVIEW AND APPROVAL	
Project Manager	Date
Construction Manager	Date
Park Manager	Date

ISSUED FOR PROCUREMENT ON_____

REVISIONS		
Rev. No.	Date	Description

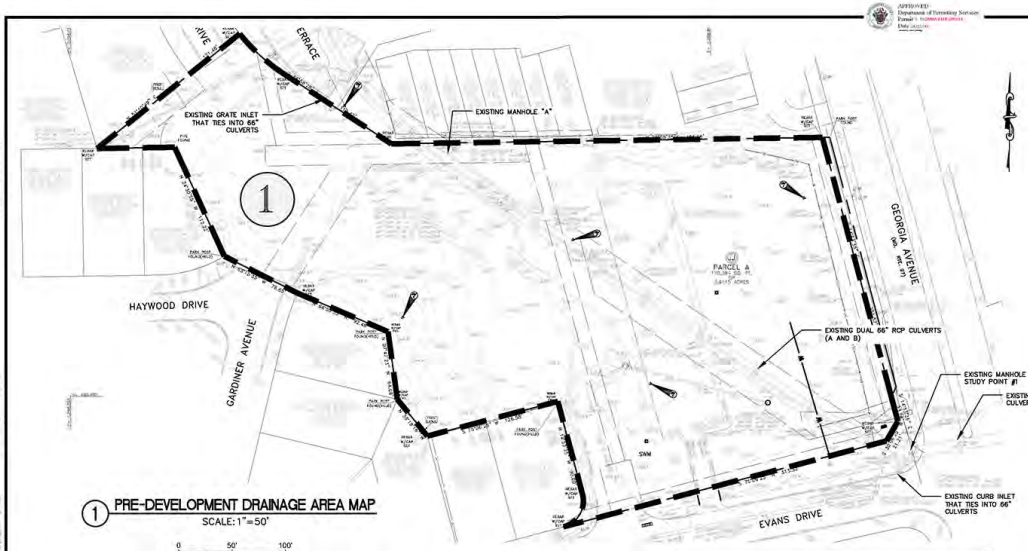
CARROLL KNOLLS LOCAL PARK
10500 Georgia Ave
Forest Glen, Maryland 20902

SCALE: AS SHOWN Parcel 495

SHT. # ___ of ___
L-1.4
TREE SAVE PLAN
NO. 42020012E

Stormwater Management (SWM) Concept Plan

	DESIGN			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.	The Maryland-National Capital Park and Planning Commission Montgomery County Department of Parks 9500 Brunett Avenue Silver Spring, Maryland 20901 (301) 495-2535	REVIEW AND APPROVAL	ISSUED FOR PROCUREMENT ON _____	CARROLL KNOLLS LOCAL PARK 10500 Georgia Ave Forest Glen, Maryland 20902	DWG. # ___ of ___ SWM-1
Designer's Name							REVISIONS		
Address	Landscape Architect	Date	Checked By:			Project Manager Date	Rev. No. / Date / Description		
City/State/Zip	Architect	Date	Checked By:	License No. PE 51168		Construction Manager Date		SCALE: AS SHOWN Liber _____ Folio ____	SHT. # ___ of ___ STORMWATER CONCEPT PLAN
Telephone Number	Engineer	Date	Checked By:	Expiration Date 01-12-2021		Park Manager Date			
	Drawn by	Date	Checked By:						

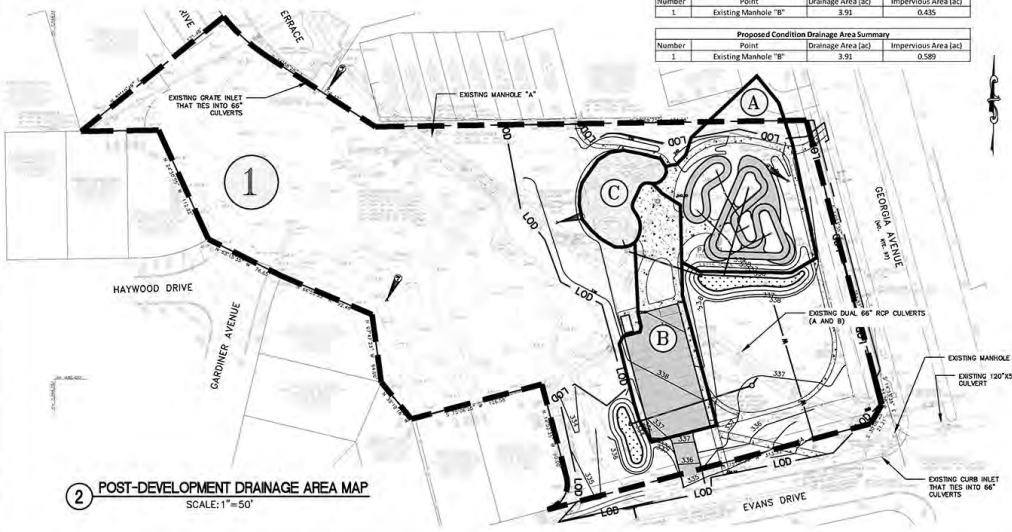


1 PRE-DEVELOPMENT DRAINAGE AREA MAP
SCALE: 1"=50'

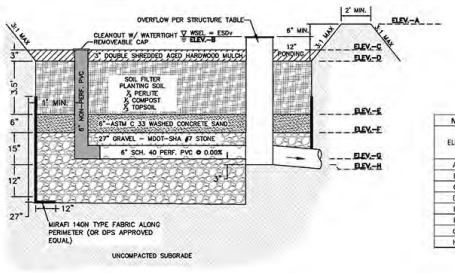
0 50' 100'
GRAPHIC SCALE

Existing Condition Drainage Area Summary			
Number	Point	Drainage Area (ac)	Impervious Area (ac)
1	Existing Manhole "B"	3.91	0.435

Proposed Condition Drainage Area Summary			
Number	Point	Drainage Area (ac)	Impervious Area (ac)
1	Existing Manhole "B"	3.91	0.589



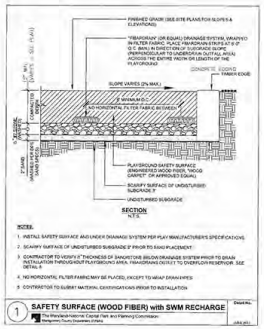
2 POST-DEVELOPMENT DRAINAGE AREA MAP
SCALE: 1"=50'



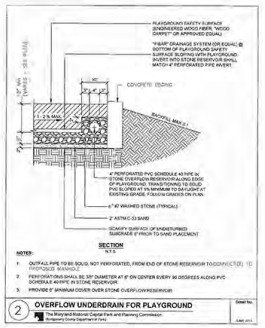
MICRO-BIORETENTION ELEVATIONS		
ELEV	MICRO BIORETENTION AREA A	MICRO BIORETENTION AREA B
A	337.00	336.00
B	336.00	335.00
C	335.25	334.25
D	335.00	334.00
E	332.00	332.00
F	331.50	331.50
G	330.50	330.50
H	330.25	330.25

NOTES:
1. UNDERDRAIN PIPE SHALL BE PERFORATED WITH 3/8" DIA. PERFORATIONS, 4" O.C., EVERY 60 DEGREES AROUND THE PIPE.
2. PERFORATED PIPE MUST BE AT LEAST 12" INSIDE THE FILTER MEDIA.
3. FILTER FABRIC MUST NOT BE WRAPPED AROUND THE UNDERDRAIN PIPE. FILTER FABRIC SHALL NOT BE PLACED AT THE BOTTOM OF THE FACILITY.
4. SEE THIS SHEET FOR SAND SPECIFICATIONS.
5. ALL METHODS AND MATERIALS TO COMPLY WITH THE LATEST MONTGOMERY COUNTY DPS MICRO-BIORETENTION DESIGN SPECIFICATIONS.
6. DO NOT PLACE GEOTEXTILE ALONG BOTTOM.

TYPICAL MICRO-BIORETENTION SECTION
NOT TO SCALE



1 SAFETY SURFACE (WOOD FIBER) with SWM RECHARGE



2 OVERFLOW UNDERDRAIN FOR PLAYGROUND

SWM SUMMARY TABLE									
Measure Number	Type of Measure	DA to Measure	Impervious Area to Measure	% Impervious	Rv for ESD Calculations	Min ESDv (cf)	Max ESDv (cf)	Credited Volume (cf)
ESD								
A	Micro-bio	17,901	5,310	30%	0.317	473	1,229	1,229
B	Micro-bio	12,388	10,941	88%	0.845	872	2,268	1,276
C	Micro-infiltration	4,547	4,547	100%	0.950	360	936	909
Total		30,289	20,798					3,415
Structural								
Total		0	0					0
Does not Drain to a SWM Measure								
QN Waiver acres and % Impervious								0
QL Waiver acres and % Impervious								0
Project Total		30,289	20,798	30%	0.533			3,415
ESDv Required			2,852					
ESDv Provided			3,415					
Structural Required			0					
Structural Provided			0					

SWM Concept Summary	
SMI#	
Type of Concept	SWM Concept/Site Development
MNCPPC Process:	Planning Board
Property Address	10500 Georgia Avenue Forest Glen, MD 20902
Legal Description	Parcel A
Property Size	3.91 ac
Total Concept Area	2.05 ac
Zoning	R-60
Watershed(s)	Sligo Creek
Special Protection Area	N/A
100 Yr Floodplain	N/A
Target P_v/Prop P_v	1.2/2.40
Target/Proposed ESD_v	2,852 / 3,415
ESD Measures	Micro-bioretention Areas
Structural Storage Required/Provided	N/A
Structural Measures	N/A
Requested to be Waived	N/A
Provided ESDv + Structural Storage Provided + Requested to be Waived	3,415
Other Information	N/A

CLARK | AZAR & ASSOCIATES
20440 Century Blvd, Suite 209
Germantown, MD. 20874
T(301) 528-2010
www.clarkazar.com
A Woman Owned Small Business

STATE OF MARYLAND
JASON T. AZAR
PROFESSIONAL ENGINEER
08/09/2019

	DESIGN		
Designer's Name			
Address	Landscape Architect	Date	Checked By:
City/State/Zip	Architect	Date	Checked By:
Telephone Number	Engineer	Date	Checked By:
	Drawn by	Date	Checked By:

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. 51168

Expiration Date 31+12+2021

The Maryland-National Capital Park and Planning Commission
Montgomery County Department of Parks
9500 Brunett Avenue
Silver Spring, Maryland 20901
(301) 495-2535

REVIEW AND APPROVAL		
Project Manager	Date	
Construction Manager	Date	
Park Manager	Date	

ISSUED FOR PROCUREMENT ON _____

REVISIONS		
Rev. No.	Date	Description

CARROLL KNOLLS LOCAL PARK
10500 Georgia Ave
Forest Glen, Maryland 20902

SCALE: AS SHOWN Liber _____ Folio ____

DWG. # ___ of ___
SWM-2
SHT. # ___ of ___
DRAINAGE AREA MAP AND DETAILS

DEPARTMENT OF PERMITTING SERVICES

Marc Elrich
County Executive

Hadi Mansouri
Acting Director

August 22, 2019

Mr. Jason Azar, PE
Clark Azar & Associates, Inc.
20440 Century Boulevard, Suite 220
Germantown, MD 20874

Re: Stormwater Management ***CONCEPT*** Request
for Carroll Knolls Local Park
Preliminary Plan #: N/A
SM File #: 285031
Tract Size/Zone: 3.91 Acres
Total Concept Area: 2.05 Acres
Lots/Block: N/A
Parcel(s): A
Watershed: Sligo Creek

Dear Mr. Azar:

Based on a review by the Department of Permitting Services Review Staff, the stormwater management concept for the above-mentioned site is **acceptable**. The stormwater management concept proposes to meet required stormwater management goals via Microbioretention.

The following items will need to be addressed during the detailed sediment control/stormwater management plan stage:

1. A detailed review of the stormwater management computations will occur at the time of detailed plan review.

2. An engineered sediment control plan must be submitted for this development.

3. All filtration media for manufactured best management practices, whether for new development or redevelopment, must consist of MDE approved material.

This list may not be all-inclusive and may change based on available information at the time.

This letter must appear on the sediment control/stormwater management plan at its initial submittal. The concept approval is based on all stormwater management structures being located outside of the Public Utility Easement, the Public Improvement Easement, and the Public Right of Way unless specifically approved on the concept plan. Any divergence from the information provided to this office; or additional information received during the development process; or a change in an applicable Executive Regulation may constitute grounds to rescind or amend any approval actions taken, and to reevaluate the site for additional or amended stormwater management requirements. If there are subsequent additions or modifications to the development, a separate concept request shall be required.

If you have any questions regarding these actions, please feel free to contact Andrew Kohler at 240-777-6275.

Sincerely,

Mark C. Etheridge, Manager
Water Resources Section
Division of Land Development Services

MCE: AK

cc: N. Braunstein
SM File # 285031

ESD: Required/Provided 3415 cf / 3852 cf
PE: Target/Achieved: 1.2"/2.4"
STRUCTURAL: N/A cf
WAIVED: N/A ac.

CLARK | AZAR & ASSOCIATES

Carroll Knolls Local Park

10500 Georgia Avenue
Forest Glen, MD 20902

Stormwater Management Engineering Report

08/12/2019

Prepared by:
Dana Clark, PE

Approved by:
Jason Azar, PE

Stormwater Management Concept #
Project No. 125.008

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.: 31168 EXPIRATION DATE: 01/12/2021

June 2019

Clark | Azar & Associates
(301) 528-2010

20440 Century Boulevard, Suite 220
Germantown, MD 20874

TABLE OF CONTENTS

Stormwater Management Engineering Report
Carroll Knolls Local Park
Forest Glen, Maryland

SECTION

I. Stormwater Management Narrative

Stormwater Management Narrative

Carroll Knolls Local Park

I. Site Introduction

M-NCPPC is proposing to make improvements to the existing Carroll Knolls Local Park located at 10150 Georgia Avenue in Forest Glen, Maryland. The site is bordered on the east by Georgia Avenue, on the south by Evans Drive and on the west and north by residential neighborhoods.

II. Existing Conditions

The existing park is 3.91 acres of passive recreational space with existing paved parking lot and sidewalks. No stormwater management exists on the property. Two – 66" concrete culverts run through the middle of the park property. The entirety of the park property drains into these two culverts by way of onsite inlets or inlets within the Georgia Avenue and Evans Drive rights-of-way. These culverts tie into a 120"x56" concrete box culvert at the intersection of Georgia Avenue and Evans Avenue at the southeast corner of the park. The box culvert is the jurisdiction of SHA.

III. Proposed Conditions

M-NCPPC is proposing improvements to the existing park which will include a pump track, a playground, a reconstructed parking area, associated ADA connections and required stormwater management. Areas of existing pavement are proposed to be removed in areas of the disturbance.

IV. Stormwater Management

a. Environmental Site Design

The project area within the limits of disturbance was designed using Environmental Site Design criteria per the Maryland Stormwater Design Manual and Montgomery County Stormwater Regulations and in compliance with the Stormwater Management Act of 2007 to the Maximum Extent Practicable (MEP). The stormwater management design strategy for this project was to seek to replicate the natural hydrology of the site by utilizing small-scale stormwater management practices to minimize the impact of land development on downstream water resources.

Per current Montgomery County DPS standards, the Pe required for treatment was calculated using the total property area to the study point. The study point was taken to be the existing manhole at the corner of Georgia Avenue and Evans drive where the two 66" culverts converge into the box culvert. The entirety of the property drains to this point in some fashion.

Table 1: ESDv Requirements Summary

Study Point	Property Area (sf)	Proposed Impervious Area (sf)	% Impervious	Soil Type	Target Pe (in)	Limits of Disturbed Area (sf)*	LOD Rv	ESDv Required (cf)	ESDv Provided (cf)
Manhole B	170,378	26,824	16%	B	1.2	87,579	0.321	2,852	3,415

The ESDv will be provided via two micro bioretention areas and additional stone infiltration under the playground. The full ESDv is provided for the limits of disturbance, therefore no CPv will be required.

V. Stormwater Quantity

a. Methodology

A stormwater quantity analysis using TR-55 was conducted for the study point where discharge leaves the site. These computations do not take into account the storage of the proposed Bioretention facilities.

The analysis was based on the best available information regarding the offsite conditions. The increase in flow for the 10 year storm from the existing condition to the proposed condition is 0.46 cfs. The increase as a percentage of the capacity of the 66" culverts and the box culvert is negligible as shown in the outfall computations.

VI. Conclusions

Full ESD requirements are being met for the proposed improvements. As a result of the proposed improvements, water quality is being increased for the areas of disturbance. Existing drainage patterns are being maintained and the outfall drainage systems are sufficient for the proposed developments per the quantity analysis.

II. Environmental Site Design Computations

a. **ESDv Required**
b. **ESDv Provided Summary**

a. ESDv Required

CLARK | AZAR & ASSOCIATES

Project:	Carroll Knolls LP	**Date:**	8/9/2019
Project Number:	120.008	**Calculated by:**	JA
Calculation:	Area Summary & ESDv Required Calculations	**Reviewed by:**	DWC

Property Area Summary for ESDv Computations								
Study Point	Property Area (sf)	Total Post Development Impervious Area (sf)	% Impervious	Rv	HSG Areas			Target Pe (in)
					HSG	Area	Pe	
1	170,378	26,824	16%	0.192	B	170,378	1.2	1.2

Property Area Summary for ESDv Computations						
Study Point	LOD Area (sf)	Total Post Development Impervious Area (sf)	% Impervious	Rv	Target Pe (in)	ESDv Required (cf)
1	87,579	26,824	31%	0.326	1.2	2,852

b. ESDv Proposed

CLARK | AZAR & ASSOCIATES

Project: Carroll Knolls LP
Project Number: 125.008
Calculation: ESDv Provided Calculations

Date: 6/20/2019
Calculated by: JA
Reviewed by: DWC

Summary of ESDv Required*			
Study Point	LOD Area	Target Pe	ESDv Required
1	87,579	1.2	2,852

*See ESDv Requirements Computations for detail

Alternative Surfaces	
GR	Green Roof
PP	Permeable Pavement
ST	Synthetic Turf

Micro-Scale Practices	
RH	Rainwater Harvesting
SGW	Submerged Gravel Wetlands
LI	Landscape Infiltration
IT	Infiltration Trench
DW	Dry Wells
MB	Micro-Bioretention
RG	Rain Gardens
SW-G or B	Swale s (specify grass or bio)
EF	Enhanced Filters

Non-Structural Practices	
DRR	Disconnection of Roof Runoff
DNR	Disconnection of Non- Roof Runoff
SCA	Sheetflow to Conservation Areas

STUDY POINT 1: NORTH STREAM

				Alternative Surfaces						Micro-Scale Practices								Non-Structural Practices										
Sub-Basin Drainage Area (sf)	Sub-Basin Total Area* (sf)	(ac)	Sub-Basin Impervious Area sf)	Sub-Basin R_v	Drainage Area of Surface (sf)	Alternative Surface Used	Filter Media Thickness (in)	P_E Provided by Surface (in)	Rv of DA of Surface	ESDv Provided by Surface (cf)	Drainage Area to Practice (sf)	Micro-Scale Practice Used	Surface Area of Practice (sf)	Depth of Media (ft)	n	ESDv Provided by Media (cf)	Ponding of ESDv (ft)	ESDv Provided by Ponding (cf)	Total ESDv Provided by Practice (cf)	Drainage Area to Practice (sf)	Non-Structural Practice Used	Disconnect Length/ Buffer Width (ft)	Ratio of Disconnect Length to Contributing Length	Rv of DA	P_E Provided by Practice (in)	ESDv Provided by Practice (cf)	Total ESDv Provided over Sub-Basin DA (in)	Minimum ESD_v over Sub-Basin (1.0 in)	Maximum ESD_v over Sub-Basin (2.6 in)	Credited ESD_v over Sub-Basin	PE Credited over Sub-Basin
A	17,901	0.411	5,310	0.317							17,901	MB	985	3.50	0.4	1379	1.00	985	2364								**2364**	473	1229	**1229**	**2.60**
B	12,388	0.284	10,941	0.845							12,388	MB	679	2.50	0.4	597	1.00	679	1276								**1276**	872	2268	**1276**	**1.46**
C	4,547	0.104	4,547	0.950							4,547	IT	4,547	0.50	0.4	909	0.00	0	909								**909**	360	936	**909**	**2.53**

*Drainage area to facility minus area of facility and embankment

Sum of ESDv Credited Within Study Area	**3,415**
P_E Credited Over Required Study Area	**2.44**

Underdrain Requirements				
Bio Area	**Bioretention Surface Area**		**Underdrain Required (ft)**	**Underdrain Provided (ft)**
A	985	0.05	50	**75**
B	679	0.05	34	**83**

III. Study Point #1 Quantity Computations

a. Existing TR-55 Flow Computations

b. Proposed TR-55 Flow Computations

c. Capacity Computations

a. Existing TR-55 Flow Computations

WinTR-55 Current Data Description

--- Identification Data ---

User: DWC
Project: Carroll Knolls Local Park
SubTitle: Existing Conditions
State: Maryland
County: Montgomery NOAA_C
Filename: J:\125.008 - Carroll Knolls LP\CIVIL\COMPUTATIONS\Existing TR-55.w55

Date: 6/13/2019
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Study Pt 1	Dual 66' Culverts	Outlet	3.91	67	.135

Total area: 3.91 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
2.97	3.95	4.8	5.5	6.3	6.75	2.5

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

Carroll Knolls Local Park
Existing Conditions
Montgomery NOAA_C County, Maryland

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
2.97	3.95	4.8	5.5	6.3	6.75	2.5

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

DWC

Carroll Knolls Local Park
Existing Conditions
Montgomery NOAA_C County, Maryland

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 10-Yr (cfs)
SUBAREAS	
Study Pt 1	9.19
REACHES	
OUTLET	9.19

DWC

Carroll Knolls Local Park
Existing Conditions
Montgomery NOAA_C County, Maryland

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 10-Yr (cfs) (hr)
SUBAREAS	
Study Pt 1	9.19 11.97
REACHES	
OUTLET	9.19

Carroll Knolls Local Park
Existing Conditions
Montgomery NOAA_C County, Maryland

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Study Pt 1	3.91	0.135	67	Outlet	Dual 66' Culverts

Total Area: 3.91 (ac)

Carroll Knolls Local Park
Existing Conditions
Montgomery NOAA_C County, Maryland

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Study Pt 1							
SHEET	100	0.0380	0.150				0.131
SHALLOW	52	0.1000	0.050				0.003
CHANNEL	38	0.0100	0.013	3.14	6.28	10.556	0.001
					Time of Concentration		.135

Carroll Knolls Local Park
Existing Conditions
Montgomery NOAA_C County, Maryland

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Study Pt 1	Open space; grass cover > 75%	(good)	B	1.847	61
	Paved parking lots, roofs, driveways		B	.435	98
	Woods - grass combination	(fair)	B	1.623	65
	Total Area / Weighted Curve Number			3.91	67

b. Proposed TR-55 Flow Computations

WinTR-55 Current Data Description

--- Identification Data ---

User: DWC
Project: Carroll Knolls Local Park
SubTitle: Proposed Conditions
State:
County:
Filename: J:\125.008 - Carroll Knolls LP\CIVIL\COMPUTATIONS\Proposed TR-55.w55

Date: 6/13/2019
Units: English
Areal Units: Acres

--- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Study Pt 1	Dual 66' Culverts	Outlet	3.91	68	.135

Total area: 3.91 (ac)

--- Storm Data --

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
2.97	3.95	4.8	5.5	6.3	6.75	2.5

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

Carroll Knolls Local Park
Proposed Conditions
County,

Storm Data

Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
2.97	3.95	4.8	5.5	6.3	6.75	2.5

Storm Data Source: User-provided custom storm data
Rainfall Distribution Type: Type II
Dimensionless Unit Hydrograph: <standard>

DWC

Carroll Knolls Local Park
Proposed Conditions
County,

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 10-Yr (cfs)
SUBAREAS	
Study Pt 1	9.65
REACHES	
OUTLET	9.65

DWC

Carroll Knolls Local Park
Proposed Conditions
County,

Hydrograph Peak/Peak Time Table

Sub-Area or Reach Identifier	Peak Flow and Peak Time (hr) by Rainfall Return Period 10-Yr (cfs) (hr)
SUBAREAS	
Study Pt 1	9.65 11.97
REACHES	
OUTLET	9.65

Carroll Knolls Local Park
Proposed Conditions
County,

Sub-Area Summary Table

Sub-Area Identifier	Drainage Area (ac)	Time of Concentration (hr)	Curve Number	Receiving Reach	Sub-Area Description
Study Pt 1	3.91	0.135	68	Outlet	Dual 66' Culverts

Total Area: 3.91 (ac)

Carroll Knolls Local Park
Proposed Conditions
County,

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
Study Pt 1							
SHEET	100	0.0380	0.150				0.131
SHALLOW	52	0.1000	0.050				0.003
CHANNEL	38	0.0100	0.013	3.14	6.28	10.556	0.001
					Time of Concentration		.135

Carroll Knolls Local Park
Proposed Conditions
County,

Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use		Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Study Pt 1	Open space; grass cover > 75%	(good)	B	1.698	61
	Paved parking lots, roofs, driveways		B	.589	98
	Woods - grass combination	(fair)	B	1.623	65
	Total Area / Weighted Curve Number			3.91	68

c. Capacity Computations

CLARK | AZAR & ASSOCIATES

Project:	Carroll Knolls Local Park	**Date:**	6/12/2019
Project Number:	125.008	**Calculated by:**	DWC
Calculation:	Capacity Computations	**Reviewed by:**	JA

Carroll Knolls Park Outfall													Flows from Park Property			
Pipe	**Pipe Size (in)**	**Upstream Node**	**Downstream Node**	**Pipe Length (ft)**	**Upstream Invert Elev (ft)**	**Downstream Invert Elev (ft)**	**Pipe** Slope (ft/ft)	**Pipe** Area (sf)	**Pw** (ft)	**R**	**n**	**Pipe Capacity (cfs)**	**Existing 10 Year Flow* (cfs)**	**Proposed 10 Year Flow* (cfs)**	**Flow Increase (cfs)**	**Flow Increase as a Percentage of Pipe Capacity (cfs)**
Existing 66" Culvert "A"	66	Existing Manhole "A"	Existing Manhole "B"	517	332.9	326.40	0.0126	23.7	17.3	1.375	0.013	377.76	9.19	9.65	0.46	0.12%
Existing 66" Culvert "B"	66	Existing Manhole "A"	Existing Manhole "B"	517	332.8	326.40	0.0124	23.7	17.3	1.375	0.013	374.84	9.19	9.65	0.46	0.12%
Existing 120'x56" Box	120"x56"	Existing Manhole "B"	Existing Manhole "C"	100	326.3	325.30	0.0100	46.7	29.3	1.591	0.013	730.05	9.19	9.65	0.46	0.06%

$$Capacity = \frac{1.49A\ S^{1/2}\ R^{2/3}}{n}$$

IV. Soil Map

Hydrologic Soil Group—Montgomery County, Maryland
(CARROLL KNOLLS LP)

Map Scale: 1:1,880 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Montgomery County, Maryland
Survey Area Data: Version 14, Sep 11, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 3, 2015—Feb 22, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2C	Glenelg silt loam, 8 to 15 percent slopes	B	0.5	2.7%
2UB	Glenelg-Urban land complex, 0 to 8 percent slopes	B	16.1	94.7%
6A	Baile silt loam, 0 to 3 percent slopes	C/D	0.4	2.6%
Totals for Area of Interest			**17.0**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

V. Adjacent Downstream Property Owner Notification Letter

CLARK | AZAR & ASSOCIATES

6/13/19

Re: Stormwater Management Concept Plan
for Carroll Knolls Local Park

To Whom It May Concern:

In accordance with Montgomery County Executive Regulation 7-02AM, this letter is to notify you of the above referenced application to the Montgomery County Department of Permitting Services (DPS). This application is for approval of a stormwater management concept plan, which may or may not be a part of a preliminary plan of subdivision. Copies of the preliminary plan (if applicable) and the proposed stormwater management concept plan are enclosed for your information. These plans are being sent to show the location of the project only. These plans have not been reviewed by DPS and the proposed design may change substantially during the course of the review. Detailed comments about the design of the project are not being solicited.

The stormwater management concept plan will be acted upon by DPS prior to action by the Montgomery County Planning Board on the Preliminary Plan of Subdivision (if applicable), or prior to the review of detailed construction plans. DPS review of the stormwater management concept plan is for the purpose of stormwater management compliance only. You, as an adjacent/downstream landowner, may provide in writing to DPS any information which you feel DPS should be aware of during our review of the proposed stormwater management concept plan, such as a history of wet basement issues, roadway flooding, or other water runoff related issues in the vicinity of the project site which you think should influence action taken by DPS when determining stormwater runoff compliance requirements for this project.

Written comments must be addressed to:

Mark C. Etheridge, Manager
Montgomery County Department of Permitting Services
Water Resources Section
255 Rockville Pike, 2nd Fl.
Rockville, MD 20850-4166
Mark.etheridge@montgomerycountymd.gov

Comments must be delivered within three weeks of receipt of this notice which has been sent by Certified Mail, and may be submitted in writing or via email.

Sincerely,

Dana Clark, PE
Project Manager

Clark | Azar & Associates, Inc.
20440 Century Boulevard, Suite 220
Germantown, MD 20874
(301) 528-2010
www.clarkazar.com

VI. FEMA Floodplain Map

FEMA
(//www.fema.gov/)

Navigation

Search

Languages

MSC Home (/portal/)

MSC Search by Address (/portal/search)

MSC Search All Products (/portal/advanceSearch)

MSC Products and Tools (/portal/resources/productsandtools)

- Hazus (/portal/resources/hazus)
- LOMC Batch Files (/portal/resources/lomc)
- Product Availability (/portal/productAvailability)

MSC Frequently Asked Questions (FAQs) (/portal/resources/faq)

MSC Email Subscriptions (/portal/subscriptionHome)

Contact MSC Help (/portal/resources/contact)

FEMA Flood Map Service Center: Search By Address

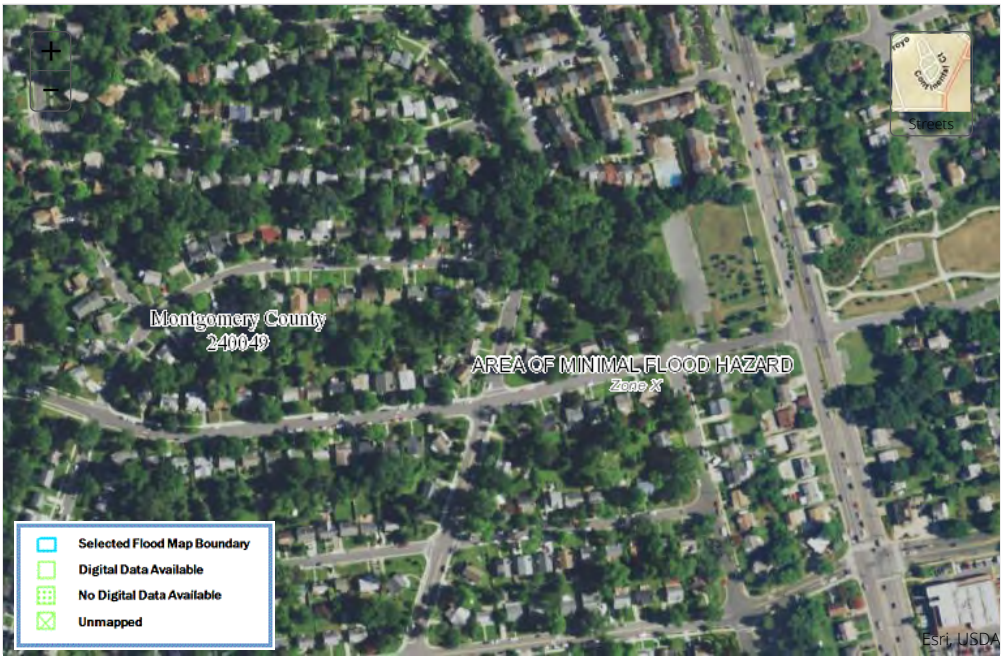
Enter an address, place, or coordinates:

10500 georgia avenue forest glen

Search

Whether you are in a high risk zone or not, you may need flood insurance (https://www.fema.gov/national-flood-insurance-program) because most homeowners insurance doesn't cover flood damage. If you live in an area with low or moderate flood risk, you are 5 times more likely to experience flood than a fire in your home over the next 30 years. For many, a National Flood Insurance Program's flood insurance policy could cost less than $400 per year. Call your insurance agent today and protect what you've built.

Learn more about steps you can take (https://www.fema.gov/what-mitigation) to reduce flood risk damage.



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ECS Mid-Atlantic, LLC

Geotechnical Engineering Report

Carroll Knolls Local Park Renovation

10500 Georgia Avenue
Silver Spring, Maryland

ECS Project Number 13:9098

June 4, 2019

June 4, 2019

Mr. Michael Norton
Norton Land Design, LLC
5146 Dorsey Hall Drive
Ellicott City, Maryland 21042

ECS Project No. 13: 9098

Reference: Geotechnical Engineering Report
Carroll Knolls Local Park Renovation
10500 Georgia Avenue
Silver Spring, Montgomery County, Maryland

Dear Mr. Norton:

ECS Mid-Atlantic, LLC (ECS) has completed the subsurface exploration and infiltration testing for the proposed renovation of the Carroll Knolls Local Park. Our services were performed in general accordance with our Proposal No. 13:10105-GP, dated January 2, 2019. This report presents our understanding of the geotechnical aspects of the project along with the results of the field exploration and laboratory testing conducted, and our design and construction recommendations.

It has been our pleasure to be of service to Norton Land Design, LLC during the design phase of this project. We would appreciate the opportunity to remain involved during the continuation of the design phase, and we would like to provide our services during construction phase operations as well. Should you have any questions concerning the information contained in this report, or if we can be of further assistance to you, please contact us.

Respectfully submitted,

ECS Mid-Atlantic, LLC

Brian A. Meley, P.G.
Geotechnical Project Manager
bmeley@ecslimited.com

Jeffrey A. McGregor, P.E.
Principal Engineer
jmcgregor@ecslimited.com

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.: 30901 Expiration Date: 08/15/2020

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APPENDICES

Appendix A – Drawings & Reports

- Site Location Diagram
- Boring Location Diagram
- Geologic Map
- Soil Survey Map

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- Infiltration Test Results

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- Laboratory Test Results Summary
- Atterberg Limits Report
- Particle Size Distribution Report
- USDA Soil Classification
- Horticulture Testing (texture, Ph, soluble salts, nutrient content, organic content)

EXECUTIVE SUMMARY

The following summarizes the main findings of the exploration, particularly those that may have a cost impact on the planned development. Information gleaned from the executive summary should not be utilized in lieu of reading the entire geotechnical report.

- The geotechnical exploration performed for the planned development included six (6) soil test borings drilled to depths of 10 to 15 feet below existing grades and the collection of five (5) bulk samples for horticultural testing.

- Beneath the surface cover, existing, undocumented fill materials were encountered at four (4) boring locations (SB-2 through SB-5) extending to depths of 3.5 to 8.0 feet below existing grades (EL 337.8 to EL 330.0). Natural soils were encountered below the surface cover (SB-1) or existing fill materials and extended to depths of up to 15.0 feet below existing grades, the maximum depths explored. The natural soils were classified as CLAY (CL), SILT (ML/CL), SAND (SP, SM), and GRAVEL (GP, GP-GM).

- The soils described above are generally expected to be suitable for reuse as engineered fill. Moisture conditioning of subgrades and fill lifts will likely be limited to the wetter months.

- Groundwater was encountered in boring SB-3 at a depth of 7.2 feet below existing grade (EL 329.3). Groundwater was not encountered at the remaining boring locations to the depths explored. As the picnic shelter, playground equipment, and other planned improvements are to be constructed at or near existing grade, groundwater is not expected to be a significant issue during construction.

- In-situ infiltration testing was performed at borings SB-2 and SB-3 at depths of 7.0 feet (EL 330.5) and 4.0 feet (EL 332.5) below existing grade, respectively. The measured infiltration rates were 0.03 in/hr (SB-2) and 0.21 in/hr (SB-3), respectively.

- The planned picnic shelter, playground equipment, and other site furnishings can be supported by conventional spread footing foundations bearing on natural soils or new structural fills. Foundations can be designed for a net allowable bearing pressure of 2,000 psf. Undercut and replacement of existing, undocumented fill materials will likely be necessary.

1.0 INTRODUCTION

1.1 GENERAL

The purpose of this study was to provide geotechnical information and infiltration results for the design of the park renovations.

The recommendations developed for this report are based on project information supplied by Norton Land Design, LLC, which includes the Carroll Knolls Local Park Renovation Facility Plans "Multi-Disciplinary A/E Services Task Order MC 2019-23" document. This report contains the results of our subsurface explorations and testing programs, site characterization, engineering analyses, and recommendations for the design and construction of planned stormwater management facilities, picnic shelter, playground equipment, and other park features.

1.2 SCOPE OF SERVICES

To obtain the necessary geotechnical information required for design of the stormwater management facilities, picnic shelter, playground equipment and park features, six (6) soil test borings were performed at locations selected by Norton Land Design, LLC. The borings were located at proposed playground and "active teen" areas, and in the vicinity of the picnic shelter, parking lot, and stormwater management facility locations.

This report discusses our exploratory and testing procedures, presents our findings and evaluations and includes the following.

- A brief review and description of our field and laboratory test procedures and the results of testing conducted.
- A review of surface topographical features and site conditions.
- A review of area and site geologic conditions.
- A review of subsurface soil stratigraphy with pertinent available physical properties.
- Final copies of our test boring logs.
- Recommendations for site preparation and construction of compacted fills, including an evaluation of on-site soils for use as compacted fills.
- Recommended foundation type(s).
- Evaluation and recommendations relative to groundwater control.
- Results of the in-situ infiltration testing and recommendations for design of stormwater management facilities.

1.3 AUTHORIZATION

Our services were provided in accordance with our Proposal No. 13:10105-GP, dated January 2, 2019, and approved by Norton Land Design, which includes the Terms and Conditions of Service outlined with our Proposal.

2.0 PROJECT INFORMATION

2.1 PROJECT LOCATION

The project site is located at 10500 Georgia Avenue, in Silver Spring, Maryland. The site is bounded to the east by Georgia Avenue, to the north by residences along Pennydog Lane and Patterbond Terrace, to the west by residences along Haywood Drive, Harmon Road and Gardiner Avenue, and to the south by Evans Drive and residences along Evans Drive.

Figure 2.1.1 below, shows the approximate project location. A Site Location Diagram has been included as Figure 1 in Appendix A.

Figure 2.1.1 Site Location

2.2 PAST SITE HISTORY/USES

Based on a review of available online historic aerial photographs and topographic maps, the site was predominately grass, brush and tree covered in 1957 (the earliest aerial photograph available for this site). Between 1908 (the earliest topographic maps available for this area) and 1963, a stream is depicted as extending northwest to southeast through the site. This stream feature was also visible on the 1957 aerial photograph. A dirt access road leading to Patterbond Terrace from

the intersection of Evans Drive and Georgia Avenue is visible on photographs taken in 1963 and 1964. This feature appears to have been located along the previously mapped stream location.

A commercial structure with associated drive lanes and parking areas was constructed on the east side of the site between 1966 and 1970. The building and portions of the drive lanes were demolished between 2013 and 2015. That portion of the site was subsequently seeded and landscaped with trees. The parking lot for the structure remained at the site and currently serves as parking for the Carroll Knolls Park.

2.3 CURRENT SITE CONDITIONS

The site is currently occupied by a paved parking lot, benches, and picnic tables. Trees are spaced throughout the park with the western half of the site being heavily wooded. Access to the parking lot is from Evans Drive. A stub road dead ending just east of the parking lot entrance appears to have been a planned extension of Douglas Avenue. A chain link fence with wood posts surrounds the eastern side of the site.

The site is moderately sloped with elevations ranging from approximately EL 347 on the southwest side of the site to approximately EL 332 in the southeast corner of the site.

2.4 PROPOSED CONSTRUCTION

The project will consist of the renovation of the existing Carroll Knolls Local Park. The renovations will include (per the "Recommended Concept" drawing provided in the above referenced task order) the construction of new stormwater management facilities, new playground facilities, a nature trail, an active teen area, fitness hub, open space/soccer fields, picnic shelter, and changes to the existing parking lot. The size and type of the SWM facilities has yet to be determined.

Finished floor level for the picnic shelter has not been established; however, we have assumed it will be at or near existing grade which is approximately EL 337.5.

2.4.1 Structural Information/Loads

The following information explains our understanding of the structures and their loads:

Table 2.4.1.1 Design Values

SUBJECT	DESIGN INFORMATION / EXPECTATIONS
Building Footprint	Not available.
# of Stories	1 story above grade.
Usage	Picnic shelter
Framing	We anticipate that the building will consist of wood or steel framing on an at grade concrete slab.
Column Loads	25 kips (Assumed by ECS)
Wall Loads	3 to 5 kips per linear foot (klf) maximum (Assumed by ECS)
Lowest Finish Floor Elevation	Assumed to be at EL 337.5

3.0 FIELD EXPLORATION

3.1 FIELD EXPLORATION PROGRAM

The field exploration was planned with the objective of characterizing the project site in general geotechnical and geological terms and to evaluate subsequent field and laboratory data to assist in the determination of geotechnical recommendations.

3.1.1 Test Borings

The subsurface conditions were explored by drilling six (6) soil test borings spread throughout the project area. An all-terrain vehicle (ATV)-mounted drill rig was utilized to drill the soil test borings. Borings were generally advanced to depths of 10 to 15 feet below the current ground surface. Subsurface explorations were completed under the general supervision of an ECS geotechnical engineer or geologist.

Boring locations were located in the field by ECS personnel by taping from existing features, prior to mobilization of our drilling equipment. The approximate as-drilled boring locations are shown on the Boring Location Diagram in Appendix A. Ground surface elevations noted on our boring logs were interpolated from the "Boundary & Topographic Survey" drawing provided to us by Norton Land Design, LLC.

Standard penetration tests (SPTs) were conducted in the borings at regular intervals in general accordance with ASTM D 1586. Small representative samples were obtained during these tests and were used to classify the soils encountered. The standard penetration resistances obtained provide a general indication of soil shear strength and compressibility. Bulk samples taken from the upper 2 to 5 feet of subsurface soils at two (2) boring locations (SB-2, and SB-6), and bulk samples from the upper 7 to 10 inches of subsurface soils at five locations (HS-1 through HS-5) were obtained for subsequent laboratory testing.

3.1.2 Storm Water Infiltration Testing

In order to evaluate potential infiltration at this property, in-situ infiltration tests holes were drilled adjacent to test boring locations SB-2 and SB-3. The infiltration testing was performed at depths of 7.0 feet (EL 330.5) at location SB-2 and 4.0 feet (EL 332.5) at location SB-3.

The in-situ infiltration testing consisted of auguring a soil probe down to the test depth and installing a solid length of five inch diameter PVC pipe. The pipe was then pre-soaked for 24 hours by filling the pipe with approximately two feet of water. After the initial filling of the pipe, infiltration testing was completed by monitoring the drop in the water level at 60-minute intervals for four hours. The rate of drop over the four total hours is considered the infiltration rate.

3.2 REGIONAL/SITE GEOLOGY

According to the Physiographic Map of Maryland (2008)[1], the site is located within the Hampstead Upland District of the Piedmont Plateau Province. The Piedmont Plateau Province is an area

[1] James P. Reger and Emery T. Cleaves. *Physiographic Map of Maryland.* 1:250,000. Maryland Geological Survey, 2008.

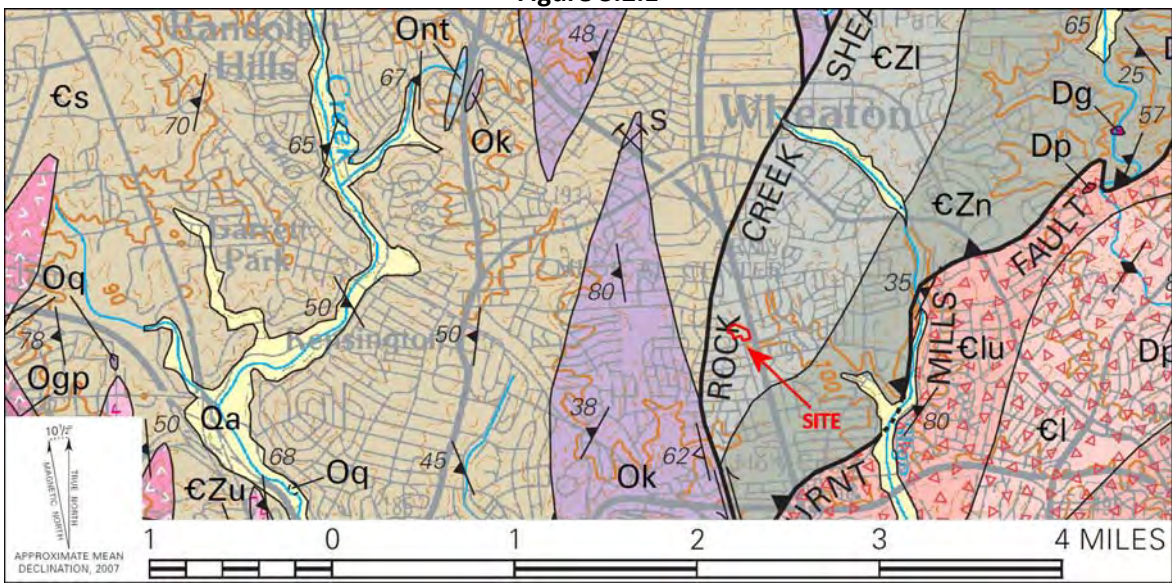
underlain by ancient igneous and metamorphic rock. The virgin soils encountered in this area are the residual product of in-place chemical weathering of the parent rock presently underlying the site. The typical residual soil profile consists of silty to clayey soils near the surface where soil weathering is more advanced, underlain by more sandy silts and silty sands that generally become harder and denser with depth to the top of parent bedrock. The boundary between soil and rock, termed weathered or decomposed rock, is not sharply defined. This transitional zone can contain boulders of more resistant rock as well as highly weathered materials.

The Hampstead Upland District is described as rolling to hilly uplands interrupted by steep-walled gorges. Differential weathering of adjacent, contrasting lithologies produces distinctive ridges, hills, barrens, and valleys. Streams may have short segments of narrow, steep-sided valleys.

Based upon the Geologic Map of the Frederick 30' x 60' Quadrangle, Maryland, Virginia, and West Virginia (2007)[2], the site is underlain by the Loch Raven Schist. The Loch Raven Schist is described as medium gray, medium to coarse grained, thin bedded, lustrous quartz muscovite biotite plagioclase schist that, in places, contains garnet, staurolite, and/or chlorite. Contains some interbedded semipelitic schist and meta-arenite similar to those of the underlying Northwest Branch Formation.

An overview of the general site geology is illustrated in Figure 3.2.1.

Figure 3.2.1



Geologic map for Figure 3.2.1 obtained from the Geologic Map of the Frederick 30' x 60' Quadrangle, Maryland, Virginia, and West Virginia (2007)

[2] Scott Southworth, David K. Brezinski, Avery Ala Drake, Jr., William C. Burton, Randall C. Orndoff, Albert J. Frolich, James E. Reddy, Danielle Denenny, and David Daniels. Geologic Map of the Frederick 30' x 60' Quadrangle, Maryland, Virginia, and West Virginia. 1:100,000. U.S. Geological Survey and Maryland Geologic Survey, 2007.

3.3 SOIL SURVEY MAPPING

Based on our review of the Soil Survey (USDA - Natural Resources Conservation Service (websoilsurvey.ncrs.usda.gov), the site soils are mapped as the Glenelg-Urban land complex. These soil types are described with properties as illustrated in Figure 3.3.1 below.

Figure 3.3.1

Unit Name		Typical Profile	Natural Drainage Class	Runoff Class	Depth to Groundwater Table	Depth to Restrictive Feature
Glenelg-Urban land complex (2UB)	Glenelg	0-10" loam 10-30" clay loam 30-54" loam 54-76" very channery sandy loam	Well drained	Medium	More than 80"	More than 80"
	Urban land	Urban land soils are generally described as land mostly covered by streets, parking lots, buildings, and other structures of urban areas.				

Soil mapping of the site vicinity is presented in Figure 3.3.2.

Figure 3.3.2

Soil Survey for Figure 3.3.2 obtained from USDA – Natural Resources Conservation Service; websoilsurvey.nrcs.usda.gov

3.4 SUBSURFACE CHARACTERIZATION

The subsurface conditions encountered were generally consistent with published geological mapping. The following sections provide generalized characterizations of the soil and rock strata encountered during our subsurface exploration. For subsurface information at a specific location, refer to the Boring Logs in Appendix B.

Table 3.4.1 Subsurface Stratigraphy

Approximate Depth Range (ft)	Elevation (ft)	Stratum	Description	Ranges of SPT[(1)] N-values (bpf)
0-0.3 ft (Surface cover)	EL 338.5-336.2	n/a	Two (2) to four (4) inches of topsoil was encountered at the boring locations.	N/A
0.2-8.0 ft	EL 337.8-330.0	I	Existing, undocumented fill materials. (SB-2 through SB-5)	4-13
0.2-15.0 ft	EL 338.3-322.5	II	Medium Dense to Dense SAND (SM, SP) and GRAVEL (GP, GP-GM), and Firm to Stiff CLAY (CL), and SILT (ML/CL), moist.	6-37

Notes: (1) Standard Penetration Test

3.5 GROUNDWATER OBSERVATIONS

Water levels were measured in our borings as noted on the soil boring logs in Appendix B. Groundwater was encountered at boring location SB-3 at a depth of 7.2 feet (EL 329.3) below the ground surface. Groundwater was not encountered in the remaining borings to the depths that the side walls caved (6.3 to 12.9 feet), which may be an indicator of groundwater presence.

It should be noted that fluctuations in the location of ground water conditions can occur as a result of seasonal variations in evaporation, precipitation, surface water run-off, localized perched water tables, and other factors not present at the time of the subsurface exploration. Perched water may be encountered at the interface of fill and natural soils, at the interface of the clayey soil horizons, or at the interface of soils and bedrock.

Based upon our interpretation of the boring data, it appears that the seasonal high groundwater level is located at a depth of 7.2 feet (EL 329.3). As such, groundwater is not likely to be a significant issue for the planned at-grade development.

4.0 LABORATORY TESTING

The laboratory testing performed by ECS for this project consisted of selected tests performed on samples obtained during our field exploration operations. The following paragraphs briefly discuss the results of the completed laboratory testing program. Classification and index property tests were performed on representative soil samples obtained from the test borings in order to aid in classifying soils according to the Unified Soil Classification System and to quantify and correlate engineering properties.

Laboratory testing included moisture content testing, a battery of horticultural testing (texture, Ph, soluble salts, nutrient content, organic content), Atterberg Limits, washed sieve gradation analyses, and hydrometer. The results of the laboratory testing are included in Appendix C.

An experienced geotechnical engineer/engineering geologist visually classified each soil sample from the test borings on the basis of texture and plasticity in accordance with the Unified Soil Classification System (USCS) and ASTM D-2488 (Description and Identification of Soils-Visual/Manual Procedures). After classification, the geotechnical engineer/engineering geologist grouped the various soil types into the major zones noted on the boring logs in Appendix B. The group symbols for each soil type are indicated in parentheses following the soil descriptions on the boring logs. The stratification lines designating the interfaces between earth materials on the boring logs are approximate; in situ, the transitions may be gradual.

5.0 DESIGN RECOMMENDATIONS

5.1 SITE DESIGN CONSIDERATIONS

The following sections provide recommendations for foundation design, soil supported slabs, seismic design parameters, and stormwater management facilities.

5.1.1 Foundations

Provided subgrades and structural fills are prepared as discussed herein, the proposed picnic shelter, playground structures and other site furnishings can be supported by conventional shallow foundations consisting of spread footings. The design of the foundation shall utilize the following parameters:

Table 5.1.1.1 Foundation Design

Design Parameter	Picnic Shelter, Playground Equipment and Site Furnishing Foundations (Shallow Spread Footings)
Net Allowable Bearing Pressure[1]	2,000 psf
Acceptable Bearing Soil Material	Stratum II (SM, SP, GP, GP-GM, ML/CL, CL) or New Structural Fill (Minimum SPT N-value = 6 bpf)
Minimum Width	30 inches (columns) 18 inches (wall footings)
Minimum Footing Embedment Depth (below slab or finished grade)	30 inches
Estimated Total Settlement	1 inch
Estimated Differential Settlement	< 0.5 inches between adjacent columns < 0.5 inches over 50 feet (walls)

1. Net allowable bearing pressure is the applied pressure in excess of the surrounding overburden soils above the base of the foundation.

It is anticipated that footing subgrades will generally be supported on natural ground or new compacted fill. However, the bases of all foundation excavations should be observed and tested by the Geotechnical Engineer.

Existing, undocumented FILL was encountered at four (4) boring locations (SB-2 through SB-5) and extended to a maximum depth of about 8 feet. Existing fill materials are likely to be encountered in other portions of the site not included in this study. **These existing fill materials are considered unsuitable for direct foundation support.**

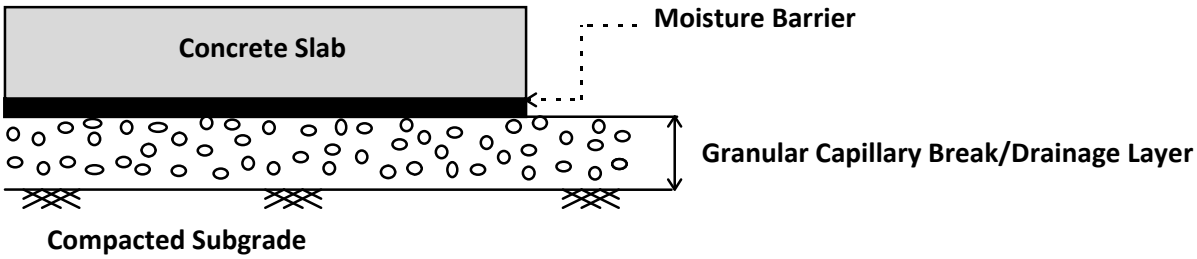
When existing fill or other unsuitable soils are encountered at planned subgrade levels for any footing, the unsuitable soils shall be undercut to suitable bearing materials. The footing can be directly supported on competent soils at greater depths or, alternatively, the design footing bearing level can be restored through placement of lean (2,500 psi) concrete or engineered fill materials. If lean concrete is to be used to restore foundation bearing levels, the undercut excavations can be made “neat” with the dimension of the footing. Lean concrete shall conform

to Maryland State Highway Mix No. 1. If the design bearing level is restored using engineered fill, however, then the excavation to remove the unsuitable soils shall extend at least 0.5 foot laterally beyond the bottom edge of the footing for each 1 foot of vertical undercut below the footing bearing level. All foundations should be constructed with Type I Portland cement concrete.

5.1.2 Floor Slabs

The on-site natural soils are considered suitable for support of the lowest floor slabs, although moisture control during earthwork operations, including the use of discing or appropriate drying equipment, may be necessary. Based on a review of the boring logs, it appears that the slabs for the picnic shelter will bear on the Stratum I, existing FILL materials or new compacted fill. These materials are likely suitable for the support of a slab-on-grade, however, there may be areas of soft, wet, or yielding soils in unexplored portions of the site that should be removed and replaced with compacted structural fill in accordance with the recommendations included in this report. Any existing fill planned to remain below floor slabs should be thoroughly evaluated by the Geotechnical Engineer during construction via proofrolling, test pitting, and/or observation of utility trenches. The following graphic depicts our soil-supported slab recommendations:

Figure 5.1.2.1



1. Drainage Layer Thickness: 4 inches
2. Drainage Layer Material: GRAVEL (GP, GW)
3. Subgrade compacted to ***98%*** maximum dry density per ASTM D698

Subgrade Modulus: Provided the placement of Structural Fill and Granular Drainage Layer per the recommendations discussed herein, the slab may be designed assuming a modulus of subgrade reaction, k_1 of 100 pci (lbs/cu. inch). The modulus of subgrade reaction value is based on a 1 ft by 1 ft plate load test basis.

Slab Isolation: Ground-supported slabs should be isolated from the foundations and foundation-supported elements of the structure so that differential movement between the foundations and slab will not induce excessive shear and bending stresses in the floor slab. Where the structural configuration prevents the use of a free-floating slab, the slab should be designed with suitable reinforcement and load transfer devices to preclude overstressing of the slab. Maximum differential settlement of soils supporting interior slabs is anticipated to be less than 1 inch in 40 feet.

5.1.3 Seismic Design Considerations

Seismic Site Classification: The International Building Code (IBC) 2015 requires site classification for seismic design based on the upper 100 feet of a soil profile. Three methods are utilized in classifying sites, namely the shear wave velocity (v_s) method; the unconfined compressive strength (s_u) method; and the Standard Penetration Resistance (N-value) method. The latter method (N-value method) was used in classifying this site.

The seismic site class definitions for the weighted average of shear wave velocity or SPT N-value in the upper 100 feet of the soil profile are shown in the following table:

Table 5.1.3.1 Seismic Site Classification

Site Class	Soil Profile Name	Shear Wave Velocity, Vs, (ft./s)	N value (bpf)
A	Hard Rock	Vs > 5,000 fps	N/A
B	Rock	2,500 < Vs ≤ 5,000 fps	N/A
C	Very dense soil and soft rock	1,200 < Vs ≤ 2,500 fps	>50
D	Stiff Soil Profile	600 ≤ Vs ≤ 1,200 fps	15 to 50
E	Soft Soil Profile	Vs < 600 fps	<15

Utilizing the data obtained from the on-site boring exploration and our previous experience at neighboring sites, a mean SPT "N"-value between 15 and 50 blows per foot (bpf) is anticipated within 100 feet of the ground surface; therefore, the Seismic Site Class is ***D***.

If it is determined that significant advantage could be gained with an improved Site Class, additional site testing could be performed to measure actual shear wave velocities using ReMi test methods along with a site specific analysis. ECS can provide additional consultation upon request.

Liquefaction: The subsurface profile consists primarily of residual soils derived from the in-place weathering of Metasiltstone rock. The subsurface conditions do not appear to exhibit liquefaction potential; therefore, it is our opinion that additional investigation regarding liquefaction potential is not necessary.

Ground Motion Parameters: In addition to the seismic site classification noted above, ECS has determined the design spectral response acceleration parameters following the IBC 2015 methodology. The Mapped Reponses were estimated from the free Seismic Design Maps calculator available from the Structural Engineers Association of California website (https://seismicmaps.org/). The design responses for the short (0.2 sec, S_{DS}) and 1-second period (S_{D1}) are noted in bold at the far right end of the following table.

Table 5.1.3.2 Ground Motion Parameters *(IBC 2015 Method)*

Period (sec)	Mapped Spectral Response Accelerations (g)		Values of Site Coefficient for Site Class		Maximum Spectral Response Acceleration Adjusted for Site Class (g)		Design Spectral Response Acceleration (g)	
Reference	Figures 1613.3.1 (1) & (2)		Tables 1613.3.3 (1) & (2)		Eqs. 16-37 & 16-38		Eqs. 16-39 & 16-40	
0.2	S_S	0.120	F_a	1.6	$S_{MS}=F_aS_s$	0.191	$S_{DS}=2/3\,S_{MS}$	0.128
1.0	S_1	0.051	F_v	2.4	$S_{M1}=F_vS_1$	0.122	$S_{D1}=2/3\,S_{M1}$	0.082

The Site Class definition should not be confused with the Seismic Design Category designation, which the Structural Engineer typically assesses. If a higher site classification is beneficial to the project, ECS would be pleased to discuss additional testing capabilities in this regard.

5.2 SITE DESIGN CONSIDERATIONS

5.2.1 Stormwater management facilities

We understand that stormwater management (SWM) facilities will be spread throughout the site. The type and size of the facilities has not yet been determined.

Infiltration Characteristics

Three in-situ infiltration tests were completed at the site on April 23, 2019. The infiltration test results are shown in Table 5.1.2.1 and in Appendix B.

Table 5.1.2.1 Infiltration Test Results

Test Location	Test Depth (ft)	Approximate Test Elevation (EL)	Soil Encountered at Test Depth	Field Infiltration Rate (in/hr)	USDA Soil Classification
SB-2	7.0	330.5	Medium Dense POORLY GRADED GRAVEL WITH CLAY (GP-GC)	0.03	Sandy Loam
SB-3	4.0	332.5	Stiff CLAYEY SILT WITH SAND (ML-CL)	0.21	Silt Loam

The results reported above are based on field measurements. We recommend that the design rate be calculated as 2/3 of the field rate to account for siltation over time.

6.0 SITE CONSTRUCTION RECOMMENDATIONS

6.1 SUBGRADE PREPARATION

6.1.1 Stripping and Grubbing

The subgrade preparation should consist of stripping all vegetation, rootmat, topsoil, and any other soft or unsuitable materials from the 10-foot expanded building and 5-foot expanded pavement limits and to 5 feet beyond the toe of structural fills. ECS should be called on to verify that topsoil and unsuitable surficial materials have been completely removed prior to the placement of Structural Fill or construction of structures. We recommend a minimum stripping depth of 12 inches be budgeted for.

6.1.2 Proofrolling

After removing all unsuitable surface materials, cutting to the proposed grade, and prior to the placement of any structural fill or other construction materials, the exposed subgrade should be examined by the Geotechnical Engineer or authorized representative. The exposed subgrade should be thoroughly proofrolled with previously approved construction equipment having a minimum axle load of 10 tons (e.g. fully loaded tandem-axle dump truck). The areas subject to proofrolling should be traversed by the equipment in two perpendicular (orthogonal) directions with overlapping passes of the vehicle under the observation of the Geotechnical Engineer or authorized representative. This procedure is intended to assist in identifying any localized yielding materials. In the event that unstable or "pumping" subgrade is identified by the proofrolling, those areas should be marked for repair prior to the placement of any subsequent structural fill or other construction materials. Methods of repair of unstable subgrade, such as undercutting or moisture conditioning or chemical stabilization, should be discussed with the Geotechnical Engineer to determine the appropriate procedure with regard to the existing conditions causing the instability. A test pit(s) may be excavated to explore the shallow subsurface materials in the area of the instability to help in determined the cause of the observed unstable materials and to assist in the evaluation of the appropriate remedial action to stabilize the subgrade.

6.1.3 Site Temporary Dewatering

General Groundwater Conditions: Groundwater observations are described in Section 3.5 of this report. Groundwater on this site can generally be characterized as being approximately 7 feet below existing grades (below approximately EL 330).

Subsurface Water: Based upon our subsurface exploration at this site, as well as significant experience on sites in nearby areas of similar geologic setting, we believe construction dewatering at this site will be limited to mainly removing accumulated rain water and some minor seepage into excavations. It appears permanent static groundwater for this site will be below the planned deepest excavation, which we have assumed to be less than 7 feet below existing grade.

Deep wells will not be required for the temporary dewatering system. However, the dewatering operations can be handled by the use of conventional submersible pumps directly in the excavation or temporary trenches or French drains consisting of free draining granular stone

wrapped in filter fabric to direct the flow of water and to remove water from the excavation. If temporary sump pits are used, we recommend they be established at an elevation 3 to 5 feet below the bottom of the excavation subgrade or bottom of footing. A perforated 55 gallon drum or other temporary structure could be used to house the pump. We recommend continuous dewatering of the excavations using electric pumps or manned gasoline pumps be used during construction.

Details of a typical french drainage installation are included as an attachment to this report. If utilized, the french drain should consist of a filter fabric lined trench filled with No. 57 stone or equivalent open graded stone. A minimum of 4-inch diameter PVC pipe should be placed in the stone bed to enhance water flow. After this installation has been completed, the filter fabric should be wrapped over the top of the gravel and pipe whereupon placement of fill may proceed to grade.

6.1.4 Subgrade Stabilization

Subgrade Benching: Fill should not be placed on ground with a slope steeper than 5H:1V, unless the fill is confined by an opposing slope, such as in a ravine. Otherwise, where steeper slopes exist, the ground should be benched so as to allow for fill placement on a horizontal surface.

Subgrade Compaction: Upon completion of subgrade documentation, the exposed subgrade within the 10-foot expanded building and 5-foot expanded pavement and embankment limits should be moisture conditioned to within -1 and +3 % of the soil's optimum moisture content and be compacted with suitable equipment (minimum 10-ton roller) to a depth of 10 inches. Subgrade compaction within the expanded building, pavement, and embankment limits should be to a dry density of at least 98% of the Standard Proctor maximum dry density (ASTM D698). Beyond these areas, compaction of at least 95% should be achieved. ECS should be called on to document that proper subgrade compaction has been achieved.

Subgrade Compaction Control: The expanded limits of the proposed construction areas should be well defined, including the limits for buildings, pavements, fills, and slopes, etc. Field density testing of subgrades will be performed at frequencies in Table 6.1.4.1.

Table 6.1.4.1 Frequency of Subgrade Compaction Testing

Location	Frequency of Tests
Expanded Structural Limits	1 test per 2,500 sq. ft.
Pavement Areas	1 test per 10,000 sq. ft.
Outparcels/SWM Facilities	1 test per 2,500 sq. ft.
All Other Non-Critical Areas	1 test per 10,000 sq. ft.

Subgrade Stabilization: Is some areas, undercutting of excessively soft materials may be considered inefficient. In such areas the use of a reinforcing geotextile or geogrid might be employed, under the advisement of ECS. Suitable stabilization materials may include medium duty woven geotextile fabrics or geogrids. The suitability and employment of reinforcing or stabilization products should be determined in the field by ECS personnel, in accordance with project specifications.

6.2 EARTHWORK OPERATIONS

6.2.1 Existing Man-Placed Fill

Fill Content: Existing Fill materials up to about 8 feet deep were encountered at four (4) of the boring locations. Fill materials may also be expected in areas of the site that were not explored. Based on a review of the fill materials, it appears that these fill materials were obtained from the general area, likely during the initial development of the site.

Fill Removal in Non-Structural Areas: All existing fill material deemed unsuitable via results of a proofroll and direct observation by the Geotechnical Engineer should be removed from below the expanded limits of pavements and Structural Fill embankments. The expanded limits of pavements and Structural Fill embankments should be defined as that area directly below pavements and Structural Fill embankments, including the reinforced zone of MSE walls, and extending horizontally beyond the edge of these a distance of 1 horizontal foot for every vertical foot of Structural Fill depth above natural subgrade, but not less than 5 feet. ECS personnel should ascertain that fill removal has been suitably accomplished.

Fill Removal in Structural Areas - Any existing fill encountered within footing excavations should be removed to natural soils as outlined in Section 5.1.1 Foundations. Existing fill can remain in-place below floor slabs provided it has been thoroughly evaluated by the Geotechnical Engineer during construction.

6.2.2 Structural Fill Materials

Product Submittals: Prior to placement of Structural Fill, representative bulk samples (about 50 pounds) of on-site and off-site borrow should be submitted to ECS for laboratory testing, which will include Atterberg limits, natural moisture content, grain-size distribution, and moisture-density relationships for compaction. Import materials should be tested prior to being hauled to the site to determine if they meet project specifications.

Satisfactory Structural Fill Materials: Materials satisfactory for use as Structural Fill should consist of inorganic soils classified as CL, ML, SM, SC, SW, SP, GW, GP, GM and GC, or a combination of these group symbols, per ASTM D 2487. The materials should be free of organic matter, debris, and should contain no particle sizes greater than 4 inches in the largest dimension. Open graded materials, such as Gravels (GW and GP), which contain void space in their mass should not be used in structural fills unless properly encapsulated with filter fabric. Suitable Structural Fill material should have the index properties shown in Table 6.2.2.1.

Table 6.2.2.1 Structural Fill Index Properties

Location with Respect to Final Grade	LL	PI
Structural Areas, upper 4 feet	40 max	20 max
Structural Areas, below upper 4 feet	50 max	20 max
Pavement Areas, upper 2 feet	40 max	20 max
Pavement Areas, below upper 2 feet	50 max	20 max

Satisfactory Site Retaining Wall Backfill: All soils used as backfill within the Critical Zone behind retaining walls should have USCS classifications of Silty SAND (SM) or more granular with a maximum of 35% fines and minimum angle of internal friction of 30 degrees when compacted to a minimum of 98% of its maximum dry density per ASTM D 698. Any existing soils not meeting these criteria should be removed from the Critical Zone of the walls, as determined by ECS personnel at the time of construction.

Unsatisfactory Materials: Unsatisfactory fill materials include materials which to not satisfy the requirements for suitable materials, as well as topsoil and organic materials (OH, OL), elastic Silt (MH), and high plasticity Clay (CH). The owner can consider allowing soils with a maximum Liquid Limit of 60 and Plasticity Index of 30 to be used as Structural Fill at depths greater than 4 feet below pavement subgrades outside the expanded building limits and within non-structural areas.

On-Site Borrow Suitability: Based on the results of the soil borings and laboratory testing performed, a majority of the on-site soils will be suitable for reuse provided they are conditioned as discussed here.

Optimum moisture content of the Proctor sample was 13.0%. As indicated on the Laboratory Test Results Summary of Appendix C, the natural moisture contents of a majority of the samples tested was generally less than 15%. Therefore, moisture conditioning of subgrades and fill lifts will likely be limited to the wetter months. Soil modification with Quick Lime or Calciment® should prove effective in reducing moisture contents of subgrades and fills.

6.2.3 Compaction

Structural Fill Compaction: Structural Fill within the expanded building, pavement, and embankment limits should be placed in maximum 8-inch loose lifts, moisture conditioned as necessary to within -1 and +3 % of the soil's optimum moisture content, and be compacted with suitable equipment to a dry density of at least 98% of the Standard Proctor maximum dry density (ASTM D698). Beyond these areas, compaction of at least 95% should be achieved. ECS should be called on to document that proper fill compaction has been achieved.

Fill Compaction Control: The expanded limits of the proposed construction areas should be well defined, including the limits of the fill zones for buildings, pavements, and slopes, etc., at the time of fill placement. Grade controls should be maintained throughout the filling operations. All filling operations should be observed on a full-time basis by a qualified representative of the construction testing laboratory to determine that the minimum compaction requirements are being achieved. Field density testing of fills will be performed at the frequencies shown in Table 6.2.3.1, but not less than 1 test per lift.

Table 6.2.3.1 Frequency of Compaction Tests in Fill Areas

Location	Frequency of Tests
Expanded Structural Limits	1 test per 2,500 sq. ft. per lift
Pavement Areas	1 test per 10,000 sq. ft. per lift
Utility Trenches	1 test per 200 linear ft. per lift
Outparcels/SWM Facilities	1 test per 5,000 sq. ft. per lift
All Other Non-Critical Areas	1 test per 10,000 sq. ft. per lift

Compaction Equipment: Compaction equipment suitable to the soil type being compacted should be used to compact the subgrades and fill materials. Sheepsfoot compaction equipment should be suitable for the fine-grained soils (Clays and Silts). A vibratory steel drum roller should be used for compaction of coarse-grained soils (Sands) as well as for sealing compacted surfaces.

Fill Placement Considerations: Fill materials should not be placed on frozen soils, on frost-heaved soils, and/or on excessively wet soils. Borrow fill materials should not contain frozen materials at the time of placement, and all frozen or frost-heaved soils should be removed prior to placement of Structural Fill or other fill soils and aggregates. Excessively wet soils or aggregates should be scarified, aerated, and moisture conditioned.

At the end of each work day, all fill areas should be graded to facilitate drainage of any precipitation and the surface should be sealed by use of a smooth-drum roller to limit infiltration of surface water. During placement and compaction of new fill at the beginning of each workday, the Contractor may need to scarify existing subgrades to a depth on the order of 4 inches so that a weak plane will not be formed between the new fill and the existing subgrade soils.

Drying and compaction of wet soils is typically difficult during the cold, winter months. Accordingly, earthwork should be performed during the warmer, drier times of the year, if practical. Proper drainage should be maintained during the earthwork phases of construction to prevent ponding of water which has a tendency to degrade subgrade soils. Alternatively, if these soils cannot be stabilized by conventional methods as previously discussed, additional modifications to the subgrade soils such as lime or cement stabilization may be utilized to adjust the moisture content. If lime or cement are utilized to control moisture contents and/or for stabilization, Quick Lime, Calciment® or regular Type 1 cement can be used. The construction testing laboratory should evaluate proposed lime or cement soil modification procedures, such as quantity of additive and mixing and curing procedures, before implementation. The contractor should be required to minimize dusting or implement dust control measures, as required.

Where fill materials will be placed to widen existing embankment fills, or placed up against sloping ground, the soil subgrade should be scarified and the new fill benched or keyed into the existing material. Fill material should be placed in horizontal lifts. In confined areas such as utility trenches, portable compaction equipment and thin lifts of 3 inches to 4 inches may be required to achieve specified degrees of compaction.

We recommend that the grading contractor have equipment on site during earthwork for both drying and wetting fill soils. We do not anticipate significant problems in controlling moisture within the fill during dry weather, but moisture control may be difficult during winter months or

extended periods of rain. The control of moisture content of higher plasticity soils is difficult when these soils become wet. Further, such soils are easily degraded by construction traffic when the moisture content is elevated.

6.3 UTILITY INSTALLATIONS

Utility Subgrades: The soils encountered in our exploration are expected to be generally suitable for support of utility pipes. The pipe subgrade should be observed and probed for stability by ECS to evaluate the suitability of the materials encountered. Any loose or unsuitable materials encountered at the utility pipe subgrade elevation should be removed and replaced with suitable compacted Structural Fill or pipe bedding material.

Utility Backfilling: The granular bedding material should be at least 4 inches thick, but not less than that specified by the project drawings and specifications. Fill placed for support of the utilities, as well as backfill over the utilities, should satisfy the requirements for Structural Fill given in this report. Compacted backfill should be free of topsoil, roots, ice, or any other material designated by ECS as unsuitable. The backfill should be moisture conditioned, placed, and compacted in accordance with the recommendations of this report.

Utility Excavation Dewatering: It is possible that perched water may be encountered by utility excavations which extend below existing grades. It is expected that removal of perched water which seeps into excavations could be accomplished by pumping from sumps excavated in the trench bottom and which are backfilled with DOT Size No. 57 Stone or open graded bedding material. Should water conditions beyond the capability of sump pumping be encountered, the contractor should submit a Dewatering Plan in accordance with project specifications.

Excavation Safety: All excavations and slopes should be made and maintained in accordance with OSHA excavation safety standards. The contractor is solely responsible for designing and constructing stable, temporary excavations and slopes and should shore, slope, or bench the sides of the excavations and slopes as required to maintain stability of both the excavation sides and bottom. The contractor's responsible person, as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. 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. ECS is providing this information solely as a service to our client. ECS is not assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

6.4 FOUNDATION AND SLAB OBSERVATIONS

Protection of Foundation Excavations: Exposure to the environment may weaken the soils at the footing bearing level if the foundation excavations remain open for too long a time. Therefore, foundation concrete should be placed the same day that excavations are made. If the bearing soils are softened by surface water intrusion or exposure, the softened soils must be removed from the foundation excavation bottom immediately prior to placement of concrete. If the excavation must remain open overnight, or if rainfall becomes imminent while the bearing soils are exposed, a 1 to 3-inch thick "mud mat" of "lean" concrete should be placed on the bearing soils before the placement of reinforcing steel.

Footing Subgrade Observations: Most of the soils at the foundation bearing elevation are anticipated to be suitable for support of the proposed structure. It will be important to have the geotechnical engineer of record observe the foundation subgrade prior to placing foundation concrete, to confirm the bearing soils are what was anticipated. If soft or unsuitable soils are observed at the footing bearing elevations, the unsuitable soils should be undercut and removed. Any undercut should be backfilled with lean concrete ($f'_c \geq 1{,}000$ psi at 28 days) up to the original design bottom of footing elevation; the original footing shall be constructed on top of the hardened lean concrete.

Slab Subgrade Verification: A representative of ECS should be called on to observe exposed subgrades within the expanded building limits prior to Structural Fill Placement to assure that adequate subgrade preparation has been achieved. A proofrolling using a drum roller or loaded dump truck should be performed in their presence at that time. Once subgrades have been prepared to the satisfaction of ECS, subgrades should be properly compacted and new Structural Fill can be placed. Existing subgrades to a depth of at least 10 inches and all Structural Fill should be moisture conditioned to within -1/+3 percentage points of optimum moisture content then be compacted to the required density. If there will be a significant time lag between the site grading work and final grading of concrete slab areas prior to the placement of the subbase stone and concrete, a representative of ECS should be called on to verify the condition of the prepared subgrade. Prior to final slab construction, the subgrade may require scarification, moisture conditioning, and re-compaction to restore stable conditions.

6.5 GENERAL CONSTRUCTION CONSIDERATIONS

Moisture Conditioning: During the cooler and wetter periods of the year, delays and additional costs should be anticipated. At these times, reduction of soil moisture may need to be accomplished by a combination of mechanical manipulation and the use of chemical additives, such as lime or cement, in order to lower moisture contents to levels appropriate for compaction. Alternatively, during the drier times of the year, such as the summer months, moisture may need to be added to the soil to provide adequate moisture for successful compaction according to the project requirements.

Subgrade Protection: Measures should also be taken to limit site disturbance, especially from rubber-tired heavy construction equipment, and to control and remove surface water from development areas, including structural and pavement areas. It would be advisable to designate a haul road and construction staging area to limit the areas of disturbance and to prevent construction traffic from excessively degrading sensitive subgrade soils and existing pavement areas. Haul roads and construction staging areas could be covered with excess depths of aggregate to protect those subgrades. The aggregate can later be removed and used in pavement areas.

Surface Drainage: Surface drainage conditions should be properly maintained. Surface water should be directed away from the construction area, and the work area should be sloped away from the construction area at a gradient of 1 percent or greater to reduce the potential of ponding water and the subsequent saturation of the surface soils. At the end of each work day, the subgrade soils should be sealed by rolling the surface with a smooth drum roller to minimize infiltration of surface water.

Excavation Safety: Cuts or excavations associated with utility excavations may require forming or bracing, slope flattening, or other physical measures to control sloughing and/or prevent slope failures. Contractors should be familiar with applicable OSHA codes to ensure that adequate protection of the excavations and trench walls is provided.

Erosion Control: The surface soils may be erodible. Therefore, the Contractor should provide and maintain good site drainage during earthwork operations to maintain the integrity of the surface soils. All erosion and sedimentation controls should be in accordance with sound engineering practices and local requirements.

7.0 CLOSING

ECS has prepared this report of findings, evaluations, and recommendations to guide geotechnical-related design and construction aspects of the project.

The description of the proposed project is based on information provided to ECS by Norton Land Design, LLC. If any of this information is inaccurate, either due to our interpretation of the documents provided or site or design changes that may occur later, ECS should be contacted immediately in order that we can review the report in light of the changes and provide additional or alternate recommendations as may be required to reflect the proposed construction.

We recommend that ECS be allowed to review the project's plans and specifications pertaining to our work so that we may ascertain consistency of those plans/specifications with the intent of the geotechnical report.

Field observations, monitoring, and quality assurance testing during earthwork and foundation installation are an extension of and integral to the geotechnical design recommendation. We recommend that the owner retain these quality assurance services and that ECS be allowed to continue our involvement throughout these critical phases of construction to provide general consultation as issues arise. ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

APPENDIX A – Drawings & Reports

Site Location Diagram
Boring Location Diagram
Geologic Map
Soil Survey Map

Site Location Diagram
CARROLL KNOLLS LOCAL PARK

10500 GEORGIA AVENUE, SILVER SPRING, MD

NORTON LAND DESIGN, LLC

ENGINEER	BAM
SCALE	1 " = 150 '
PROJECT NO.	13:9098
SHEET	1 OF 1
DATE	4/9/2019

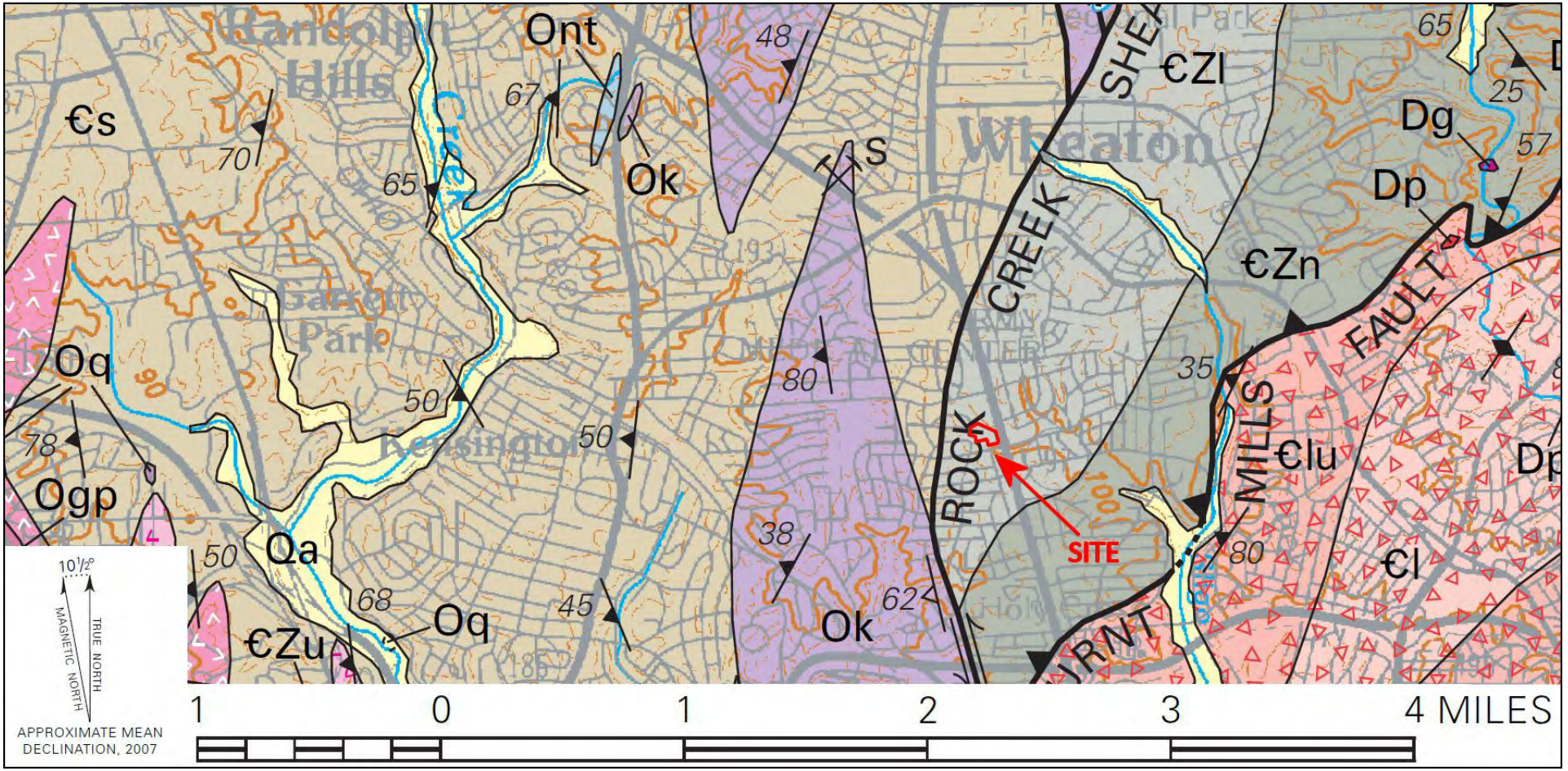
Boring Location Diagram

NORTON LAND DESIGN, LLC

CARROLL KNOLLS LOCAL PARK RENOVATION FACILITY

10500 GEORGIA AVENUE, SILVER SPRING, MD

ENGINEER	BAM
SCALE	1 " = 60 '
PROJECT NO.	13:9098
SHEET	1 OF 1
DATE	5/31/2019



Geologic map for Figure 3.2.1 obtained from the Geologic Map of the Frederick 30' x 60' Quadrangle, Maryland, Virginia, and West Virginia (2007)

Soil Survey image obtained from USDA – Natural Resources Conservation Service; websoilsurvey.nrcs.usda.gov

Appendix A – Drawings and Reports
Soil Survey Map
ECS Project No. 13:9098

ECS LLC MID-ATLANTIC

Carroll Knolls Local Park Renovation Facility Plan
10500 Georgia Avenue
Silver Spring, Montgomery County, Maryland

APPENDIX B – Field Operations

Reference Notes for Boring Logs
Boring Logs (SB-1 and SB-6)
Infiltration Test Results

REFERENCE NOTES FOR BORING LOGS

MATERIAL[1,2]	
	ASPHALT
	CONCRETE
	GRAVEL
	TOPSOIL
	VOID
	BRICK
	AGGREGATE BASE COURSE
	FILL[3] MAN-PLACED SOILS
GW	**WELL-GRADED GRAVEL** gravel-sand mixtures, little or no fines
GP	**POORLY-GRADED GRAVEL** gravel-sand mixtures, little or no fines
GM	**SILTY GRAVEL** gravel-sand-silt mixtures
GC	**CLAYEY GRAVEL** gravel-sand-clay mixtures
SW	**WELL-GRADED SAND** gravelly sand, little or no fines
SP	**POORLY-GRADED SAND** gravelly sand, little or no fines
SM	**SILTY SAND** sand-silt mixtures
SC	**CLAYEY SAND** sand-clay mixtures
ML	**SILT** non-plastic to medium plasticity
MH	**ELASTIC SILT** high plasticity
CL	**LEAN CLAY** low to medium plasticity
CH	**FAT CLAY** high plasticity
OL	**ORGANIC SILT or CLAY** non-plastic to low plasticity
OH	**ORGANIC SILT or CLAY** high plasticity
PT	**PEAT** highly organic soils

DRILLING SAMPLING SYMBOLS & ABBREVIATIONS			
SS	Split Spoon Sampler	PM	Pressuremeter Test
ST	Shelby Tube Sampler	RD	Rock Bit Drilling
WS	Wash Sample	RC	Rock Core, NX, BX, AX
BS	Bulk Sample of Cuttings	REC	Rock Sample Recovery %
PA	Power Auger (no sample)	RQD	Rock Quality Designation %
HSA	Hollow Stem Auger		

PARTICLE SIZE IDENTIFICATION		
DESIGNATION		**PARTICLE SIZES**
Boulders		12 inches (300 mm) or larger
Cobbles		3 inches to 12 inches (75 mm to 300 mm)
Gravel:	Coarse	¾ inch to 3 inches (19 mm to 75 mm)
	Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)
Sand:	Coarse	2.00 mm to 4.75 mm (No. 10 to No. 4 sieve)
	Medium	0.425 mm to 2.00 mm (No. 40 to No. 10 sieve)
	Fine	0.074 mm to 0.425 mm (No. 200 to No. 40 sieve)
Silt & Clay ("Fines")		<0.074 mm (smaller than a No. 200 sieve)

COHESIVE SILTS & CLAYS		
UNCONFINED COMPRESSIVE STRENGTH, Q_P[4]	**SPT[5] (BPF)**	**CONSISTENCY[7] (COHESIVE)**
<0.25	<3	Very Soft
0.25 - <0.50	3 - 4	Soft
0.50 - <1.00	5 - 8	Medium Stiff
1.00 - <2.00	9 - 15	Stiff
2.00 - <4.00	16 - 30	Very Stiff
4.00 - 8.00	31 - 50	Hard
>8.00	>50	Very Hard

GRAVELS, SANDS & NON-COHESIVE SILTS	
SPT[5]	**DENSITY**
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

RELATIVE AMOUNT[7]	COARSE GRAINED (%)[8]	FINE GRAINED (%)[8]
Trace	≤5	≤5
Dual Symbol *(ex: SW-SM)*	10	10
With	15 - 20	15 - 25
Adjective *(ex: "Silty")*	≥25	≥30

WATER LEVELS[6]		
	WL	Water Level (WS)(WD)
		(WS) While Sampling
		(WD) While Drilling
	SHW	Seasonal High WT
	ACR	After Casing Removal
	SWT	Stabilized Water Table
	DCI	Dry Cave-In
	WCI	Wet Cave-In

[1] *Classifications and symbols per ASTM D 2488-09 (Visual-Manual Procedure) unless noted otherwise.*

[2] *To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.*

[3] *Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-**FILL**)].*

[4] *Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).*

[5] *Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf).*

[6] *The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.*

[7] *Minor deviation from ASTM D 2488-09 Note 16.*

[8] *Percentages are estimated to the nearest 5% per ASTM D 2488-09.*

CLIENT	Job #:	BORING #	SHEET
Norton Land Design, LLC	13:9098	SB-1	1 OF 1

PROJECT NAME: Carroll Knolls Local Park Renovation Facility Plan

ARCHITECT-ENGINEER:

SITE LOCATION: 10500 Georgia Avenue, Silver Spring, Montgomery County, MD

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

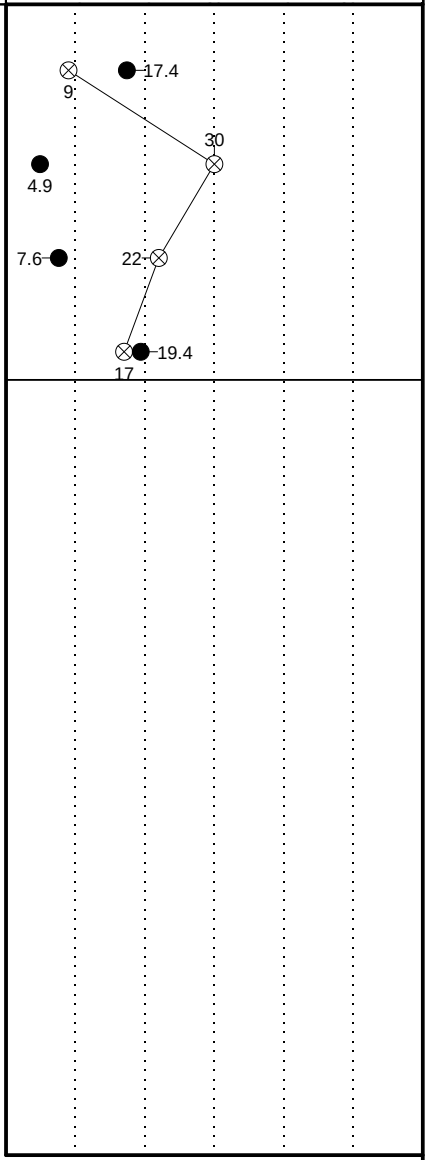
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 337

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Thickness [2.00"]			
	S-1	SS	18	16	(CL) SANDY LEAN CLAY, trace gravel, contains slight roots, light brown, moist, stiff		335	2 4 5
	S-2	SS	18	12	(GP) GRAVEL WITH SAND And SILT, trace clay brownish white, moist, medium dense			9 13 17
5	S-3	SS	18	16	(GP-GM) GRAVEL WITH SILT And SAND, brownish tan, moist, medium dense		330	29 10 12
	S-4	SS	18	18	(SM) SILTY SAND, contains mica, tan, moist, medium dense			6 8 9
10					END OF BORING @ 10'		325	
15							320	
20							315	
25							310	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL DRY WS ☐ WD ☒	BORING STARTED 04/22/19	CAVE IN DEPTH 7.7
WL(SHW) WL(ACR)	BORING COMPLETED 04/22/19	HAMMER TYPE Auto
WL	RIG CME 550 FOREMAN Dale Price	DRILLING METHOD HSA

CLIENT	Job #:	BORING #	SHEET
Norton Land Design, LLC	13:9098	SB-2	1 OF 1

PROJECT NAME: Carroll Knolls Local Park Renovation Facility Plan

ARCHITECT-ENGINEER:

SITE LOCATION: 10500 Georgia Avenue, Silver Spring, Montgomery County, MD

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - - - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

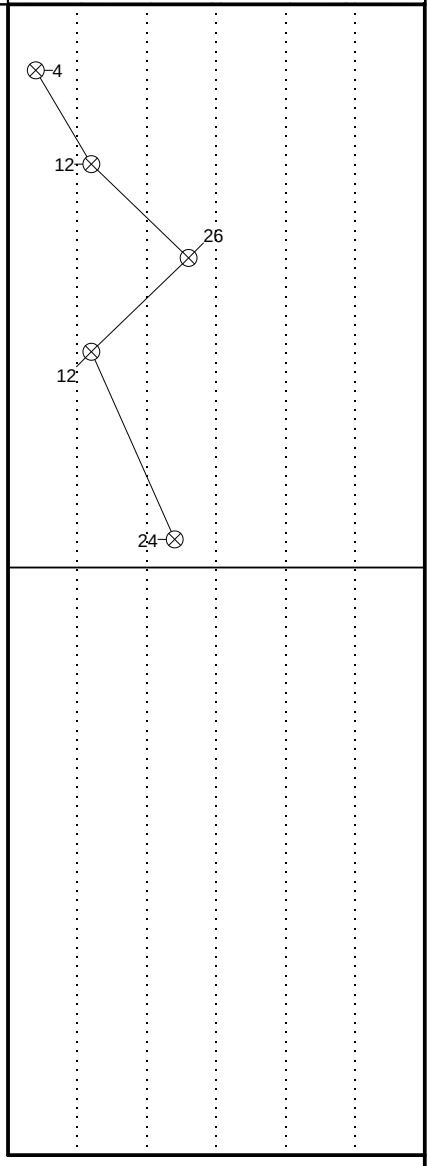
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 337.5

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Thickness [2.00"]			
	S-1	SS	18	16	(CL FILL) FILL, SANDY LEAN CLAY, trace gravel, brownish tan, moist, soft to stiff		335	2 2 2
	S-2	SS	18	4				3 5 7
5	S-3	SS	18	12	(GP) Poorly Graded GRAVEL WITH CLAY, tannish orange, moist, medium dense		330	10 14 12
	S-4	SS	18	14	(SM) SILTY SAND, trace gravel, contains mica, tan, moist, medium dense			6 5 7
10							325	
	S-5	SS	18	18	(SM) SILTY SAND, trace clay, contains mica, tan, moist, medium dense			8 11 13
15					END OF BORING @ 15'		320	
20							315	
25							310	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL DRY WS ☐ WD ☒	BORING STARTED 04/22/19	CAVE IN DEPTH 12.9
WL(SHW) WL(ACR)	BORING COMPLETED 04/22/19	HAMMER TYPE Auto
WL	RIG CME 550 FOREMAN Dale Price	DRILLING METHOD HSA

CLIENT	Job #:	BORING #	SHEET
Norton Land Design, LLC	13:9098	SB-3	1 OF 1

PROJECT NAME: Carroll Knolls Local Park Renovation Facility Plan

ARCHITECT-ENGINEER:

SITE LOCATION: 10500 Georgia Avenue, Silver Spring, Montgomery County, MD

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

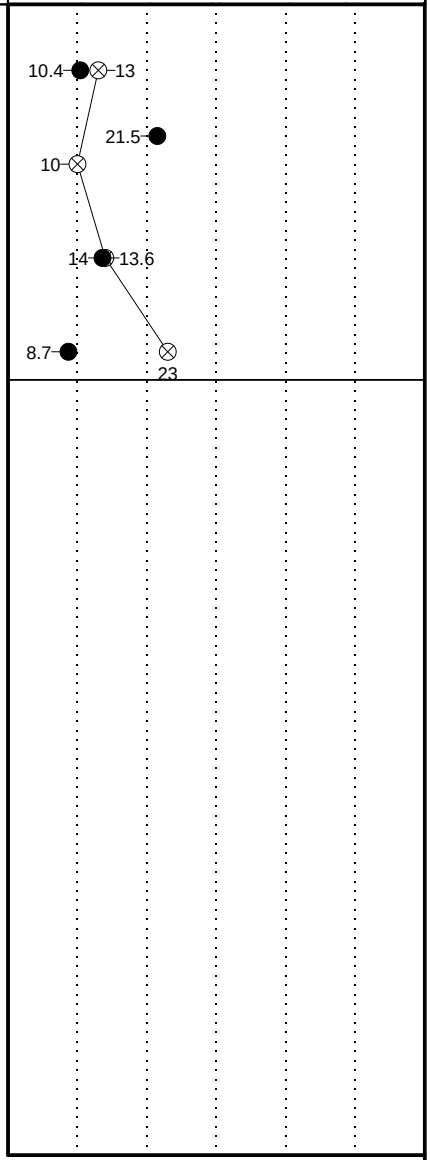
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 336.5

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Thickness [4.00"]			
	S-1	SS	18	10	(GP-GM FILL) FILL, GRAVEL WITH SILT And SAND, trace clay, contains mica, brownish tan, moist, medium dense		335	5 6 7
	S-2	SS	18	18	(ML-CL) CLAYEY SILT WITH SAND, gray, moist, stiff			2 4 6
5	S-3	SS	18	18	(SP) SAND, trace silt, contains slight mica, gray, moist, medium dense	▼	330	5 7 7
	S-4	SS	18	12	(GP) GRAVEL WITH SAND, brown, moist, medium dense			11 12 11
10					END OF BORING @ 10'		325	
15							320	
20							315	
25							310	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

▽ WL 8.0 WS ☐ WD ☒	BORING STARTED 04/22/19	CAVE IN DEPTH 7.4
▽ WL(SHW) ▼ WL(ACR) 7.2	BORING COMPLETED 04/22/19	HAMMER TYPE Auto
▽ WL	RIG CME 550 FOREMAN Dale Price	DRILLING METHOD HSA

CLIENT	Job #:	BORING #	SHEET
Norton Land Design, LLC	13:9098	SB-4	1 OF 1

PROJECT NAME: Carroll Knolls Local Park Renovation Facility Plan

ARCHITECT-ENGINEER:

SITE LOCATION: 10500 Georgia Avenue, Silver Spring, Montgomery County, MD

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT²

ROCK QUALITY DESIGNATION & RECOVERY
RQD% - - - REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

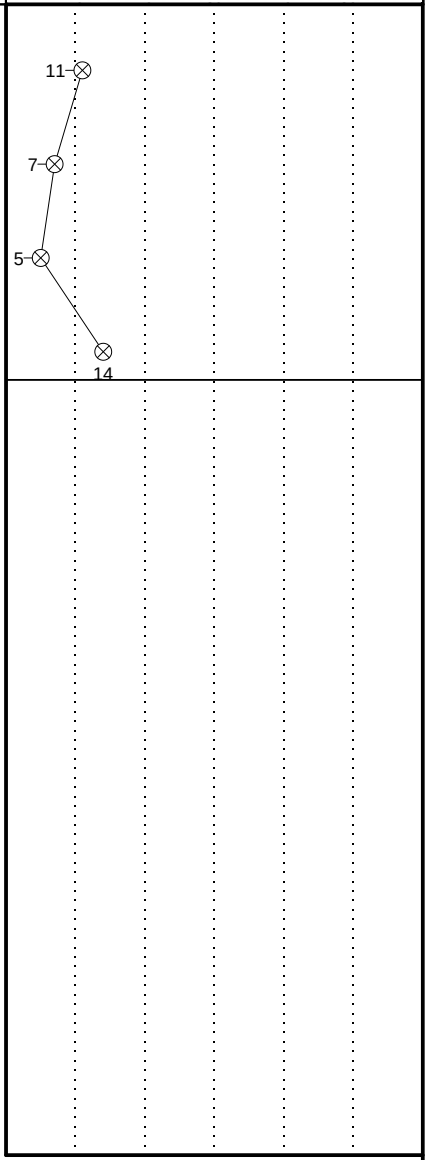
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 338

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Thickness [3.00"]			
	S-1	SS	18	14	(SM FILL) FILL, SILTY SAND, contains slight mica, brownish tan, moist, medium dense		335	3 5 6
	S-2	SS	18	18	(ML FILL) FILL, SANDY SILT, trace gravel, contains mica, pinkish brown, moist, loose			2 3 4
5	S-3	SS	18	6	(ML FILL) FILL, SANDY SILT, trace gravel, contains mica, gray, moist, loose, contains organic odor		330	1 3 2
	S-4	SS	18	14	(SM) SILTY SAND, contains mica, tan, moist, medium dense			5 6 8
10					END OF BORING @ 10'		325	
15							320	
20							315	
25							310	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL DRY WS ☐ WD ☒	BORING STARTED 04/22/19	CAVE IN DEPTH 7
WL(SHW) WL(ACR)	BORING COMPLETED 04/22/19	HAMMER TYPE Auto
WL	RIG CME 550 FOREMAN Dale Price	DRILLING METHOD HSA

CLIENT	Job #:	BORING #	SHEET
Norton Land Design, LLC	13:9098	SB-5	1 OF 1

PROJECT NAME: Carroll Knolls Local Park Renovation Facility Plan

ARCHITECT-ENGINEER:

SITE LOCATION: 10500 Georgia Avenue, Silver Spring, Montgomery County, MD

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

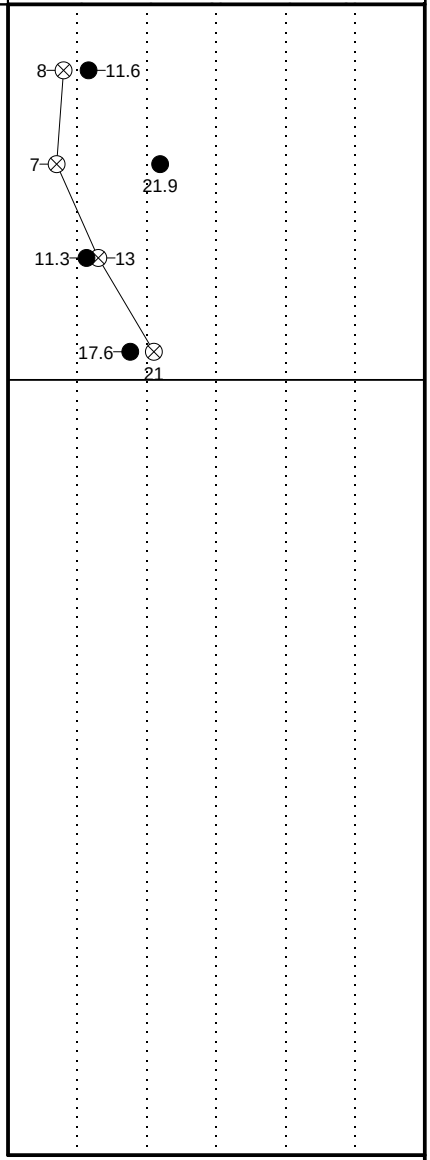
STANDARD PENETRATION BLOWS/FT

ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 337.5

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Thickness [4.00"]			
	S-1	SS	18	12	(GP FILL) FILL, GRAVEL WITH SAND, trace clay, brown, moist, loose		335	3 4 4
	S-2	SS	18	12	(CL FILL) FILL, LEAN CLAY WITH SAND, contains slight roots and mica, tan, moist, firm			3 3 4
5	S-3	SS	18	14	(SM) SILTY SAND WITH GRAVEL, contains mica, contains slight roots, tan, moist, medium dense		330	6 6 7
	S-4	SS	18	14	(SM) SILTY SAND, contains mica, orangish tan, moist, medium dense			5 9 12
10					END OF BORING @ 10'		325	
15							320	
20							315	
25							310	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL DRY WS ☐ WD ☒	BORING STARTED 04/22/19	CAVE IN DEPTH 7.3
WL(SHW) WL(ACR)	BORING COMPLETED 04/22/19	HAMMER TYPE Auto
WL	RIG CME 550 FOREMAN Dale Price	DRILLING METHOD HSA

CLIENT	Job #:	BORING #	SHEET
Norton Land Design, LLC	13:9098	SB-6	1 OF 1

PROJECT NAME: Carroll Knolls Local Park Renovation Facility Plan

ARCHITECT-ENGINEER:

SITE LOCATION: 10500 Georgia Avenue, Silver Spring, Montgomery County, MD

NORTHING | EASTING | STATION

CALIBRATED PENETROMETER TONS/FT^2

ROCK QUALITY DESIGNATION & RECOVERY
RQD% – — – REC% ———

PLASTIC LIMIT% | WATER CONTENT% | LIQUID LIMIT%

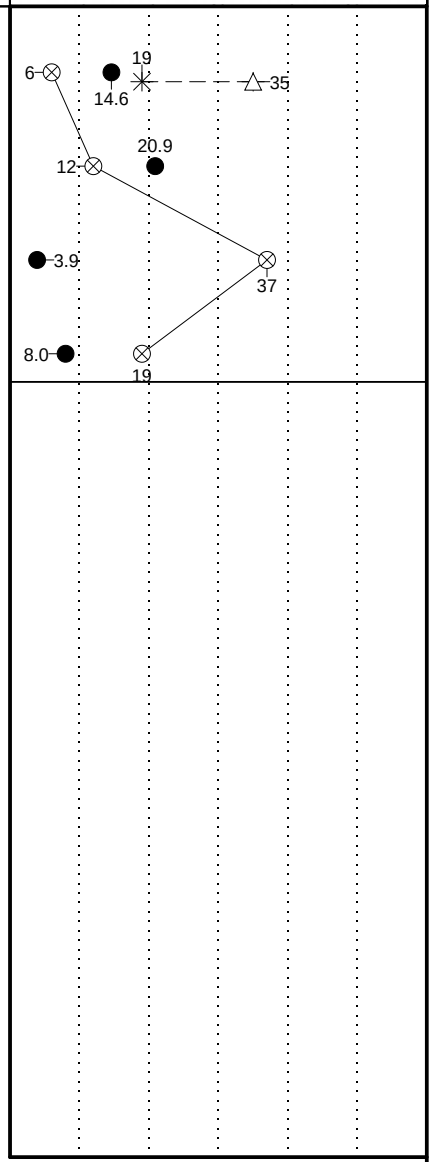
STANDARD PENETRATION BLOWS/FT

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING | LOSS OF CIRCULATION

SURFACE ELEVATION 338.5

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Thickness [3.00"]			
	S-1 BAG	SS	18	14	(CL) SANDY LEAN CLAY, brown, moist, firm to stiff			2 2 4
							335	
	S-2	SS	18	18				3 5 7
5								
	S-3	SS	18	10	(GP) GRAVEL WITH SAND, orangish white, moist, dense			11 16 21
							330	
	S-4	SS	18	12	(SP) SAND, trace silt, trace gravel, grayish brown, moist, medium dense			8 9 10
10					END OF BORING @ 10'			
							325	
15								
							320	
20								
							315	
25								
							310	
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL DRY WS ☐ WD ☒	BORING STARTED 04/22/19	CAVE IN DEPTH 6.3
WL(SHW) WL(ACR)	BORING COMPLETED 04/22/19	HAMMER TYPE Auto
WL	RIG CME 550 FOREMAN Dale Price	DRILLING METHOD HSA

Test Location	Test Depth (ft)	Approximate Test Elevation (EL)	Soil Encountered at Test Depth	Field Infiltration Rate (in/hr)	USDA Soil Classification
SB-2	7.0	330.5	Medium Dense POORLY GRADED GRAVEL WITH CLAY (GP-GC)	0.03	Sandy Loam
SB-3	4.0	332.5	Stiff CLAYEY SILT WITH SAND (ML-CL)	0.21	Silt Loam

APPENDIX C – Laboratory Testing

Laboratory Test Results Summary
Atterberg Limits Report
Particle Size Distribution Report
USDA Soil Classification
Horticulture Testing (texture, Ph, soluble salts, nutrient content, organic content)

Laboratory Testing Summary

Sample Source	Sample Number	Start Depth (feet)	End Depth (feet)	Sample Distance (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
							LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
SB-6	SB-6 2-5	2.0	2.0			CL	35	19	16	57.2	118.2	13.0		
B-2	S-3	6.0	6.0			GP-GC				11.0				
B-3	S-1	1.0	1.0		10.4									
	S-2	3.5	3.5		21.5	ML-CL				72.1				
	S-3	6.0	6.0		13.6									
	S-4	8.5	8.5		8.7									
B-1	S-1	1.0	1.0		17.4									
	S-2	3.5	3.5		4.9									
	S-3	6.0	6.0		7.6									
	S-4	8.5	8.5		19.4									
B-5	S-1	1.0	1.0		11.6									
	S-2	3.5	3.5		21.9									
	S-3	6.0	6.0		11.3									
	S-4	8.5	8.5		17.6									
B-6	S-1	1.0	1.0		14.6									
	S-2	3.5	3.5		20.9									
	S-3	6.0	6.0		3.9									
	S-4	8.5	8.5		8.0									

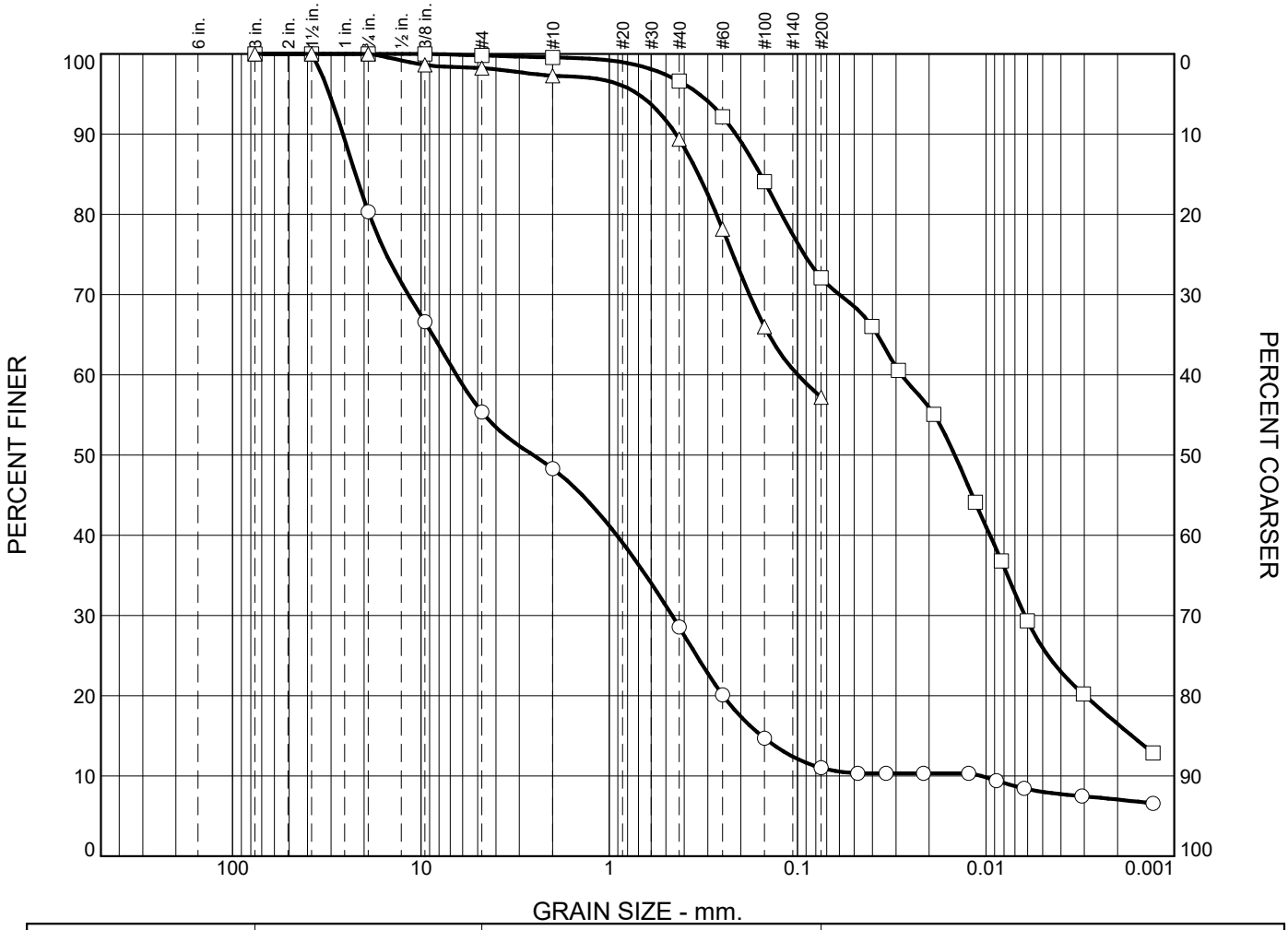
Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 13:9098
Project Name: Carroll Knolls Local Park Renovation Facility Plan
PM: Brian A. Meley
PE: Jeff McGregor
Printed On: Monday, May 6, 2019

ECS MID-ATLANTIC, LLC
5112 Pegasus Court, Suite S
Frederick, MD 21704
Phone: (301) 668-4303
Fax: (301) 668-3519

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	19.6	25.0	7.1	19.7	17.6	4.0	7.0
□	0.0	0.0	0.2	0.2	3.0	24.5	55.6	16.5
△	0.0	0.0	1.8	0.9	7.9	32.2	57.2	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	B-2	S-3	6.00-7.50	Tannish Orange Poorly Graded GRAVEL w/Clay	GP-GC
□	B-3	S-2	3.50-5.00	Gray Clayey SILT w/Sand	ML-CL
△	SB-6	SB-6 2-5	2.00-5.00	Brown Sandy LEAN CLAY	CL

ECS MID-ATLANTIC, LLC
5112 Pegasus Court, Suite S
Frederick, MD 21704
Phone: (301) 668-4303
Fax: (301) 668-3519

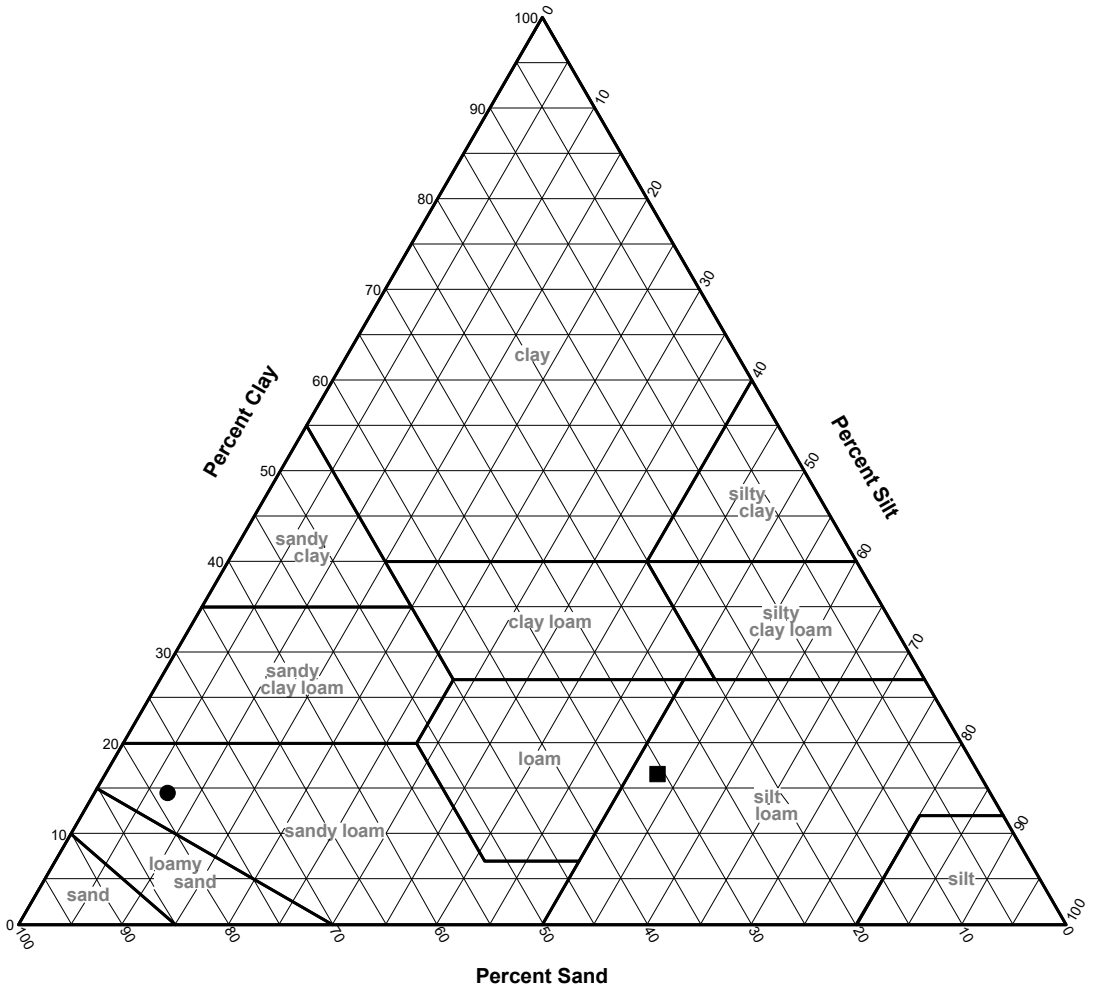
Client: Norton Land Design, LLC

Project: Carroll Knolls Local Park Renovation Facility Plan

Project No.: 9098 **Figure**

Tested By: PK **Checked By:** PK

USDA Soil Classification



SOIL DATA

	Source	Sample No.	Depth	Percentages From Material Passing a #10 Sieve			Classification
				Sand	Silt	Clay	
●	B-2	S-3	6.00-7.50	78.5	7.0	14.5	Sandy loam
■	B-3	S-2	3.50-5.00	30.7	52.7	16.6	Silt loam

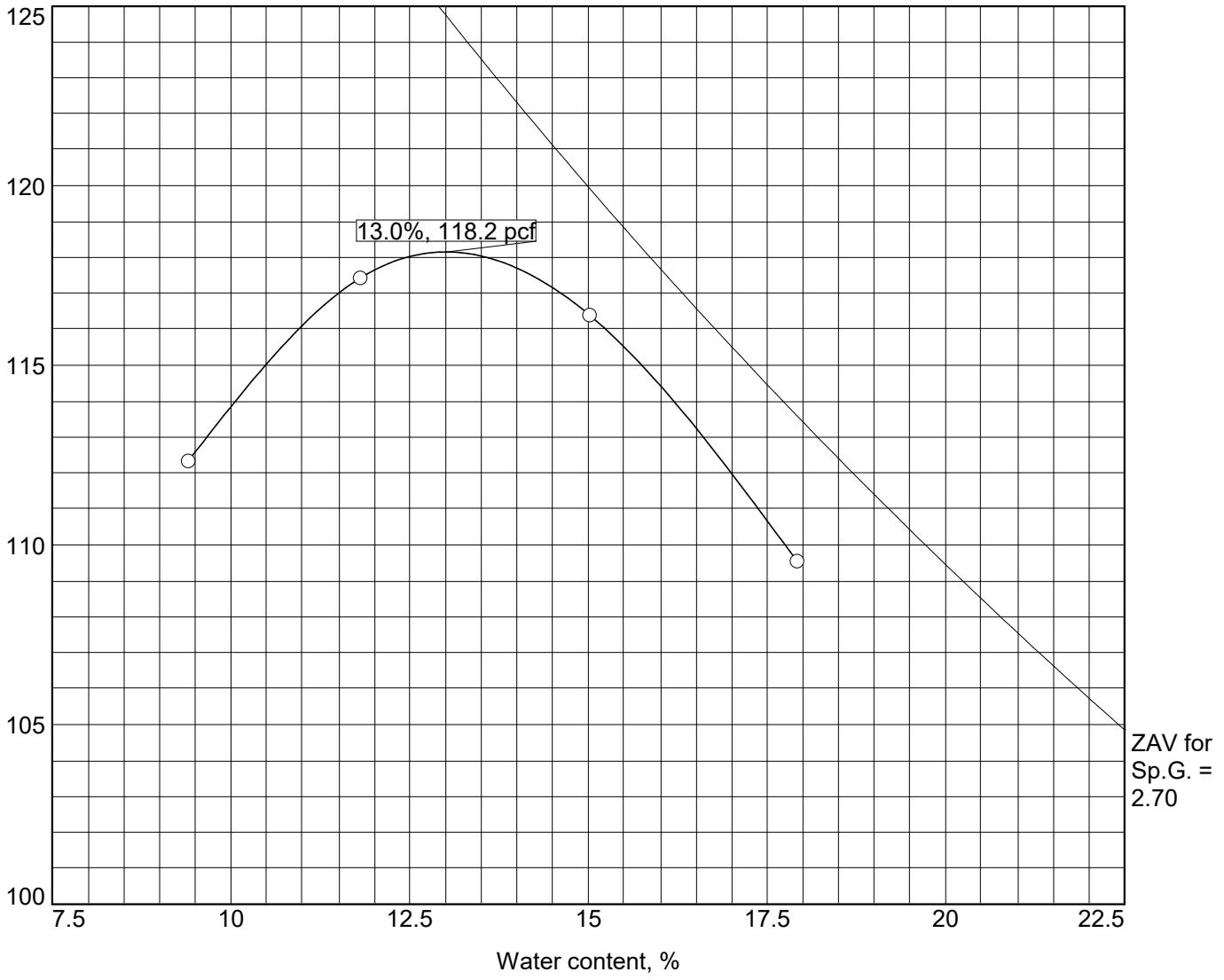
ECS MID-ATLANTIC, LLC
5112 Pegasus Court, Suite S
Frederick, MD 21704
Phone: (301) 668-4303
Fax: (301) 668-3519

Client: Norton Land Design, LLC

Project: Carroll Knolls Local Park Renovation Facility Plan

Project No.: 9098 **Figure**

COMPACTION TEST REPORT For Curve No. SB-6/SB 2-5



Test specification: ASTM D 698-12 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
2.00-5.00	CL	A-6(6)		2.7	35	16		57.2

TEST RESULTS

Maximum dry density = 118.2 pcf

Optimum moisture = 13.0 %

MATERIAL DESCRIPTION

Brown Sandy LEAN CLAY

Project No. 9098 **Client:** Norton Land Design, LLC

Project: Carroll Knolls Local Park Renovation Facility Plan

Date: 05/03/

○ **Source of Sample:** SB-6 **Sample Number:** SB-6 2-5

Remarks:

ECS MID-ATLANTIC, LLC
5112 Pegasus Court, Suite S
Frederick, MD 21704
Phone: (301) 668-4303
Fax: (301) 668-3519

Figure

Tested By: PK **Checked By:** PK

MOISTURE, ASH, AND ORGANIC MATTER
OF PEAT AND OTHER ORGANIC SOILS
(LOSS ON IGNITION)
ASTM D 2974-14 Method A&C

Client ECS Mid-Atlantic, LLC.
Client Project 13-9098 Carroll Knolls
Project No. 41708

Boring	NA	NA	NA	NA	NA
Depth	9.0"-10.0"	8.0"-9.0"	9.0"	9.0"-9.75"	10.0"
Sample	HS-1	HS-2	HS-3	HS-4	HS-5
Lab Sample No.	41708001	41708002	41708003	41708004	41708005
AS-RECEIVED MOISTURE CONTENT @ 110 °C					
Tare Number	T	V	W	Y	Z
Wt. Tare & WS, gm	92.41	89.22	89.19	84.42	70.39
Wt. Tare & DS, gm	83.47	81.17	79.85	75.19	64.15
Wt. Water, gm	8.94	8.05	9.34	9.23	6.24
Wt. Tare, gm	33.94	39.68	35.79	32.86	25.35
Wt. DS, gm	49.53	41.49	44.06	42.33	38.80
Moisture Content ,%	18.0	19.4	21.2	21.8	16.1
ASH CONTENT @ 440 °C					
Tare Number	T	V	W	Y	Z
Wt. Tare & DS, gm	83.47	81.17	79.85	75.19	64.15
Wt. Tare & Ash, gm	82.09	80.05	78.43	74.85	62.81
Wt. Volatiles, gm	1.38	1.12	1.42	0.34	1.34
Wt. Tare, gm	33.94	39.68	35.79	32.86	25.35
Wt. Ash, gm	48.15	40.37	42.64	41.99	37.46
LOSS ON IGNITION					
Percent Solids, %	84.7	83.8	82.5	82.1	86.1
Ash Content, %	97.2	97.3	96.8	99.2	96.5
Loss On Ignition, %	**2.8**	**2.7**	**3.2**	**0.8**	**3.5**

Input Validation: MC Reviewed By: ALO (R) Date Tested: 04/29/2019

Corrosivity Testing

Client ECS Mid-Atlantic, LLC.
Client Project 13-9098 Carroll Knolls
Project No. 41708

Lab Sample ID	Boring	Depth	Sample	Matrix	pH AASHTO T289		
					Result	Date Tested	Tested By
41708001	NA	9.0"-10.0"	HS-1	Soil	7.6	4/29/2019	MC
41708002	NA	8.0"-9.0"	HS-2	Soil	7.7	4/29/2019	MC
41708003	NA	9.0"	HS-3	Soil	7.6	4/29/2019	MC
41708004	NA	9.0"-9.75"	HS-4	Soil	7.9	4/29/2019	MC
41708005	NA	10.0"	HS-5	Soil	7.6	4/29/2019	MC

Input Validation: MC Reviewed By: ALO (R)

PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	9.0"-10.0"
Project No.	41708	Sample	HS-1
		Lab Sample	41708001

Sample Color: **BROWN**
USCS Group Name: **CLAYEY SAND**
USCS Group Symbol: **sc** USDA: **LOAM** AASHTO: **NA**

MECHANICAL SIEVE

Total Sample	
Total Sample Wet Wt, gm (-3")	592
Sample Split on Sieve	No. 4
Coarse Washed Dry Sample, gm	71
Wet Wt Passing Split, gm	521
Dry Wt. Passing Split, gm	439
Total Sample Dry Wt, gm	510

Split Sample - Passing No. 4	
Tare No.	69
Tare + WS., gm	523.11
Tare + DS., gm	454.11
Tare, gm	84.76
Water Content of Split Sample	**18.7%**
Wt. of DS., gm	369.35
Wt. of +#200 Sample, gm	174.16

Sieve Size	Nominal Opening, mm	Dry Wt, gm	Split Normalized % Retained	Split Normalized % Finer	Project Specifications
3"	75	0	0.0%	100.0%	
2-1/2"	63	0	0.0%	100.0%	
2"	50	0	0.0%	100.0%	
1-1/2"	37.5	0	0.0%	100.0%	
1"	25	0	0.0%	100.0%	
3/4"	19	26.97	5.3%	94.7%	
1/2"	12.5	13.3	2.6%	92.1%	
3/8"	9.5	6.86	1.3%	90.8%	
No. 4	4.75	23.82	4.7%	86.1%	
No. 10	2	14.02	3.3%	82.8%	
No. 20	0.85	17.73	4.1%	78.7%	
No. 40	0.425	31.81	7.4%	71.3%	
No. 60	0.25	37.5	8.7%	62.5%	
No. 140	0.106	57.8	13.5%	49.1%	
No. 200	0.075	15.3	3.6%	45.5%	

HYDROMETER (-#200)

Tare No.	767	Wt. Dispers., gm	5	Specific Gravity	2.7
Wt. Tare + DS., gm	212.22	Wt. Dry Soil, gm (*-#200*)	26.98		Assumed
Wt. Tare, gm	180.24	*-#10 Dispersed 1min in Hamilton Beach Mixer*		*a Factor*	*0.9889*

Elapsed Time (min.)	R Measured	Temp *C	Composite Correction	R Corrected	K Factor	Percent Finer (%)	Particle Diameter (mm)	Adjusted % Finer (%)
2	28	22.3	5.4	22.6	0.0131	82.8	0.0316	37.7%
5	26	22.3	5.4	20.6	0.0131	75.5	0.0203	34.4%
15	22	22.3	5.4	16.6	0.0131	60.8	0.0120	27.7%
30	20	22.4	5.4	14.6	0.0131	53.5	0.0086	24.3%
60	18	22.3	5.4	12.6	0.0131	46.2	0.0062	21.0%
250	15	22.6	5.3	9.7	0.0131	35.6	0.0031	16.2%
1440	12	21.7	5.6	6.4	0.0132	23.5	0.0013	10.7%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**13.9**	Silt=25.9% Clay=19.6%	
Coarse=5.3; Fine=8.6		D60, mm	NA
% Sand (-#4 & +#200)	**40.6**	D30, mm	NA
Coarse=3.3; Medium=11.5; Fine=25.8		D10, mm	NA
% Fines (-#200)	**45.5**	Cc	NA
% Plus #200 (-3")	**54.5**	Cu	NA

USCS Description
CLAYEY SAND

USCS Group Symbol	Atterberg Limits Group Symbol
sc	**cl - Lean Clay (assumed)**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)
100	100
2	82.8
0.05	41.8
0.002	13.4

Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
Gravel	17.2	0
Sand	41.0	49.5
Silt	28.4	34.3
Clay	13.4	16.2

USDA Classification
LOAM

Performed By: VA/MAC Input Validation: AR Reviewed By: ALO (R) Date Tested: 5/2/2019

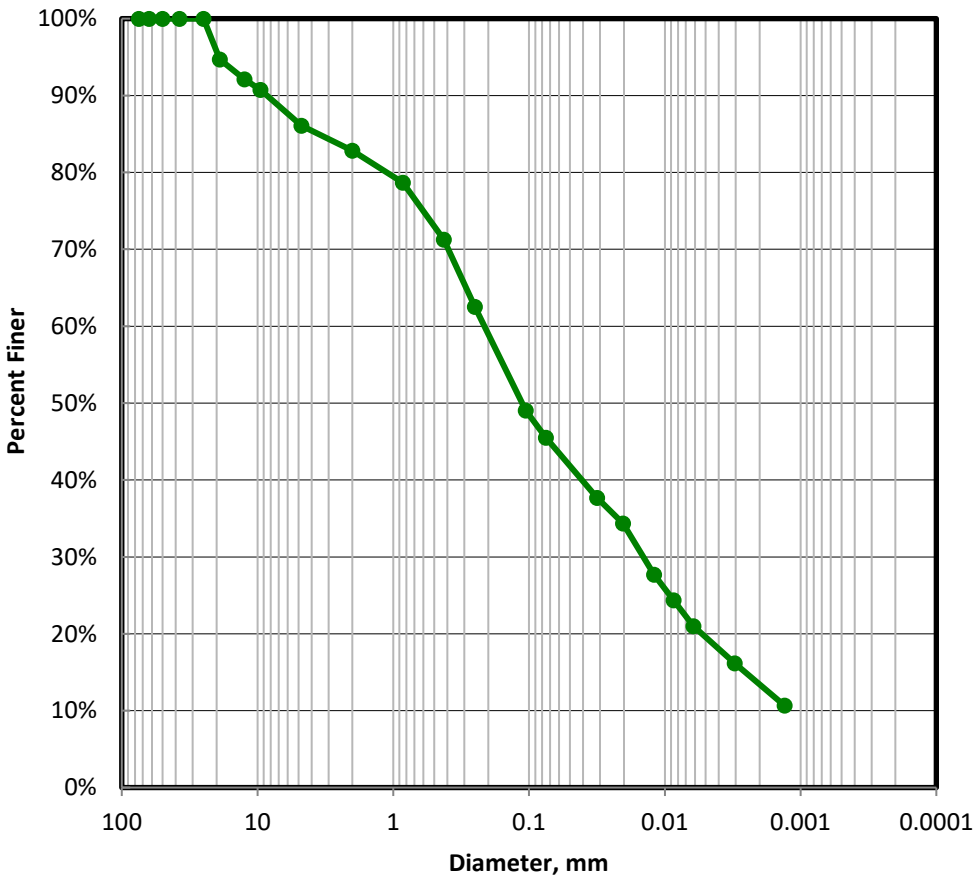
PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	9.0"-10.0"
Project No.	41708	Sample	HS-1
		Lab Sample	41708001

Sample Color: **BROWN**

USCS Group Name: **CLAYEY SAND**

USCS Group Symbol: **sc** USDA: **LOAM** AASHTO: **NA**



US Std. Sieve Size	Particle Diameter (mm)	Percent Finer
3"	75	100.0%
2-1/2"	63	100.0%
2"	50	100.0%
1-1/2"	37.5	100.0%
1"	25	100.0%
3/4"	19	94.7%
1/2"	12.5	92.1%
3/8"	9.5	90.8%
No. 4	4.75	86.1%
No. 10	2	82.8%
No. 20	0.85	78.7%
No. 40	0.425	71.3%
No. 60	0.25	62.5%
No. 140	0.106	49.1%
No. 200	0.075	45.5%
NA	0.0316	37.7%
NA	0.0203	34.4%
NA	0.0120	27.7%
NA	0.0086	24.3%
NA	0.0062	21.0%
NA	0.0031	16.2%
NA	0.0013	10.7%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**13.9**	Silt=25.9% Clay=19.6%	
Coarse=5.3; Fine=8.6		D60, mm	NA
% Sand (-#4 & +#200)	**40.6**	D30, mm	NA
Coarse=3.3; Medium=11.5; Fine=25.8		D10, mm	NA
% Fines (-#200)	**45.5**	Cc	NA
% Plus #200 (-3")	**54.5**	Cu	NA

USCS Description

CLAYEY SAND

USCS Group Symbol	Atterberg Limits Group Symbol
sc	**cl - Lean Clay (assumed)**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)	Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
100	100			
		Gravel	17.2	0
2	82.8			
		Sand	41.0	49.5
0.05	41.8			
		Silt	28.4	34.3
0.002	13.4			
		Clay	13.4	16.2

USDA Classification

LOAM

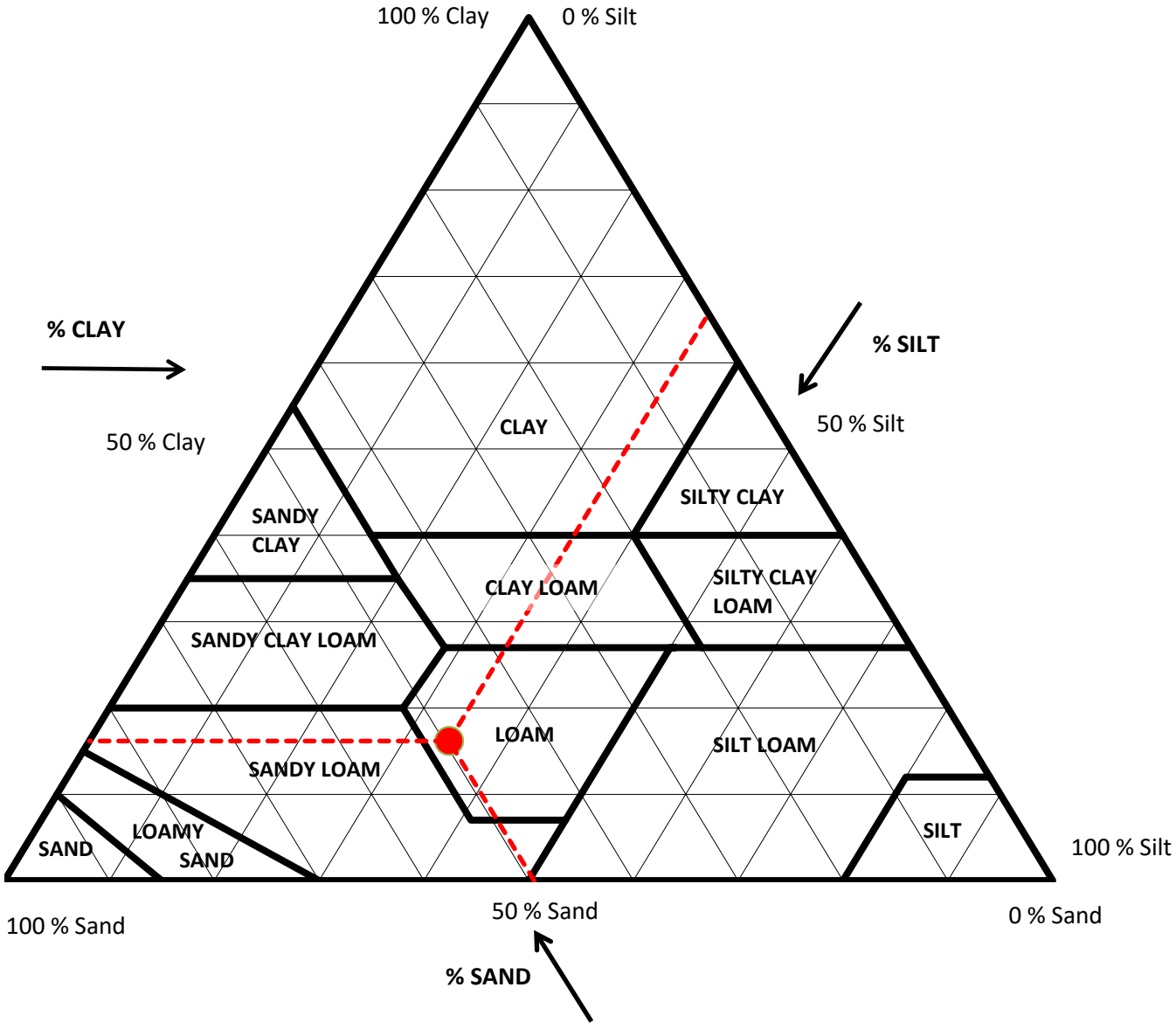
USDA CLASSIFICATION CHART

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	9.0"-10.0"
Project No.	41708	Sample	HS-1
		Lab Sample	41708001

Sample Color: **BROWN**
USCS Group Name: **CLAYEY SAND**
USCS Group Symbol: **sc** USDA: **LOAM** AASHTO: **NA**

Corrected for 0% gravel	
Percent Gravel, %	0.0
Percent Sand, %	49.5
Percent Silt, %	34.3
Percent Clay, %	16.2

Sand Subsizes Corrected Percentages	
Very Coarse Sand; 2-1	4.0
Coarse Sand; 1-0.5	7.8
Medium Sand; 0.5-0.25	12.7
Fine Sand; 0.25-0.1	17.0
Very Fine Sand; 0.1-0.05	8.0
Total	**49.5**



PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	8.0"-9.0"
Project No.	41708	Sample	HS-2
		Lab Sample	41708002

Sample Color: **BROWN**
USCS Group Name: **CLAYEY SAND**
USCS Group Symbol: **sc** USDA: **LOAM** AASHTO: **NA**

MECHANICAL SIEVE

Total Sample	
Total Sample Wet Wt, gm (-3")	438
Sample Split on Sieve	No. 4
Coarse Washed Dry Sample, gm	48
Wet Wt Passing Split, gm	390
Dry Wt. Passing Split, gm	328
Total Sample Dry Wt, gm	376

Split Sample - Passing No. 4	
Tare No.	105
Tare + WS., gm	392.81
Tare + DS., gm	343.62
Tare, gm	83.99
Water Content of Split Sample	**18.9%**
Wt. of DS., gm	259.63
Wt. of +#200 Sample, gm	120.69

Sieve Size	Nominal Opening, mm	Dry Wt, gm	Split Normalized % Retained	Split Normalized % Finer	Project Specifications
3"	75	0	0.0%	100.0%	
2-1/2"	63	0	0.0%	100.0%	
2"	50	0	0.0%	100.0%	
1-1/2"	37.5	0	0.0%	100.0%	
1"	25	30.37	8.1%	91.9%	
3/4"	19	0	0.0%	91.9%	
1/2"	12.5	4.76	1.3%	90.7%	
3/8"	9.5	3.18	0.8%	89.8%	
No. 4	4.75	9.92	2.6%	87.2%	
No. 10	2	8.41	2.8%	84.4%	
No. 20	0.85	14.84	5.0%	79.4%	
No. 40	0.425	27.48	9.2%	70.1%	
No. 60	0.25	25.18	8.5%	61.7%	
No. 140	0.106	35.02	11.8%	49.9%	
No. 200	0.075	9.76	3.3%	46.7%	

HYDROMETER (-#200)

Tare No.	215	Wt. Dispers., gm	5	Specific Gravity	2.7
Wt. Tare + DS., gm	218	Wt. Dry Soil, gm (*-#200*)	30.93		Assumed
Wt. Tare, gm	182.07	*-#10 Dispersed 1min in Hamilton Beach Mixer*		*a Factor*	*0.9889*

Elapsed Time (min.)	R Measured	Temp *C	Composite Correction	R Corrected	K Factor	Percent Finer (%)	Particle Diameter (mm)	Adjusted % Finer (%)
2	33	22.3	5.4	27.6	0.0131	88.2	0.0305	41.2%
5	31	22.3	5.4	25.6	0.0131	81.8	0.0196	38.2%
15	27.5	22.3	5.4	22.1	0.0131	70.7	0.0116	33.0%
30	25	22.4	5.4	19.6	0.0131	62.7	0.0083	29.2%
60	22.5	22.4	5.4	17.1	0.0131	54.7	0.0060	25.5%
250	18.5	22.6	5.3	13.2	0.0131	42.2	0.0030	19.7%
1440	15	21.7	5.6	9.4	0.0132	30.1	0.0013	14.0%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**12.8**	Silt=22.7% Clay=24%	
Coarse=8.1; Fine=4.7		D60, mm	NA
% Sand (-#4 & +#200)	**40.5**	D30, mm	NA
Coarse=2.8; Medium=14.2; Fine=23.5		D10, mm	NA
% Fines (-#200)	**46.7**	Cc	NA
% Plus #200 (-3")	**53.3**	Cu	NA

USCS Description
CLAYEY SAND

USCS Group Symbol	Atterberg Limits Group Symbol
sc	**cl - Lean Clay (assumed)**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)
100	100
2	84.4
0.05	44.2
0.002	17.0

Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
Gravel	15.6	0
Sand	40.2	47.6
Silt	27.2	32.3
Clay	17.0	20.1

USDA Classification
LOAM

Performed By: VA/MAC Input Validation: AR Reviewed By: ALO (R) Date Tested: 5/2/2019

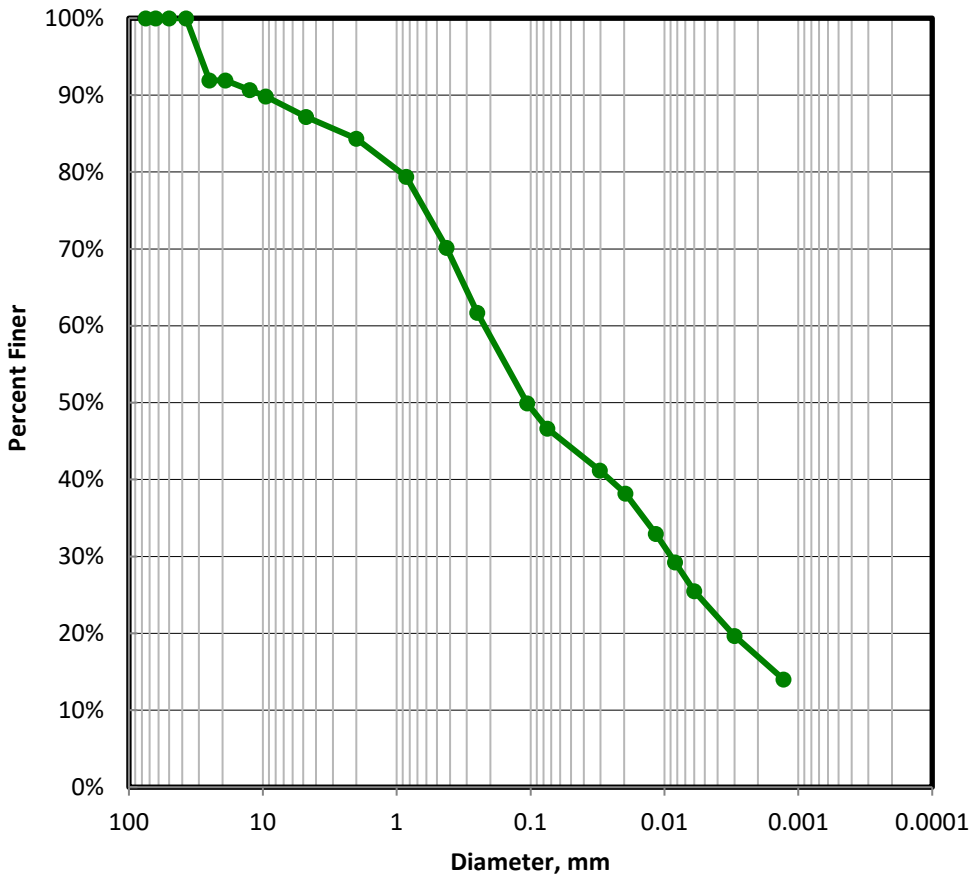
PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	8.0"-9.0"
Project No.	41708	Sample	HS-2
		Lab Sample	41708002

Sample Color: **BROWN**

USCS Group Name: **CLAYEY SAND**

USCS Group Symbol: **sc** USDA: **LOAM** AASHTO: **NA**



US Std. Sieve Size	Particle Diameter (mm)	Percent Finer
3"	75	100.0%
2-1/2"	63	100.0%
2"	50	100.0%
1-1/2"	37.5	100.0%
1"	25	91.9%
3/4"	19	91.9%
1/2"	12.5	90.7%
3/8"	9.5	89.8%
No. 4	4.75	87.2%
No. 10	2	84.4%
No. 20	0.85	79.4%
No. 40	0.425	70.1%
No. 60	0.25	61.7%
No. 140	0.106	49.9%
No. 200	0.075	46.7%
NA	0.0305	41.2%
NA	0.0196	38.2%
NA	0.0116	33.0%
NA	0.0083	29.2%
NA	0.0060	25.5%
NA	0.0030	19.7%
NA	0.0013	14.0%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**12.8**	Silt=22.7% Clay=24%	
Coarse=8.1; Fine=4.7		D60, mm	NA
% Sand (-#4 & +#200)	**40.5**	D30, mm	NA
Coarse=2.8; Medium=14.2; Fine=23.5		D10, mm	NA
% Fines (-#200)	**46.7**	Cc	NA
% Plus #200 (-3")	**53.3**	Cu	NA

USCS Description

CLAYEY SAND

USCS Group Symbol	Atterberg Limits Group Symbol
sc	**cl - Lean Clay (assumed)**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)	Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
100	100			
		Gravel	15.6	0
2	84.4			
		Sand	40.2	47.6
0.05	44.2			
		Silt	27.2	32.3
0.002	17.0			
		Clay	17.0	20.1

USDA Classification

LOAM

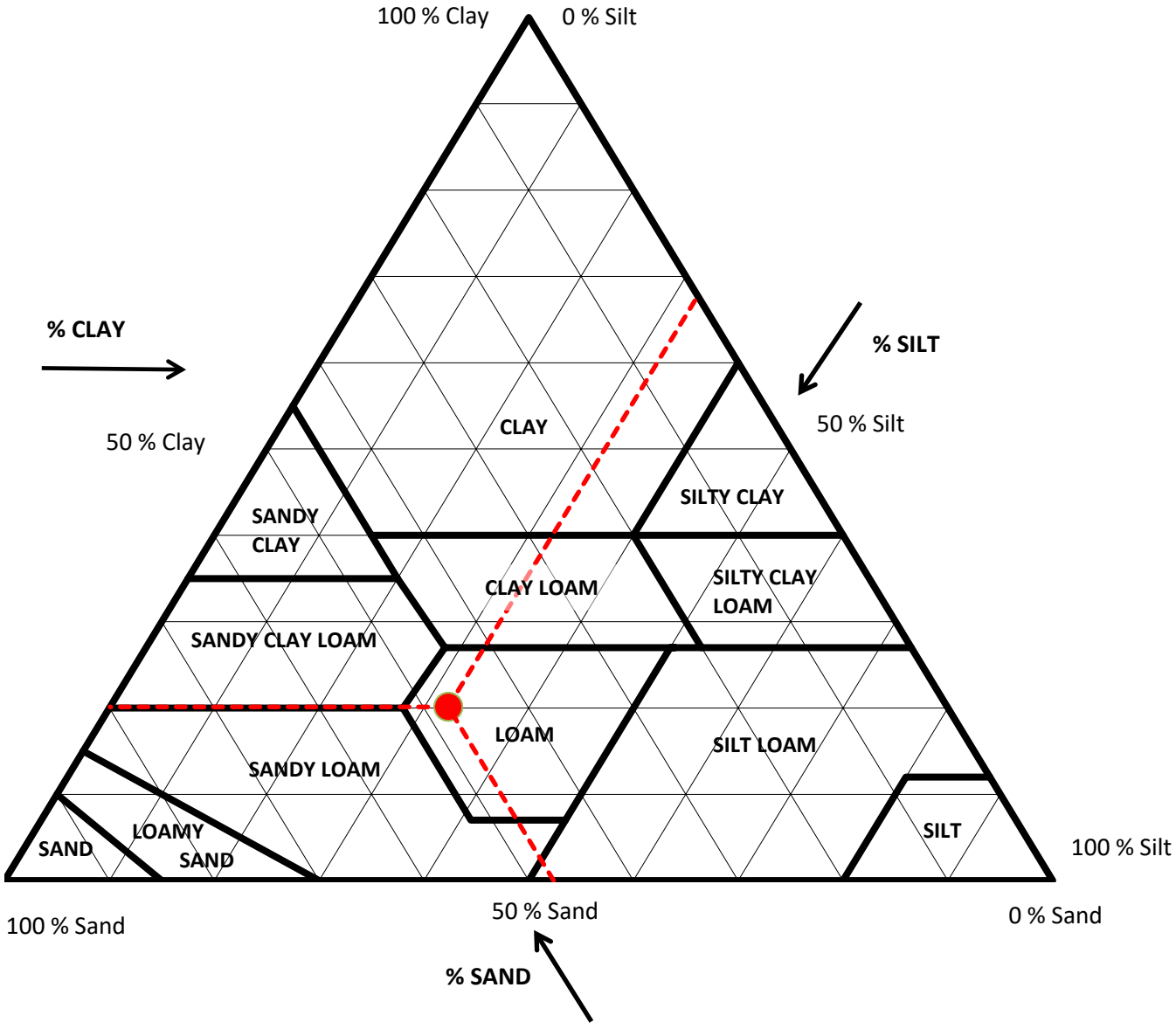
USDA CLASSIFICATION CHART

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	8.0"-9.0"
Project No.	41708	Sample	HS-2
		Lab Sample	41708002

Sample Color: **BROWN**
USCS Group Name: **CLAYEY SAND**
USCS Group Symbol: **sc** USDA: **LOAM** AASHTO: **NA**

Corrected for 0% gravel	
Percent Gravel, %	0.0
Percent Sand, %	47.6
Percent Silt, %	32.3
Percent Clay, %	20.1

Sand Subsizes Corrected Percentages	
Very Coarse Sand; 2-1	4.8
Coarse Sand; 1-0.5	9.5
Medium Sand; 0.5-0.25	12.6
Fine Sand; 0.25-0.1	14.6
Very Fine Sand; 0.1-0.05	6.2
Total	**47.6**



PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	9.0"
Project No.	41708	Sample	HS-3
		Lab Sample	41708003

Sample Color: **BROWN**
USCS Group Name: **SANDY LEAN CLAY**
USCS Group Symbol: **cl** USDA: **LOAM** AASHTO: **NA**

MECHANICAL SIEVE

Total Sample	
Total Sample Wet Wt, gm (-3")	450
Sample Split on Sieve	No. 4
Coarse Washed Dry Sample, gm	14
Wet Wt Passing Split, gm	436
Dry Wt. Passing Split, gm	360
Total Sample Dry Wt, gm	374

Split Sample - Passing No. 4	
Tare No.	108
Tare + WS., gm	448.81
Tare + DS., gm	384.93
Tare, gm	82.83
Water Content of Split Sample	**21.1%**
Wt. of DS., gm	302.10
Wt. of +#200 Sample, gm	137.70

Sieve Size	Nominal Opening, mm	Dry Wt, gm	Split Normalized % Retained	Split Normalized % Finer	Project Specifications
3"	75	0	0.0%	100.0%	
2-1/2"	63	0	0.0%	100.0%	
2"	50	0	0.0%	100.0%	
1-1/2"	37.5	0	0.0%	100.0%	
1"	25	0	0.0%	100.0%	
3/4"	19	0	0.0%	100.0%	
1/2"	12.5	6.53	1.7%	98.3%	
3/8"	9.5	2.36	0.6%	97.6%	
No. 4	4.75	4.95	1.3%	96.3%	
No. 10	2	5.31	1.7%	94.6%	
No. 20	0.85	13.55	4.3%	90.3%	
No. 40	0.425	24.44	7.8%	82.5%	
No. 60	0.25	30.79	9.8%	72.7%	
No. 140	0.106	48.01	15.3%	57.4%	
No. 200	0.075	15.6	5.0%	52.4%	

HYDROMETER (-#200)

Tare No.	221	Wt. Dispers., gm	5	Specific Gravity	2.7
Wt. Tare + DS., gm	211.38	Wt. Dry Soil, gm (*-#200*)	26.73		Assumed
Wt. Tare, gm	179.65	*-#10 Dispersed 1min in Hamilton Beach Mixer*		*a Factor*	*0.9889*

Elapsed Time (min.)	R Measured	Temp *C	Composite Correction	R Corrected	K Factor	Percent Finer (%)	Particle Diameter (mm)	Adjusted % Finer (%)
2	28.5	22.3	5.4	23.1	0.0131	85.5	0.0315	44.8%
5	25	22.3	5.4	19.6	0.0131	72.5	0.0204	38.0%
15	22	22.4	5.4	16.6	0.0131	61.4	0.0120	32.2%
30	20	22.3	5.4	14.6	0.0131	54.0	0.0086	28.3%
60	18	22.3	5.4	12.6	0.0131	46.6	0.0062	24.4%
250	14.5	22.6	5.3	9.2	0.0131	34.0	0.0031	17.8%
1440	12	21.8	5.5	6.5	0.0132	24.0	0.0013	12.6%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**3.7**	Silt=30% Clay=22.4%	
Coarse=0; Fine=3.7		D60, mm	NA
% Sand (-#4 & +#200)	**43.9**	D30, mm	NA
Coarse=1.7; Medium=12.1; Fine=30.1		D10, mm	NA
% Fines (-#200)	**52.4**	Cc	NA
% Plus #200 (-3")	**47.6**	Cu	NA

USCS Description
SANDY LEAN CLAY

USCS Group Symbol	Atterberg Limits Group Symbol
cl	**cl - Lean Clay (assumed)**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)
100	100
2	94.6
0.05	48.8
0.002	15.2

Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
Gravel	5.4	0
Sand	45.8	48.4
Silt	33.6	35.6
Clay	15.2	16.1

USDA Classification
LOAM

Performed By: VA/MAC Input Validation: AR Reviewed By: ALO (R) Date Tested: 5/2/2019

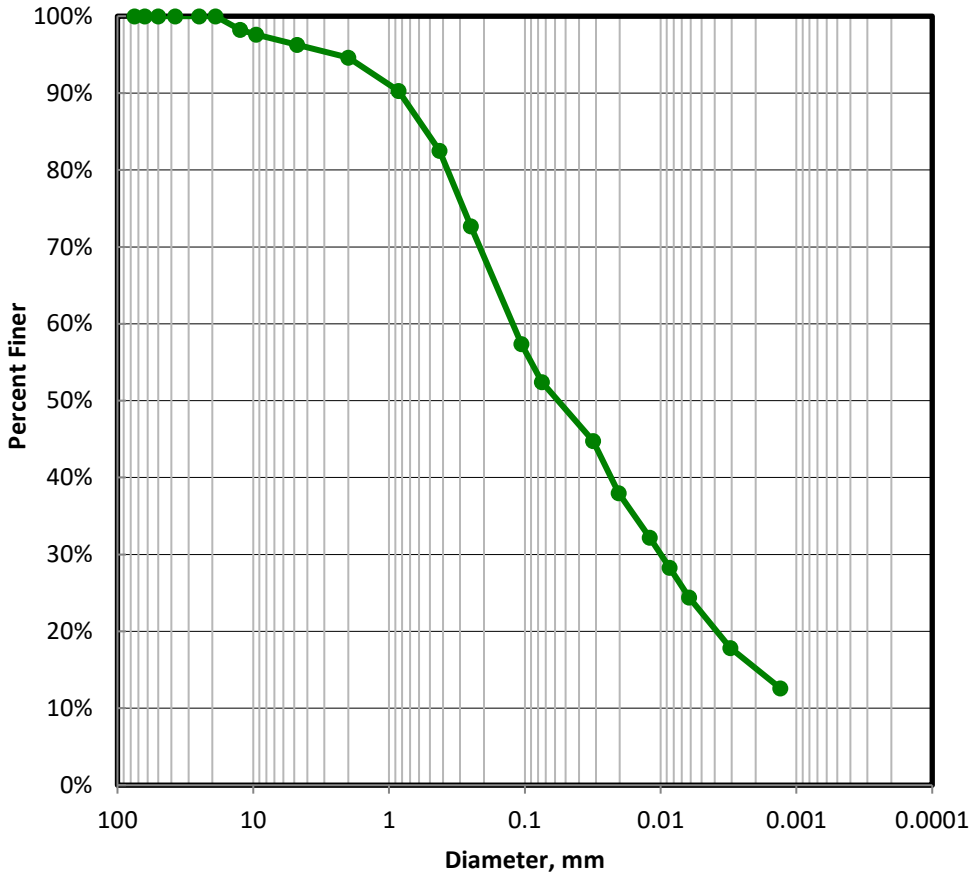
PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	9.0"
Project No.	41708	Sample	HS-3
		Lab Sample	41708003

Sample Color: **BROWN**

USCS Group Name: **SANDY LEAN CLAY**

USCS Group Symbol: **cl** USDA: **LOAM** AASHTO: **NA**



US Std. Sieve Size	Particle Diameter (mm)	Percent Finer
3"	75	100.0%
2-1/2"	63	100.0%
2"	50	100.0%
1-1/2"	37.5	100.0%
1"	25	100.0%
3/4"	19	100.0%
1/2"	12.5	98.3%
3/8"	9.5	97.6%
No. 4	4.75	96.3%
No. 10	2	94.6%
No. 20	0.85	90.3%
No. 40	0.425	82.5%
No. 60	0.25	72.7%
No. 140	0.106	57.4%
No. 200	0.075	52.4%
NA	0.0315	44.8%
NA	0.0204	38.0%
NA	0.0120	32.2%
NA	0.0086	28.3%
NA	0.0062	24.4%
NA	0.0031	17.8%
NA	0.0013	12.6%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**3.7**	Silt=30% Clay=22.4%	
Coarse=0; Fine=3.7		D60, mm	NA
% Sand (-#4 & +#200)	**43.9**	D30, mm	NA
Coarse=1.7; Medium=12.1; Fine=30.1		D10, mm	NA
% Fines (-#200)	**52.4**	Cc	NA
% Plus #200 (-3")	**47.6**	Cu	NA

USCS Description

SANDY LEAN CLAY

USCS Group Symbol	Atterberg Limits Group Symbol
cl	**cl - Lean Clay (assumed)**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)
100	100
2	94.6
0.05	48.8
0.002	15.2

Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
Gravel	5.4	0
Sand	45.8	48.4
Silt	33.6	35.6
Clay	15.2	16.1

USDA Classification

LOAM

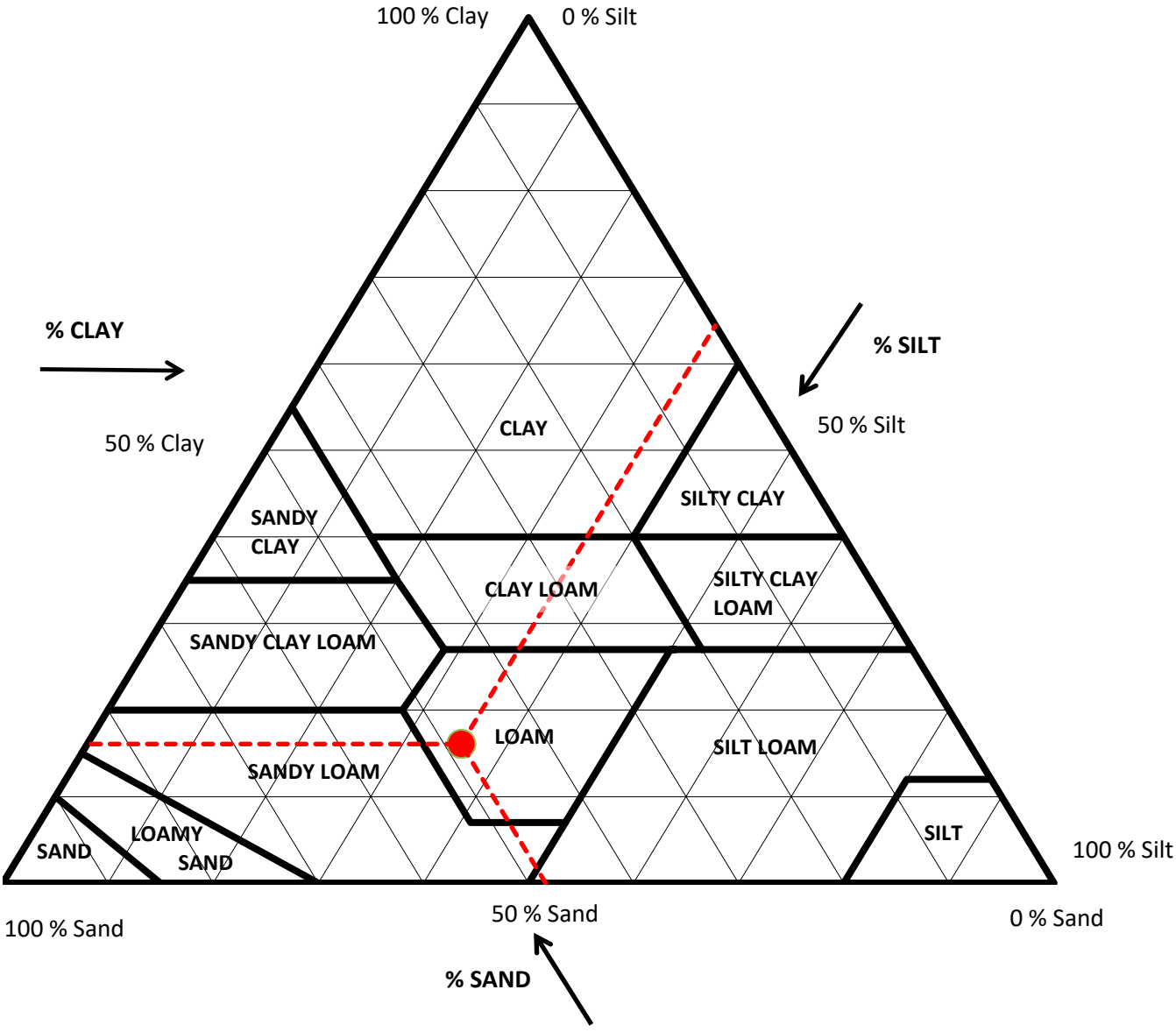
USDA CLASSIFICATION CHART

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	9.0"
Project No.	41708	Sample	HS-3
		Lab Sample	41708003

Sample Color: **BROWN**
USCS Group Name: **SANDY LEAN CLAY**
USCS Group Symbol: **cl** USDA: **LOAM** AASHTO: **NA**

Corrected for 0% gravel	
Percent Gravel, %	0.0
Percent Sand, %	48.4
Percent Silt, %	35.6
Percent Clay, %	16.1

Sand Subsizes Corrected Percentages	
Very Coarse Sand; 2-1	3.7
Coarse Sand; 1-0.5	7.2
Medium Sand; 0.5-0.25	12.3
Fine Sand; 0.25-0.1	17.1
Very Fine Sand; 0.1-0.05	8.1
Total	**48.4**



PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	9.0"-9.75"
Project No.	41708	Sample	HS-4
		Lab Sample	41708004

Sample Color: **BROWN**
USCS Group Name: **SANDY LEAN CLAY**
USCS Group Symbol: **cl** USDA: **SILT LOAM** AASHTO: **NA**

MECHANICAL SIEVE

Total Sample	
Total Sample Wet Wt, gm (-3")	502
Sample Split on Sieve	No. 4
Coarse Washed Dry Sample, gm	35
Wet Wt Passing Split, gm	467
Dry Wt. Passing Split, gm	382
Total Sample Dry Wt, gm	417

Split Sample - Passing No. 4	
Tare No.	15
Tare + WS., gm	401.05
Tare + DS., gm	342.98
Tare, gm	82.93
Water Content of Split Sample	**22.3%**
Wt. of DS., gm	260.05
Wt. of +#200 Sample, gm	80.68

Sieve Size	Nominal Opening, mm	Dry Wt, gm	Split Normalized % Retained	Split Normalized % Finer	Project Specifications
3"	75	0	0.0%	100.0%	
2-1/2"	63	0	0.0%	100.0%	
2"	50	0	0.0%	100.0%	
1-1/2"	37.5	0	0.0%	100.0%	
1"	25	0	0.0%	100.0%	
3/4"	19	0	0.0%	100.0%	
1/2"	12.5	13.28	3.2%	96.8%	
3/8"	9.5	2.52	0.6%	96.2%	
No. 4	4.75	19.01	4.6%	91.6%	
No. 10	2	8.77	3.1%	88.6%	
No. 20	0.85	19.9	7.0%	81.5%	
No. 40	0.425	12.48	4.4%	77.1%	
No. 60	0.25	7.91	2.8%	74.4%	
No. 140	0.106	16.1	5.7%	68.7%	
No. 200	0.075	15.52	5.5%	63.2%	

HYDROMETER (-#200)

Tare No.	768	Wt. Dispers., gm	5	Specific Gravity	2.7
Wt. Tare + DS., gm	213.3	Wt. Dry Soil, gm (*-#200*)	27.71		Assumed
Wt. Tare, gm	180.59	*-#10 Dispersed 1min in Hamilton Beach Mixer*		*a Factor*	*0.9889*

Elapsed Time (min.)	R Measured	Temp *C	Composite Correction	R Corrected	K Factor	Percent Finer (%)	Particle Diameter (mm)	Adjusted % Finer (%)
2	24	22.3	5.4	18.6	0.0131	66.4	0.0325	42.0%
5	19	22.3	5.4	13.6	0.0131	48.5	0.0212	30.7%
15	15	22.3	5.4	9.6	0.0131	34.3	0.0126	21.7%
30	13.5	22.3	5.4	8.1	0.0131	28.9	0.0090	18.3%
60	11.5	22.3	5.4	6.1	0.0131	21.8	0.0064	13.8%
250	9	22.5	5.3	3.7	0.0131	13.2	0.0032	8.3%
1440	7.5	21.7	5.6	1.9	0.0132	6.8	0.0013	4.3%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**8.4**	Silt=51.3% Clay=11.9%	
Coarse=0; Fine=8.4		D60, mm	NA
% Sand (-#4 & +#200)	**28.4**	D30, mm	NA
Coarse=3.1; Medium=11.4; Fine=13.9		D10, mm	NA
% Fines (-#200)	**63.2**	Cc	NA
% Plus #200 (-3")	**36.8**	Cu	NA

USCS Description
SANDY LEAN CLAY

USCS Group Symbol	Atterberg Limits Group Symbol
cl	**cl - Lean Clay (assumed)**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)
100	100
2	88.6
0.05	52.9
0.002	6.2

Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
Gravel	11.4	0
Sand	35.6	40.2
Silt	46.8	52.8
Clay	6.2	7.0

USDA Classification
SILT LOAM

Performed By: VA/MAC Input Validation: AR Reviewed By: ALO (R) Date Tested: 5/2/2019

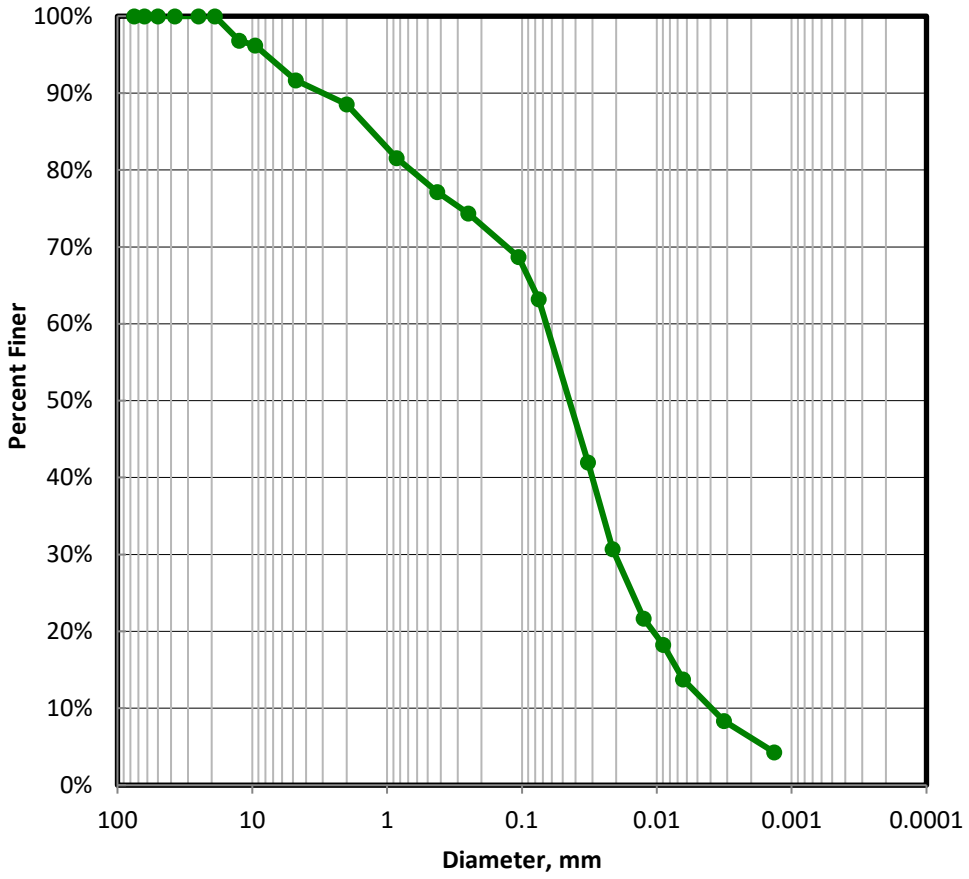
PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	9.0"-9.75"
Project No.	41708	Sample	HS-4
		Lab Sample	41708004

Sample Color: **BROWN**

USCS Group Name: **SANDY LEAN CLAY**

USCS Group Symbol: **cl** USDA: **SILT LOAM** AASHTO: **NA**



US Std. Sieve Size	Particle Diameter (mm)	Percent Finer
3"	75	100.0%
2-1/2"	63	100.0%
2"	50	100.0%
1-1/2"	37.5	100.0%
1"	25	100.0%
3/4"	19	100.0%
1/2"	12.5	96.8%
3/8"	9.5	96.2%
No. 4	4.75	91.6%
No. 10	2	88.6%
No. 20	0.85	81.5%
No. 40	0.425	77.1%
No. 60	0.25	74.4%
No. 140	0.106	68.7%
No. 200	0.075	63.2%
NA	0.0325	42.0%
NA	0.0212	30.7%
NA	0.0126	21.7%
NA	0.0090	18.3%
NA	0.0064	13.8%
NA	0.0032	8.3%
NA	0.0013	4.3%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**8.4**	Silt=51.3% Clay=11.9%	
Coarse=0; Fine=8.4		D60, mm	NA
% Sand (-#4 & +#200)	**28.4**	D30, mm	NA
Coarse=3.1; Medium=11.4; Fine=13.9		D10, mm	NA
% Fines (-#200)	**63.2**	Cc	NA
% Plus #200 (-3")	**36.8**	Cu	NA

USCS Description

SANDY LEAN CLAY

USCS Group Symbol	Atterberg Limits Group Symbol
cl	**cl - Lean Clay (assumed)**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)	Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
100	100			
		Gravel	11.4	0
2	88.6			
		Sand	35.6	40.2
0.05	52.9			
		Silt	46.8	52.8
0.002	6.2			
		Clay	6.2	7.0

USDA Classification

SILT LOAM

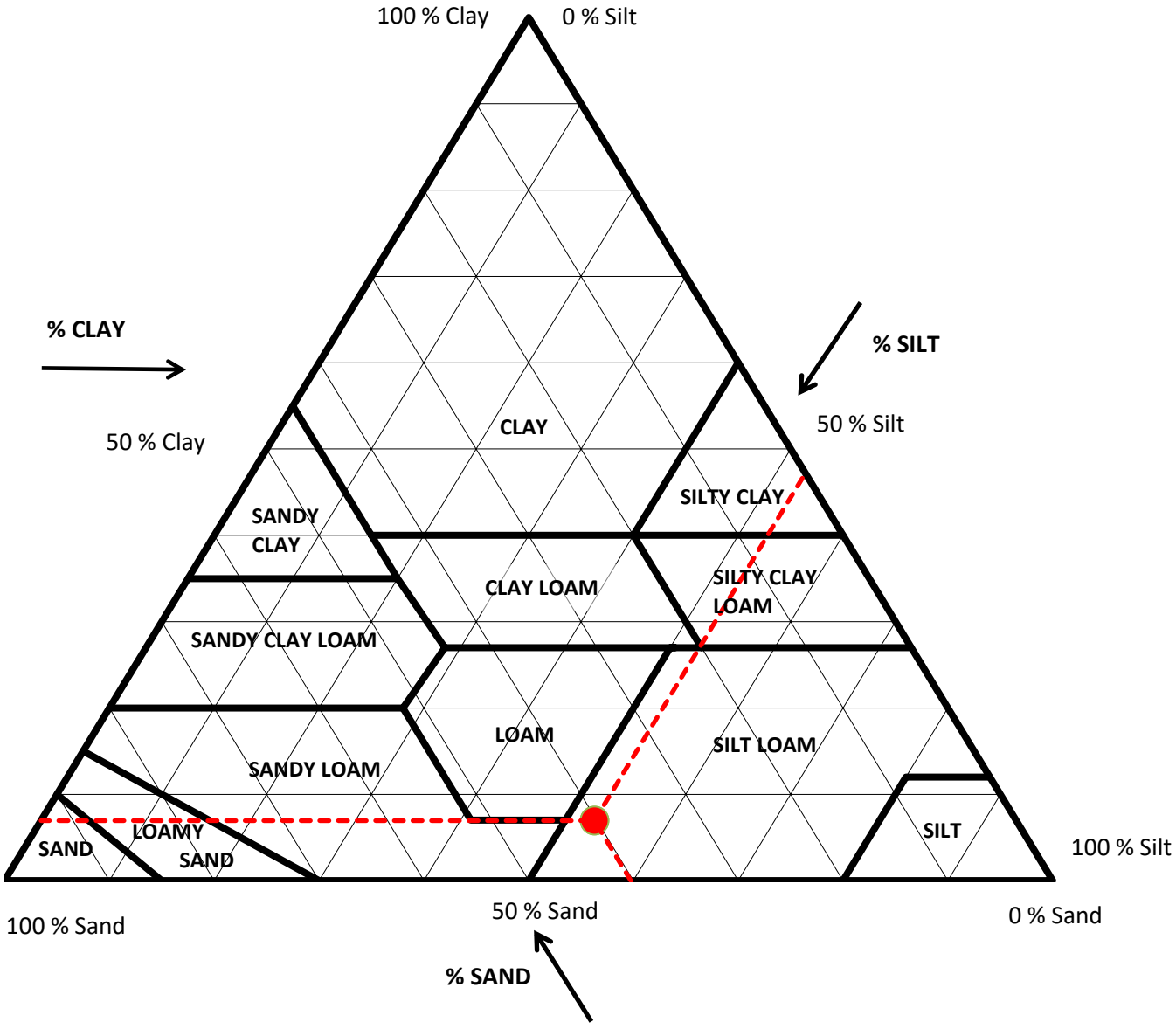
USDA CLASSIFICATION CHART

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	9.0"-9.75"
Project No.	41708	Sample	HS-4
		Lab Sample	41708004

Sample Color: **BROWN**
USCS Group Name: **SANDY LEAN CLAY**
USCS Group Symbol: **cl** USDA: **SILT LOAM** AASHTO: **NA**

Corrected for 0% gravel	
Percent Gravel, %	0.0
Percent Sand, %	40.2
Percent Silt, %	52.8
Percent Clay, %	7.0

Sand Subsizes Corrected Percentages	
Very Coarse Sand; 2-1	6.4
Coarse Sand; 1-0.5	5.3
Medium Sand; 0.5-0.25	4.3
Fine Sand; 0.25-0.1	7.4
Very Fine Sand; 0.1-0.05	16.8
Total	**40.2**



PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	10.0"
Project No.	41708	Sample	HS-5
		Lab Sample	41708005

Sample Color: **BROWN**
USCS Group Name: **CLAYEY SAND**
USCS Group Symbol: **sc** USDA: **SANDY LOAM** AASHTO: **NA**

MECHANICAL SIEVE

Total Sample	
Total Sample Wet Wt, gm (-3")	412
Sample Split on Sieve	No. 4
Coarse Washed Dry Sample, gm	26
Wet Wt Passing Split, gm	386
Dry Wt. Passing Split, gm	331
Total Sample Dry Wt, gm	357

Split Sample - Passing No. 4	
Tare No.	100
Tare + WS., gm	385.66
Tare + DS., gm	343.04
Tare, gm	82.9
Water Content of Split Sample	**16.4%**
Wt. of DS., gm	260.14
Wt. of +#200 Sample, gm	157.69

Sieve Size	Nominal Opening, mm	Dry Wt, gm	Split Normalized % Retained	Split Normalized % Finer	Project Specifications
3"	75	0	0.0%	100.0%	
2-1/2"	63	0	0.0%	100.0%	
2"	50	0	0.0%	100.0%	
1-1/2"	37.5	0	0.0%	100.0%	
1"	25	0	0.0%	100.0%	
3/4"	19	0	0.0%	100.0%	
1/2"	12.5	0	0.0%	100.0%	
3/8"	9.5	3.53	1.0%	99.0%	
No. 4	4.75	22.23	6.2%	92.8%	
No. 10	2	14.16	5.1%	87.7%	
No. 20	0.85	11.65	4.2%	83.6%	
No. 40	0.425	21.86	7.8%	75.8%	
No. 60	0.25	31.56	11.3%	64.5%	
No. 140	0.106	61.62	22.0%	42.5%	
No. 200	0.075	16.84	6.0%	36.5%	

HYDROMETER (-#200)

Tare No.	755	Wt. Dispers., gm	5	Specific Gravity	2.7
Wt. Tare + DS., gm	211.57	Wt. Dry Soil, gm (*-#200*)	23.32		Assumed
Wt. Tare, gm	183.25	*-#10 Dispersed 1min in Hamilton Beach Mixer*		*a Factor*	*0.9889*

Elapsed Time (min.)	R Measured	Temp *C	Composite Correction	R Corrected	K Factor	Percent Finer (%)	Particle Diameter (mm)	Adjusted % Finer (%)
2	25	22.3	5.4	19.6	0.0131	83.1	0.0323	30.4%
5	23.5	22.3	5.4	18.1	0.0131	76.8	0.0206	28.0%
15	20	22.3	5.4	14.6	0.0131	61.9	0.0122	22.6%
30	18	22.3	5.4	12.6	0.0131	53.4	0.0087	19.5%
60	16	22.3	5.4	10.6	0.0131	45.0	0.0062	16.4%
250	14	22.6	5.3	8.7	0.0131	36.9	0.0031	13.5%
1440	11.5	21.7	5.6	5.9	0.0132	25.0	0.0013	9.1%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**7.2**	Silt=21% Clay=15.5%	
Coarse=0; Fine=7.2		D60, mm	NA
% Sand (-#4 & +#200)	**56.2**	D30, mm	NA
Coarse=5.1; Medium=12; Fine=39.2		D10, mm	NA
% Fines (-#200)	**36.5**	Cc	NA
% Plus #200 (-3")	**63.5**	Cu	NA

USCS Description
CLAYEY SAND

USCS Group Symbol	Atterberg Limits Group Symbol
sc	**cl - Lean Clay (assumed)**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)
100	100
2	87.7
0.05	33.6
0.002	11.3

Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
Gravel	12.3	0
Sand	54.2	61.7
Silt	22.3	25.4
Clay	11.3	12.9

USDA Classification
SANDY LOAM

Performed By: VA/MAC Input Validation: AR Reviewed By: ALO (R) Date Tested: 5/2/2019

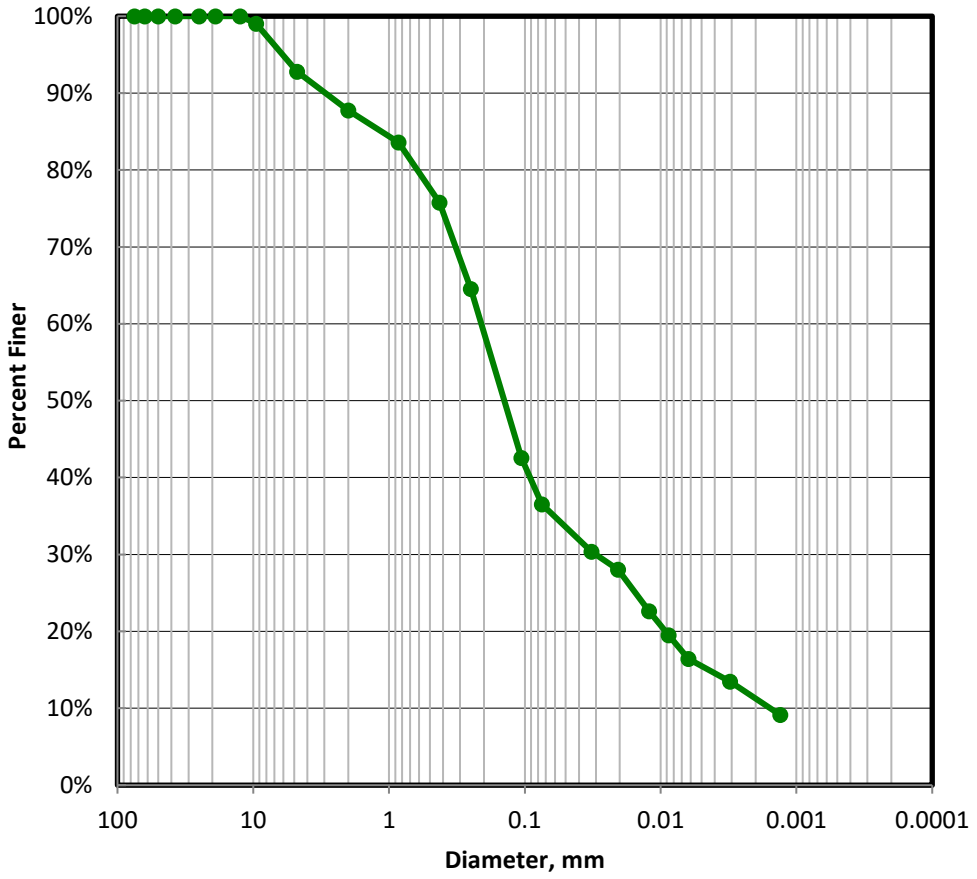
PARTICLE-SIZE ANALYSIS OF SOILS - ASTM D422-63(2007)

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	10.0"
Project No.	41708	Sample	HS-5
		Lab Sample	41708005

Sample Color: **BROWN**

USCS Group Name: **CLAYEY SAND**

USCS Group Symbol: **sc** USDA: **SANDY LOAM** AASHTO: **NA**



US Std. Sieve Size	Particle Diameter (mm)	Percent Finer
3"	75	100.0%
2-1/2"	63	100.0%
2"	50	100.0%
1-1/2"	37.5	100.0%
1"	25	100.0%
3/4"	19	100.0%
1/2"	12.5	100.0%
3/8"	9.5	99.0%
No. 4	4.75	92.8%
No. 10	2	87.7%
No. 20	0.85	83.6%
No. 40	0.425	75.8%
No. 60	0.25	64.5%
No. 140	0.106	42.5%
No. 200	0.075	36.5%
NA	0.0323	30.4%
NA	0.0206	28.0%
NA	0.0122	22.6%
NA	0.0087	19.5%
NA	0.0062	16.4%
NA	0.0031	13.5%
NA	0.0013	9.1%

USCS SOIL CLASSIFICATION

Corrected For 100% Passing a 3" Sieve

% Gravel (-3" & +#4)	**7.2**	Silt=21% Clay=15.5%	
Coarse=0; Fine=7.2		D60, mm	NA
% Sand (-#4 & +#200)	**56.2**	D30, mm	NA
Coarse=5.1; Medium=12; Fine=39.2		D10, mm	NA
% Fines (-#200)	**36.5**	Cc	NA
% Plus #200 (-3")	**63.5**	Cu	NA

USCS Description

CLAYEY SAND

USCS Group Symbol	Atterberg Limits Group Symbol
sc	**cl - Lean Clay (assumed)**

Auxiliary Information	Wt Ret, gm	% Retained	% Finer
12" Sieve - 300 mm	0	0.0	100.0
6" Sieve - 150 mm	0	0.0	100.0
3" Sieve - 75 mm	0	0.0	100.0

USDA CLASSIFICATION

Particle Size (mm)	Percent Finer (%)	Percent of Each Component (Material)	(%)	Corrected Percent of -2.0 mm Material for USDA
100	100			
		Gravel	12.3	0
2	87.7			
		Sand	54.2	61.7
0.05	33.6			
		Silt	22.3	25.4
0.002	11.3			
		Clay	11.3	12.9

USDA Classification

SANDY LOAM

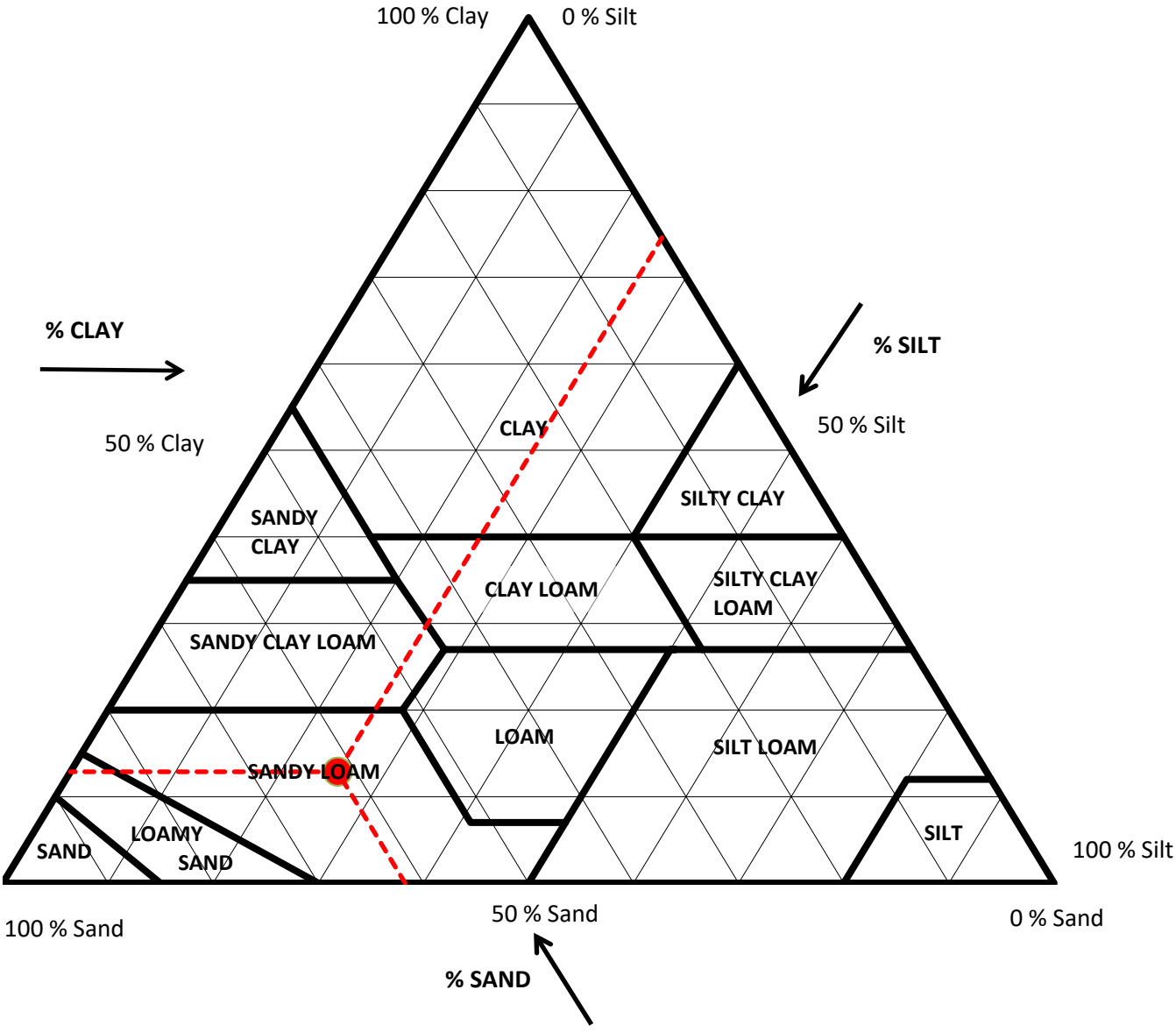
USDA CLASSIFICATION CHART

Client	ECS Mid-Atlantic, LLC.	Boring	NA
Client Project	13-9098 Carroll Knolls	Depth	10.0"
Project No.	41708	Sample	HS-5
		Lab Sample	41708005

Sample Color: **BROWN**
USCS Group Name: **CLAYEY SAND**
USCS Group Symbol: **sc** USDA: **SANDY LOAM** AASHTO: **NA**

Corrected for 0% gravel	
Percent Gravel, %	0.0
Percent Sand, %	61.7
Percent Silt, %	25.4
Percent Clay, %	12.9

Sand Subsizes Corrected Percentages	
Very Coarse Sand; 2-1	3.8
Coarse Sand; 1-0.5	7.7
Medium Sand; 0.5-0.25	14.9
Fine Sand; 0.25-0.1	26.2
Very Fine Sand; 0.1-0.05	9.1
Total	**61.7**

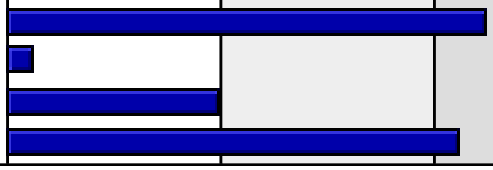


Agricultural Analytical Services Laboratory
The Pennsylvania State University
111 Ag Analytical Svcs Lab
University Park, PA 16802
(814) 863-0841 aaslab@psu.edu www.aasl.psu.edu

SOIL TEST REPORT FOR:	ADDITIONAL COPY TO:
AMBER ONDREY GEOTECHNICAL TESTING SERVICES 103 CORAOPOLIS RD CORAOPOLIS PA 15108	

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
05/06/2019	S19-22455		Allegheny			HS-1	

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
[1]Soil pH	7.7				
[2]Phosphorus (P)	5	ppm			
[2]Potassium (K)	91	ppm			
[2]Magnesium (Mg)	148	ppm			



RECOMMENDATIONS: *(See back messages for important information)*

Limestone*: NONE

Magnesium (Mg): NONE

***Calcium Carbonate equivalent**

Plant Nutrients:

(If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P_2O_5/A)	Potash (lb K_2O/A)	
1	Other	0	0	0	0	*See ST2 for other crop recommendations*

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	*See ST2 for other crop recommendations*

No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	*See ST2 for other crop recommendations*

No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:						Optional Tests:			[2]Trace Elements		
[2]Calcium (ppm)	[3]Acidity (meq/100 g)	[4]CEC (meq/100 g)	% Saturation of the CEC K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Salts mmhos/cm (1:2 soil:water)	*See back for comments* Zinc ppm	Copper ppm	Sulfur ppm
1675	0.0	9.8	2.4	12.5	85.1			0.18	66.6	4.0	5.9

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 (ICP), [3]Mehlich Buffer pH, [4]Summation of Cations

Agronomy

Recommendation Messages

Enclosures

ST-2 Fertilizer Recommendation Table- Guidelines for making recommendations for other crops and for adjusting for a different expected yield.

ST-4 Interpreting Soil Tests for Agronomic Crops-Explains the soil test report and provides additional information on the recommendations.

Soil Nutrient Levels Soil nutrient levels are given as parts per million (ppm) elemental P, K , and Mg. As a rule of thumb to convert ppm to lb/A multiply ppm x 2. The elemental results in lb/A can be converted to oxide forms using the following conversions: P x 2.3=P_2O_5, K x 1.2=K_2O, Mg x 1.6=MgO

Below Optimum-Nutrient is deficient. There should be an economic response to adding the recommended nutrient.	**Optimum-**Nutrient is adequate. There will be no yield response to adding more of a nutrient but a recommendation is made to replace what the crop removes and thus maintain the soil test in the optimum range.	**Above Optimum-**The nutrient is more than adequate. Not only will there not be a yield response but the soil nutrient levels are also adequate to accommodate crop removal.

Recommendations N,P, and K recommendations are made for three crop years on this field. New samples should be taken after 3 years. The recommendations for the 2nd and 3rd year assume that the earlier recommendations were followed. These recommendations are based on the results of the soil test and the information provided with the sample. If you think that there is an error on the report, contact the lab at the address on the front of the report. Tables that can be used to adjust or change recommendations for all crops based on the soil test can be found on the web at: www.aasl.psu.edu.

Limestone Recommendations The recommended limestone application should be adequate for 3 years. Limestone recommendations are based on 100% calcium carbonate equivalent limestone and assume "Fine-sized" limestone with 95% passing 20 mesh, 60% passing 60 mesh and 50% passing 100 mesh. Use "ST-2 Liming Materials Conversion Table (enclosed) to adjust for limestone quality. Also see Agronomy Facts #3 "Soil Acidity and Aglime".

Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

Starter Fertilizer Starter fertilizer is important to get a corn crop off to a good start when planting in cold, wet conditions. However, on optimum or higher testing soils, as planting dates get later and soils warm up, the benefit from starter fertilizer goes down. An N only starter is often adequate when soil test levels are above optimum. The correct material, rate, and placement for starter fertilizer are critical to be effective. See Agronomy Facts #51 "Starter Fertilizer".

Nitrogen Nitrogen recommendations on this report are not based on a soil test. They are based on crop requirements for the expected yield of the crop to be grown. The pre-sidedress nitrate soil tests (PSNT) and the Chlorophyll meter test are both available for improving nitrogen recommendations on corn especially when manure is being applied. See: Agronomy Facts 17 "Pre-sidedress Soil Nitrate Test for Corn" and Agronomy Facts 53 "The Early-season Chlorophyll Meter Test for Corn". For optimum efficiency, N should be applied as close to the time of crop need as practical. For corn apply 50-90% of the N when the corn is 10-20" tall. For winter grains apply the N in the spring prior to growth stage 5. For forage grasses split the recommended N for each cutting.

Manure Manure is a very important part of a fertility program. Manure applications may supply all or most of the nutrients recommended and in some cases may apply significantly more than the crop requires. Manure nutrients should be taken into account in developing your fertility program. For details on how to do this see the Penn State Agronomy Guide. Manure analysis kits are available through your county agent.

Very High Soil Test Levels Very high soil test levels should be avoided as much as possible. High soil nutrient levels might not only represent an economic loss but they may also indicate potential crop, animal or environmental problems.

Very high pH can results in micronutrient deficiencies and may affect the activity of some pesticides resulting in injury or poor pest control.

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Normal ranges of Zn, Cu and S in Pennsylvania Soils (Mehlich 3)		
Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

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SOIL TEST REPORT FOR:	ADDITIONAL COPY TO:
AMBER ONDREY GEOTECHNICAL TESTING SERVICES 103 CORAOPOLIS RD CORAOPOLIS PA 15108	

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
05/06/2019	S19-22456		Allegheny			HS-2	

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
[1]Soil pH	7.5				
[2]Phosphorus (P)	5	ppm			
[2]Potassium (K)	104	ppm			
[2]Magnesium (Mg)	102	ppm			

RECOMMENDATIONS: *(See back messages for important information)*

Limestone*: NONE

Magnesium (Mg): NONE

***Calcium Carbonate equivalent**

Plant Nutrients:

(If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P_2O_5/A)	Potash (lb K_2O/A)	
1	Other	0	0	0	0	*See ST2 for other crop recommendations*

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	*See ST2 for other crop recommendations*

No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	*See ST2 for other crop recommendations*

No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:

[2]Calcium (ppm)	[3]Acidity (meq/100 g)	[4]CEC (meq/100 g)	% Saturation of the CEC K	Mg	Ca
1506	0.0	8.6	3.1	9.8	87.1

Optional Tests:

Organic Matter %	Nitrate-N ppm	Salts mmhos/cm (1:2 soil:water)
		0.15

[2]Trace Elements *See back for comments*

Zinc ppm	Copper ppm	Sulfur ppm
9.2	1.7	3.4

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 (ICP), [3]Mehlich Buffer pH, [4]Summation of Cations

Agronomy

Recommendation Messages

Enclosures

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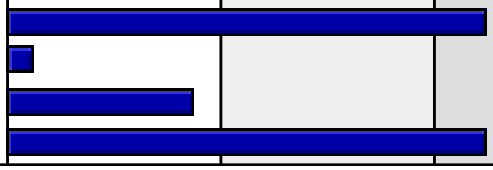
AMBER ONDREY GEOTECHNICAL TESTING SERVICES 103 CORAOPOLIS RD CORAOPOLIS PA 15108	

DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
05/06/2019	S19-22457		Allegheny			HS-3	

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
[1]Soil pH	7.6				
[2]Phosphorus (P)	4	ppm			
[2]Potassium (K)	84	ppm			
[2]Magnesium (Mg)	198	ppm			



RECOMMENDATIONS: *(See back messages for important information)*

Limestone*: NONE

Magnesium (Mg): NONE

***Calcium Carbonate equivalent**

Plant Nutrients:

(If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P_2O_5/A)	Potash (lb K_2O/A)	
1	Other	0	0	0	0	*See ST2 for other crop recommendations*

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	*See ST2 for other crop recommendations*

No crop was specified. Therefore no recommendation is given.

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No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:						Optional Tests:			[2]Trace Elements		
[2]Calcium (ppm)	[3]Acidity (meq/100 g)	[4]CEC (meq/100 g)	% Saturation of the CEC K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Salts mmhos/cm (1:2 soil:water)	*See back for comments* Zinc ppm	Copper ppm	Sulfur ppm
1398	0.0	8.9	2.4	18.6	78.9			0.14	1.7	2.9	5.7

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 (ICP), [3]Mehlich Buffer pH, [4]Summation of Cations

Agronomy

Recommendation Messages

Enclosures

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DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
05/06/2019	S19-22458		Allegheny			HS-4	

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
[1]Soil pH	8.2				
[2]Phosphorus (P)	3	ppm			
[2]Potassium (K)	31	ppm			
[2]Magnesium (Mg)	91	ppm			

RECOMMENDATIONS: *(See back messages for important information)*

Limestone*: NONE

Magnesium (Mg): NONE

***Calcium Carbonate equivalent**

Plant Nutrients:

(If manure will be applied, adjust these recommendations accordingly. See back of report.)

Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P_2O_5/A)	Potash (lb K_2O/A)	
1	Other	0	0	0	0	*See ST2 for other crop recommendations*

No crop was specified. Therefore no recommendation is given.

2	Other	0	0	0	0	*See ST2 for other crop recommendations*

No crop was specified. Therefore no recommendation is given.

3	Other	0	0	0	0	*See ST2 for other crop recommendations*

No crop was specified. Therefore no recommendation is given.

ADDITIONAL RESULTS:						Optional Tests:			[2]Trace Elements		
[2]Calcium (ppm)	[3]Acidity (meq/100 g)	[4]CEC (meq/100 g)	% Saturation of the CEC K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Salts mmhos/cm (1:2 soil:water)	*See back for comments* Zinc ppm	Copper ppm	Sulfur ppm
327	0.0	2.5	3.2	30.7	66.1			0.11	1.3	1.2	8.3

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 (ICP), [3]Mehlich Buffer pH, [4]Summation of Cations

Agronomy

Recommendation Messages

Enclosures

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DATE	LAB #	SERIAL #	COUNTY	ACRES	ASCS ID	FIELD ID	SOIL
05/06/2019	S19-22459		Allegheny			HS-5	

SOIL NUTRIENT LEVELS			Below Optimum	Optimum	Above Optimum
[1]Soil pH	7.6				
[2]Phosphorus (P)	95	ppm			
[2]Potassium (K)	96	ppm			
[2]Magnesium (Mg)	229	ppm			

RECOMMENDATIONS: *(See back messages for important information)*

Limestone*: NONE

Magnesium (Mg): NONE

***Calcium Carbonate equivalent**

Plant Nutrients:

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Year	Crop	Expected Yield	Nitrogen (lb N/A)	Phosphate (lb P_2O_5/A)	Potash (lb K_2O/A)	
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[2]Calcium (ppm)	[3]Acidity (meq/100 g)	[4]CEC (meq/100 g)	% Saturation of the CEC K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Salts mmhos/cm (1:2 soil:water)	*See back for comments* Zinc ppm	Copper ppm	Sulfur ppm
2308	0.0	13.7	1.8	13.9	84.3			0.19	8.9	3.9	16.9

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 (ICP), [3]Mehlich Buffer pH, [4]Summation of Cations

Agronomy

Recommendation Messages

Enclosures

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Magnesium Only one Mg Recommendation is made for three years. Magnesium is most economically applied by using a limestone containing Mg. Low Mg levels in soils may result in low Mg levels in forage crops especially if a significant amount of N and/or K fertilizer is applied. This can result in potentially fatal grass tetany in animals. Use caution if grazing. Apply the recommended Mg and be sure your feed rations are properly balanced.

Starter Fertilizer Starter fertilizer is important to get a corn crop off to a good start when planting in cold, wet conditions. However, on optimum or higher testing soils, as planting dates get later and soils warm up, the benefit from starter fertilizer goes down. An N only starter is often adequate when soil test levels are above optimum. The correct material, rate, and placement for starter fertilizer are critical to be effective. See Agronomy Facts #51 "Starter Fertilizer".

Nitrogen Nitrogen recommendations on this report are not based on a soil test. They are based on crop requirements for the expected yield of the crop to be grown. The pre-sidedress nitrate soil tests (PSNT) and the Chlorophyll meter test are both available for improving nitrogen recommendations on corn especially when manure is being applied. See: Agronomy Facts 17 "Pre-sidedress Soil Nitrate Test for Corn" and Agronomy Facts 53 "The Early-season Chlorophyll Meter Test for Corn". For optimum efficiency, N should be applied as close to the time of crop need as practical. For corn apply 50-90% of the N when the corn is 10-20" tall. For winter grains apply the N in the spring prior to growth stage 5. For forage grasses split the recommended N for each cutting.

Manure Manure is a very important part of a fertility program. Manure applications may supply all or most of the nutrients recommended and in some cases may apply significantly more than the crop requires. Manure nutrients should be taken into account in developing your fertility program. For details on how to do this see the Penn State Agronomy Guide. Manure analysis kits are available through your county agent.

Very High Soil Test Levels Very high soil test levels should be avoided as much as possible. High soil nutrient levels might not only represent an economic loss but they may also indicate potential crop, animal or environmental problems.

Very high pH can results in micronutrient deficiencies and may affect the activity of some pesticides resulting in injury or poor pest control.

Very high phosphorus levels in the soil may lead to crop production problems especially with no manure and may result in potentially harmful P loss to the environment. Best management practices may be necessary to reduce the potential for environmental problems with P.

Zinc, Copper and Sulfur Results The normal ranges for zinc (Zn) copper (Cu), and sulfur (S) in Pennsylvania soils are listed below. Cu, Zn and S deficiencies are uncommon in PA, but may occur on soils testing below the normal range. Cu, Zn and S toxicities may occur at levels testing well above the normal range, but have not been observed in Pennsylvania in agronomic crops even on soils testing 2 to 3 times above the normal range. For additional information, see ST4.

Normal ranges of Zn, Cu and S in Pennsylvania Soils (Mehlich 3)		
Zn (ppm)	Cu (ppm)	S (ppm)
1.1 - 9.4	1.2 - 5.5	10 - 25

Distribution of Soil Test Results Summaries of soil test results may be used in educational programs. However, individual results will not be released outside of Penn State without permission of the client. Electronic copies of your results are available to you, contact the lab for more information.

For additional information on these topics please see the current **Penn State Agronomy Guide** or the **AASL website**: www.aasl.psu.edu. This soil test is part of an ongoing research and extension program of Penn State. If you have any questions or comments about this program or would like copies of publications referenced here, please contact your Penn State County Extension agent.

Land Acquisition
Carroll Knolls Local Park

MCPB Item # 8

9/27/2012

September 20, 2012

TO: Montgomery County Planning Board

VIA: Mary Bradford, Director of Parks
Michael F. Riley, Deputy Director of Parks
John E. Hench, Ph. D., Chief, Park Planning and Stewardship Division
Mitra Pedoeem, Chief, Park Development Division

FROM: William Gries, Park Development Division
Brenda Sandberg, Park Planning and Stewardship Division
Dominic Quattrocchi, Park Planning and Stewardship Division

SUBJECT: Land Acquisition Recommendation
Montgomery College Foundation, Inc., Property (a.k.a., Maryland College of Art and Design or MCAD)
10500 Georgia Avenue, Wheaton, MD
Carroll Knolls Local Park
2.47 acres, more or less, improved

STAFF RECOMMENDATON

Staff recommends approval of the attached Resolution #12-111 with respect to the Montgomery College Foundation, Inc., property (the former Maryland College of Art and Design, hereafter referred to as the MCAD property), that resolves the following:

1. Designation of the 2.47 acre, more or less, improved, Montgomery College Foundation, Inc., property as an Urban Open Space Resource within the Legacy Open Space Functional Master Plan.

2. Acquisition of the property for the negotiated purchase price of $1,140,000 as Carroll Knolls Local Park, to be funded through the Legacy Open Space program.

3. Site restoration and demolition of the improvements on the property, not expected to exceed $350,000, to be funded through the Legacy Open Space program.

Figure 1. MCAD Property (13 lots), Additional Outlot, and Potential Future Park Boundary

PROPERTY DESCRIPTION

The MCAD property, outlined in black in Figure 1, consists of approximately 2.47 acres on 13 undeveloped lots immediately west of Georgia Avenue and north of Evans Drive. The site is located on the west side of Georgia Avenue between Forest Glen and Wheaton and across Georgia Avenue from Evans Parkway Neighborhood Park. The site is within the Kensington-Wheaton Master Plan (but outside the Wheaton CBD Sector Plan boundary) and is part of the Sligo Creek Watershed. MCAD is improved with an unoccupied 14,000 square foot building with associated parking (60 spaces). The site also includes areas of lawn that currently function as community open space as well as young developing forest. Areas of open space in the current configuration have served as de facto public open space since the 1960's, being used by the local community for picnics, small-scale soccer, cricket practice, and children's play, among other observed activities.

The park that would be created with this acquisition will include several undeveloped road rights-of-way. Staff will pursue abandonment of these ROWs to create unified park ownership, as has been done for many other parks. In addition, a small outlot under different ownership is a logical future addition to this new park, and is currently in process to be acquired through donation. The total acreage for the proposed new park would be approximately 3.6 acres, providing a significant area of urban open space to serve the community. See Figure 2 for an aerial view of the potential park site.

Figure 2. Potential Park at MCAD Site: Aerial Photo Looking North (2005 image)

LEGACY OPEN SPACE DESIGNATION HISTORY

In December 2007, staff recommended that this site be added to Legacy Open Space program as an Urban Open Space. The Board did not approve adding the site to LOS (based on concerns over budget impacts and Legacy definitions), but did express support for the site as future parkland.

In January 2012, staff recommended to the Board that the MCAD site be reconsidered for LOS designation due to new policies and plans adopted since 2007 (see MASTER PLAN AND POLICY SUPPORT below) plus new 2010 census data indicating rapidly increasing population density in close proximity to the MCAD site. The Board supported the staff proposal to pursue negotiations with the property owner, with the caveat that Board approval of the LOS designation would be sought at time of contract approval and would be contingent upon adequately addressing issues of budget impact and policy support for the acquisition.

LOS URBAN OPEN SPACE CRITERIA ANALYSIS

The MCAD property meets the criteria for designation as an Urban Open Space and is proposed to be acquired as parkland using funds in the Legacy Open Space (LOS) project in the Commission's CIP.

The LOS Urban Open Space category is less restrictive than most of the other LOS open space types that focus on conservation of existing natural and cultural resources. Instead, Urban Open Space was created to provide open space of varying types to serve densely developed communities and can result in new parks that fall into several park classifications as described in the *Parks, Recreation, and Open Space (PROS) Plan* (approved July 2012). Examples of acquired LOS Urban Open Spaces (with their current park classification category in *italics*) range from a small wooded *Neighborhood Conservation Area* (Sligo Mill) to a landscaped, garden-like *Community Use Urban Park – Neighborhood Green* between single-family residential and a CBD (Chevy Chase Open Space) to a

Countywide Urban Park - Civic Green that could include large areas of hardscape to support public events (Clarksburg Triangle). Note that there is no language in the urban open space description in the LOS Master Plan that prohibits elements of active recreation (e.g., athletic field or playground) within a park acquired under the Urban Open Space category.

Staff analysis of the MCAD site yields the conclusion that the site meets all three of the LOS Urban Open Space criteria (see sidebar), specifically that the site would:

a) Provide a significant opportunity to increase access to public open space in a community with a high and fast-growing population density (Forest Glen/Wheaton);
b) Protect scarce open space that currently exists in the urbanized Georgia Avenue corridor between Wheaton and Silver Spring; and
c) Improve the green character of Georgia Avenue, a designated Green Boulevard of countywide significance in the LOS Plan.

Urban Open Space Criteria
LOS Functional Master Plan, p. 17

The Resource provides a significant opportunity:

a) to increase access to public open space in communities with high population densities;
b) to protect scarce open space in an urbanized community; [or]
c) to improve the character of a green boulevard of countywide or regional significance.

MASTER PLAN AND POLICY SUPPORT

In addition to the Legacy Open Space Plan, several recent planning and policy documents include recommendations that support the acquisition of MCAD as parkland.

Wheaton CBD and Vicinity Sector Plan (Approved 2011)

The Wheaton CBD Sector Plan has specific recommendations to attempt to find more open space and active recreation areas near the CBD since limited open space is available within the CBD:

- Provide opportunities for urban recreation in the downtown.
- The Department of Parks should explore opportunities for large parks outside but near the Plan area to meet the standards established in the LPPRP (*Land Preservation, Parks and Recreation Plan*, 2005).

Vision 2030 (June 2011)

Newly completed park planning studies and tools are providing new standards for measuring needs for parks, specifically including the factor of walking distance to open space and recreational amenities. In Vision 2030, the relevant recommendations to the MCAD site include:

- A quarter mile radius is considered to be the distance within which a resident can reasonably walk to a park or recreation component. (Volume 1, page 98)
- Plan, design and create more unprogrammed flexible parks and recreation spaces, and features that are multi-functional or adaptable for multiple purposes. (Volume 3, Action 5.2b)

***Parks, Recreation and Open Space (PROS) Plan* (Approved July 2012)**

The PROS Plan includes a new focus on providing parks and facilities to meet the needs of increasingly dense urban areas of the County. Relevant recommendations and definitions in the Plan include:

- Community Open Space, a new facility type consisting of open, level grassy areas for informal recreational activities, is recommended to be provided through acquisition of additional land in areas with high population density and in urbanizing areas.
- Urban Wooded Area, a new facility type that consists of treed areas that create natural space within an urban environment, is recommended to be provided through acquisition of additional lands in existing and future urban areas.
- This part of the County (Georgia Avenue Team Area, per the 2005 LPPRP/PROS Plan) has an unmet demand for youth and adult rectangular athletic fields.

Figure 3. Quarter-Mile Service Area from Parks between Wheaton and Forest Glen

ADDITIONAL ACQUISITION JUSTIFICATIONS

MCAD offers a unique opportunity to provide both natural, green open space and other facilities for recreation to a densely developed suburban community, in addition to providing visual improvement along Georgia Avenue. Additional factors and details that support the importance of this site as parkland are briefly described below.

Demand Factors

- Community groups, elected officials (four County Council members and five members of the State delegation), and the Legacy Open Space Advisory Group continued to support this site as parkland over a period of five years.
- 2010 U.S. Census figures show a significant 15.5% increase in population within one mile of the property since 2000. Similarly, increasing numbers of families with children are indicated by overcrowded school populations, illustrated by the opening of a new elementary school about one-half mile from the site with an estimated population of 700 students by the next school year.
- Park managers report very heavy use of nearby park facilities and anticipate that this additional parkland will help relieve pressure on these nearby parks.

Opportunities

- The site provides an opportunity for a walking-distance park (within 10 minutes or ¼ mile) on the west side of Georgia Avenue, a *de facto* river of traffic that blocks pedestrian access to most parks in the area that are on the east side of Georgia Avenue (see Figure 3).
- The MCAD site is generally flat and conducive for a variety of recreational activities in addition to green open space, creating the potential to meet several identified facility needs in this community.
- Acquisition of the site implements the Green Boulevard concept (from the LOS plan and Georgia Avenue Concept Study) through the provision of a green respite along a heavily travelled route for the benefit of the local community and visual relief for users of the transportation corridor.
- The MCAD site is one of the few remaining non-park green spaces in the Sligo Creek Watershed.

PROPOSED USE

This property is proposed to be added to the park system as Local Park to provide a combination of green space and recreation space. Although smaller than a typical local park, this site has the potential to provide several facilities that fit within the local park classification (Park Classification System, 2012 PROS Plan). This proposed Local Park could include play equipment, a youth-sized rectangular field, a sitting area and shelter, a multi-use court, and an urban wooded area and community open space.

The proposed uses for the park can be thought of in two phases: Phase I being an interim park with minimal development, and Phase II being a fully designed and constructed local park.

Phase I

To create the platform for the interim park, the existing improvements (the building and most of the asphalt parking) will be removed from the property as soon as possible after acquisition and the land grassed and stabilized. To create a safe and usable interim park, additional site cleanup and improvements would include removal of non-native invasive plants and hazardous trees, installation of appropriate fencing and park signage, and other minor improvements.

Phase II

The open space and facilities for this park in its ultimate stage will be determined through a future park facility planning process using needs identified in Park plans and studies and with input from local communities. The list of potential facilities that could be provided in this Local Park is quite broad, including play equipment, a youth-sized rectangular field, sitting and picnic areas, community open space, wooded areas, courts, and parking. A key element of this park is its unique ability to provide for an Urban Wooded Area and Community Open Space, two newly defined facilities in the PROS plan and a key factor in identifying this site as an LOS Urban Open Space. The site is also large enough to potentially provide a rectangular field, one of the most needed park facilities in this area of the County per the 2005 PROS Plan.

CONCLUSION

The MCAD property represents a unique combination of attributes: location in a dense and a recreationally underserved neighborhood, existing woods and open space, and flat topography that allows for a variety of recreation, all adjacent to Georgia Avenue, a designated Green Boulevard in the Legacy Open Space program. Maintaining this site for public use meets the long-term vision of the Legacy Open Space program, enhancing Georgia Avenue as an attractive and walkable community long into the future. Acquisition of the former MCAD site as a Local Park is consistent with the long standing tradition of the M-NCPPC in providing a quality park system to the public.

Attachment: Resolution #12-111

cc: Steve Chandlee
Mohammed Turay
Antonio DeVaul
David Vismara
John Nissel
Mary Ellen Venzke
Sean Dixon
Kate Stookey
Glenn Kreger

MCPB
12-111

RESOLUTION

WHEREAS, The Maryland-National Capital Park and Planning Commission ("Commission") is authorized by Article 28, Section 5-101 of the Annotated Code of Maryland to acquire, develop, maintain and operate a public park system within the Maryland-Washington Metropolitan District; and

WHEREAS, Montgomery County, Maryland (the "County"), has appropriated certain funds from the County's General Obligation Bond proceeds to fund the Commission's Legacy Open Space (LOS) Capital Improvement Program (CIP); and

WHEREAS, the Commission identifies properties that are eligible for acquisition with funds from the LOS CIP and the Commission recommends that the County acquire such properties with such funds; and

WHEREAS, the Montgomery College Foundation, Inc. (the "Foundation"), owns certain property, known as Maryland College of Art and Design (MCAD), located in Wheaton, Maryland, containing 2.47 acres, more or less, of improved land (the "Property"); and

WHEREAS, the Montgomery County Planning Board on behalf of the Commission recommends that the County acquire from the Foundation the Property; and

WHEREAS, the Property meets parkland acquisition criteria as an Urban Open Space under the Legacy Open Space (LOS) Master Plan of 2001 and staff of the Commission recommends that the Property be designated as an Urban Open Space under said Master Plan; and

WHEREAS, there are sufficient monies available in the Commission's LOS CIP to pay for the acquisition and subsequent demolition and site restoration costs;

NOW THEREFORE BE IT RESOLVED, that the Montgomery County Planning Board hereby designates the Property, as an Urban Open Space under the Legacy Open Space Master Plan of 2001; and

BE IT FURTHER RESOLVED, that the Montgomery County Planning Board recommends that the County acquire the Property from the Foundation with LOS CIP funds for a purchase price of One Million One Hundred Forty Thousand Dollars ($1,140,000.00) and other valuable consideration; and

BE IT FURTHER RESOLVED, that the Montgomery County Planning Board recommends that County uses LOS CIP funds, which are not expected to exceed $350,000.00, for the demolition and site restoration costs for the Property.

* * * * * * * * * * * * *

This is to certify the foregoing is a true and correct copy of a resolution adopted by the Montgomery County Planning Board of the Maryland-National Capital Park and Planning Commission on motion of Commissioner _____, seconded by Commissioner _____, with Commissioners _____, _____, _____, _____, and _____ all voting in favor of the motion at its regular meeting held on Thursday, September 27, 2012 in Silver Spring, Maryland.

_____
Françoise M. Carrier, Chair
Montgomery County Planning Board