

GEO-TECHNOLOGY ASSOCIATES, INC.

GEOTECHNICAL AND
ENVIRONMENTAL CONSULTANTS

A Practicing Geoprofessional Business Association Member Firm



Toll Brothers, Inc.
516 North Newtown Street Road
Newtown Square, Pennsylvania 19073

Attn: Mr. Michael A. Downs, P.E.

Re: Summary of Infiltration Testing
Crebilly Farm
Westtown Township, Chester County, Pennsylvania

Mr. Downs:

In accordance with our Agreement, Geo-Technology Associates, Inc. (GTA) has evaluated potential stormwater management (SWM) facility locations at the site for infiltration potential of underlying soils. A *Site Location Map* is attached to this Report in *Appendix A*.

GTA performed SWM soil evaluations at the site in 2016, 2019 and 2020. The results of our 2016 and 2019 evaluations are summarized in the following documents: *Report of Preliminary Geotechnical Exploration dated August 11, 2016 (GTA, 2016)*; *our August 19, 2019 Crebilly Farm- Robinson Tract Memo (GTA, 2019a)*; and *our November 18, 2019 Crebilly Farm- The Robinson Tract Additional testing Memo (GTA, 2019b)*. The results of the 2020 evaluations, as well as the infiltration results for the previous 2016 and 2019 evaluations, are summarized herein.

GTA performed infiltration testing in 2020 at locations requested by ESE Consultants (ESE). The test pit locations were staked by ESE prior to our work and the approximate locations are depicted on the attached *Exploration Location Plan*. The subsurface exploration and infiltration testing was performed on January 23 and 24, 2020 (at Locations TP4-01 and – 01A, and TP4-02 through -06), and on July 28, 2020 (at Locations TP5-01 through -05). Deep test pits were initially excavated at each location to evaluate the subsurface conditions and limiting zones. Where two test pits were adjacent to each other, one deep test pit was excavated in the approximate middle. Shallower offset test pits were then excavated to perform field infiltration testing. Infiltration testing was performed using a double-ring infiltrometer and the stabilized values recorded over the last four time-intervals were recorded. Soil samples retrieved from select test pits were delivered GTA's laboratory for visual classification by engineering personnel. Samples obtained from select test pits were tested for grain-size analysis to determine the United States Department of Agriculture (USDA) classification for the soil.

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Based on our observations made during the subsurface exploration, it is our opinion that managing stormwater quality through the use of infiltration will be feasible with some limitations in portions of the site. However, the surficial fine-grained soils, depth to groundwater, and depth to weathered rock could impact the design and construction of the proposed facilities. Where infiltration is desired, it is recommended that the proposed subgrades be extended through the fine-grained soils in to the sandy residual soils. If the subgrades need to be undercut below the design grade, the proposed subgrade elevations can be re-established with ASTM C33 sand (concrete sand) or AASHTO #57 stone.

The guidelines established in the Pennsylvania Stormwater Best Management Practices Manual, Appendix C Site Evaluation and Soil Testing indicates that the minimum infiltration rate for all runoff reduction and infiltration practices is 0.1-inch per hour. Also, a vertical separation of two (2) feet from the seasonal high groundwater elevation is required.

The approximate locations of infiltration tests with rates that appear to be suitable for infiltration are indicated on *Test Plan A*, attached to this Report in *Appendix A*. *Table 1* summarizes the field-testing results and indicates the soil types at tested depths, for test locations with rates that appear to be suitable for infiltration.

Table 1: FIELD INFILTRATION TEST SUMMARY for TEST LOCATIONS WITH APPARENTLY SUITABLE RATES*

Location	Test Depth (feet)	Unfactored Field Infiltration Rate	USCS Soil Classification
TP-1	4	2	Silty SAND (SM)
TP-2	2 ½	2	Silty GRAVEL with sand (GM)
TP-3	4 ½	1	Silty SAND (SM)
TP-5	3 ½	0.5	Silty Clayey SAND with gravel (SM-SC)
TP-6	4 ½	2	Silty SAND (SM)
TP-7	3	2	Silty SAND (SM)
TP-8	3	1	Silty SAND (SM)
TP-9	5	0.2	Silty SAND with gravel (SM)
TP-11	4	1	(SC-SM)
TP-12	4 ½	2	Sandy SILT (ML)
TP-13	3 ½	4	Silty SAND (SM)
TP2-01	4 ½	1	Silty SAND with gravel (SM)
TP2-02	7	6	Well-graded GRAVEL with silt and sand
TP2-03	5 ½	4.5	Silty SAND (SM)
TP2-05	7	6	Silty SAND (SM)
TP3-04	9	3.5	Silty SAND (SM)
TP3-05	10	0.5	Silty SAND (SM)
TP3-05A	6	1	Sandy SILT (ML)
TP3-06	6	0.5	Sandy SILT (ML)

Location	Test Depth (feet)	Unfactored Field Infiltration Rate	USCS Soil Classification
TP3-11	6	1	Sandy SILT (ML)
TP3-12	6	4	Silty SAND (SM)
TP4-02	2	0.25	Sandy SILT (ML)
TP4-03	3	0.25	Silty SAND (SM)
TP4-04	6	0.25	Silty SAND (SM)
TP4-05	3	0.75	Silty SAND (SM)
TP4-06	6	0.75	Silty SAND (SM)
TP5-01	4	1.3	Silty SAND (SM)
TP5-03	5	1.3	Sandy SILT (SM)
TP5-04	4	0.8	Silty SAND (SM)
TP5-05	5	0.4	Sandy SILT (ML)

***Note:** See *Appendix B* of this Report for results for all explored locations

Unfactored field measured infiltration rates ranged up to 6 inches per hour at the tested locations and depths, for the locations with apparently suitable rates for infiltration. However, we recommend that a design infiltration rate of no more than 25 to 50 percent of the field measured rate be used for the final design of the facilities. We do not recommend averaging rates at various locations and applying the averaged rate to the site or per facility. This recommendation is based on the inherent problems associated with these systems as they become less permeable due to densification during construction and partial clogging or siltation occurring over time. Additionally, design phase infiltration testing should be performed to confirm the preliminary rates in this report and for refinement/confirmation of suitable SWM areas.

It is noted that all explored/tested locations from our 2016, 2019 and 2020 evaluations, including suitable and unsuitable locations, are indicated on *Test Plan B* in *Appendix B* of this Report. Field testing results for all of our 2016, 2019 and 2020 test locations are indicated on the Table inset to *Test Plan B* in *Appendix B*, along with notes (also included on *Test Plan B*) on results, recommendations and limitations.

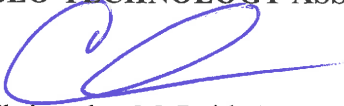
Observed soil conditions at SWM exploration locations from our 2016, 2019 and 2020 evaluations are summarized on the *Test Pit Exploration Logs*, attached to this Report in *Appendix C*. The soil descriptions indicated on the logs are based on visual observations using the Unified Soil Classification System (USCS) of the individual soil samples as summarized on the *Notes for Exploration Logs*, also attached to this report in *Appendix C*. Samples obtained from select test pits were tested for grain-size analysis to evaluate the United States Department of Agriculture (USDA) classification for the soil. The classifications provide information regarding soils permeability. The results of the lab testing are summarized on the *Summary of Laboratory Testing Table* in *Appendix D* and in the *Particle Size Distribution Reports*, also in *Appendix D*. The USDA correlated infiltration rates based on the texture classification generally agree with the field measured rates.


Once the design of the proposed facilities has been completed, GTA should be provided the opportunity to review the plans to evaluate if the geotechnical issues have been addressed. Also, GTA should be provided the opportunity to review the facility subgrade during construction and perform additional field testing, if warranted. This is to observe compliance with the design concepts, specifications or recommendations, and to allow for field changes in the event that the soils conditions differ from that anticipated prior to that start of construction. This data should be used with the other information and recommendations contained in our initial report for the project dated August 11, 2016 (GTA, 2016), as well as in GTA 2019a and 2019b.

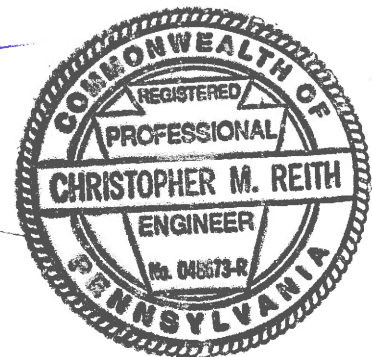
This report, including all supporting logs, field data, field notes, laboratory test data, calculations, estimates and other documents prepared by GTA in connection with this Project have been prepared in accordance with generally accepted engineering practice. Use and reproduction of this report by any other person without the expressed written permission of GTA and Toll Brothers is unauthorized and such use is at the sole risk of the user.

Thank you for the opportunity to assist you with this project. Should you have any questions or require any additional information, please contact our office at (410) 515-9446.

Sincerely,
GEO-TECHNOLOGY ASSOCIATES, INC.


Christopher M. Reith, P.E.
Vice President


Paul S. Scott, P.G.
Vice President



PSS/CR/gmm
31161348x1

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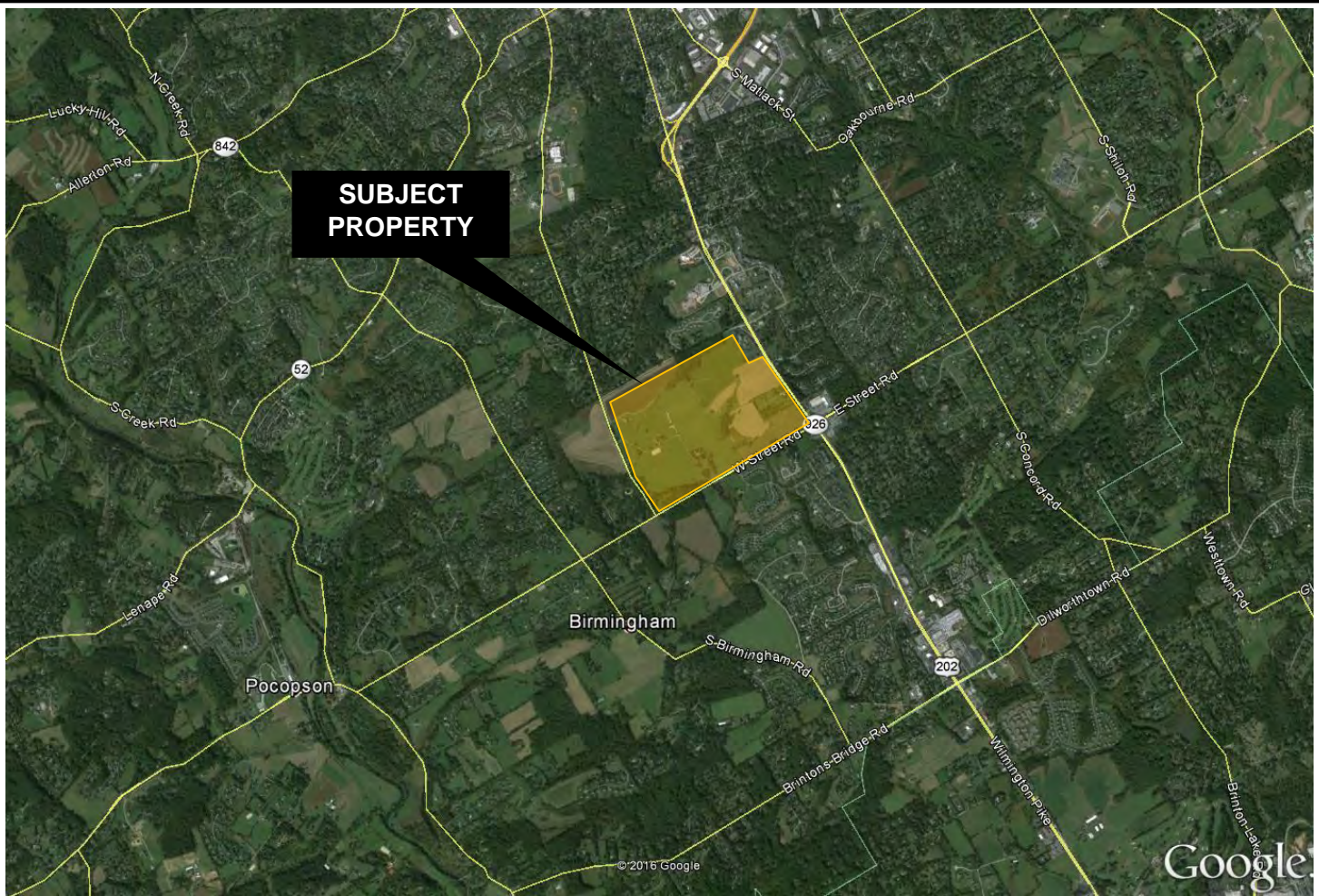
LIST OF APPENDICES

Appendix A	Site Location Plan Test Plan A
Appendix B	Test Plan B
Appendix C	Notes for Exploration Logs Test Pit Exploration Logs (36 Logs)
Appendix D	Summary of Laboratory Testing Table Particle Size Distribution Reports (24 Sheets)

APPENDIX A

Site Location Plan

Test Plan A



Notes: (1) Layout was obtained from a Google Earth Imagery, dated October 7, 2011.



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SITE LOCATION MAP

CREBILLY FARM

WESTTOWN TOWNSHIP
 CHESTER COUNTY, PENNSYLVANIA

SCALE
 NTS

DATE
 AUG 2016

DRAWN BY
 GOOGLE

REVIEW BY
 CMR

JOB NO.
 161348

FIGURE:
 1



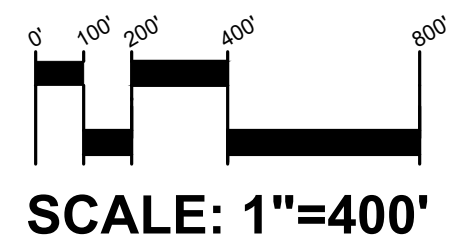
NOTE: SEE GTA (2016, 2019A AND 2019B) FOR ADDITIONAL INFORMATION, RECOMMENDATIONS AND LIMITATIONS; SEE ALSO EXPLORATION LOCATION PLAN B IN APPENDIX B OF THIS REPORT FOR ADDITIONAL TESTING INFORMATION AND NOTES

Test Pit	Total Depth (ft)	Test Depth (ft)	Unfactored Field Infiltration Rate (in/hr)	Soil Description (USCS)	Depth to Refusal (ft)	Depth to Water (ft)
TP-1	10	4	2	Silty SAND (SM)	N/A	N/A
TP-2	7.5	2.5	2	Silty GRAVEL with sand (GM)	7.5	N/A
TP-3	11	4.5	1	Silty SAND (SM)	N/A	N/A
TP-5	11	3.5	0.5	Silty Clayey SAND with gravel (SM-SC)	N/A	N/A
TP-6	10.5	4.5	2	Silty SAND (SM)	N/A	N/A
TP-7	9	3	2	Silty SAND (SM)	N/A	N/A
TP-8	7.5	3	1	Silty SAND (SM)	7.5	N/A
TP-9	11	5	0.2	Silty SAND with gravel (SM)	N/A	10.7
TP-11	11	4	1	(SC-SM)	N/A	N/A
TP-12	9	4.5	2	Sandy SILT (ML)	9	N/A
TP-13	9	3.5	4	Silty SAND (SM)	N/A	N/A
TP2-01	9.5	4.5	1	Silty SAND with gravel (SM)	N/A	7.6
TP2-02	11.2	7	6	Well-graded GRAVEL with silt and sand	11.2	N/A
TP2-03	8.1	5.5	4.5	Silty SAND (SM)	8.1	N/A
TP2-05	11.3	7	6	Silty SAND (SM)	11.3	N/A
TP3-04	12.5	9	3.5	Silty SAND (SM)	N/A	N/A
TP3-05	13	10	0.5	Silty SAND (SM)	N/A	N/A
TP3-05A	13	6	1	Sandy SILT (ML)	N/A	N/A
TP3-06	13	6	0.5	Sandy SILT (ML)	N/A	N/A
TP3-11	7	6	1	Sandy SILT (ML)	N/A	N/A
TP3-12	9.7	6	4	Silty SAND (SM)	N/A	N/A
TP4-02	10	2	0.25	Sandy SILT (ML)	N/A	10
TP4-03	9	3	0.25	Silty SAND (SM)	N/A	7
TP4-04	9	6	0.25	Silty SAND (SM)	N/A	7
TP4-05	10	3	0.75	Silty SAND (SM)	N/A	10
TP4-06	10	6	0.75	Silty SAND (SM)	N/A	10
TP5-01	9	4	1.25	Silty SAND (SM)	N/A	N/A
TP5-03	8	5	1.25	Sandy SILT (ML)	N/A	7.5
TP5-04	8.5	4	0.8125	Silty SAND (SM)	N/A	N/A
TP5-05	10	5	0.4375	Sandy SILT (ML)	N/A	N/A

Note: See Appendix B of this Report for results for all explored locations

LEGEND

 APPROXIMATE SUITABLE TEST PIT LOCATION

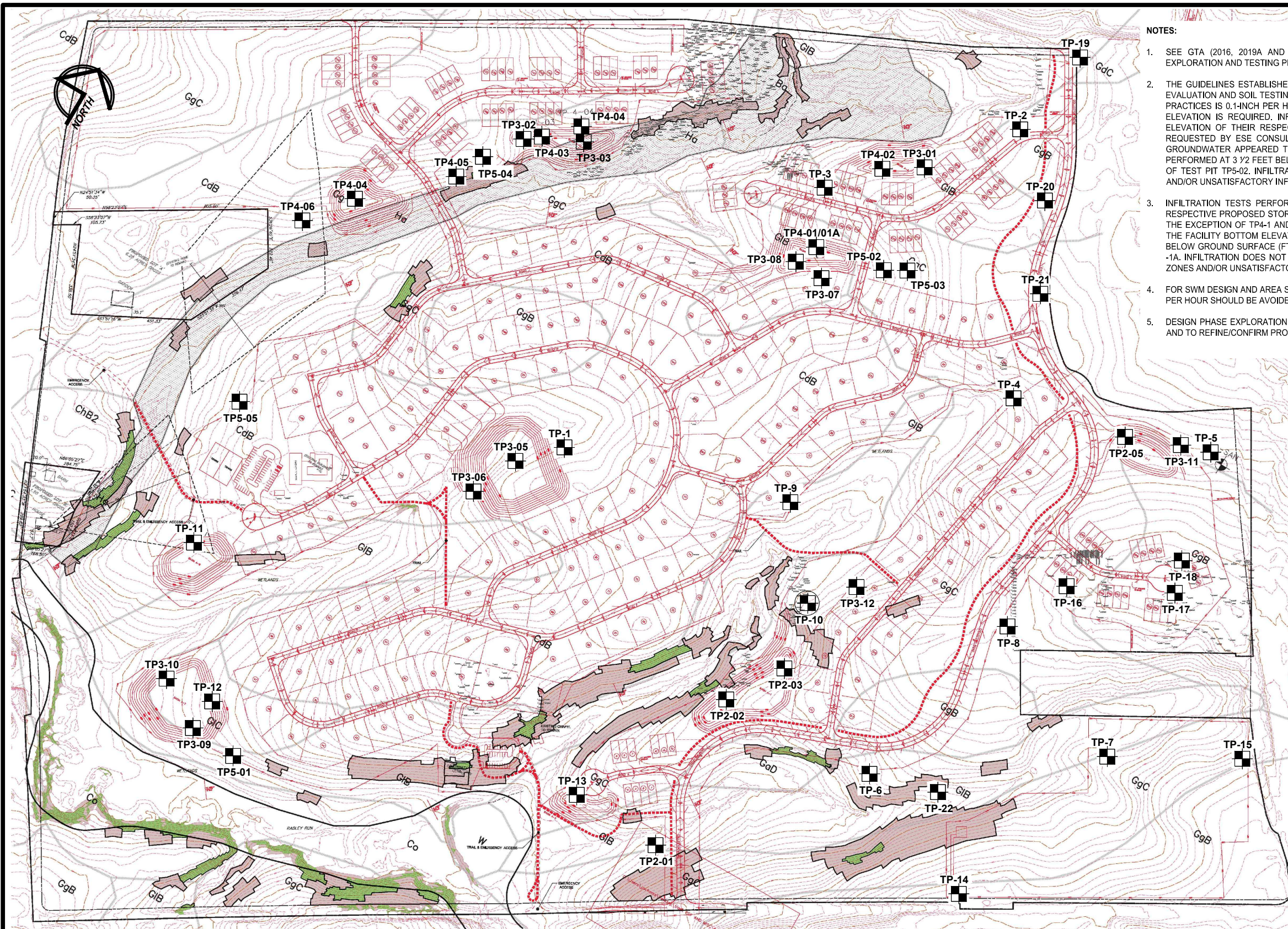


GTA
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 JOB NO. 31161348 SCALE: 1"=400' DATE: JULY 2020

TEST PLAN A
CREBILLY FARM
 CHESTER COUNTY, PENNSYLVANIA
 DRAWN BY: GMM REVIEW BY: PSS FIGURE: 1 OF 1

APPENDIX B

Test Plan B



NOTES:

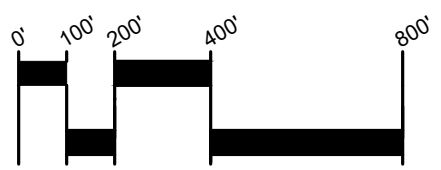
- SEE GTA (2016, 2019A AND 2019B) FOR ADDITIONAL INFORMATION, RECOMMENDATIONS AND LIMITATIONS IN REGARDS TO EXPLORATION AND TESTING PERFORMED BY GTA IN 2016 AND 2019
- THE GUIDELINES ESTABLISHED IN THE PENNSYLVANIA STORMWATER BEST MANAGEMENT PRACTICES MANUAL, APPENDIX C SITE EVALUATION AND SOIL TESTING INDICATES THAT THE MINIMUM INFILTRATION RATE FOR ALL RUNOFF REDUCTION AND INFILTRATION PRACTICES IS 0.1-INCH PER HOUR. ALSO, A VERTICAL SEPARATION OF TWO (2) FEET FROM THE SEASONAL HIGH GROUNDWATER ELEVATION IS REQUIRED. INFILTRATION TESTS PERFORMED IN JULY 2020 WERE PERFORMED AT DEPTHS NEAR THE BOTTOM ELEVATION OF THEIR RESPECTIVE PROPOSED STORMWATER MANAGEMENT FACILITY, I.E. APPROXIMATELY 4 TO 6 FT BGS AS REQUESTED BY ESE CONSULTANTS, INC. ON JULY 20, 2020, WITH THE EXCEPTION OF TP5-02. IN THAT INSTANCE, MEASURED GROUNDWATER APPEARED TO BE LESS THAN TWO FEET FROM THE PROPOSED TEST DEPTH OF 4 TO 6 FT BGS. A TEST WAS PERFORMED AT 3 1/2 FEET BELOW GROUND SURFACE (FT BGS) TO EVALUATE SHALLOWER SOIL STRATA IN THE IMMEDIATE VICINITY OF TEST PIT TP5-02. INFILTRATION DOES NOT APPEAR TO BE PRACTICAL AT THIS LOCATION DUE TO SHALLOW LIMITING ZONES AND/OR UNSATISFACTORY INFILTRATION RATES
- INFILTRATION TESTS PERFORMED IN JANUARY 2020 WERE PERFORMED AT DEPTHS NEAR THE BOTTOM ELEVATION OF THEIR RESPECTIVE PROPOSED STORMWATER MANAGEMENT FACILITY, PROVIDED BY ESE CONSULTANTS, INC. ON JANUARY 17, 2019, WITH THE EXCEPTION OF TP4-1 AND -1A. IN THAT INSTANCE, MEASURED GROUNDWATER APPEARED TO BE LESS THAN TWO FEET FROM THE FACILITY BOTTOM ELEVATION OF 316 FEET ABOVE MEAN SEA LEVEL (FT MSL). TESTS WERE PERFORMED AT 2 AND 4 1/2 FEET BELOW GROUND SURFACE (FT BGS) TO EVALUATE SHALLOWER SOIL STRATA IN THE IMMEDIATE VICINITY OF TEST PITS TP4-1 AND -1A. INFILTRATION DOES NOT APPEAR TO BE PRACTICAL AT THIS LOCATION, I.E., TP4-01, AND TP4-1A, DUE TO SHALLOW LIMITING ZONES AND/OR UNSATISFACTORY INFILTRATION RATES
- FOR SWM DESIGN AND AREA SELECTION TEST PIT LOCATIONS IN TABLE INSET TO THIS PLAN WITH INFILTRATION RATES OF <0.1 INCH PER HOUR SHOULD BE AVOIDED
- DESIGN PHASE EXPLORATION AND TESTING SHOULD BE PERFORMED TO CONFIRM PRELIMINARY RATES INDICATED ON THIS PLAN, AND TO REFINE/CONFIRM PROPOSED SWM AREAS

Test Pit	Total Depth (ft)	Test Depth (ft)	Unfactored Field Infiltration Rate (in/hr)	Soil Description (USCS)	Depth to Refusal (ft)	Depth to Water (ft)
TP-1	10	4	2	Silty SAND (SM)	N/A	N/A
TP-2	7.5	2 1/2	2	Silty GRAVEL with sand (GM)	7.5	N/A
TP-3	11	4 1/2	1	Silty SAND (SM)	N/A	N/A
TP-4	10.5	5 1/2	<0.1	SILT (ML)	N/A	8.5
TP-5	11	3 1/2	0.5	Silty Clayey SAND with gravel (SM-SC)	N/A	N/A
TP-6	10.5	4 1/2	2	Silty SAND (SM)	N/A	N/A
TP-7	9	3	2	Silty SAND (SM)	N/A	N/A
TP-8	7.5	3	1	Silty SAND (SM)	7.5	N/A
TP-9	11	5	0.2	Silty SAND with gravel (SM)	N/A	10.7
TP-10	10	4	<0.1	Silty Clayey SAND	N/A	N/A
TP-11	11	4	1	(SC-SM)	N/A	N/A
TP-12	9	4 1/2	2	Sandy SILT (ML)	9	N/A
TP-13	9	3 1/2	4	Silty SAND (SM)	N/A	N/A
TP2-01	9.5	4 1/2	1	Silty SAND with gravel (SM)	N/A	7.6
TP2-02	11.2	7	6	Well-graded GRAVEL with silt and sand	11.2	N/A
TP2-03	8.1	5 1/2	4.5	Silty SAND (SM)	8.1	N/A
TP2-05	11.3	7	6	Silty SAND (SM)	11.3	N/A
TP3-01	10	7	<0.1	Silty SAND (SM)	N/A	N/A
TP3-02	12.5	2	<0.1	Sandy Lean CLAY (CL)	N/A	8.4
TP3-03	12.5	7	<0.1	Silty SAND (SM)	N/A	8.4
TP3-04	12.5	9	3.5	Silty SAND (SM)	N/A	N/A
TP3-05	13	10	0.5	Silty SAND (SM)	N/A	N/A
TP3-05A	13	6	1	Sandy SILT (ML)	N/A	N/A
TP3-06	13	6	0.5	Sandy SILT (ML)	N/A	N/A
TP3-07	6	2	<0.1	Sandy SILT (ML)	N/A	5
TP3-08	6	3	<0.1	Sandy SILT (ML)	N/A	5
TP3-09	9.5	6	<0.1	Silty SAND (SM)	N/A	9
TP3-10	9.5	3	<0.1	Lean CLAY (CL)	N/A	9
TP3-11	7	6	1	Sandy SILT (ML)	N/A	N/A
TP3-12	9.7	6	4	Silty SAND (SM)	N/A	N/A
TP4-01	9	2	<0.1	Sandy Lean CLAY (CL)	N/A	7
TP4-01A	9	4 1/2	<0.1	Sandy Lean CLAY (CL)	N/A	7
TP4-02	10	2	0.25	Sandy SILT (ML)	N/A	10
TP4-03	9	3	0.25	Silty SAND (SM)	N/A	7
TP4-04	9	6	0.25	Silty SAND (SM)	N/A	7
TP4-05	10	3	0.75	Silty SAND (SM)	N/A	10
TP4-06	10	6	0.75	Silty SAND (SM)	N/A	10
TP5-01	9	4	1.25	Silty SAND (SM)	N/A	N/A
TP5-02	6.5	3 1/2	<0.1	Silty CLAY (CL-ML)	N/A	5.5
TP5-03	8	5	1.25	Sandy SILT (ML)	N/A	7.5
TP5-04	8.5	4	0.8125	Silty SAND (SM)	N/A	N/A
TP5-05	10	5	0.4375	Sandy SILT (ML)	N/A	N/A

SOURCE: PLAN ADAPTED FROM A PLAN PROVIDED TO GTA ON JANUARY 17, 2020 BY ESE CONSULTANTS, INC.

LEGEND

APPROXIMATE TEST PIT LOCATION



SCALE: 1"=400'



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**TEST PLAN B
 CREBILLY FARM**

CHESTER COUNTY, PENNSYLVANIA

JOB NO. 31161348 SCALE: 1"=400' DATE: JULY 2020 DRAWN BY: GMM REVIEW BY: PSS FIGURE: 1 OF 1














APPENDIX C

Notes for Exploration Logs

Test Pit Exploration Logs

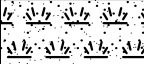

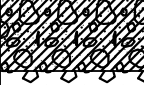
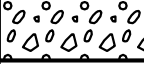
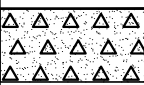

NOTES FOR EXPLORATION LOGS

KEY TO USCS TERMINOLOGY AND GRAPHIC SYMBOLS

MAJOR DIVISIONS (BASED UPON ASTM D 2488)			SYMBOLS	
			GRAPHIC	LETTER
COARSE - GRAINED SOILS	GRAVEL AND GRAVELY SOILS	CLEAN GRAVELS (LESS THAN 5% PASSING THE NO. 200 SIEVE)		GW
		GRAVELS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		GP
	SAND AND SANDY SOILS	CLEAN SANDS (LESS THAN 5% PASSING THE NO. 200 SIEVE)		SW
				SP
		SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)		SM
				SC
FINE - GRAINED SOILS	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50	SILT OR CLAY (<15% RETAINED THE NO. 200 SIEVE)		ML
		SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED THE NO. 200 SIEVE)		CL
		SANDY OR GRAVELY SILT OR CLAY (>30% RETAINED THE NO. 200 SIEVE)		OL
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50	SILT OR CLAY (<15% RETAINED THE NO. 200 SIEVE)		MH
		SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED THE NO. 200 SIEVE)		CH
		SANDY OR GRAVELY SILT OR CLAY (>30% RETAINED THE NO. 200 SIEVE)		OH
HIGHLY ORGANIC SOILS				PT

NOTE: DUAL SYMBOLS ARE USED TO INDICATE COARSE-GRAINED SOILS CONTAINING AN ESTIMATED 10% FINES BY VISUAL CLASSIFICATION OR WHEN THE SOIL HAS BETWEEN 5 AND 12 PERCENT FINES FROM LABORATORY TESTS; AND FOR FINE-GRAINED SOILS WHEN THE PLOT OF LIQUID LIMIT & PLASTICITY INDEX VALUES FALLS IN THE PLASTICITY CHART'S CROSSHATCHED AREA. RESULTS OF LABORATORY TESTING ARE USED TO SUPPLEMENT THE CLASSIFICATION OF THE SOILS BASED ON THE VISUAL-MANUAL PROCEDURES OF ASTM D2488.

ADDITIONAL TERMINOLOGY AND GRAPHIC SYMBOLS

ADDITIONAL DESIGNATION	DESCRIPTION		GRAPHIC SYMBOLS
	TOPSOIL		
	MAN-MADE FILL		
	GLACIAL TILL		
	COBBLES AND BOULDERS		
RESIDUAL SOIL DESIGNATION	DESCRIPTION	"N" VALUE	
	HIGHLY WEATHERED ROCK	50 TO 50/1"	
	PARTIALLY WEATHERED ROCK	MORE THAN 50 BLOWS FOR 1" PENETRATION, AUGER PENETRABLE	

COARSE-GRAINED SOILS (GRAVEL AND SAND)

DESIGNATION	BLOWS PER FOOT (BPF) "N"
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	>50

NOTE: "N" VALUE DETERMINED AS PER ASTM D1586

FINE-GRAINED SOILS (SILT AND CLAY)




CONSISTENCY	BPF "N"
VERY SOFT	<2
SOFT	2 - 4
MEDIUM STIFF	5 - 8
STIFF	9 - 15
VERY STIFF	16 - 30
HARD	>30

NOTE: ADDITIONAL DESIGNATIONS TO ADVANCE SAMPLER INDICATED IN BLOW COUNT COLUMN:
WOH = WEIGHT OF HAMMER
WOR = WEIGHT OF ROD(S)

SAMPLE TYPE

DESIGNATION	SYMBOL
SPLIT-SPOON	S-
SHELBY TUBE	U-
ROCK CORE	R-

WATER DESIGNATION

DESCRIPTION	SYMBOL
ENCOUNTERED DURING DRILLING	
UPON COMPLETION OF DRILLING	
24 HOURS AFTER COMPLETION	

NOTE: WATER OBSERVATIONS WERE MADE AT THE TIME INDICATED. POROSITY OF SOIL STRATA, WEATHER CONDITIONS, SITE TOPOGRAPHY, ETC. MAY CAUSE WATER LEVEL CHANGES.


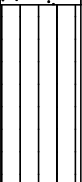
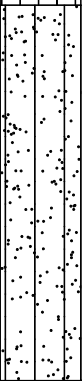
LOG OF TEST PIT NO. TP-1

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **7/25/2016**
 DATE COMPLETED: **7/25/2016**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **310.6**
 DATUM: **Survey**
 LOGGED BY: **T. Hill**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 14 inches	
309.5		ML		Brown, moist, Sandy SILT	
	3				
306.6		SM		Brown, moist, Silty SAND, contains rock fragments	
	6			Orange and brown, moist, Silty SAND, contains rock fragments	
				Same, gray	
	9				
300.6				Test pit terminated at 10 feet. Dry upon completion and at end of day.	
	12				
	15				
	18				

NOTES: **Surveyed locations provided by Northeast Surveyors, LLC.**



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LOG OF TEST PIT NO. TP-1




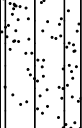

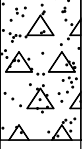
LOG OF TEST PIT NO. TP-2

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **7/25/2016**
 DATE COMPLETED: **7/25/2016**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **337.3**
 DATUM: **Survey**
 LOGGED BY: **T. Hill**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 11 inches	
336.4		ML		Brown, moist, Sandy SILT	
335.8		SM		Brown, moist, Silty SAND, contains rock fragments	
	3			Brown, moist, Silty GRAVEL with sand	
				Same, gray	
332.3		HW		Gray, moist, Highly Weathered ROCK	
329.8				Bucket refusal at 7.5 feet. Dry upon completion and at end of day.	
	9				
	12				
	15				
	18				

NOTES: **Surveyed locations provided by Northeast Surveyors, LLC.**



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LOG OF TEST PIT NO. TP-2


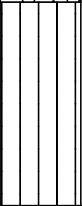
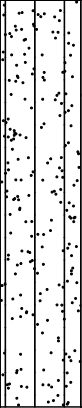
LOG OF TEST PIT NO. TP-3

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **7/25/2016**
 DATE COMPLETED: **7/25/2016**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **325.2**
 DATUM: **Survey**
 LOGGED BY: **T. Hill**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 15 inches	
324.0		ML		Brown, moist, SILT with sand, contains rock fragments	
	3				
320.7		SM		Brown, moist, Silty SAND, contains rock fragments	
	6				
				Brown, orange, and gray, moist, Silty SAND, contains rock fragments	
	9				
314.2				Test pit terminated at 11 feet. Dry upon completion and at end of day.	
	12				
	15				
	18				

NOTES: **Surveyed locations provided by Northeast Surveyors, LLC.**



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LOG OF TEST PIT NO. TP-3


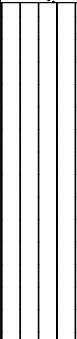
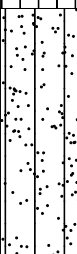
LOG OF TEST PIT NO. TP-4

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **7/25/2016**
 DATE COMPLETED: **7/25/2016**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **8.5 feet**
 GROUND SURFACE ELEVATION: **340.6**
 DATUM: **Survey**
 LOGGED BY: **T. Hill**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 12 inches	
339.6		ML		Brown, moist, SILT	
	3			Same, contains rock fragments	
	6				
334.1		SM		Brown and orange, moist, Silty SAND, contains rock fragments	
	9			Same, wet	▼
330.1				Test pit terminated at 10.5 feet. Water at 10.3 feet upon completion. Water at 8.5 feet end of day.	
	12				
	15				
	18				

NOTES: **Surveyed locations provided by Northeast Surveyors, LLC.**



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LOG OF TEST PIT NO. TP-4


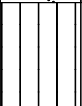
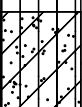
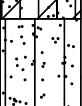
LOG OF TEST PIT NO. TP-5

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **7/25/2016**
 DATE COMPLETED: **7/25/2016**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **351.4**
 DATUM: **Survey**
 LOGGED BY: **T. Hill**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 12 inches	
350.4		ML		Brown, moist, SILT with sand	
	3				
347.9		SC-SM		Orange and brown, moist, Silty, Clayey SAND with gravel	
	6				
344.4		SM		Brown, orange, and gray, moist, Silty SAND with rock fragments	
	9				
340.4				Test pit terminated at 11 feet. Dry upon completion and at end of day.	
	12				
	15				
	18				

NOTES: **Surveyed locations provided by Northeast Surveyors, LLC.**



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LOG OF TEST PIT NO. TP-5




LOG OF TEST PIT NO. TP-6

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **7/25/2016**
 DATE COMPLETED: **7/25/2016**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **325.6**
 DATUM: **Survey**
 LOGGED BY: **T. Hill**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 11 inches	
324.5		ML		Orange and brown, moist, SILT with sand	
	3				
321.1		SM		Orange and brown, moist, Silty SAND, contains rock fragments	
	6				
	9			Brown, orange, and gray, moist, Silty SAND, contains rock fragments	
315.1				Test pit terminated at 10.5 feet. Dry upon completion and at end of day.	
	12				
	15				
	18				

NOTES: **Surveyed locations provided by Northeast Surveyors, LLC.**



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LOG OF TEST PIT NO. TP-6


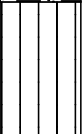
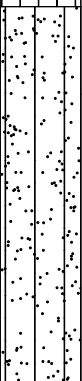
LOG OF TEST PIT NO. TP-7

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **7/25/2016**
 DATE COMPLETED: **7/25/2016**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **344.9**
 DATUM: **Survey**
 LOGGED BY: **T. Hill**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 10 inches	
344.1		ML		Brown, moist, Sandy SILT	
341.9	3	SM		Brown, moist, Silty SAND	
	6			Brown, orange, and gray, moist, Silty SAND, contains rock fragments	
335.9	9			Test pit terminated at 9 feet. Dry upon completion and at end of day,	
	12				
	15				
	18				

NOTES: **Surveyed locations provided by Northeast Surveyors, LLC.**



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LOG OF TEST PIT NO. TP-7


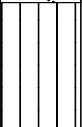
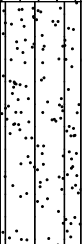

LOG OF TEST PIT NO. TP-8

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **7/25/2016**
 DATE COMPLETED: **7/25/2016**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **356.4**
 DATUM: **Survey**
 LOGGED BY: **T. Hill**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 12 inches	
355.4		ML		Brown, moist, Sandy SILT	
353.4	3	SM		Brown, moist, Silty SAND, contains rock fragments	
	6			Brown and gray, moist, Silty SAND, contains rock fragments	
349.4		HW		Brown and gray, moist, Highly Weathered ROCK	
348.9				Bucket refusal at 7.5 feet. Dry upon completion and at end of day.	
	9				
	12				
	15				
	18				

NOTES: **Surveyed locations provided by Northeast Surveyors, LLC.**



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LOG OF TEST PIT NO. TP-8





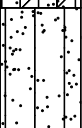

LOG OF TEST PIT NO. TP-9

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **7/25/2016**
 DATE COMPLETED: **7/25/2016**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **10.7**
 GROUND SURFACE ELEVATION: **325.4**
 DATUM: **Survey**
 LOGGED BY: **T. Hill**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 10 inches	
324.6		ML		Brown, moist, Sandy SILT	
323.4		SM		Brown, moist, Silty SAND, contains rock fragments	
	3				
320.4		SC-SM		Brown, moist, Silty, Clayey SAND	
	6				
316.4		SM		Brown, gray, and white, moist, Silty SAND, contains rock fragments	
	9				
314.4				Test pit terminated at 11 feet. Dry upon completion. Water at 10.7 feet at end of day.	
	12				
	15				
	18				

NOTES: **Surveyed locations provided by Northeast Surveyors, LLC.**



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LOG OF TEST PIT NO. TP-9


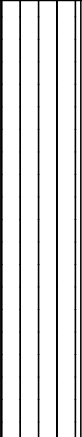
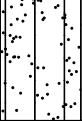
LOG OF TEST PIT NO. TP-10

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **7/25/2016**
 DATE COMPLETED: **7/25/2016**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **321.7**
 DATUM: **Survey**
 LOGGED BY: **T. Hill**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 12 inches	
320.7		ML		Orange and brown, moist, SILT with sand	
	3			Orange and brown, moist, Sandy SILT	
	6				
313.7		SM		Brown, orange, gray, and white, Silty SAND, contains rock fragments	
	9				
311.7				Test pit terminated at 10 feet. Dry upon completion and at end of day.	
	12				
	15				
	18				

NOTES: **Surveyed locations provided by Northeast Surveyors, LLC.**



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LOG OF TEST PIT NO. TP-10


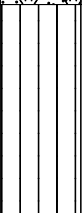
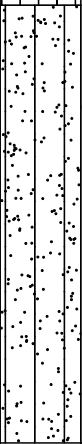
LOG OF TEST PIT NO. TP-11

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **7/26/2016**
 DATE COMPLETED: **7/26/2016**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **299.9**
 DATUM: **Survey**
 LOGGED BY: **T. Hill**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 7 inches	
299.3		ML		Orange and brown, SILT with sand	
	3				
295.9		SM		Orange and brown, moist, Silty SAND, contains rock fragments Same, brown and gray	
	6				
	9			Brown, gray, and white, moist, Silty SAND, contains rock fragments	
288.9				Test pit terminated at 11 feet. Dry upon completion and at end of day.	
	12				
	15				
	18				

NOTES: **Surveyed locations provided by Northeast Surveyors, LLC.**



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LOG OF TEST PIT NO. TP-11


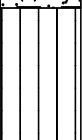




LOG OF TEST PIT NO. TP-12

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **7/26/2016**
 DATE COMPLETED: **7/26/2016**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **276.2**
 DATUM: **Survey**
 LOGGED BY: **T. Hill**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 9 inches	
275.4		ML		Orange and brown, moist, Sandy SILT	
273.2	3	SM		Orange and brown, moist, Silty SAND, contains rock fragments	
		SM		Same, brown	
	6			Same, brown and gray	
268.7		HW		Brown, gray, and white, moist, Highly Weathered ROCK	
267.2	9			Bucket refusal at 9.0 feet. Dry upon completion and at end of day.	
	12				
	15				
	18				

NOTES: **Surveyed locations provided by Northeast Surveyors, LLC.**



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LOG OF TEST PIT NO. TP-12






LOG OF TEST PIT NO. TP-13

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **7/26/2016**
 DATE COMPLETED: **7/26/2016**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **290.6**
 DATUM: **Survey**
 LOGGED BY: **T. Hill**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 8 inches	
289.9		ML		Brown, moist, Sandy SILT	
289.1		SM		Brown, moist, Silty SAND, contains rock fragments	
	3			Same, brown and gray	
287.1		GW-GM		Brown and gray, moist, Rock fragments with silt and sand	
	6				
283.6		HW		Brown and gray, moist, Highly Weathered ROCK	
281.6	9			Bucket refusal at 9 feet. Dry upon completion and at end of day.	
	12				
	15				
	18				

NOTES: **Surveyed locations provided by Northeast Surveyors, LLC.**



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LOG OF TEST PIT NO. TP-13



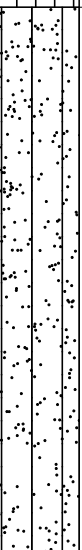

LOG OF TEST PIT NO. TP 2-01

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **8/8/19**
 DATE COMPLETED: **8/8/19**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **7.6 feet**
 GROUND SURFACE ELEVATION: **295.4**
 DATUM: **Survey**
 LOGGED BY: **A. Carta**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 8 inches	
294.7		ML		Brown, moist, SILT with sand	
	2				
291.7		SM		Brown, moist, Silty SAND contains rock fragments	
	4				
	6				
	8				
285.9				Test pit terminated at 9.5 feet. Water at 8.1 feet upon completion Water at 7.6 feet at end of day	
	10				
	12				

NOTES:



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LOG OF TEST PIT NO. TP 2-01


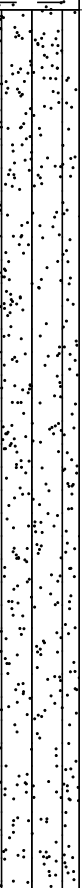

LOG OF TEST PIT NO. TP 2-02

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **8/8/19**
 DATE COMPLETED: **8/8/19**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **316.6**
 DATUM: **Survey**
 LOGGED BY: **A. Carta**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 8 inches	
315.9		SM		Brown, moist, Silty SAND	
	2				
	4				
	6				
	8				
306.6	10	HW		Brown, moist, Highly Weathered ROCK	
305.4				Test pit refusal at 11.2 feet.	
	12				

NOTES:



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LOG OF TEST PIT NO. TP 2-02




LOG OF TEST PIT NO. TP 2-03

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **8/8/19**
 DATE COMPLETED: **8/8/19**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **318.4**
 DATUM: **Survey**
 LOGGED BY: **A. Carta**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 10 inches	
317.6		SM		Light Brown, moist, Silty SAND	
	2				
	4				
	6				
310.9		HW		Brown, moist, Highly Weathered ROCK	
310.3	8			Test pit refusal at 8.1 feet.	
	10				
	12				

NOTES:



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LOG OF TEST PIT NO. TP 2-03


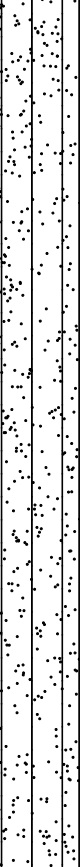

LOG OF TEST PIT NO. TP 2-05

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **8/8/19**
 DATE COMPLETED: **8/8/19**
 CONTRACTOR: **R. Keating and Sons, Inc.**
 EQUIPMENT: **Case 580 Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **351.6**
 DATUM: **Survey**
 LOGGED BY: **A. Carta**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 10 inches	
350.8		SM		Brown, moist, Silty SAND contains rock fragments	
	2				
	4				
	6				
	8				
341.6	10	HW		Brown, moist, Highly Weathered ROCK	
340.3	11.3			Test pit refusal at 11.3 feet.	
	12				

NOTES:



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LOG OF TEST PIT NO. TP 2-05



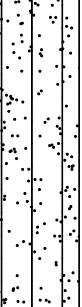
LOG OF TEST PIT NO. TP 3-01

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **11/11/19**
 DATE COMPLETED: **11/11/19**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **John Deere Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **333.0**
 DATUM: **Topo**
 LOGGED BY: **A. Carta**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 11 inches	
332.1		ML		Light brown, moist, Sandy SILT	
	3				
328.1		SM		Tan, moist, Silty SAND, contains rock fragments	
	6			Dark Brown, moist, Silty SAND	
	9				
323.0				Test pit terminated at 10.0 feet.	
	12				
	15				
	18				

NOTES: **Elevation and location should be considered approximate.**



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LOG OF TEST PIT NO. TP 3-01



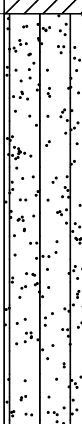
LOG OF TEST PIT NO. TP 3-02/03

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **11/11/19**
 DATE COMPLETED: **11/11/19**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **John Deere Backhoe**

GROUNDWATER ENCOUNTERED: **8.4**
 GROUND SURFACE ELEVATION: **303.0**
 DATUM: **Topo**
 LOGGED BY: **A. Carta**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 10 inches	
302.2		CL		Brown, moist, Sandy Lean CLAY Brown, moist, Lean CLAY	
	3				
	6	SM		Tan, moist, Silty SAND, contains rock fragments	
297.1					
	9				
	12			Test pit terminated at 12.5 feet.	
290.5					
	15				
	18				



Groundwater encountered at 12.0 feet. Stabilized at 8.4 feet.

NOTES: Elevation and location should be considered approximate.



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
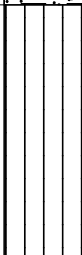
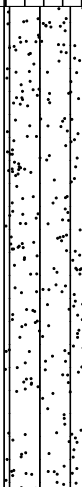
LOG OF TEST PIT NO. TP 3-04

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **11/11/19**
 DATE COMPLETED: **11/11/19**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **John Deere Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **302.9**
 DATUM: **Topo**
 LOGGED BY: **A. Carta**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 10 inches	
302.1		ML		Brown, moist, Sandy SILT	
	3				
298.1		SM		Tan, moist, Silty SAND, contains gravel and highly weathered rock	
	6				
	9			Brown, moist, Silty SAND, contains gravel rock fragments	
	12				
290.4				Test pit terminated at 12.5 feet.	
	15				
	18				

NOTES: **Elevation and location should be considered approximate.**



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LOG OF TEST PIT NO. TP 3-04


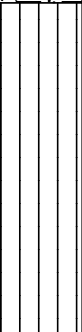
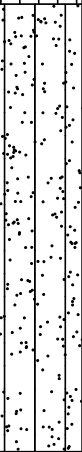
LOG OF TEST PIT NO. TP 05/06

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **11/11/19**
 DATE COMPLETED: **11/11/19**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **John Deere Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **304.0**
 DATUM: **Topo**
 LOGGED BY: **A. Carta**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
303.2	0			Topsoil +/- 9 inches	
	3	ML		Tan, moist, Sandy SILT, contains rock fragments	
298.0	6	SM		Tan, moist, Silty SAND, contains rock fragments	
291.0	13			Test pit terminated at 13.0 feet.	
	15				
	18				

NOTES: **Elevation and location should be considered approximate.**



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LOG OF TEST PIT NO. TP 05/06




LOG OF TEST PIT NO. TP 3-07/08

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **11/11/19**
 DATE COMPLETED: **11/11/19**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **John Deere Backhoe**

GROUNDWATER ENCOUNTERED: **5.0**
 GROUND SURFACE ELEVATION: **318.0**
 DATUM: **Topo**
 LOGGED BY: **A. Carta**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 12 inches	
317.0		ML		Brown, moist, Sandy SILT	
	3				
	6			Brown, moist, Sandy SILT, contains rock fragments	 Groundwater encountered at 5.0 feet.
312.0					
	9				
	12				
	15				
	18				

NOTES: **Elevation and location should be considered approximate.**



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LOG OF TEST PIT NO. TP 3-07/08



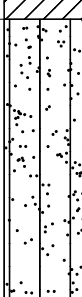
LOG OF TEST PIT NO. TP 3-09/10

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **11/11/19**
 DATE COMPLETED: **11/11/19**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **John Deere Backhoe**

GROUNDWATER ENCOUNTERED: **9.0**
 GROUND SURFACE ELEVATION: **269.0**
 DATUM: **Topo**
 LOGGED BY: **A. Carta**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 10 inches	
268.2		CL		Light brown, moist, Lean CLAY	
	3				
264.0		SM		Dark brown, moist, Silty SAND, contains rock fragments	
	6				
259.5				Test pit terminated at 9.5 feet.	▼ Groundwater encountered at 9.0 feet.
	9				
	12				
	15				
	18				

NOTES: **Elevation and location should be considered approximate.**



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LOG OF TEST PIT NO. TP 3-09/10


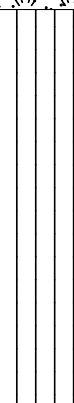
LOG OF TEST PIT NO. TP 3-11

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **11/12/19**
 DATE COMPLETED: **11/12/19**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **John Deere Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **350.0**
 DATUM: **Topo**
 LOGGED BY: **A. Carta**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0			Topsoil +/- 9 inches	
349.3		ML		Tan, moist, Sandy SILT	
	3				
	6				
343.0				Test pit terminated at 7.0 feet.	
	9				
	12				
	15				
	18				

NOTES: **Elevation and location should be considered approximate.**



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LOG OF TEST PIT NO. TP 3-11


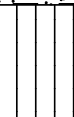
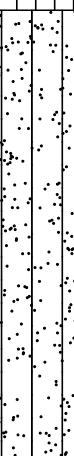
LOG OF TEST PIT NO. TP 3-12

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers, Inc.**

PROJECT NO.: **161348**

DATE STARTED: **11/12/19**
 DATE COMPLETED: **11/12/19**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **John Deere Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **326.4**
 DATUM: **Topo**
 LOGGED BY: **A. Carta**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
325.6	0			Topsoil +/- 10 inches	
		ML		Light brown, moist, Sandy SILT	
323.7	3	SM		Tan, moist, Silty SAND, contains rock fragments	
316.7	9.7			Test pit terminated at 9.7	
	12				
	15				
	18				

NOTES: **Elevation and location should be considered approximate.**



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 New Castle, DE 19720

LOG OF TEST PIT NO. TP 3-12


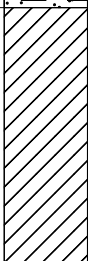
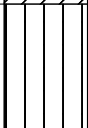
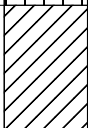
LOG OF TEST PIT NO. TP4-01

PROJECT: **Crebilly Farms**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers**

PROJECT NO.: **161348**

DATE STARTED: **1/24/2020**
 DATE COMPLETED: **1/24/2020**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **John Deere Backhoe**

GROUNDWATER ENCOUNTERED: **7 ft**
 GROUND SURFACE ELEVATION: **322**
 DATUM: **Survey**
 LOGGED BY: **G. McKee**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0	TS		Topsoil +/- 12 inches	
321.0		CL		Brown, moist, Sandy Lean CLAY	
	3			Brown, moist, Sandy Lean CLAY, mottled	
				Brown, moist, Sandy Lean CLAY, containing highly weathered rock fragments	
317.0		ML		Brown and gray, Sandy SILT, containing weathered rock fragments	
	6				
315.0		CL		Brown and gray, moist Sandy Lean CLAY, containing weathered rock fragments	▼
	9			Test pit terminated at 9 feet	
	12				
	15				
	18				

NOTES:



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LOG OF TEST PIT NO. TP4-01





LOG OF TEST PIT NO. TP4-02

PROJECT: **Crebilly Farms**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers**

DATE STARTED: **1/24/2020**
 DATE COMPLETED: **1/24/2020**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **John Deere Backhoe**

PROJECT NO.: **161348**

GROUNDWATER ENCOUNTERED: **10 ft**
 GROUND SURFACE ELEVATION: **322**
 DATUM: **Survey**
 LOGGED BY: **G. McKee**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0	TS		Topsoil +/- 12 inches	
321.0		ML		Brown, moist, Sandy SILT,	
	3			Red brown, moist, Sandy SILT	
317.0		SM		Red brown, moist, Silty SAND, containing weathered rock fragments	
	6				
	9				
312.0				Test pit terminated at 10 feet	
	12				
	15				
	18				

NOTES:



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LOG OF TEST PIT NO. TP4-02


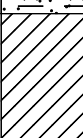


LOG OF TEST PIT NO. TP4-03

PROJECT: **Crebilly Farms**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers**

DATE STARTED: **1/23/2020**
 DATE COMPLETED: **1/23/2020**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **John Deere Backhoe**

PROJECT NO.: **161348**

GROUNDWATER ENCOUNTERED: **7 ft**
 GROUND SURFACE ELEVATION: **303**
 DATUM: **Survey**
 LOGGED BY: **G. McKee**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0	TS		Topsoil +/- 12 inches	
302.0		CL		Brown, moist, Lean CLAY	
300.0	3	SM		Brown, moist, Silty SAND	
	6			Red brown, moist, Silty SAND, containing weathered rock fragments	
294.0	9			Test pit terminated at 9 feet	
	12				
	15				
	18				

NOTES:



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LOG OF TEST PIT NO. TP4-03




LOG OF TEST PIT NO. TP4-04

PROJECT: **Crebilly Farms**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers**

PROJECT NO.: **161348**

DATE STARTED: **1/23/2020**
 DATE COMPLETED: **1/23/2020**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **John Deere Backhoe**

GROUNDWATER ENCOUNTERED: **7 ft**
 GROUND SURFACE ELEVATION: **310**
 DATUM: **Survey**
 LOGGED BY: **G. McKee**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0	TS		Topsoil +/- 12 inches	
309.0		ml		Brown, moist, sandy SILT	
307.0	3	sm		Gray, moist, Silty SAND, containing weathered rock fragments	
	6				▼
301.0	9			Test pit terminated at 9 feet	
	12				
	15				
	18				

NOTES:



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LOG OF TEST PIT NO. TP4-04


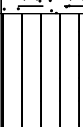
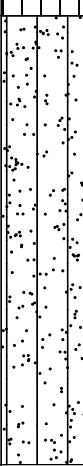
LOG OF TEST PIT NO. TP4-05

PROJECT: **Crebilly Farms**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers**

PROJECT NO.: **161348**

DATE STARTED: **1/23/2020**
 DATE COMPLETED: **1/23/2020**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **John Deere Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **302**
 DATUM: **Survey**
 LOGGED BY: **G. McKee**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0	TS		Topsoil +/- 12 inches	
301.0		ML		Brown, moist, Sandy SILT	
299.0	3	SM		Gray, moist, Silty SAND, containing weathered rock fragments	
	6				
	9				
292.0				Test pit terminated at 10 feet	
	12				
	15				
	18				

NOTES:



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LOG OF TEST PIT NO. TP4-05




LOG OF TEST PIT NO. TP4-06

PROJECT: **Crebilly Farms**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers**

PROJECT NO.: **161348**

DATE STARTED: **1/23/2020**
 DATE COMPLETED: **1/23/2020**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **John Deere Backhoe**

GROUNDWATER ENCOUNTERED: **Dry**
 GROUND SURFACE ELEVATION: **303**
 DATUM: **Survey**
 LOGGED BY: **G. McKee**
 CHECKED BY: **C. Reith**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0	TS		Topsoil +/- 12 inches	
302.0		ML		Brown, moist, Sandy SILT	
	3				
299.0		SM		Gray, moist, Silty SAND, containing weathered rock fragments	
	6				
				Brown, moist, Silty SAND, containing weathered rock fragments	
	9				
293.0				Test pit terminated at 10 feet	
	12				
	15				
	18				

NOTES:



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LOG OF TEST PIT NO. TP4-06





LOG OF TEST PIT NO. TP5-01

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers**

PROJECT NO.: **31161348**

DATE STARTED: **7/28/2020**
 DATE COMPLETED: **7/28/2020**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **Rubber Tire Backhoe**

GROUNDWATER ENCOUNTERED: **N/A**
 GROUND SURFACE ELEVATION: **274**
 DATUM: **Survey**
 LOGGED BY: **Greg McKee**
 CHECKED BY: **Paul Scott**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0	TS		Topsoil +/- 12 inches	
273.0		ML		Red, Sandy SILT, containing Clay	
	2				
271.5		SM		Red and Brown, Silty SAND, containing Gravel	
	4				
269.5		SM		Black and Red, SAND, with Silt and Highly Weathered Rock	
	6				
	8				
265.0				Test Pit Terminated at 9 feet	
	10				
	12				

NOTES:



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LOG OF TEST PIT NO. TP5-01


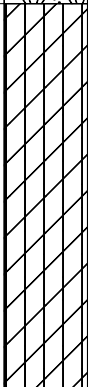

LOG OF TEST PIT NO. TP5-02

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers**

PROJECT NO.: **31161348**

DATE STARTED: **7/28/2020**
 DATE COMPLETED: **7/28/2020**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **Rubber Tire Backhoe**

GROUNDWATER ENCOUNTERED: **5.5**
 GROUND SURFACE ELEVATION: **330**
 DATUM: **Survey**
 LOGGED BY: **Greg McKee**
 CHECKED BY: **Paul Scott**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0	TS		Topsoil +/- 12 inches	
329.0		CL		Grey, Silty CLAY, mottled	
	2				
	4				
325.0		ML		Brown, Sandy SILT, containing Gravel	▼
	6				
323.5				Test Pit Terminated at 6.5 ft	
	8				
	10				
	12				

NOTES:



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LOG OF TEST PIT NO. TP5-02

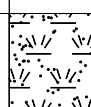
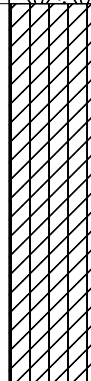


LOG OF TEST PIT NO. TP5-03

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers**

PROJECT NO.: **31161348**

DATE STARTED: **7/28/2020**
 DATE COMPLETED: **7/28/2020**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **Rubber Tire Backhoe**

GROUNDWATER ENCOUNTERED: **7.5**
 GROUND SURFACE ELEVATION: **334**
 DATUM: **Survey**
 LOGGED BY: **Greg McKee**
 CHECKED BY: **Paul Scott**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
333.0	0	TS		Topsoil +/- 12 inches	
	2	ML		Grey, SILT, containing Clay, mottled	
329.0	6	SM		Brown, Micaceous, Silty SAND, containing Gravel	
326.0	8			Test Pit Terminated at 8 ft	
	10				
	12				

NOTES:



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LOG OF TEST PIT NO. TP5-03





LOG OF TEST PIT NO. TP5-04

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers**

PROJECT NO.: **31161348**

DATE STARTED: **7/28/2020**
 DATE COMPLETED: **7/28/2020**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **Rubber Tire Backhoe**

GROUNDWATER ENCOUNTERED: **N/A**
 GROUND SURFACE ELEVATION: **311**
 DATUM: **Survey**
 LOGGED BY: **Greg McKee**
 CHECKED BY: **Paul Scott**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0	TS		Topsoil +/- 12 inches	
310.0	2	ML		Red SILT, containing Gravel	
308.0	4	SM		Grey, Silty SAND, containing Gravel	
	6			Grey, Silty SAND, containing Weathered Rock	
302.5	8.5			Test Pit Terminated at 8.5	
	10				
	12				

NOTES:



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LOG OF TEST PIT NO. TP5-04





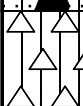
LOG OF TEST PIT NO. TP5-05

PROJECT: **Crebilly Farm**
 PROJECT LOCATION: **Chester County, Pennsylvania**
 CLIENT: **Toll Brothers**

PROJECT NO.: **31161348**

DATE STARTED: **7/28/2020**
 DATE COMPLETED: **7/28/2020**
 CONTRACTOR: **Cavan Construction**
 EQUIPMENT: **Rubber Tire Backhoe**

GROUNDWATER ENCOUNTERED: **N/A**
 GROUND SURFACE ELEVATION: **284**
 DATUM: **Survey**
 LOGGED BY: **Greg McKee**
 CHECKED BY: **Paul Scott**

ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
	0	TS		Topsoil +/- 6 inches	
283.5		SC		Brown, Clayey SAND	
282.5	2	ML		Orange, Micaceous, SILT, containing Sand and Clay	
	4				
279.5	6	ML		Brown, Micaceous, Sandy SILT containing Gravel	
	8	ML		Grey, Micaceous, SILT, containing Weathered Rock	
275.0	10			Test Pit Terminated at 9 ft	
	12				

NOTES:



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LOG OF TEST PIT NO. TP5-05

APPENDIX D

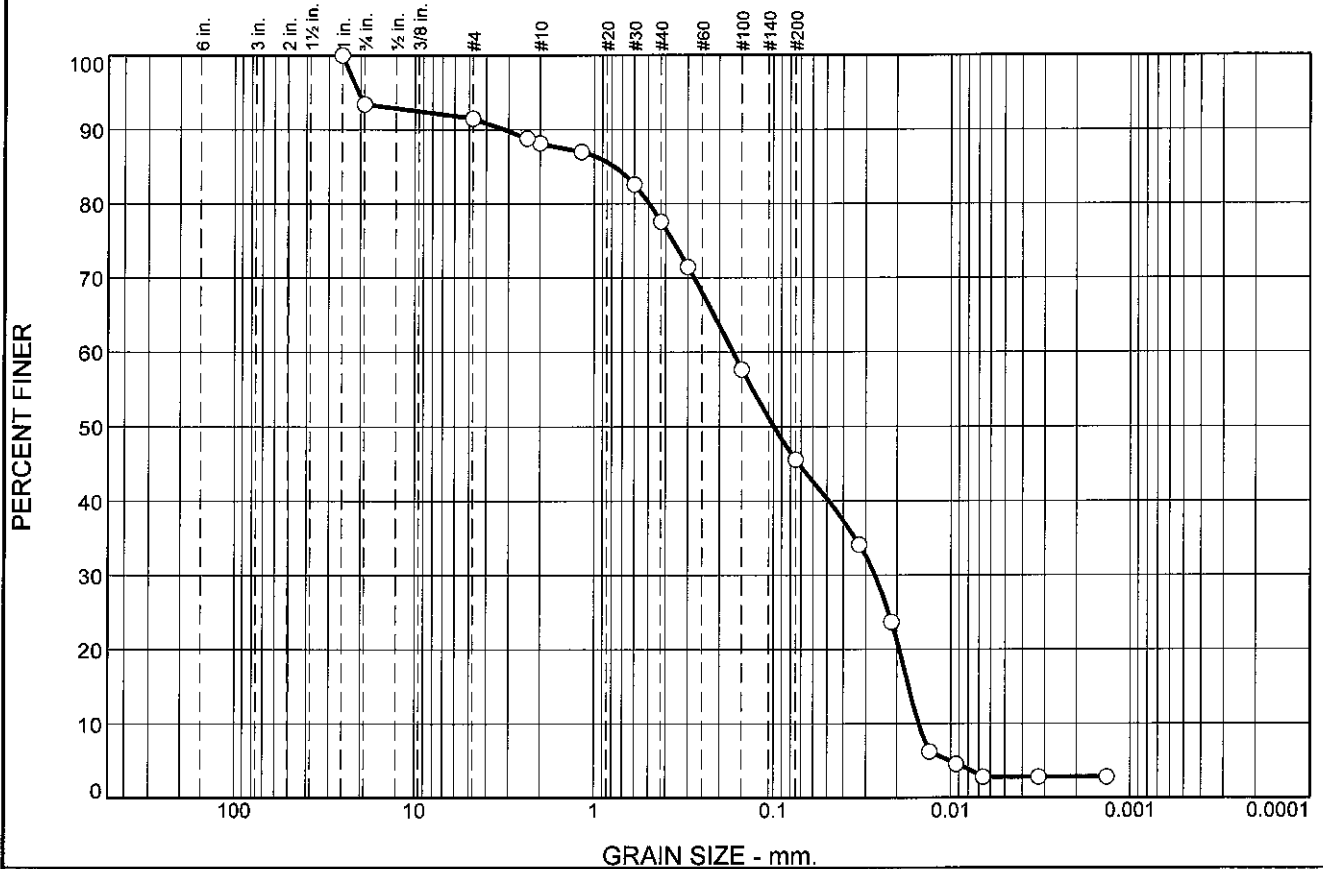
Summary of Laboratory Testing Table

Particle Size Distribution Reports

SUMMARY OF LABORATORY TESTING TABLE

TEST PIT	DEPTH (ft)	USDA CLASSIFICATION
TP-1	4	Sandy Loam (1.02)
TP-2	2 ½	Sandy Loam (1.02)
TP-3	4 ½	Sandy Loam (1.02)
TP-5	3 ½	Sandy Loam (1.02)
TP-6	4 ½	Sandy Loam (1.02)
TP-7	3	Sandy Loam (1.02)
TP-8	3	Loam (0.52)
TP-9	5	Sandy Loam (1.02)
TP-10	4	Loam (0.52)
TP-11	4	Loam (0.52)
TP-12	4 ½	Sandy Loam (1.02)
TP-13	3 ½	Sandy Loam (1.02)
TP3-01	7	Sandy Loam (1.02)
TP3-02/03	2	Silt Loam (0.27)
TP3-04	9	Loam (0.52)
TP3-05/06	10	Sandy Loam (1.02)
TP3-09/10	3	Silty Clay Loam (0.06)
TP3-11	6	Loam (0.52)
TP4-01	2	Loam (0.52)
TP5-03	5	Sandy Loam (1.02)
TP5-05	5	Loam (0.52)

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.6	1.9	3.3	10.6	32.0	42.8	2.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	93.4		
#4	91.5		
#8	88.8		
#10	88.2		
#16	87.0		
#30	82.6		
#40	77.6		
#50	71.5		
#100	57.7		
#200	45.6		
0.0326 mm.	34.1		
0.0215 mm.	23.7		
0.0131 mm.	6.2		
0.0093 mm.	4.6		
0.0066 mm.	2.8		
0.0032 mm.	2.8		
0.0014 mm.	2.8		

Soil Description

Brown, moist, Silty SAND

Atterberg Limits

PL= 25 LL= 33 PI= 8 NM= 15.6

Coefficients

D₉₀= 3.1722 D₈₅= 0.7710 D₆₀= 0.1685
D₅₀= 0.0994 D₃₀= 0.0266 D₁₅= 0.0173
D₁₀= 0.0151 C_u= 11.14 C_c= 0.28

Classification

USCS= SM AASHTO= A-4(1)

Remarks

USDA: Sandy Loam

* (no specification provided)

Source of Sample: TP-1 **Depth:** 4.0

Date: 8/2/2016



GEO-TECHNOLOGY ASSOCIATES, INC.
18 Boulden Circle, Suite 36
New Castle, DE 19720

Client: Toll Brothers, Inc.
Project: Crebilly Farm

Project No: 161348

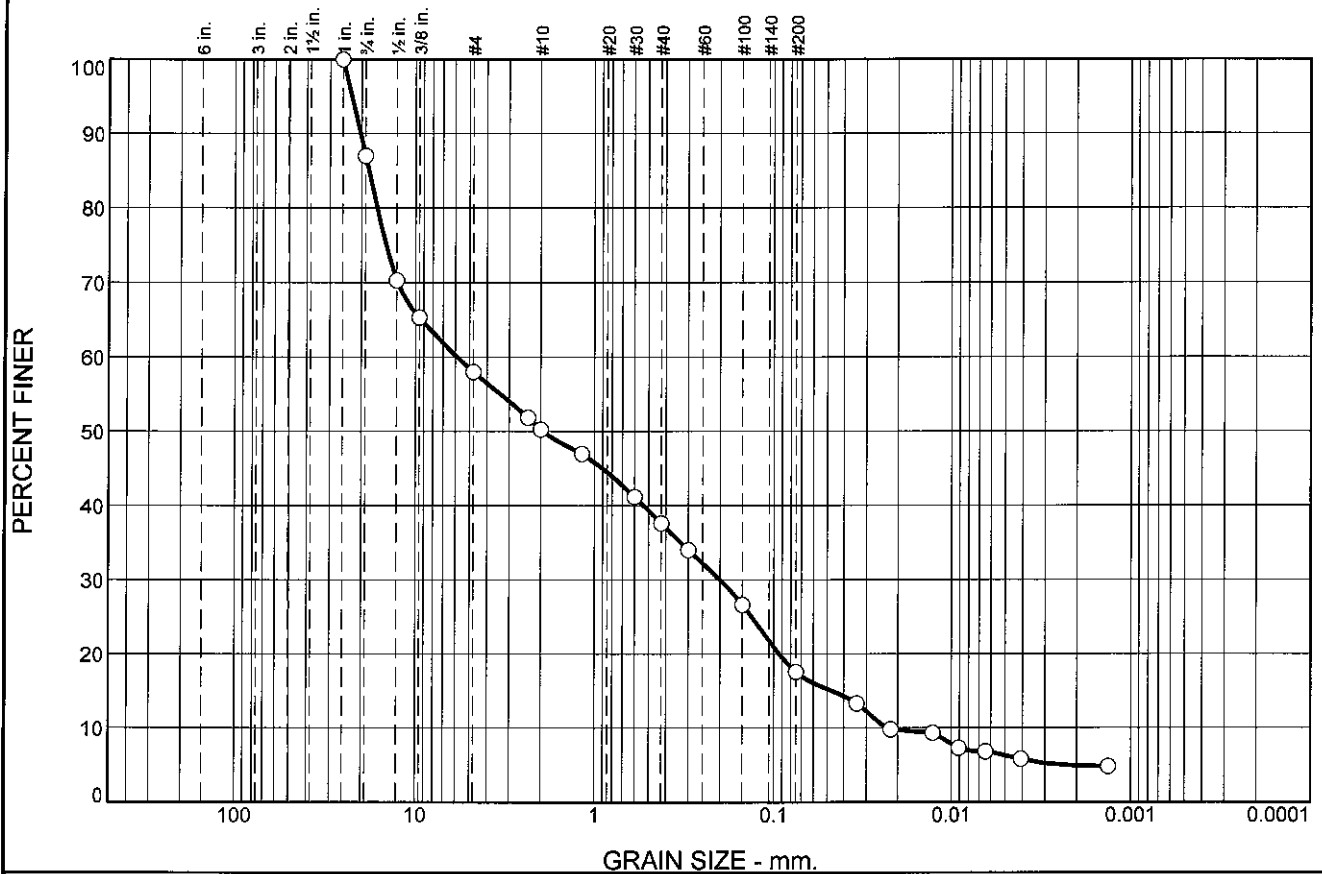
Figure No. 3

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Tested By: M. Kerezsi

Checked By: E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.0	29.0	7.8	12.6	20.0	11.3	6.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
.75	87.0		
.5	70.3		
.375	65.3		
#4	58.0		
#8	51.8		
#10	50.2		
#16	47.0		
#30	41.2		
#40	37.6		
#50	34.0		
#100	26.6		
#200	17.6		
0.0340 mm.	13.3		
0.0219 mm.	9.8		
0.0127 mm.	9.3		
0.0091 mm.	7.3		
0.0064 mm.	6.8		
0.0041 mm.	5.8		
0.0013 mm.	4.8		

Soil Description
Brown, moist, Silty GRAVEL with sand

Atterberg Limits
PL= 26 LL= 32 PI= 6 NM= 12.4

Coefficients
 D₉₀= 20.3379 D₈₅= 18.2596 D₆₀= 5.8616
 D₅₀= 1.9456 D₃₀= 0.2004 D₁₅= 0.0468
 D₁₀= 0.0229 C_u= 255.70 C_c= 0.30

Classification
USCS= AASHTO= A-1-b

Remarks
USDA: Sandy Loam

* (no specification provided)

Source of Sample: TP-2 Depth: 2.5

Date: 7/27/2016

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.



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New Castle, DE 19720

Client: Toll Brothers, Inc.
Project: Crebilly Farm

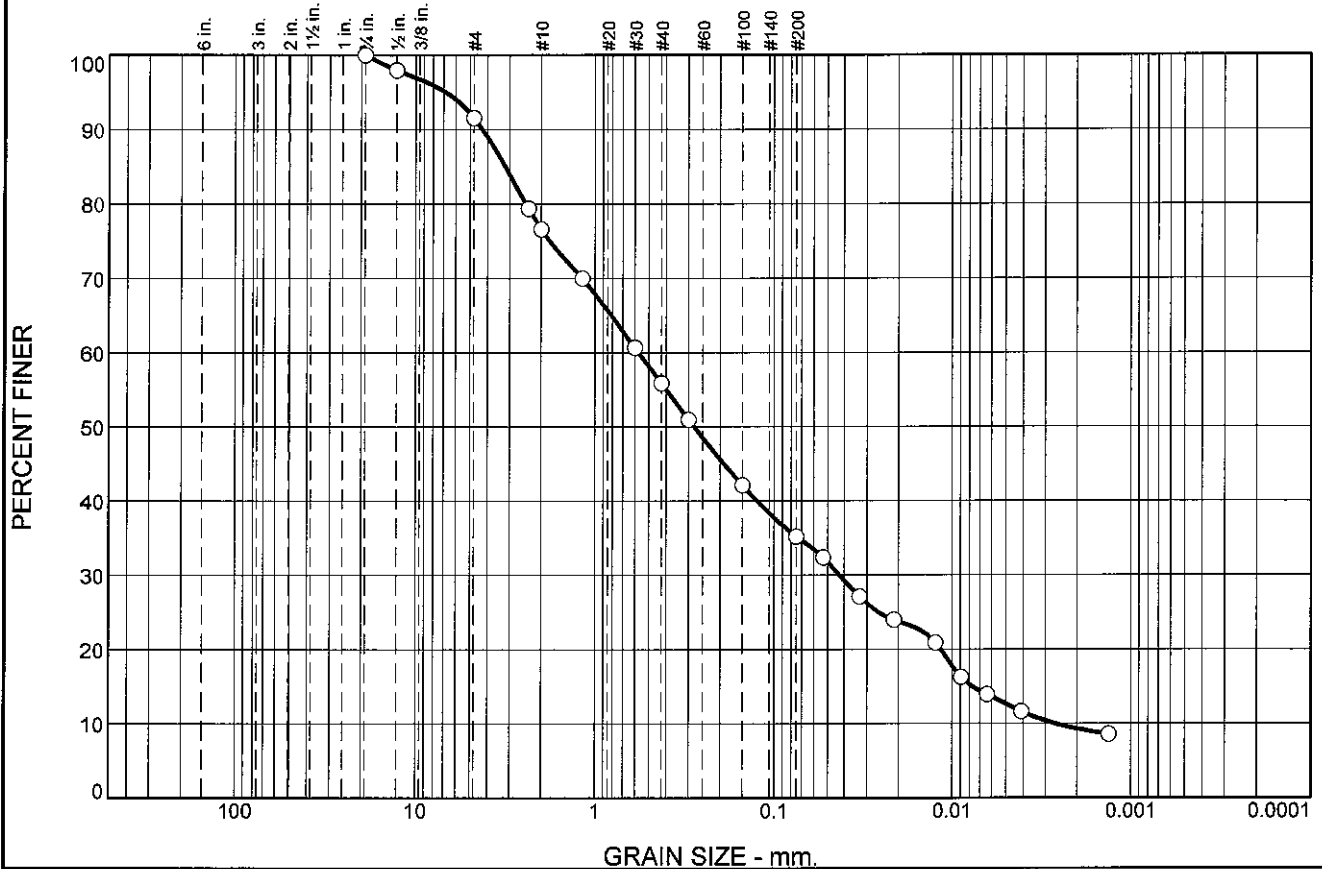
Project No: 161348

Figure No. 4

Tested By: C. Jackson

Checked By: E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	8.5	14.9	20.7	20.7	22.5	12.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	97.9		
#4	91.5		
#8	79.4		
#10	76.6		
#16	70.0		
#30	60.7		
#40	55.9		
#50	51.0		
#100	42.1		
#200	35.2		
#270	32.4		
0.0331 mm.	27.1		
0.0212 mm.	24.0		
0.0124 mm.	20.9		
0.0089 mm.	16.3		
0.0064 mm.	14.0		
0.0041 mm.	11.6		
0.0013 mm.	8.5		

* (no specification provided)

Soil Description

Brown, moist, Silty SAND

Atterberg Limits

PL= 24 LL= 26 PI= 2 NM= 15.2

Coefficients

D ₉₀ = 4.2608	D ₈₅ = 3.1874	D ₆₀ = 0.5716
D ₅₀ = 0.2799	D ₃₀ = 0.0428	D ₁₅ = 0.0077
D ₁₀ = 0.0026	C _u = 215.98	C _c = 1.21

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

USDA: Sandy Loam

Source of Sample: TP-3 Depth: 4.5

Date: 7/27/2016

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.



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Client: Toll Brothers, Inc.
Project: Crebilly Farm

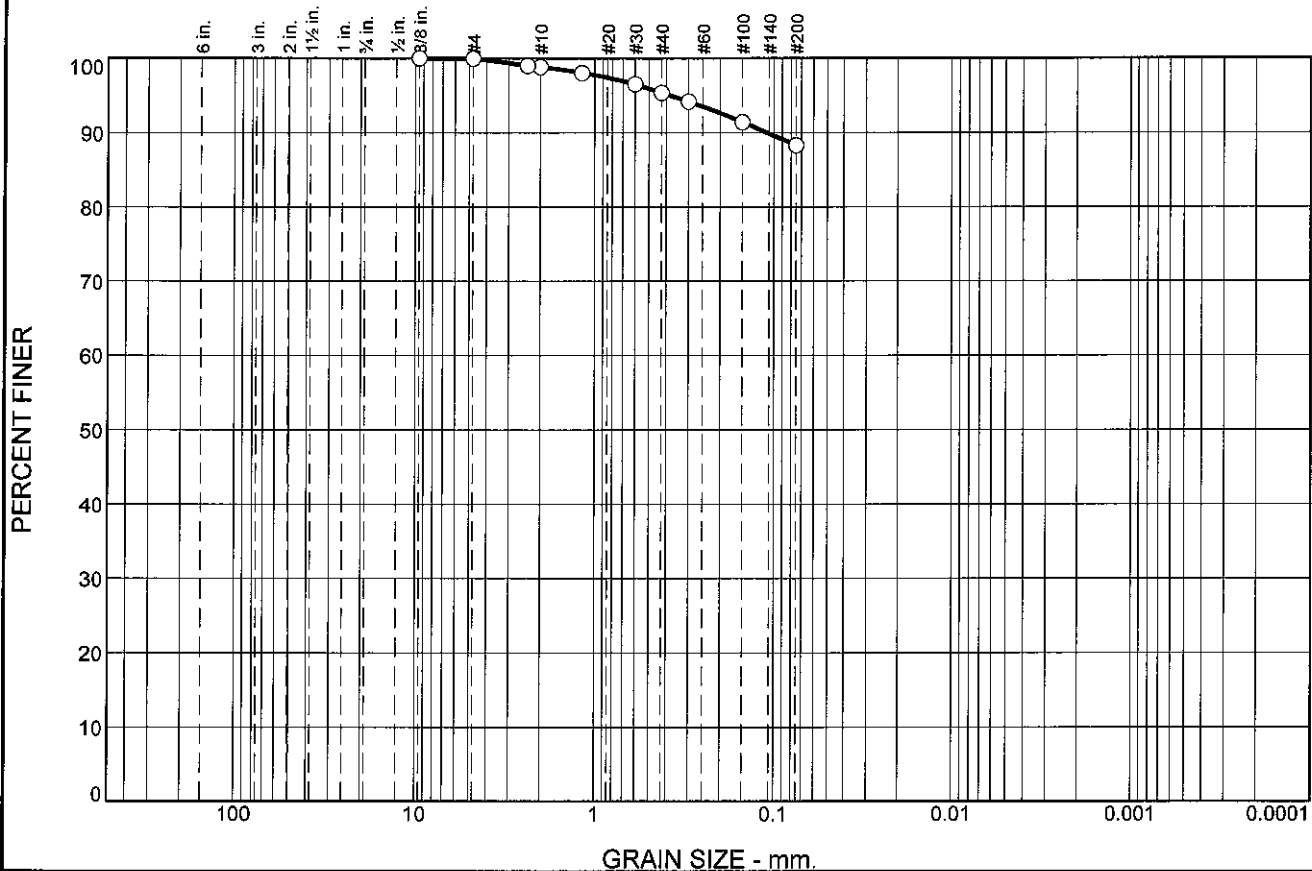
Project No: 161348

Figure No. 5

Tested By: D. Jeffery

Checked By: E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	1.1	3.4	7.1	88.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#8	99.0		
#10	98.8		
#16	98.0		
#30	96.5		
#40	95.4		
#50	94.2		
#100	91.4		
#200	88.3		

Soil Description

Brown, moist, SILT

Atterberg Limits

PL= 25 LL= 33 PI= 8 NM= 24.8

Coefficients

D₉₀= 0.1086 D₈₅= D₆₀=
D₅₀= D₃₀= D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= AASHTO= A-4(7)

Remarks

* (no specification provided)

Source of Sample: TP-4 Depth: 2-5ft
Sample Number: S-072616

Date: 7/25/2016



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Client: Toll Brothers, Inc.
Project: Crebilly Farm

Project No: 161348

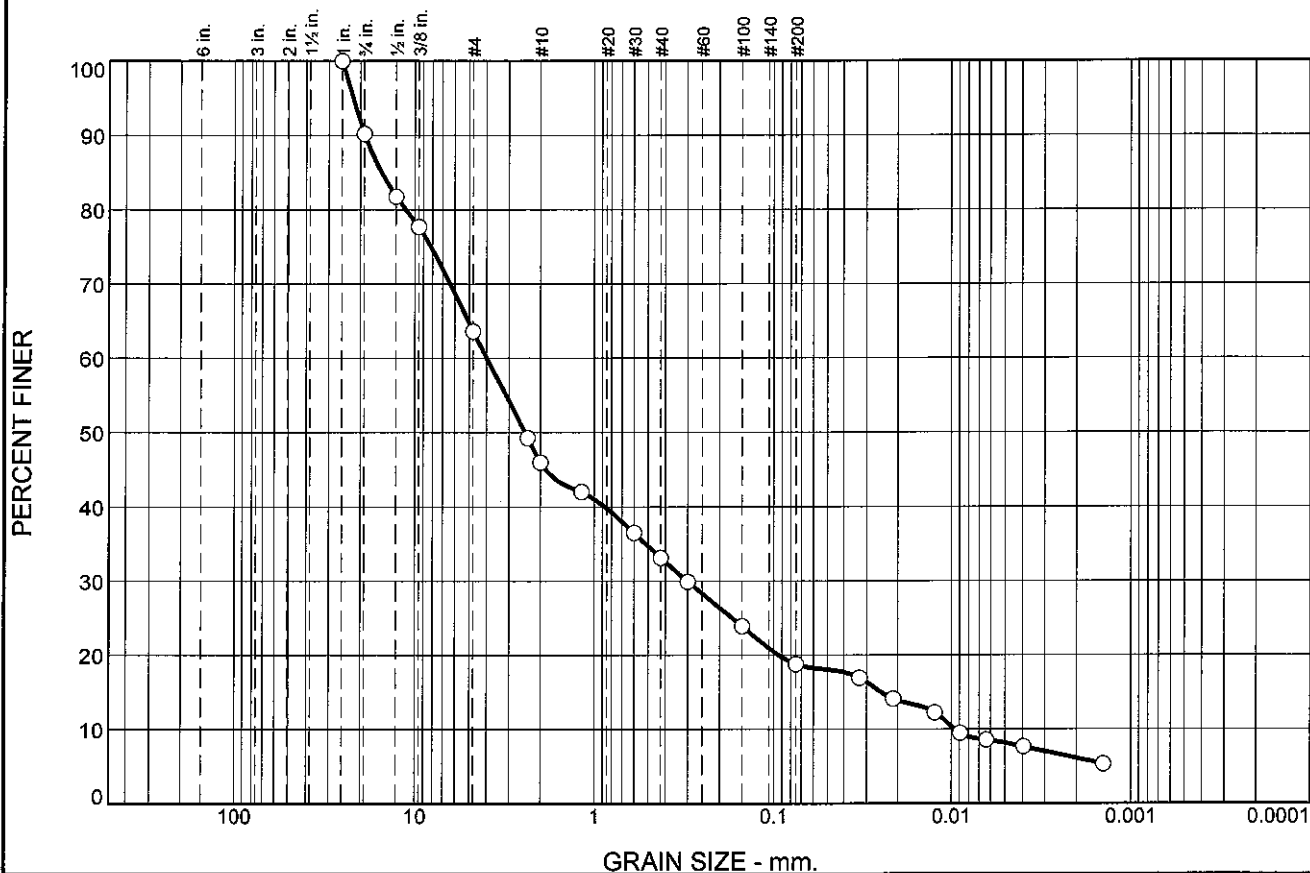
Figure No. 6

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Tested By: D. Jeffery

Checked By: E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.8	26.6	17.6	12.8	14.4	10.6	8.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	90.2		
.5	81.8		
.375	77.7		
#4	63.6		
#8	49.3		
#10	46.0		
#16	42.0		
#30	36.5		
#40	33.2		
#50	29.9		
#100	23.9		
#200	18.8		
0.0328 mm.	16.9		
0.0212 mm.	14.1		
0.0124 mm.	12.3		
0.0089 mm.	9.5		
0.0064 mm.	8.6		
0.0040 mm.	7.6		
0.0014 mm.	5.3		

* (no specification provided)

Soil Description

Orange and brown, moist, Silty, Clayey SAND with gravel

Atterberg Limits

PL= 22 LL= 28 PI= 6 NM= 13.1

Coefficients

D₉₀= 18.9121 D₈₅= 15.3366 D₆₀= 3.9996
 D₅₀= 2.4428 D₃₀= 0.3029 D₁₅= 0.0247
 D₁₀= 0.0096 C_u= 417.58 C_c= 2.39

Classification

USCS= SC-SM AASHTO= A-1-b

Remarks

USDA: Sandy Loam

Source of Sample: TP-5 Depth: 3.5

Date: 7/27/2016



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Project No: 161348

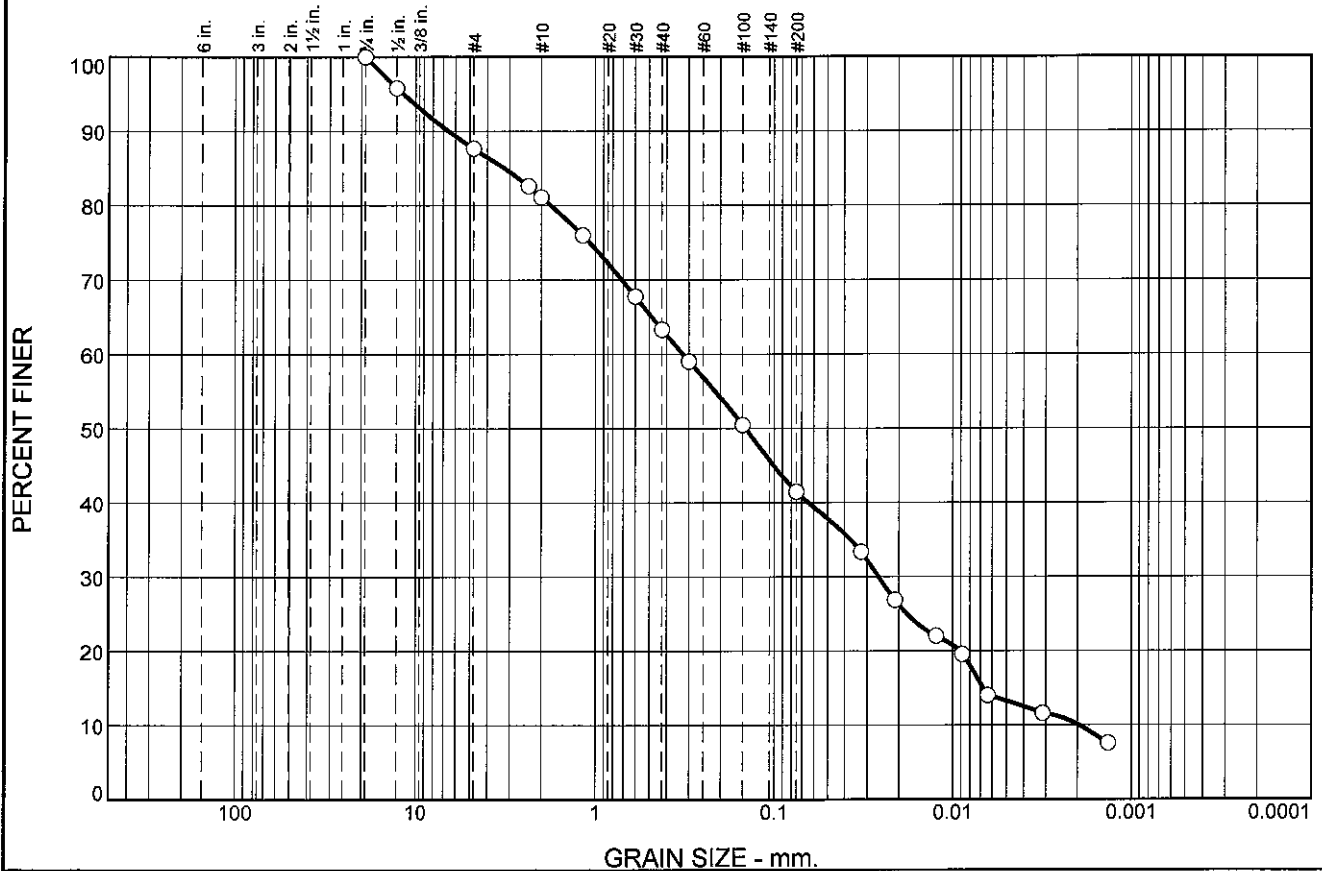
Figure No. 7

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Tested By: C. Jackson

Checked By: E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	12.4	6.5	17.8	21.8	28.2	13.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	95.8		
#4	87.6		
#8	82.6		
#10	81.1		
#16	76.0		
#30	67.8		
#40	63.3		
#50	59.1		
#100	50.5		
#200	41.5		
0.0324 mm.	33.4		
0.0211 mm.	26.9		
0.0124 mm.	22.0		
0.0088 mm.	19.6		
0.0064 mm.	14.0		
0.0031 mm.	11.6		
0.0013 mm.	7.6		

Soil Description
Orange and brown, moist, Silty SAND

Atterberg Limits
PL= 30 LL= 38 PI= 8 NM= 19.8

Coefficients
 D₉₀= 6.5593 D₈₅= 3.2233 D₆₀= 0.3246
 D₅₀= 0.1449 D₃₀= 0.0259 D₁₅= 0.0068
 D₁₀= 0.0020 C_u= 165.28 C_c= 1.05

Classification
USCS= SM AASHTO= A-4(1)

Remarks
USDA: Sandy Loam

* (no specification provided)

Source of Sample: TP-6 Depth: 4.5

Date: 8/2/2016

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.



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Project: Crebilly Farm

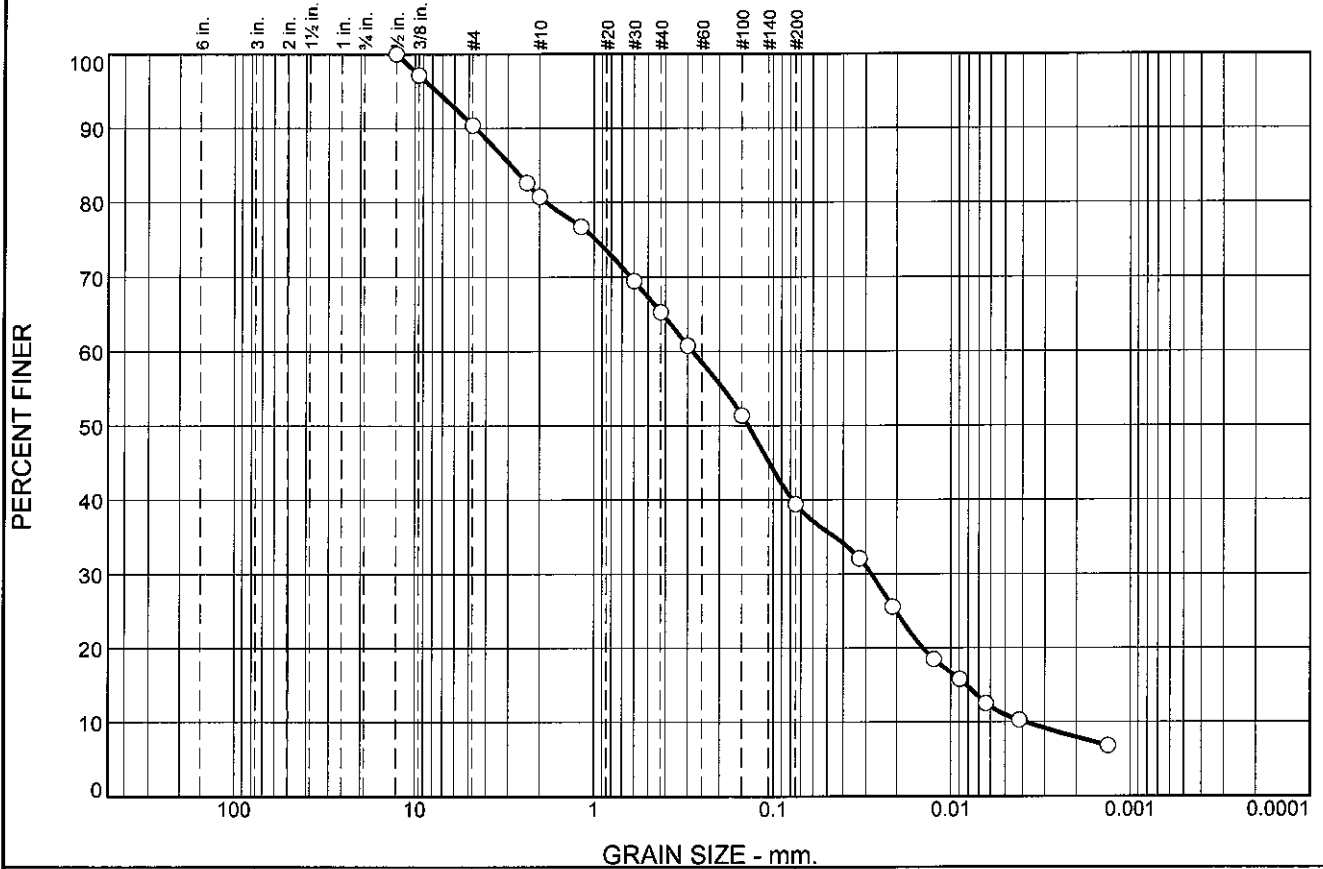
Project No: 161348

Figure No. 8

Tested By: J. Friant

Checked By: E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	9.6	9.6	15.5	25.9	28.4	11.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	97.2		
#4	90.4		
#8	82.6		
#10	80.8		
#16	76.7		
#30	69.5		
#40	65.3		
#50	60.8		
#100	51.4		
#200	39.4		
0.0325 mm.	32.1		
0.0211 mm.	25.6		
0.0124 mm.	18.5		
0.0089 mm.	15.8		
0.0064 mm.	12.5		
0.0042 mm.	10.2		
0.0013 mm.	6.8		

* (no specification provided)

Soil Description

Brown, moist, Silty SAND

Atterberg Limits

PL= 29 LL= 36 PI= 7 NM= 20.2

Coefficients

D₉₀= 4.5766 D₈₅= 2.9009 D₆₀= 0.2825
D₅₀= 0.1384 D₃₀= 0.0278 D₁₅= 0.0082
D₁₀= 0.0039 C_u= 72.67 C_c= 0.70

Classification

USCS= SM AASHTO= A-4(0)

Remarks

USDA: Sandy Loam

Source of Sample: TP-7 Depth: 3.0

Date: 7/27/2016



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Project: Crebilly Farm

Project No: 161348

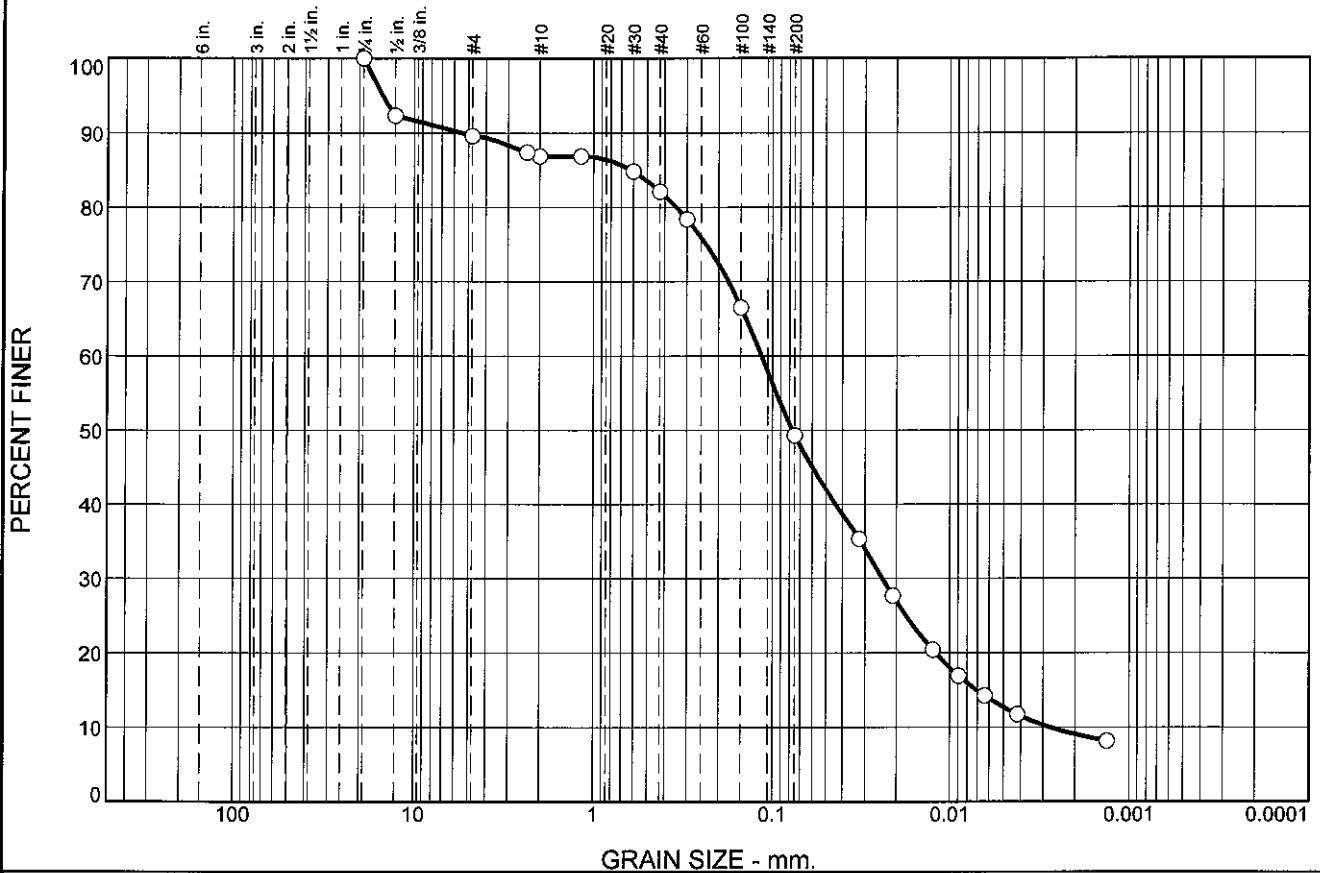
Figure No. 9

Tested By: M. Kerezsi

Checked By: E. Williams

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	10.4	2.7	4.8	32.8	36.6	12.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	92.3		
#4	89.6		
#8	87.4		
#10	86.9		
#16	86.9		
#30	84.8		
#40	82.1		
#50	78.4		
#100	66.5		
#200	49.3		
0.0324 mm.	35.3		
0.0210 mm.	27.7		
0.0125 mm.	20.4		
0.0089 mm.	16.9		
0.0064 mm.	14.3		
0.0042 mm.	11.8		
0.0013 mm.	8.2		

Soil Description

Brown, moist, Silty SAND

Atterberg Limits

PL= 28 LL= 28 PI= NP NM= 10.2

Coefficients

D ₉₀ = 5.3945	D ₈₅ = 0.6159	D ₆₀ = 0.1155
D ₅₀ = 0.0774	D ₃₀ = 0.0240	D ₁₅ = 0.0070
D ₁₀ = 0.0027	C _u = 42.39	C _c = 1.83

Classification

USCS= SM AASHTO= A-4(0)

Remarks

USDA: Loam

* (no specification provided)

Source of Sample: TP-8 Depth: 3.0

Date: 7/27/2016

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.



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 New Castle, DE 19720

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Project: Crebilly Farm

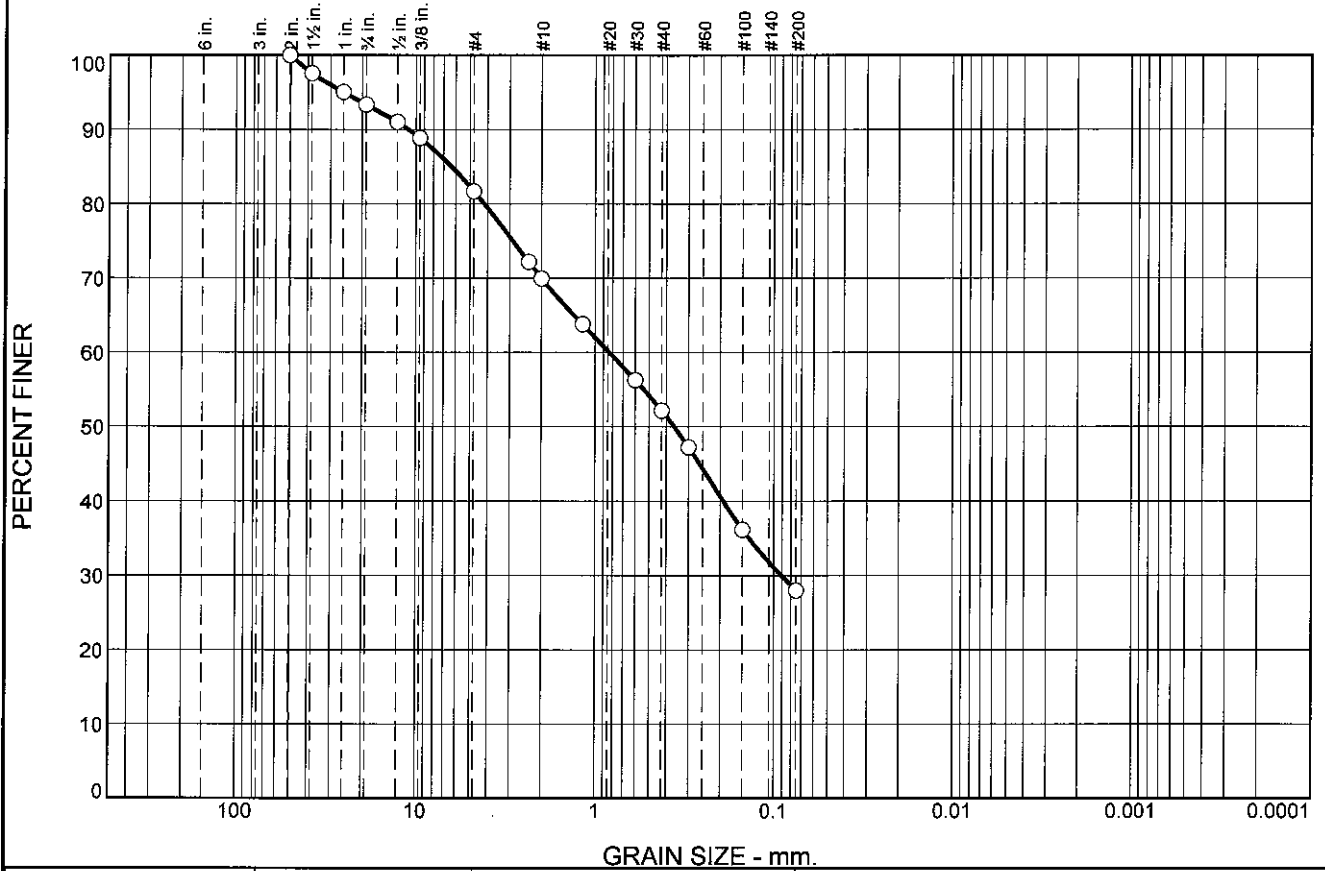
Project No: 161348

Figure No. 10

Tested By: M. Kerezsi

Checked By: E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.6	11.7	11.7	17.8	24.2	28.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2	100.0		
1.5	97.6		
1	95.1		
.75	93.4		
.5	91.0		
.375	88.9		
#4	81.7		
#8	72.2		
#10	70.0		
#16	63.8		
#30	56.3		
#40	52.2		
#50	47.2		
#100	36.2		
#200	28.0		

Soil Description

Brown, moist, Silty SAND with gravel

Atterberg Limits

PL= 28 LL= 33 PI= 5 NM= 14.0

Coefficients

D₉₀= 10.9987 D₈₅= 6.3352 D₆₀= 0.8377
D₅₀= 0.3620 D₃₀= 0.0906 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

* (no specification provided)

Source of Sample: TP-9 Depth: 2.0
Sample Number: S-072616

Date: 7/26/2016

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.



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Project: Crebilly Farm

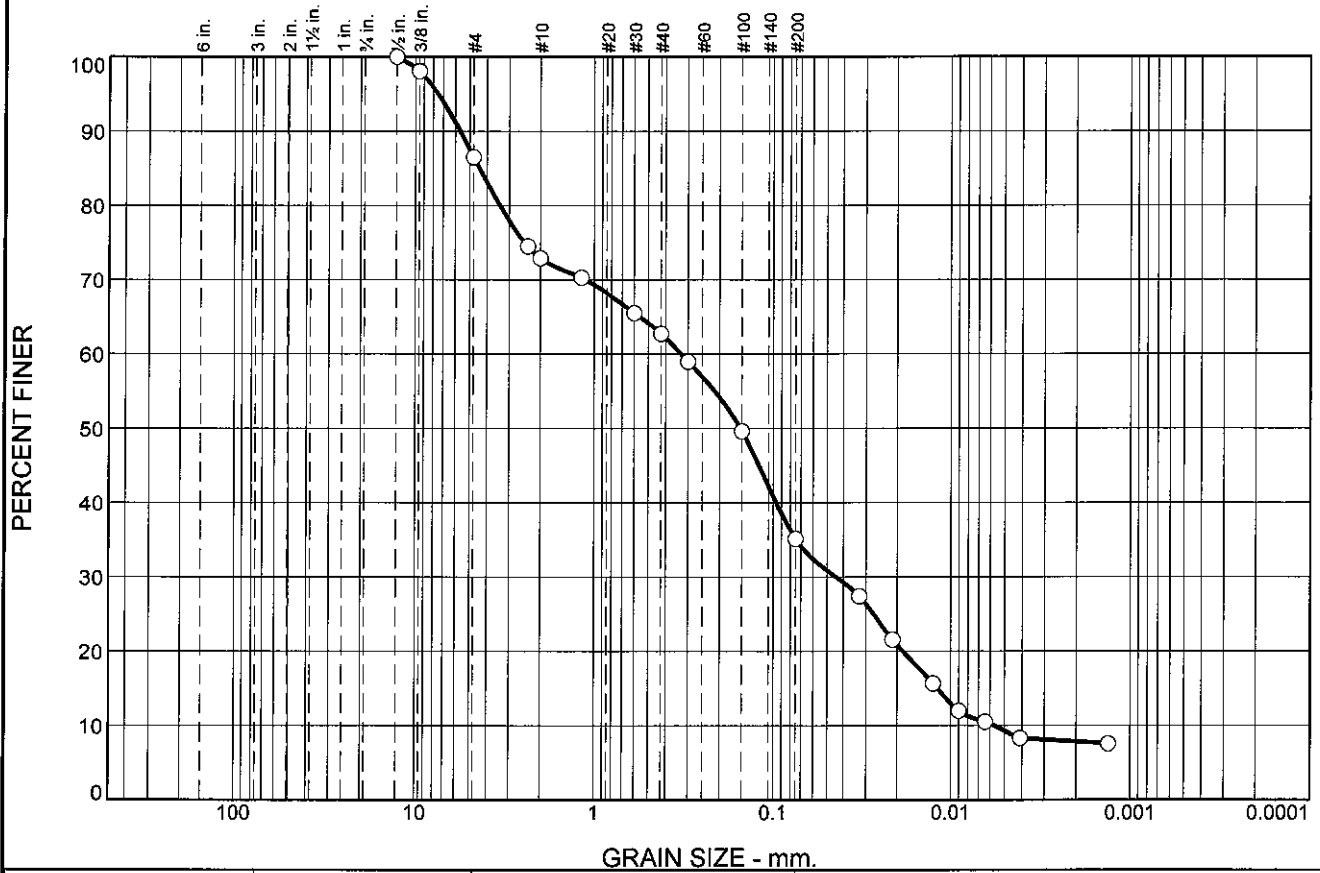
Project No: 161348

Figure No. 11

Tested By: D. Jeffery

Checked By: E. Williams

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	13.5	13.6	10.2	27.5	25.9	9.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	98.0		
#4	86.5		
#8	74.5		
#10	72.9		
#16	70.3		
#30	65.5		
#40	62.7		
#50	58.9		
#100	49.6		
#200	35.2		
0.0327 mm.	27.4		
0.0212 mm.	21.5		
0.0126 mm.	15.7		
0.0090 mm.	12.0		
0.0064 mm.	10.5		
0.0041 mm.	8.3		
0.0013 mm.	7.6		

* (no specification provided)

Soil Description

Brown, moist, Silty, Clayey SAND

Atterberg Limits

PL= 22 LL= 29 PI= 7 NM= 13.8

Coefficients

D₉₀= 5.6657 D₈₅= 4.4017 D₆₀= 0.3293
D₅₀= 0.1532 D₃₀= 0.0441 D₁₅= 0.0119
D₁₀= 0.0057 C_u= 57.88 C_c= 1.04

Classification

USCS= SC-SM AASHTO= A-2-4(0)

Remarks

USDA: Sandy Loam

Source of Sample: TP-9 Depth: 5

Date: 7/27/2016



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New Castle, DE 19720

Client: Toll Brothers, Inc.
Project: Crebilly Farm

Project No: 161348

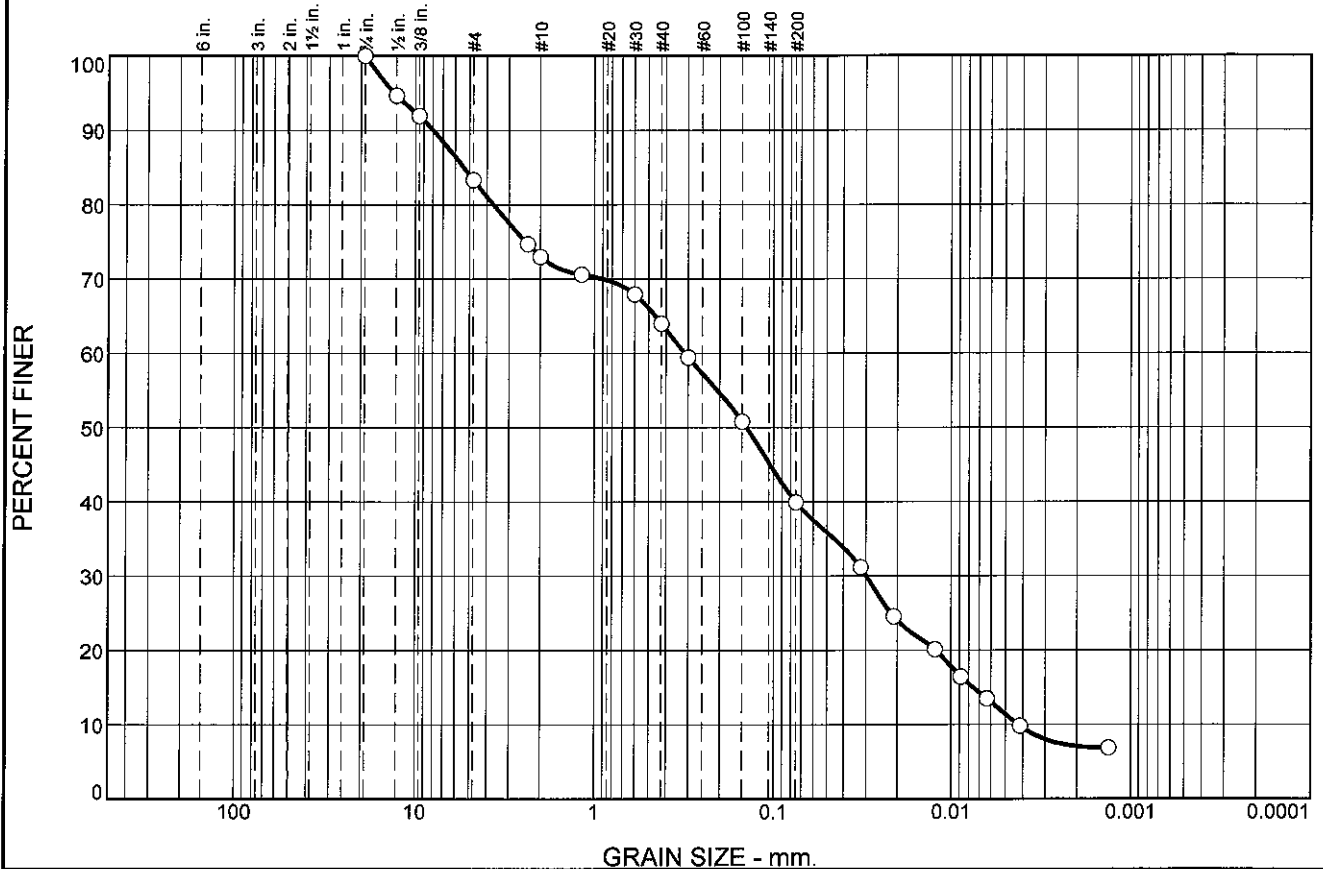
Figure No. 12

Tested By: C. Jackson

Checked By: E. Williams

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	16.7	10.3	9.0	24.0	28.6	11.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.5	94.7		
.375	92.0		
#4	83.3		
#8	74.7		
#10	73.0		
#16	70.6		
#30	67.9		
#40	64.0		
#50	59.4		
#100	50.8		
#200	40.0		
0.0322 mm.	31.2		
0.0210 mm.	24.5		
0.0123 mm.	20.1		
0.0089 mm.	16.4		
0.0063 mm.	13.5		
0.0041 mm.	9.8		
0.0013 mm.	6.9		

* (no specification provided)

Soil Description

Orange and brown, moist, Silty SAND with gravel

Atterberg Limits

PL= 36 LL= 43 PI= 7 NM= 33.2

Coefficients

D₉₀= 7.9413 D₈₅= 5.3853 D₆₀= 0.3137
D₅₀= 0.1420 D₃₀= 0.0298 D₁₅= 0.0076
D₁₀= 0.0043 C_u= 73.73 C_c= 0.67

Classification

USCS= SM AASHTO= A-5(0)

Remarks

USDA: Loam

Source of Sample: TP-11 Depth: 4.0

Date: 7/27/2016



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New Castle, DE 19720

Client: Toll Brothers, Inc.
Project: Crebilly Farm

Project No: 161348

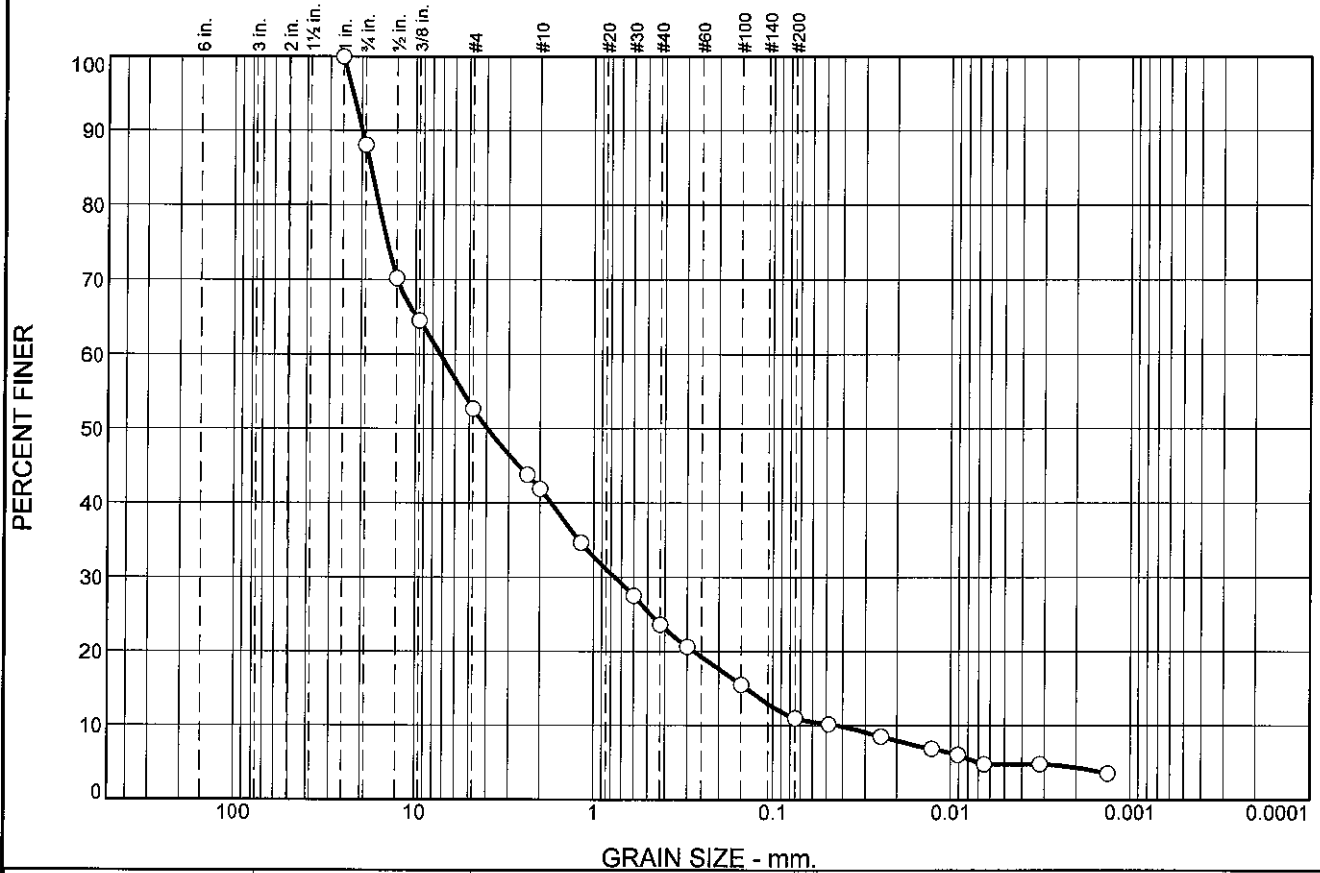
Figure No. 14

Tested By: C. Jackson

Checked By: E. Williams

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	11.9	35.4	10.8	18.3	12.6	6.2	4.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	88.1		
.5	70.2		
.375	64.5		
#4	52.7		
#8	43.8		
#10	41.9		
#16	34.7		
#30	27.5		
#40	23.6		
#50	20.6		
#100	15.5		
#200	11.0		
0.0483 mm.	10.2		
0.0245 mm.	8.5		
0.0128 mm.	6.9		
0.0091 mm.	6.0		
0.0065 mm.	4.8		
0.0032 mm.	4.8		
0.0013 mm.	3.6		

* (no specification provided)

Soil Description

Brown and gray, moist, Well-graded GRAVEL with silt and sand

Atterberg Limits

PL= 25 LL= 32 PI= 7 NM= 9.2

Coefficients

D₉₀= 19.8909 D₈₅= 17.8561 D₆₀= 7.2522
 D₅₀= 3.9575 D₃₀= 0.7624 D₁₅= 0.1406
 D₁₀= 0.0434 C_u= 167.04 C_c= 1.85

Classification

USCS= GW-GM AASHTO= A-2-4(0)

Remarks

USDA: Sandy Loam

Source of Sample: TP-13 Depth: 3.5

Date: 7/27/2016



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 18 Boulden Circle, Suite 36
 New Castle, DE 19720

Client: Toll Brothers, Inc.
Project: Crebilly Farm

Project No: 161348

Figure No. 16

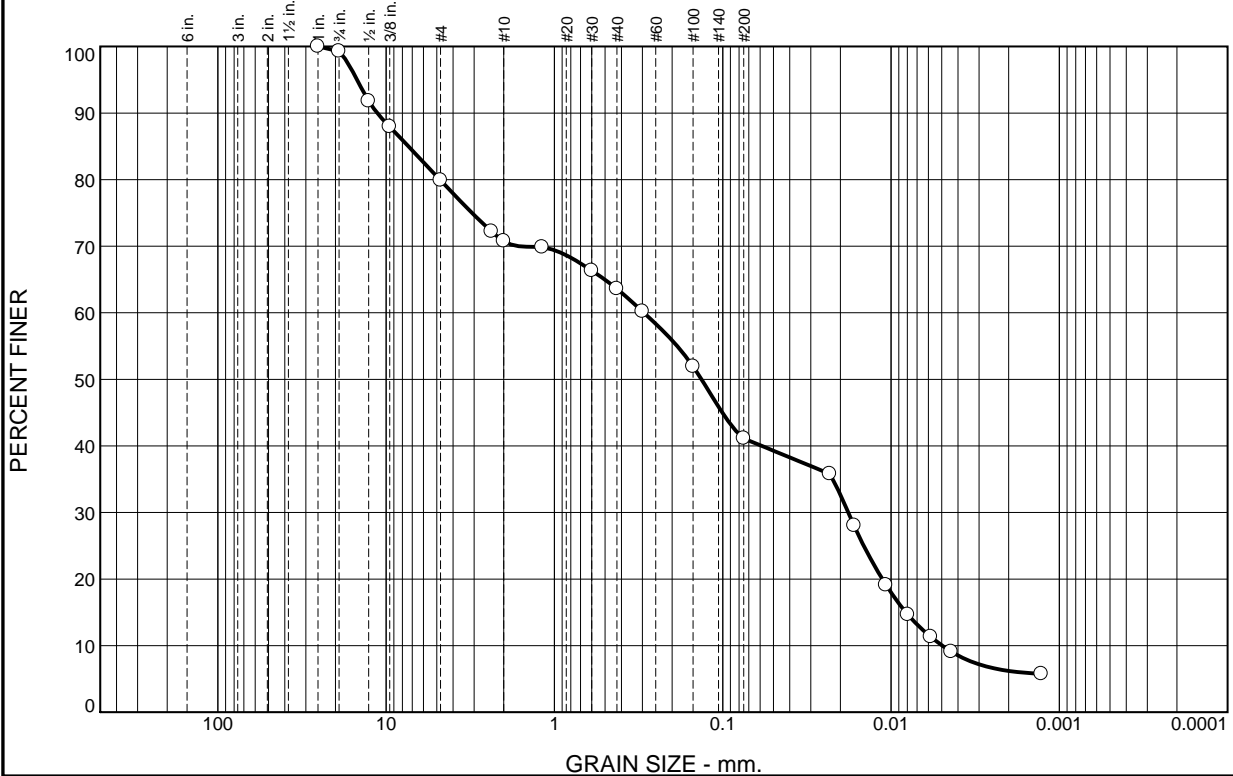
ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Tested By: D. Jeffery

Checked By: E. Williams

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	0.7	19.4	9.1	1.4	4.4	6.7	13.4	5.6	6.6	26.5	6.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	99.3		
.5	91.8		
.375	87.9		
#4	79.9		
#8	72.2		
#10	70.8		
#16	69.8		
#30	66.3		
#40	63.6		
#50	60.2		
#100	51.9		
#200	41.1		
0.0231 mm.	35.8		
0.0166 mm.	28.0		
0.0107 mm.	19.1		
0.0079 mm.	14.7		
0.0058 mm.	11.3		
0.0044 mm.	9.1		
0.0013 mm.	5.7		

* (no specification provided)

Soil Description

LOAM (0.521)

Atterberg Limits

PL= LL= PI= NM=

Coefficients

D₉₀= 11.3006 D₈₅= 7.3768 D₆₀= 0.2944
D₅₀= 0.1337 D₃₀= 0.0179 D₁₅= 0.0082
D₁₀= 0.0050 C_u= 59.27 C_c= 0.22

Classification

USCS= Silty SAND (SM) AASHTO=

Remarks

Source of Sample: TP 3-04 Depth: 9.0

Date: 11/18/2019



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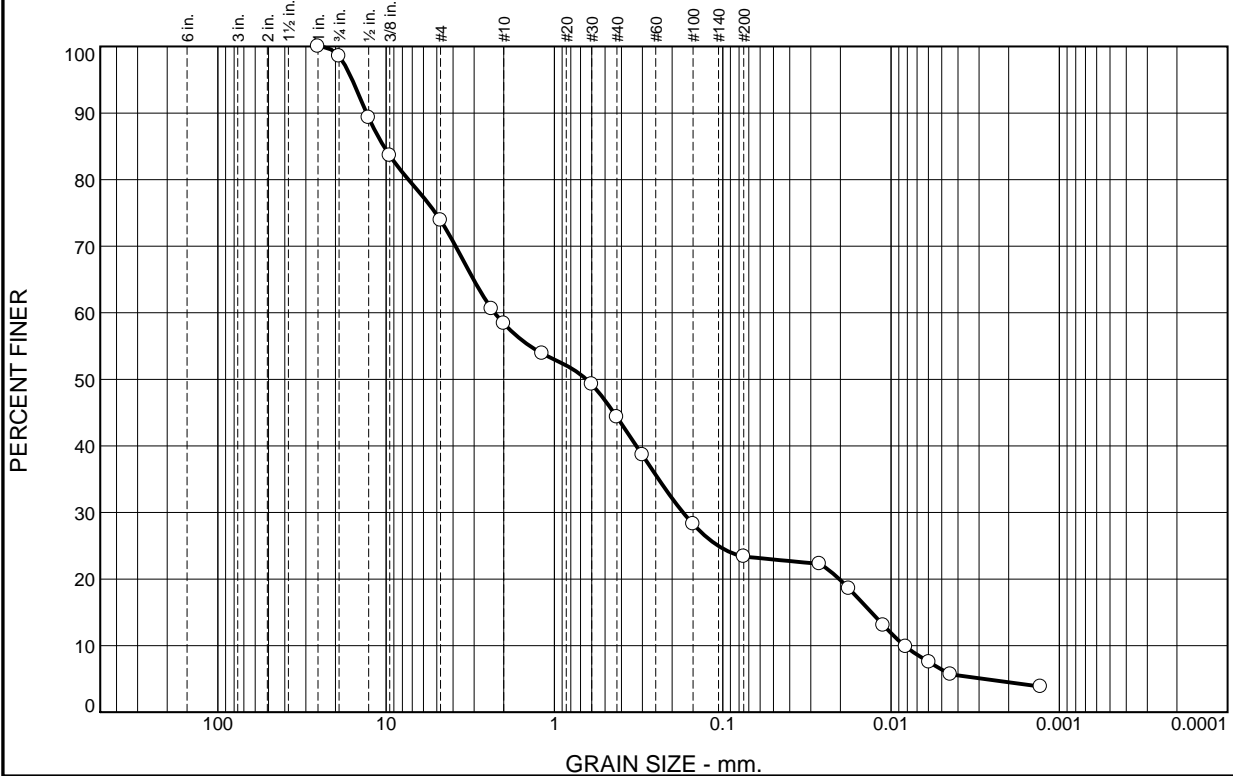
Client: Toll Brothers, Inc.
Project: Crebilly Farm
Project No: 161348

Figure

Tested By: A. Veith Checked By: C. Reith

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	1.5	24.6	15.5	5.4	6.2	11.2	11.0	1.7	3.1	15.3	4.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0		
.75	98.5		
.5	89.3		
.375	83.6		
#4	73.9		
#8	60.6		
#10	58.4		
#16	53.9		
#30	49.2		
#40	44.3		
#50	38.6		
#100	28.2		
#200	23.4		
0.0266 mm.	22.3		
0.0178 mm.	18.6		
0.0111 mm.	13.1		
0.0082 mm.	9.8		
0.0059 mm.	7.5		
0.0044 mm.	5.7		
0.0013 mm.	3.8		

* (no specification provided)

Soil Description

Sandy LOAM (1.02)

Atterberg Limits

PL= LL= PI= NM=

Coefficients

D₉₀= 13.0714 D₈₅= 10.3306 D₆₀= 2.2692

D₅₀= 0.6450 D₃₀= 0.1722 D₁₅= 0.0131

D₁₀= 0.0083 C_u= 272.74 C_c= 1.57

Classification

USCS= Silty SAND (SM) AASHTO=

Remarks

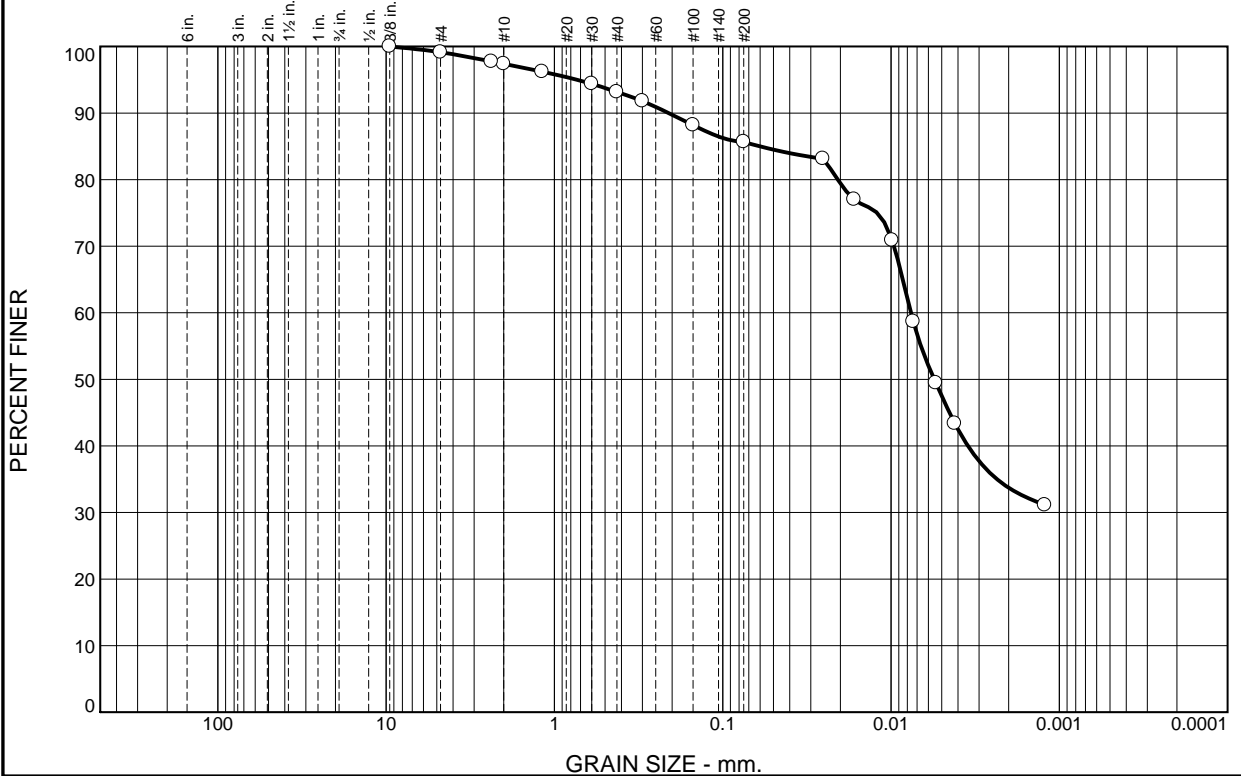
Source of Sample: TP 3-05/06 **Depth:** 10.0 **Date:** 11/18/2019

	<p>GEO-TECHNOLOGY ASSOCIATES, INC.</p> <p>18 Boulden Circle, Suite 36 New Castle, DE 19720</p>	<p>Client: Toll Brothers, Inc.</p> <p>Project: Crebilly Farm</p> <p>Project No: 161348</p>	<p>Figure</p>
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Tested By: A. Veith **Checked By:** C. Reith

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	0.0	0.9	1.7	1.6	2.0	2.9	4.6	1.8	5.0	45.8	33.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.1		
#8	97.7		
#10	97.4		
#16	96.2		
#30	94.4		
#40	93.2		
#50	91.8		
#100	88.2		
#200	85.7		
0.0253 mm.	83.1		
0.0166 mm.	77.0		
0.0099 mm.	70.9		
0.0074 mm.	58.7		
0.0054 mm.	49.5		
0.0042 mm.	43.4		
0.0012 mm.	31.1		

Soil Description

Silty CLAY LOAM (0.06)

Atterberg Limits

PL= LL= PI= NM=

Coefficients

D₉₀= 0.2096 D₈₅= 0.0601 D₆₀= 0.0076

D₅₀= 0.0055 D₃₀= D₁₅=

D₁₀= C_u= C_c=

Classification

USCS= Lean CLAY (CL) AASHTO=

Remarks

* (no specification provided)

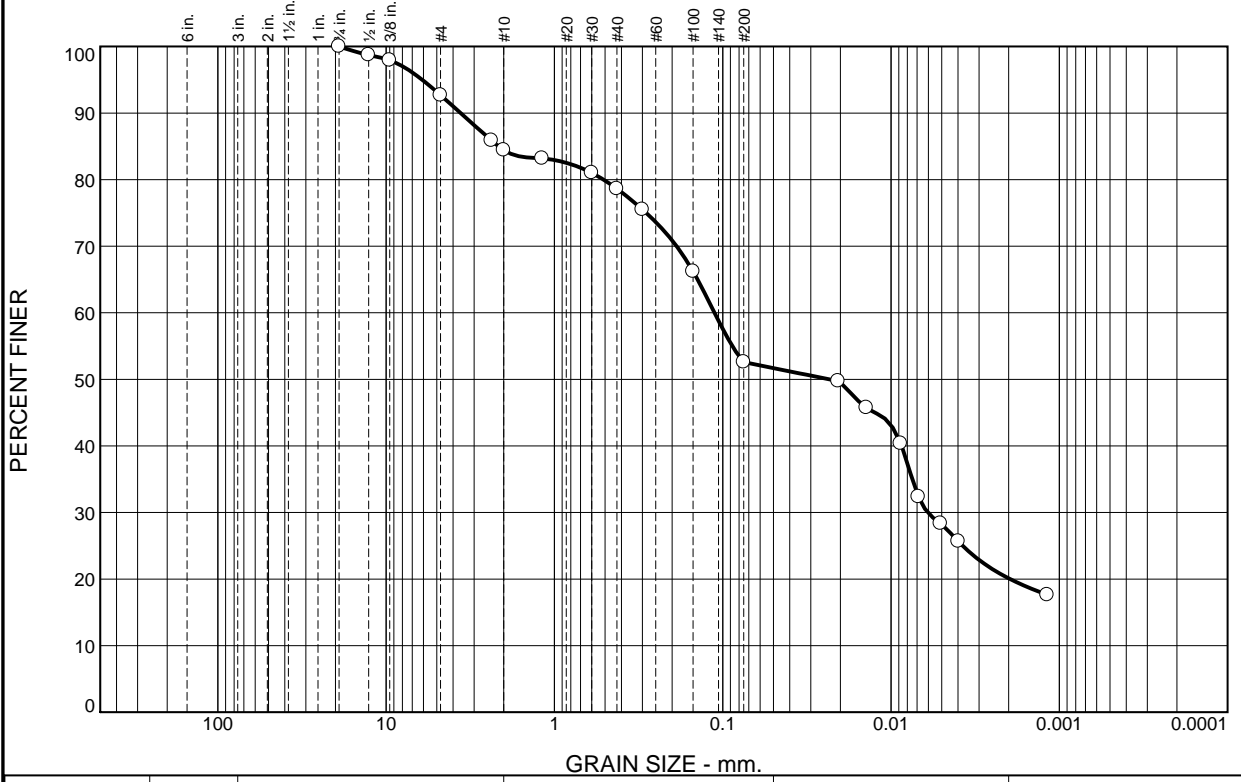
Source of Sample: TP 3-09/10 Depth: 3.0 Date: 11/18/2019

	<p>GEO-TECHNOLOGY ASSOCIATES, INC.</p> <p>18 Boulden Circle, Suite 36 New Castle, DE 19720</p>	<p>Client: Toll Brothers, Inc.</p> <p>Project: Crebilly Farm</p> <p>Project No: 161348</p>	<p>Figure</p>
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Tested By: A. Veith Checked By: C. Reith

ASTM Specifications performed may include D421, D422, D2216, D2217 and D4318.

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	0.0	7.3	8.3	1.5	3.0	6.3	16.0	5.9	2.2	29.4	20.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	98.7		
.375	97.9		
#4	92.7		
#8	85.9		
#10	84.4		
#16	83.2		
#30	81.0		
#40	78.6		
#50	75.5		
#100	66.2		
#200	52.6		
0.0206 mm.	49.7		
0.0140 mm.	45.7		
0.0088 mm.	40.4		
0.0069 mm.	32.3		
0.0051 mm.	28.3		
0.0040 mm.	25.7		
0.0012 mm.	17.6		

Soil Description

LOAM (0.52)

Atterberg Limits

PL= LL= PI= NM=

Coefficients

D₉₀= 3.6041 D₈₅= 2.1485 D₆₀= 0.1120
D₅₀= 0.0232 D₃₀= 0.0061 D₁₅=
D₁₀= C_u= C_c=

Classification

USCS= Sandy SILT (ML) AASHTO=

Remarks

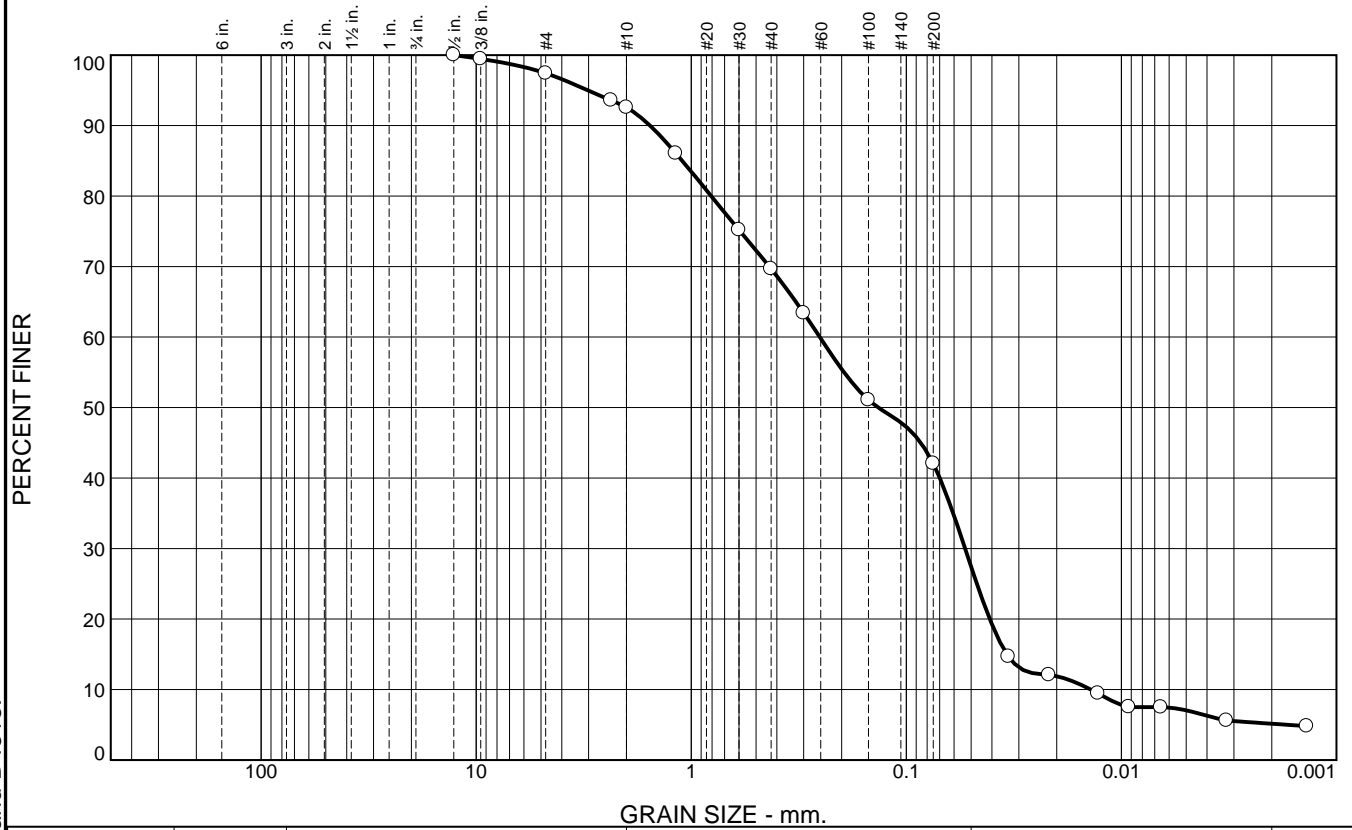
* (no specification provided)

Source of Sample: TP 3-11 **Depth:** 6.0 **Date:** 11/18/2019

	<p>GEO-TECHNOLOGY ASSOCIATES, INC.</p> <p>18 Boulden Circle, Suite 36 New Castle, DE 19720</p>	<p>Client: Toll Brothers, Inc. Project: Crebilly Farm</p>	<p>Project No: 161348 Figure</p>
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Tested By: A. Veith **Checked By:** C. Reith

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	0.0	2.6	4.8	9.1	11.2	12.5	12.6	19.8	15.5	6.8	5.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5	100.0		
.375	99.4		
#4	97.4		
#8	93.6		
#10	92.6		
#16	86.1		
#30	75.2		
#40	69.7		
#50	63.4		
#100	51.1		
#200	42.1		
0.0335 mm.	14.7		
0.0217 mm.	12.1		
0.0129 mm.	9.4		
0.0092 mm.	7.5		
0.0065 mm.	7.5		
0.0032 mm.	5.6		
0.0014 mm.	4.8		

* (no specification provided)

Soil Description

USDA Classification - Sandy LOAM
 T88 Textural Analysis -
 % Sand: 55.3 % Silt: 35.1 % Clay: 7.0

Atterberg Limits

PL= NP LL= NP PI= NP NM= 10.8

Coefficients

D₉₀= 1.5553 D₈₅= 1.1018 D₆₀= 0.2527
 D₅₀= 0.1350 D₃₀= 0.0533 D₁₅= 0.0341
 D₁₀= 0.0139 C_u= 18.17 C_c= 0.81

Classification

USCS= SM AASHTO= A-4(0)

Remarks

Source of Sample: TP-05-03, 5 ft

Date: 7/31/2020

ASTM Specifications performed may include: D421, D422, D2216, D2217, and D4318.



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 Abingdon, MD 21009

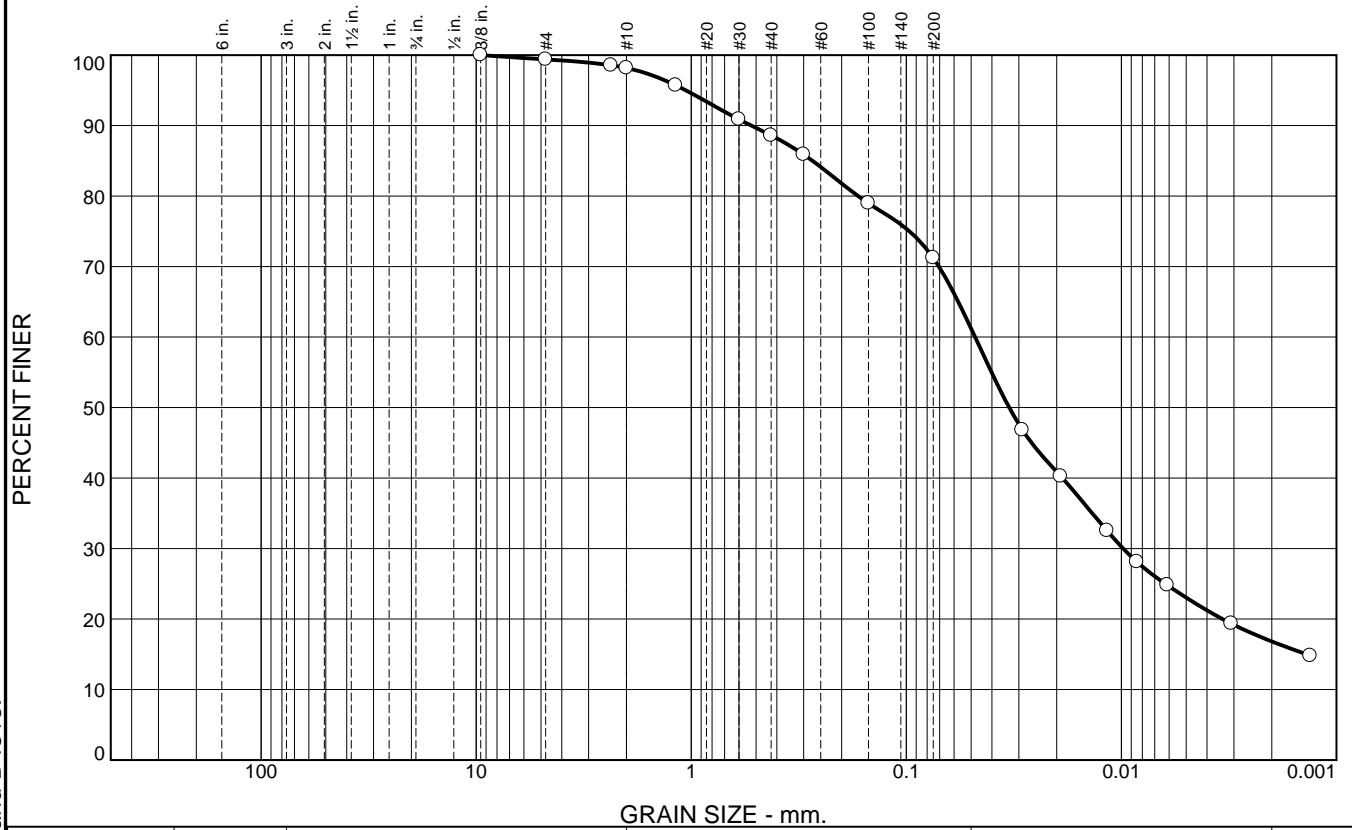
Client: Toll Brothers
Project: Crebilly Farm
Project No: 31161348

Figure

Tested By: W. Pinder

Checked By: E. Church

Particle Size Distribution Report



PERCENT FINER

GRAIN SIZE - mm.

% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	0.0	0.6	1.2	3.6	4.9	5.6	8.7	14.2	20.3	24.1	16.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.4		
#8	98.6		
#10	98.2		
#16	95.7		
#30	90.9		
#40	88.6		
#50	85.9		
#100	79.0		
#200	71.2		
0.0289 mm.	46.8		
0.0191 mm.	40.3		
0.0117 mm.	32.5		
0.0085 mm.	28.1		
0.0061 mm.	24.8		
0.0031 mm.	19.3		
0.0013 mm.	14.8		

* (no specification provided)

Soil Description

USDA Classification - LOAM
 T88 Textural Analysis -
 % Sand: 28.2 % Silt: 48.2 % Clay: 23.0

Atterberg Limits

PL= 28 LL= 38 PI= 10 NM= 22.3

Coefficients

D₉₀= 0.5257 D₈₅= 0.2732 D₆₀= 0.0479
 D₅₀= 0.0332 D₃₀= 0.0098 D₁₅= 0.0014
 D₁₀= C_u= C_c=

Classification

USCS= ML AASHTO= A-4(7)

Remarks

Source of Sample: TP-05-05, 5 ft

Date: 7/31/2020

ASTM Specifications performed may include: D421, D422, D2216, D2217, and D4318.



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 Abingdon, MD 21009

Client: Toll Brothers
Project: Crebilly Farm
Project No: 31161348

Figure

Tested By: W. Pinder

Checked By: E. Church