REPORT OF PRELIMINARY GEOTECHNICAL AND STORMWATER BASIN AREA INVESTIGATION

PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
251 Grove Avenue
Block 1201, Lot 12
Township of Verona, Essex County, New Jersey

Prepared for:

JMF PROPERTIES
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Block 1201, Lot 12
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1.0 EXECUTIVE SUMMARY

Dynamic Earth, LLC (Dynamic Earth) has completed a preliminary geotechnical and stormwater basin area investigation at the subject site. The subsurface conditions encountered generally included existing fill material and organic deposits that were underlain with glacial deposits and apparent rock. **Based on the subsurface conditions encountered, the existing fill material and organic deposits are not suitable for support of the proposed structure without the risk of excessive settlement. As such, these materials will need to be overexcavated and replaced where encountered below proposed building footprint area.** Following overexcavation and replacement of the unsuitable materials, the proposed structure may be designed with conventional shallow foundations and ground supported floor slab bearing within newly placed compacted structural fill material and/or approved non-organic natural deposits (if encountered). Portions of the on-site soils may be suitable for support of proposed pavements, however due to the potential variability of the existing fill material and debris, partial overexcavation and replacement and/or subgrade stabilization should be anticipated as part of the project planning.

Since groundwater was encountered at depths shallower than the existing fill/organic layers, the need for construction phase groundwater control will be required during overexcavation and replacement of the unsuitable materials, as detailed herein.

2.0 PROJECT DETAILS

The subject site is located at 251 Grove Avenue in the Township of Verona, Essex County, New Jersey. The site is further identified as Block 1201, Lot 12. At the time of our investigation, the subject site was occupied by a construction yard with five existing single-story buildings and associated pavements and utilities. The site is bound to the north by commercial buildings with residential properties and Grove Avenue beyond; to the east by the Peckman River with the Verona Waste Water Treatment Plant beyond; to the south by residential properties with Ann Street beyond; and to the west by residential properties with residential properties beyond.

Based on an October 20, 2025 *Conceptual Study* prepared by Lessard Design, the proposed redevelopment will include demolition of the existing structures and construction of a three to four-story multi-family building and associated parking garage, pavements, and utilities. The proposed building will occupy a building footprint area of approximately 90,000 square feet. Conceptual grading plans were not developed at this time.

Topographic information was provided on an October 29, 2024 (revision 1) *Boundary, Location, and Topographic Survey* prepared by Dynamic Survey, LLC. Existing site grades range from a high elevation of approximately 330.0 feet within the eastern portion of the site, to a low elevation of

approximately 317.0 feet along within the southern portion of the site. A slope down to the Peckman River on the eastern portion of the site ranges from approximate elevation 328 down to approximate elevation 301. The elevations referenced in the survey, and throughout this report, are given in 1988 North American Vertical Datum (NAVD88), unless otherwise noted.

The final structural loads have not been provided this time. Based on our experience with similar projects, we assume that the maximum loads will be less than the following:

- Column – 180 kips;
- Wall – 2.0 kips per linear foot;
- Floor Slab – 125 pounds per square feet; and
- Pavement – 60,000 Equivalent Single Axle Loads (ESAL's).

3.0 SCOPE OF SERVICES

3.1 Field Investigation

Field exploration of the project site was conducted by means of nine soil borings (identified as borings B-1 through B-7; including offset locations B-1A and B-1B) five soil profile pits (identified as soil profile pits SPP-1 through SPP-5), and three surface infiltration tests (identified as INF-1 through INF-3). The soil borings were drilled with a truck-mounted drill rig using hollow-stem drilling techniques. The soil profile pits were excavated at the site using a rubber-tracked backhoe. The test locations are shown on the accompanying *Test Location Plan* included in the Appendix of this report.

Test Location Summary Table		
Number	**Location**	**Final Depth (feet)**
B-1	Building – Northeastern Portion of Site	0.8[1]
B-1A		1.5[1]
B-1B		2.3[1]
B-2	Parking Garage – Central Portion of Site	12.5[1]
B-3	Building – Western Portion of Site	23.8[1]
B-4	Building – Central Portion of Site	18.8[1]
B-5		9.0[1]
B-6	Building – Eastern Portion of Site	7.2[1]
B-7	Building – Central Portion of Site	13.0[1]
SPP-1	Northern Portion of Site	11.0
SPP-2		4.5
SPP-3	Southwestern Portion of Site	7.0
SPP-4	Southern Portion of Site	5.0[1]
SPP-5		9.2

[1] Machine Refusal

The soil borings and soil profile pits were completed in the presence of a Dynamic Earth representative who performed field tests, recorded visual classifications, and collected samples of the various strata encountered. The test locations were located in the field using conventional taping procedures with estimated right angles and are presumed to be accurate within several feet of the location plotted on the plans. Surface elevations were topographically estimated utilizing existing survey data provided on the documents referenced herein.

Soil borings and standard penetration tests (SPTs) were conducted in general accordance with ASTM D6151 (*Standard Practice for Using Hollow-Stem Augers for Geotechnical Exploration and Soil Sampling*) and ASTM D1586 (*Standard Test Method for Standard Penetration Test and Split Barrel Sampling of Soils*). The SPT resistance value (N) can be used as an indicator of the consistency of fine-grained soils and the relative density of coarse-grained soils. The N-value for various soil types can be correlated with the engineering behavior of soils to develop earthwork and foundation recommendations. Unconfined compressive strength (Q_p) pocket penetrometer values were also recorded within fine-grained portions of the soil profile.

The soils encountered within the possible areas of the proposed stormwater management facilities were classified using the United States Department of Agriculture (USDA) Classification System. Observations were made for groundwater and/or soil mottling and mineral deposits potentially indicative of zones of saturation or seasonal high groundwater. Soil logs are included in the Appendix of the report.

Tube permeameter samples were collected in general accordance with New Jersey Department of Environmental Protection (N.J.D.E.P.) *Stormwater Best Practices Manual – Chapter 12 Soil Testing Criteria* test methods on representative horizons obtained from anticipated stormwater management facility infiltration depth.

Groundwater level observations were recorded during and at the completion of field operations prior to backfilling the borings and soil profile pits. Seasonal variations, temperature effects, man-made effects, and recent rainfall conditions may influence the levels of the groundwater, and the observed levels will depend on the permeability of the soils. Groundwater elevations derived from sources other than seasonally observed groundwater monitoring wells may not be representative of true groundwater levels. Environmental conditions were not evaluated by Dynamic Earth.

3.2 Laboratory Testing

Physical/Textural Analysis: Each sample was visually classified in general accordance with ASTM D2488 (visual-manual procedure). In addition, representative samples of selected strata encountered were subjected to a laboratory testing program which included moisture content

determinations (ASTM D2216), particle size distribution (ASTM D6913), Atterberg Limits (ASTM D4318), and washed gradation analyses (ASTM D1140) in order to perform supplementary engineering soil classifications in general accordance with ASTM D2487. The soil strata tested were classified by the Unified Soil Classification System (USCS) and results of the laboratory testing are summarized in the following table:

LABORATORY TEST RESULTS							
Boring	**Sample No.**	**Depth (feet)**	**Moisture Content (%)**	**Liquid Limit**	**Plasticity Index**	**Percent Passing No. 200 (%)**	**USCS Classification**
B-3	S-5	8-10	23.4	Not Plastic		80.9	ML
B-5	S-4	6-8	13.6	29	8	38.3	GC

4.0 SUMMARY OF SUBSURFACE CONDITIONS

4.1 Published Geology

The subject site is located within the Piedmont Physiographic Province of New Jersey. Specifically, the subject property is situated in the Feltville Formation (Upper Jurassic and Upper Triassic Age). The formation is comprised of fine to coarse grained sandstone, siltstone, and silty mudstone. Overburden soils include glacial delta deposits consisting of light gray, reddish brown, and yellowish brown sand, pebble to cobble gravel, and silt with interbedded lake clays. Overburden soils also include man-made fills.

4.2 United States Department of Agriculture (USDA) Soil Survey

Based on a review of the United States Department of Agriculture – Natural Resources Conservation Services (USDA-NRCS) soil survey, the following soil resources are mapped underlying the site within the area of the proposed site improvements, are shown on the *USDA-NRCS Custom Soil Resource Report* included in the appendix of this report, and are described below:

Peckmantown – Urban land, Peckmantown substratum complex, zero to eight percent slopes (PecuuB): This soil series is mapped for the entirety of the site and the parent material is described as coarse-silty glaciolacustrine deposits derived from basalt. The typical soil profile (as detailed in the survey) consists of silt loam to a depth of two inches; loam to a depth of 14 inches; silt loam to a depth of 27 inches; loam to a depth of 37 inches; silt loam to a depth of 59 inches; gravelly loamy coarse sand to a depth of 63 inches; underlain by coarse sand to a depth of 88 inches below the natural ground surface (limit of the report). The depth to water table is reported to be more than 80 inches below the natural ground surface.

4.3 Subsurface Conditions

Details of the subsurface materials encountered are presented on the *Records of Subsurface Exploration* presented in the Appendix. The subsurface soil conditions encountered in the soil borings consisted of the following generalized strata in order of increasing depth.

Surface Cover Material: The soil borings and soil profile pits were performed within currently undeveloped areas or existing pavement areas. Test locations performed within undeveloped areas encountered existing fill material at the surface. Test locations performed within existing pavement areas encountered approximately 2.5 to seven inches of asphaltic concrete at the surface with up to approximately eight inches of apparent subbase material.

Existing Fill Material: At the ground surface or beneath the surface cover material (where encountered), existing fill material was encountered that generally consisted of clay, sand, and gravel with variable amounts of silt and debris. The debris encountered included brick, glass, asphalt, concrete, millings, plastic, and wood. The existing fill materials were encountered to depths ranging between approximately one foot and eight feet below the ground surface; corresponding to elevations ranging between 326.3 feet and 311.8 feet. Refusal was encountered within the existing fill material at depths ranging between approximately 0.8 feet and 1.5 feet below the ground surface; corresponding to elevations ranging between 327.5 feet and 326.8 feet. Standard Penetration Testing (SPT) N-values ranged between three blows per foot (bpf) and 44 bpf.

Organic Deposits: Beneath the existing fill material, organic deposits were encountered on the western and central portion of the site that generally consisted of clay (USCS: OL) with variable amounts of peat, silt, and sand. The organic deposits were encountered to depths of approximately six feet to eight feet below the ground surface; corresponding to elevations ranging between 311.8 feet and 309.8 feet. Unconfined compressive strength pocket penetrometer values (Q_p) ranged between approximately less than 0.25 tons per square foot (tsf) and 0.5 tsf .

Glacial Deposits: Beneath the existing fill material and/or organic deposits (where encountered), glacial deposits were encountered that generally consisted of clay (USCS: CL), silt (USCS: ML), sand (USCS: SM), and gravel (USCS: GC). The natural glacial deposits were encountered to termination/refusal depths ranging between approximately 2.3 feet and 23.8 feet below the ground surface; corresponding to elevations ranging between 326.0 feet and 296.0 feet. SPT N-values ranged between nine bpf and 47 bpf and averaged 19 bpf, generally indicating a medium stiff condition. Unconfined compressive strength pocket penetrometer values (Q_p) within the fine grained ranged between 0.25 tsf and 4.25 tsf and averaged approximately 2.6 tsf; generally indicating a very stiff condition.

Weathered Rock/Rock: Beneath the existing fill or glacial deposit, refusal was encountered, which is assumed to be on apparent weathered rock/rock. Refusal depths ranged between 0.8 feet below ground surface on the northeastern portion of the site and 23.8 feet below ground surface on the southwestern portion of the site; corresponding to elevations of 382.5 feet and 296.0 feet.

4.4 Groundwater

Seasonal high groundwater and groundwater were encountered at depths ranging between approximately 3.9 feet and 9.8 feet below the ground surface; corresponding to elevations ranging between 316.4 feet and 310.0 feet. Seepage within the stone fill layer was encountered at approximately 1.5 feet below ground surface on the southern portion of the site. Groundwater levels are expected to fluctuate seasonally and following significant periods of precipitation.

5.0 PRELIMINARY DEVELOPMENT CONSIDERATIONS

5.1 General

Overexcavation and Supplemental Evaluation of Existing Fill Materials: Existing, undocumented fill materials were noted with sufficient variability to suggest uncontrolled conditions for foundation support. In addition, organic deposits were encountered within the proposed building footprint that are not suitable for direct foundation support. **As such, Dynamic Earth preliminarily recommends overexcavating the unsuitable existing fill material and organic deposits below proposed foundations and floor slabs.**

Since the groundwater was encountered at depths shallower than the existing fill/organic layer, the need for construction phase groundwater control will be required during overexcavation and replacement of the unsuitable materials, as detailed herein.

The following preliminary considerations are based on the soil conditions encountered during our limited subsurface investigation for the proposed site development and are intended to provide general characteristics of the subsurface conditions for preliminary planning purposes and should not be utilized for final design of structural foundations, floor slabs, or pavements. Specific geotechnical design and site development recommendations will need to be developed from a detailing subsurface investigation and engineering analyses of the final site development plans.

5.2 Preliminary Foundation and Floor Slab Recommendations

Anticipated Bearing Strata: Proposed foundations are expected to primarily bear within the existing fill material or organic deposits, **which are not suitable for direct support of foundations without the risk of excessive settlement. As such, these materials will need to be overexcavated and replaced with structural fill material as detailed herein.** Approved portions of the natural soils may be suitable for the support of proposed conventional shallow foundations, provided they are properly evaluated and inspected as detailed herein. **Due to the moisture sensitive on-site soils, at least partial overexcavation and replacement beyond the limits of the existing fill material and organic deposits should be included as part of the project planning.**

Shallow Foundation Design Criteria: Following overexcavation of unsuitable existing fill material and organic deposits, the proposed structure may be supported on conventional shallow foundations bearing within newly placed and compacted structural fill material. Foundations may be designed to impart a maximum allowable net bearing pressure of 3,000 psf. Regardless of loading conditions, proposed foundations should be sized no less than minimum dimensions of 24 inches for continuous wall footings and 36 inches for isolated column footings.

Any footings subject to tension loads should be designed so that the maximum toe pressure due to the combined effect of vertical loads and overturning moment does not exceed the recommended maximum allowable net bearing pressure recommended above. In addition, positive contact pressure should be maintained throughout the base of the footings such that no uplift or tension exists between the base of the footings and the supporting soil. Uplift loads should be resisted by the weight of the concrete, side friction (vertical along the footer) should be neglected.

Lateral resistance should be provided by friction on the base of the footing with a recommended coefficient of friction against sliding:

- Formed concrete on gravel subbase material – 0.40;
- Mass concrete on gravel subbase material – 0.50; and
- Mass concrete on on-site natural soils - 0.30.

Inspection/Overexcavation Criteria: The suitability of the bearing soils along and below the footing bottoms must be verified by Dynamic Earth's geotechnical engineer prior to placing concrete. Any overexcavation to be restored with structural fill (on-site or imported) will need to extend at least one foot laterally beyond footing edges for each vertical foot of overexcavation. The bottom of overexcavations should be compacted with smooth drum rollers, walk-behind compactors, vibrating plates or plate tampers ("jumping jacks") to compact locally disturbed materials and densify underlying natural soil zones. Alternatively, lean concrete/Controlled

Low-Strength Material (CLSM) or light-weight flowable fill material may be considered if lateral overexcavation is not possible.

Frost Coverage: Footings subject to frost action should be placed at least 36 inches below adjacent exterior grades or as required by the local building code to provide protection from frost penetration. Interior footings not subject to frost action (including during the period of construction) may be placed at a minimum depth of 18 inches below the slab subgrade.

Floor Slab: Following overexcavation of unsuitable existing fill material and organic deposits, the proposed floor slabs may be supported on newly placed and compacted structural fill material. A minimum four-inch layer of stone should be installed below the floor slabs to provide a capillary break. A moisture vaper barrier beneath the floor slab is recommended. The floor slab settlement tolerances will need to be coordinated between the structural engineer or end user and the ground improvement design engineer.

5.3 Preliminary Groundwater Considerations

Groundwater was encountered at depths ranging between approximately 3.9 feet and 9.8 feet below the ground surface; corresponding to elevations ranging between 310.0 feet and 316.4 feet. Seepage in the stone fill layer was encountered at a depth of 1.5 feet below the ground surface. Unsuitable soils were encountered to depths of up to approximately eight feet below the ground surface; corresponding to elevations ranging between 309.8 feet and 326.3 feet. Additionally, water can accumulate at the underface of soil and rock. As such, the need for construction phase groundwater control should be expected during overexcavation and replacement of these materials. Once site grading plans are finalized, additional groundwater considerations may be necessary.

While the contractor will be responsible for determining groundwater control and maintaining lowered groundwater levels to accomplish the work, excavations extending less than approximately two feet below the groundwater levels typically can be controlled by providing a sufficient number of sump pumps to draw down groundwater one foot below the bottom of excavations. Deeper excavations that remain open for relatively long periods often require more extensive dewatering systems, possibly including a well point system.

Depending on the final site grades and floor slab elevations, extensive permanent groundwater control should be expected as part of the proposed site development. Surface water runoff must be controlled and diverted away from construction areas by grading and limiting the exposure of excavations to rainfall.

5.4 Preliminary Earthwork Considerations

Import/On-site Structural Fill Material: Soils placed as structural fill material should consist of well graded sand or gravel with a maximum particle size of three inches in diameter and less than 15 percent of material passing the number 200 sieve. These materials should be free of objectionable debris (clay clumps, organic and/or deleterious material, etc.) and within moisture contents suitable for compaction. Alternative soil types with higher percentages of silt and clay may be considered, provided that the contractor is able to achieve proper compaction and maintain suitable subgrade once the material is placed. Fine-grained soils and/or granular soils with higher percentages of silt and clay are extremely moisture sensitive and will only be suitable for reuse as structural fill material under ideal weather conditions. Materials wetted beyond the optimum moisture content; that contain oversized rock or debris; or with increased amounts of objectionable debris will not be suitable for reuse as structural fill material without special handling. As such, the contractor should be responsible for importing structural fill material and/or processing on-site soils as required so that these materials are suitable for structural fill placement.

The organic deposits are not suitable for use as structural fill material. The existing fill material included objectionable debris, oversized material, and portions consisted of fine grained soils. Therefore, only limited portion of the existing fill materials may be suitable for reuse as structural fill, provided moisture contents are within tolerable limits to achieve compaction. If the existing fill material is proposed for reuse as structural fill, these materials will likely require special handling to segregate objectionable debris. Portions of the natural glacial deposits above the ground water are expected to be suitable for reuse as structural fill, provided moisture contents are within tolerable limits to achieve compaction. The existing fill material and natural glacial deposits are considered extremely moisture sensitive and will require moisture conditioning during periods of favorable weather, mixing with granular materials, and/or mixing with lime/cement, or will become not suitable for reuse if exposed to moisture. Reuse of these materials will be contingent upon further evaluation during construction.

Cobbles, boulders and/or oversized debris greater than three inches in diameter will need to be separated from material to be placed as structural fill. Approved material between three to 12 inches in diameter may be crushed or individually placed in fill layers deeper than two feet below proposed subgrade levels. Care must be taken to individually seat any large particles and to compact soil around large particles with hand operated equipment to minimize the risk of void formation. The larger material should not be placed near areas of the proposed utility or planned excavation. Boulders larger than approximately 12 inches are not expected to be adequate for use as fill or backfill and should be removed from the site or crushed to an adequate size.

Submerged Fill: The initial backfill at excavations that extend below the groundwater level (in conjunction with dewatering methods) may consist of nominally three-quarter- to one-inch crushed, washed aggregate placed to a minimum of one-foot above water levels before subsequent lifts of structural fill. Submerged fill should be separated from surrounding soils (below, adjacent, and above) with a woven geotextile, such as Mirafi 500X or equivalent to prevent migration of fines from surrounding soils into the aggregate.

Structural Fill Testing: Before filling operations begin, representative samples of each proposed fill material (on-site and imported) should be collected. The samples should be tested to determine the maximum dry density, optimum moisture content, natural moisture content, gradation, and plasticity of the soil. These tests are needed for quality control during compaction and also to determine if the fill material is acceptable. The placement of all fill and backfill will need to be monitored by Dynamic Earth to ensure that the specified material and lift thicknesses are properly installed. A sufficient number of in-place density tests should be performed during fill placement to ensure that the specified compaction is achieved throughout the height of the fill or backfill.

Difficult Excavation: Difficult auger advancement and auger refusal were encountered at depths as shallow as 0.8 feet below the ground surface during our investigation. Depending on final site grading, difficult excavation should be anticipated during construction.

5.5 Temporary Excavation

The natural soils encountered during the investigation are consistent with Type C Soil Conditions as defined by 29 CFR Part 1926 (OSHA) which require a maximum unbraced excavation angle of 1.5:1 (horizontal:vertical). Actual conditions encountered during construction should be evaluated by a competent person (as defined by OSHA) to ensure that safe excavation methods and/or shoring and bracing requirements are implemented.

5.6 Surface Water Infiltration

The surface water observations were made within the area as shown on the *Test Location Plan* in the appendix of our report. The observations made during the testing demonstrated that water, which was initially discharged at the ground surface over an approximately four- to six-inch diameter area, ultimately followed site grades and spread laterally between distances ranging between approximately seven feet to 17 feet from the initial location. Representative photographs of the initial and final spread of the surface infiltration tests are included in the report appendix.

5.7 Stormwater Management Basin Area Test Summary

The soil strata tested for the proposed stormwater facilities had permeability rates ranging between approximately less than 0.2 inches per hour (iph) and 5.7 iph.

A summary of the seasonal high groundwater level and permeability test results is presented in the following table:

SEASONAL HIGH GROUNDWATER AND PERMEABILITY TEST SUMMARY						
Location	Surface Elevation (feet)	Seasonal High Groundwater and Groundwater		Permeability Test Results		
		Depth (feet)	Elevation (feet)	Depth (inches)	Permeability (in/hr)	
					Replicate A	Replicate B
SPP-1	326.4	9.8	316.6	12	<0.2	<0.2
				36	<0.2	<0.2
				78	4.1	5.7
SPP-2	320.3	3.9	316.4	18	0.4	0.6
SPP-3	320.0	6.0	314.0	36	<0.2	<0.2
SPP-4	318.2	Not Encountered		54	<0.2	<0.2
SPP-5	318.0	8.0	310.0	54	<0.2	<0.2
				84	<0.2	<0.2

The seasonal high groundwater is currently reported as the encountered groundwater, but it should be confirmed during the wet season if groundwater is encountered shallower.

5.8 Supplemental Evaluation and Investigation

Since these preliminary geotechnical investigation activities have been completed during the initial design phase, many critical assumptions or preliminarily details regarding assumed structural loads, proposed elevations, etc. affect the geotechnical analysis. The preliminary considerations presented herein should be considered to help develop the optimum site design and grading, and Dynamic Earth should remain involved during final design.

Additionally, there is a potential risk of variability in the existing fill materials; and depth of organic deposits, which may not be disclosed solely by soil borings because conventional augering and split-spoon sampling only reveal a very limited section of subsurface materials. Therefore, the composition of the existing fill should be verified by visual observation and test pit excavations prior to or during the early phase of construction to further evaluate the depth and lateral extent of these materials.

Once site grading plans are finalized, we recommend installation of monitoring wells and performance of aquifer pump tests to further evaluate the depth of groundwater and to provide more substantial groundwater control recommendations.

Once site plans are finalized, a slope stability analysis should be performed to evaluate the stability of the existing slope along the eastern portion of the site.

The subsurface conditions in inaccessible areas below the existing structures should also be evaluated to verify if the underlying soil conditions are consistent with the soil conditions encountered during this subsurface exploration. If additional unsuitable conditions are encountered, alternative recommendations, possibly including more extensive overexcavation and replacement and/or alternative foundation type, may be required.

6.0 GENERAL COMMENTS AND LIMITATIONS

Supplemental recommendations will be required upon finalization of conceptual site plans or if significant changes are made in the characteristics or location of the proposed structures. Dynamic Earth should be included as a consultant to the design team and should be provided final plans for review to confirm these criteria apply or to modify recommendations as necessary.

The recommendations presented herein should be utilized by a qualified engineer in preparing preliminary design concepts and site grading. The engineer should consider these recommendations as minimum physical standards that may be superseded by local and regional building codes and structural considerations. These recommendations are prepared for the use of the client for the specific project detailed and should not be used by any third party. These recommendations are relevant to the preliminary design phase and should not be substituted for construction specifications.

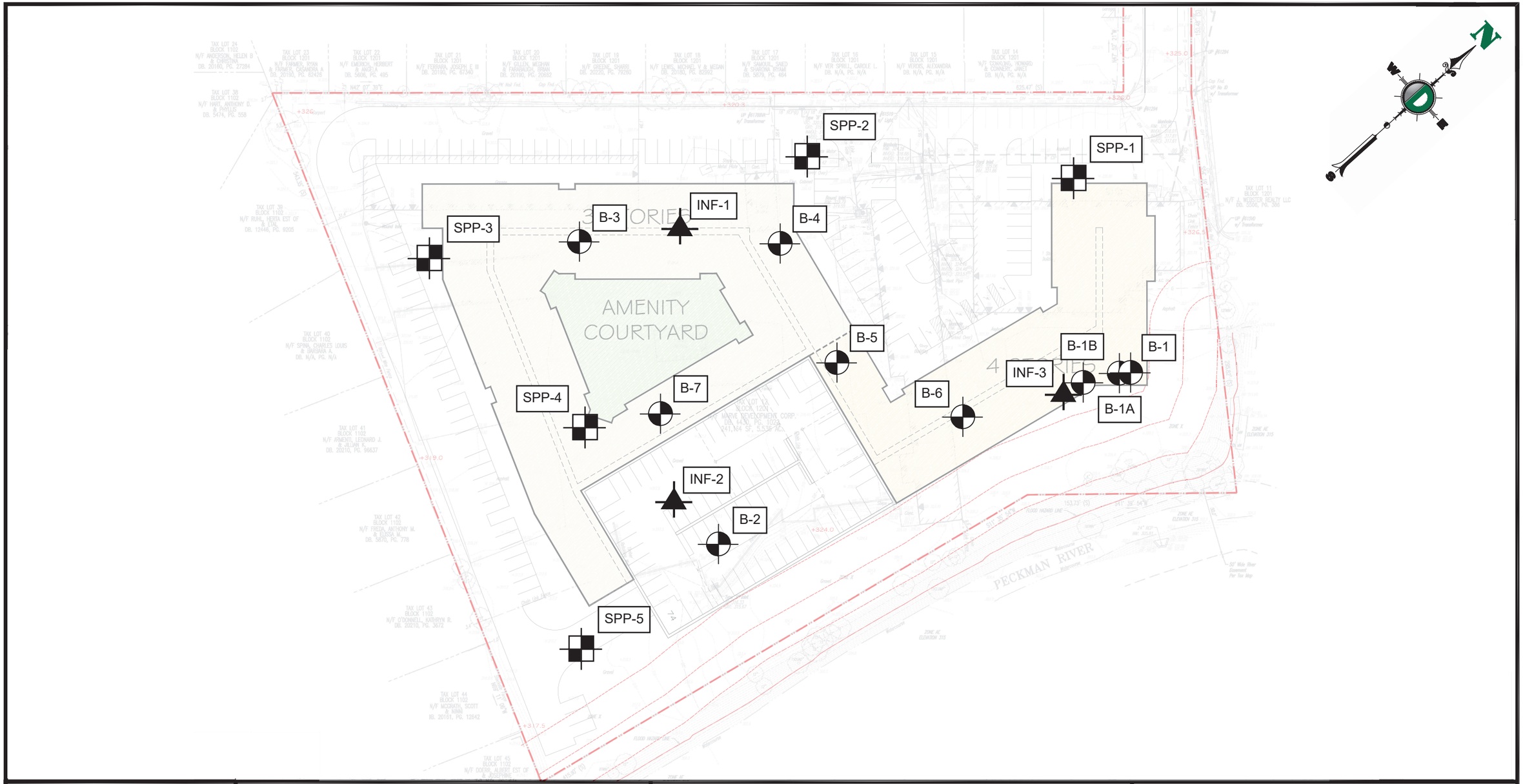
The possibility exists that conditions between test locations may differ from those at specific test pit locations, and conditions may not be as anticipated by the designers or contractors. In addition, the construction process may itself alter soil conditions. Therefore, Dynamic Earth Geotechnical Engineers or their representatives should observe and document the final construction procedures used and the conditions encountered, as well as conduct testing and inspection to ensure the design criteria are met or recommendations to address deviations are implemented.

Dynamic Earth assumes that a qualified contractor will be employed to perform the construction work, and that the contractor will be required to exercise care to ensure all excavations are performed in accordance with applicable regulations and good practice. Particular attention should be paid to avoiding damaging or undermining adjacent properties and maintaining slope stability.

The exploration and analysis of the foundation conditions reported herein are presented to form a reasonable basis for preliminary site evaluation. The recommendations submitted for the proposed construction are based on the available soil information and the preliminary design details furnished or assumed. Deviations from the noted subsurface conditions encountered during construction should be brought to the attention of the geotechnical engineer.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been promulgated after being prepared in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics, and engineering geology. No other warranties are implied or expressed.

Test Location Plan



SCALE: N.T.S.	JOB No: 25-03661	
SHEET No: 1 OF 1	DRAWN BY: BK	
	DESIGNED BY: --	
	CHECKED BY: AP	
	DATE: 11/25/2025	

TITLE:

TEST LOCATION PLAN

PROJECT: **JMF PROPERTIES**
PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
251 Grove Avenue
Block 1201; Lot 12
Township of Verona, Essex County, New Jersey

Rev. # 0 | DEC Client Code: 0922

LEGEND:

INF-X — APPROXIMATE LOCATION OF SURFACE INFILTRATION TEST

B-X — APPROXIMATE LOCATION OF BORING

SPP-X — APPROXIMATE LOCATION OF SOIL PROFILE PIT

NOTES:
1. THIS PLAN IS NOT FOR CONSTRUCTION AND WAS PREPARED TO ILLUSTRATE TEST LOCATIONS ONLY AND MAY NOT REFLECT THE MOST CURRENT REVISION OF THE BASE PLAN.
2. BASE PLAN OBTAINED FROM AN OCTOBER 20, 2025 *CONCEPTUAL STUDY* PREPARED BY LESSARD DESIGN.

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Records of Subsurface Exploration

DYNAMIC EARTH

BOREHOLE LOG

Boring No : B-1

Project:	Proposed Multi-Family Residential Development	**Proj. No.:**	0922 25-03661
Location:	251 Grove Avenue, Township of Verona, Essex County, New Jersey	**Client:**	JMF Properties

Surface Elevation:	328.3 feet	**Date Started:**	09-24-2025	**Groundwater Data**	**Depth**	**El.**	**Additional Groundwater Data**	**Depth**	**El.**
Termination Depth:	0.8 feet	**Date Completed:**	09-24-2025		**(ft)**	**(ft)**		**(ft)**	**(ft)**
Proposed Location:	Building	**Logged by:**	B. Peschel	**While Drilling:** ▽	NE	-			
Drill/Test Method:	HSA/SPT	**Contractor:**	Beechwood	**At Completion:** ▼	NE	-			
Hammer Type:	Auto	**Rig Type:**	CME 55						

Sample Information							Depth (ft)	Strata	DESCRIPTION OF MATERIALS (Classification)	Remarks
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (mm:ss)	N				
0.0-0.8	S-1	SS	3	--	19 / -- 50/4 / --	50/4		FILL	Gray coarse to fine sand, and coarse to fine gravel, little silt, little debris (millings), moist (FILL)	
									Boring B-1 encountered refusal at approximately 0.8 feet below the ground surface.	
							5			
							10			
							15			
							20			

DYNAMIC EARTH

BOREHOLE LOG

Boring No : B-1A

Project:	Proposed Multi-Family Residential Development	**Proj. No.:**	0922 25-03661
Location:	251 Grove Avenue, Township of Verona, Essex County, New Jersey	**Client:**	JMF Properties

Surface Elevation:	328.3 feet	**Date Started:**	09-24-2025	**Groundwater Data**	**Depth**	**El.**	**Additional Groundwater Data**	**Depth**	**El.**
Termination Depth:	1.5 feet	**Date Completed:**	09-24-2025		**(ft)**	**(ft)**		**(ft)**	**(ft)**
Proposed Location:	Building	**Logged by:**	B. Peschel	**While Drilling:** ▽	NE	-			
Drill/Test Method:	HSA/SPT	**Contractor:**	Beechwood	**At Completion:** ▼	NE	-			
Hammer Type:	Auto	**Rig Type:**	CME 55						

Sample Information							Depth (ft)	Strata	DESCRIPTION OF MATERIALS (Classification)	Remarks
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (mm:ss)	N				
0.0-1.5	S-1	SS	0	--	50/0 -- / -- --	50/0		FILL	No recovery	
									Boring B-1A encountered refusal at approximately 1.5 feet below the ground surface.	
							5			
							10			
							15			
							20			

DYNAMIC EARTH

BOREHOLE LOG

Boring No : B-1B

Project:	Proposed Multi-Family Residential Development	**Proj. No.:**	0922 25-03661
Location:	251 Grove Avenue, Township of Verona, Essex County, New Jersey	**Client:**	JMF Properties

				Groundwater Data	Depth (ft)	El. (ft)	Additional Groundwater Data	Depth (ft)	El. (ft)
Surface Elevation:	328.3 feet	**Date Started:**	09-24-2025						
Termination Depth:	2.3 feet	**Date Completed:**	09-24-2025						
Proposed Location:	Building	**Logged by:**	B. Peschel	**While Drilling:** ▽	NE	-			
Drill/Test Method:	HSA/SPT	**Contractor:**	Beechwood	**At Completion:** ▼	NE	-			
Hammer Type:	Auto	**Rig Type:**	CME 55						

Sample Information							Depth (ft)	Strata	DESCRIPTION OF MATERIALS (Classification)	Remarks
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (mm:ss)	N				
0.0-2.0	S-1	SS	13	--	21 / 34 50/4 / --	84/10		FILL	Gray coarse to fine sand, and coarse to fine gravel, some silt, moist (FILL)	
2.0-2.3	S-2	SS	3	--	50/4 / --	50/4		Glacial Deposits	Brown silt, some coarse to fine gravel, little coarse to fine sand, moist, hard (ML)	
									Boring B-1B encountered refusal at approximately 2.3 feet below the ground surface.	
							5			
							10			
							15			
							20			

DYNAMIC EARTH

BOREHOLE LOG

Boring No : B-2

Project:	Proposed Multi-Family Residential Development	**Proj. No.:**	0922 25-03661
Location:	251 Grove Avenue, Township of Verona, Essex County, New Jersey	**Client:**	JMF Properties

				Groundwater Data	Depth (ft)	El. (ft)	Additional Groundwater Data	Depth (ft)	El. (ft)
Surface Elevation:	316.7 feet	**Date Started:**	09-23-2025						
Termination Depth:	12.5 feet	**Date Completed:**	09-23-2025						
Proposed Location:	Parking Garage	**Logged by:**	B. Peschel	**While Drilling:** ▽	6.0	310.7			
Drill/Test Method:	HSA/SPT	**Contractor:**	Beechwood	**At Completion:** ▼	7.0	309.7			
Hammer Type:	Auto	**Rig Type:**	CME 55						

Sample Information								Depth (ft)	Strata	DESCRIPTION OF MATERIALS (Classification)	Remarks
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (mm:ss)	N					
0.0-2.0	S-1	SS	12	--	22 18 22 20	40			FILL	Dark gray coarse to fine sand, some debris (millings, wood), little silt, little coarse to fine gravel, moist (FILL)	
2.0-4.0	S-2	SS	7	--	25 20 14 14	34				Dark gray coarse to fine sand, some silt, little coarse to fine gravel, little debris (millings), trace clay, moist (FILL)	
4.0-6.0	S-3	SS	8	--	7 6 6 8	12		5	Glacial Deposits	Brownish gray coarse to fine sand, and silt, trace roots, moist, medium dense (SM)	
6.0-8.0	S-4	SS	12	--	7 6 5 6	11		▽ ▼		Brownish gray coarse to fine sand, some silt, wet, medium dense (SM)	
8.0-10.0	S-5	SS	18	--	14 16 31 24	47		10		Gray coarse to fine sand, some silt, little clay, little coarse to fine gravel, wet, dense (SM)	
12.5	S-6	SS	0	0	50/0 -- -- --	50/0		15		Boring B-2 encountered refusal at approximately 12.5 feet below the ground surface.	
								20			

DYNAMIC EARTH

BOREHOLE LOG

Boring No : B-3

Project:	Proposed Multi-Family Residential Development	**Proj. No.:**	0922 25-03661
Location:	251 Grove Avenue, Township of Verona, Essex County, New Jersey	**Client:**	JMF Properties

				Groundwater Data	Depth (ft)	El. (ft)	Additional Groundwater Data	Depth (ft)	El. (ft)
Surface Elevation:	319.8 feet	**Date Started:**	09-23-2025						
Termination Depth:	23.8 feet	**Date Completed:**	09-23-2025						
Proposed Location:	Building	**Logged by:**	B. Peschel	**While Drilling:** ▽	7.0	312.8			
Drill/Test Method:	HSA/SPT	**Contractor:**	Beechwood	**At Completion:** ▼	8.0	311.8			
Hammer Type:	Auto	**Rig Type:**	CME 55						

Sample Information							Depth (ft)	Strata	DESCRIPTION OF MATERIALS (Classification)	Remarks
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (mm:ss)	N				
								Surface Cover	3 inches of asphalt	
0.5-2.0	S-1	SS	7	--	-- 19 / 12 13	31		FILL	Gray coarse to fine sand, and coarse to fine gravel, little silt, moist (FILL)	
2.0-2.8	S-2	SS	12	--	6 50/2 / -- --	50/2			Gray coarse to fine sand, and silt, little coarse to fine gravel, little clay, moist (FILL)	
4.0-6.0	S-3	SS	13	--	2 2 / 2 2	4	5	Organic Deposits	Gray clay, some peat, little coarse to fine sand, moist, medium stiff (CL)	Qp = 0.5 tsf
6.0-8.0	S-4	SS	24	--	2 2 / 8 11	10	▽ ▼		Dark gray clay, some peat, little coarse to fine sand, wet, soft (OL)	Qp < 0.25 tsf
8.0-10.0	S-5	SS	10	--	9 11 / 11 11	22	10	Glacial Deposits	Brown silt, some coarse to fine sand, wet, very stiff (ML)	
13.0-15.0	S-6	SS	16	--	4 4 / 5 5	9	15		As above, stiff (ML)	
18.0-20.0	S-7	SS	15	--	7 17 / 12 12	29	20		As above, very stiff (ML)	
23.0-23.8	S-8	SS	6	--	25 50/4 / -- --	50/4			Grayish brown clay, some silt, little coarse to fine sand, wet, very stiff (CL)	Qp = 3.0 tsf
									Boring B-3 encountered refusal at approximately 23.8 feet below the ground surface.	

DYNAMIC EARTH

BOREHOLE LOG

Boring No : B-4

Project:	Proposed Multi-Family Residential Development	**Proj. No.:**	0922 25-03661
Location:	251 Grove Avenue, Township of Verona, Essex County, New Jersey	**Client:**	JMF Properties

				Groundwater Data	Depth (ft)	El. (ft)	Additional Groundwater Data	Depth (ft)	El. (ft)
Surface Elevation:	319.8 feet	**Date Started:**	09-24-2025						
Termination Depth:	18.8 feet	**Date Completed:**	09-24-2025						
Proposed Location:	Building	**Logged by:**	B. Peschel	**While Drilling:** ▽	4.0	315.8			
Drill/Test Method:	HSA/SPT	**Contractor:**	Beechwood	**At Completion:** ▼	4.0	315.8			
Hammer Type:	Auto	**Rig Type:**	CME 55						

Sample Information										
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (mm:ss)	N	Depth (ft)	Strata	DESCRIPTION OF MATERIALS (Classification)	Remarks
0.0-2.0	S-1	SS	14	--	9 12 / 12 13	24	0	FILL	Gray coarse to fine sand, and coarse to fine gravel, little silt, moist (FILL)	
2.0-4.0	S-2	SS	10	--	10 9 / 6 5	15			As above (FILL)	
4.0-6.0	S-3	SS	4	--	2 2 / 1 WOH	3	5		As above, wet (FILL)	
6.0-8.0	S-4	SS	0	--	1 1 / 2 4	3			No recovery	
8.0-10.0	S-5	SS	11	--	5 5 / 5 5	10	10		Brown silt, some coarse to fine sand, wet, stiff (ML)	
13.0-15.0	S-6	SS	16	--	32 15 / 14 14	29	15	Glacial Deposits	Brown silt, little coarse to fine gravel, little coarse to fine sand, wet, hard (ML)	Qp = 4.25 tsf
18.0-18.8	S-7	SS	7	--	29 50/3 / -- --	50/3			Brown silt, little coarse to fine sand, little coarse to fine gravel, little clay, wet, hard (ML)	Rig chatter Qp = 4.0 tsf
							20		Boring B-4 encountered refusal at approximately 18.8 feet below the ground surface.	

DYNAMIC EARTH

BOREHOLE LOG

Boring No : B-5

Project:	Proposed Multi-Family Residential Development	**Proj. No.:**	0922 25-03661
Location:	251 Grove Avenue, Township of Verona, Essex County, New Jersey	**Client:**	JMF Properties

				Groundwater Data	Depth (ft)	El. (ft)	Additional Groundwater Data	Depth (ft)	El. (ft)
Surface Elevation:	320.0 feet	**Date Started:**	09-24-2025						
Termination Depth:	9.0 feet	**Date Completed:**	09-24-2025						
Proposed Location:	Building	**Logged by:**	B. Peschel	**While Drilling:** ▽	4.0	316.0			
Drill/Test Method:	HSA/SPT	**Contractor:**	Beechwood	**At Completion:** ▼	4.0	316.0			
Hammer Type:	Auto	**Rig Type:**	CME 55						

Sample Information							Depth (ft)	Strata	DESCRIPTION OF MATERIALS (Classification)	Remarks
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (mm:ss)	N				
								Surface Cover	2.5 inches of asphalt, 8 inches of subbase	
1.0-2.0	S-1	SS	6	--	7 20 -- --	27		FILL	Dark brown coarse to fine sand, some silt, little coarse to fine gravel, moist (FILL)	
2.0-2.3	S-2	SS	3	--	50/4 --	50/4			Dark brown clay, some coarse to fine sand, some silt, little debris (concrete), trace roots, moist (FILL)	
4.0-6.0	S-3	SS	8	--	10 9 4 3	13	5	Organic Deposits	Gray clay, some coarse to fine sand, little silt, trace organics, moist, soft (CL)	Qp < 0.25 tsf
6.0-8.0	S-4	SS	14	--	3 3 6 6	9		Glacial Deposits	Bluish gray coarse to fine gravel, and clay, some coarse to fine sand, wet, loose (GC)	
8.0-9.0	S-5	SS	7	--	3 2 50/0 --	52/6			As above, very dense (GC)	
							10		Boring B-5 encountered refusal at approximately 9 feet below the ground surface.	
							15			
							20			

DYNAMIC EARTH

BOREHOLE LOG

Boring No : B-6

Project:	Proposed Multi-Family Residential Development	**Proj. No.:**	0922 25-03661
Location:	251 Grove Avenue, Township of Verona, Essex County, New Jersey	**Client:**	JMF Properties

				Groundwater Data	Depth (ft)	El. (ft)	Additional Groundwater Data	Depth (ft)	El. (ft)
Surface Elevation:	328.0 feet	**Date Started:**	09-24-2025						
Termination Depth:	7.2 feet	**Date Completed:**	09-24-2025						
Proposed Location:	Building	**Logged by:**	B. Peschel	**While Drilling:** ▽	NE	-			
Drill/Test Method:	HSA/SPT	**Contractor:**	Beechwood	**At Completion:** ▼	NE	-			
Hammer Type:	Auto	**Rig Type:**	CME 55						

Sample Information							Depth (ft)	Strata	DESCRIPTION OF MATERIALS (Classification)	Remarks
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (mm:ss)	N				
0.0-2.0	S-1	SS	8	--	19, 22, 22, 19	44		FILL	Gray coarse to fine gravel, some coarse to fine sand, little silt, moist (FILL)	
2.0-4.0	S-2	SS	3	--	17, 19, 12, 12	31		FILL	Brown coarse to fine sand, some silt, little coarse to fine gravel, moist (FILL)	
4.0-6.0	S-3	SS	5	--	13, 12, 13, 19	25	5	Glacial Deposits	Brown coarse to fine sand, some silt, little coarse to fine gravel, moist, medium dense (SM)	
6.0-7.2	S-4	SS	7	--	11, 26, 50/2, --	76/8		Glacial Deposits	As above, very dense (SM)	
							10		Boring B-6 encountered refusal at approximately 7.2 feet below the ground surface.	
							15			
							20			

DYNAMIC EARTH

BOREHOLE LOG

Boring No : B-7

Project:	Proposed Multi-Family Residential Development	**Proj. No.:**	0922 25-03661
Location:	251 Grove Avenue, Township of Verona, Essex County, New Jersey	**Client:**	JMF Properties

				Groundwater Data	Depth (ft)	El. (ft)	Additional Groundwater Data	Depth (ft)	El. (ft)
Surface Elevation:	317.8 feet	**Date Started:**	09-23-2025						
Termination Depth:	13.0 feet	**Date Completed:**	09-23-2025						
Proposed Location:	Building	**Logged by:**	B. Peschel	**While Drilling:** ▽	4.0	313.8			
Drill/Test Method:	HSA/SPT	**Contractor:**	Beechwood	**At Completion:** ▼	3.0	314.8			
Hammer Type:	Auto	**Rig Type:**	CME 55						

Sample Information							Depth (ft)	Strata		DESCRIPTION OF MATERIALS (Classification)	Remarks
Depth (Feet)	Number	Type	Rec (in)	RQD %	Blows per 6" or drill time (mm:ss)	N					
0.0-2.0	S-1	SS	6	--	9 10 / 23 12	33		FILL		Gray coarse to fine sand, and coarse to fine gravel, little silt, little debris (millings), moist (FILL)	
2.0-4.0	S-2	SS	5	--	16 19 / 13 13	32				Gray coarse to fine sand, some silt, little coarse to fine gravel, moist (FILL)	
4.0-6.0	S-3	SS	12	--	4 5 / 4 3	9	5			Gray coarse to fine sand, and silt, little clay, little coarse to fine gravel, wet (FILL)	
6.0-8.0	S-4	SS	16	--	3 2 / 3 6	5		Organic Deposits		Gray clay, some silt, little peat, trace sand, wet, medium stiff (CL)	Qp = 0.5 tsf
8.0-10.0	S-5	SS	5	--	6 7 / 9 10	16	10	Glacial Deposits		Brown clay, and coarse to fine sand, little coarse to fine gravel, wet, stiff (CL)	Qp = 1.5 tsf
13.0	S-6	SS	0	0	50/0 -- / -- --	50/0				Boring B-7 encountered refusal at approximately 13 feet below the ground surface.	
							15				
							20				

DYNAMIC EARTH

SOIL PROFILE PIT LOG

Soil Profile Pit: SPP-1

Project: Proposed Multi-Family Residential Development
Project No.: 0922 25-03661
Location: 251 Grove Avenue, Township of Verona, Essex County, New Jersey
Client: JMF Properties

Surface Elevation (ft): 326.4
Termination Depth (ft): 11.0
Proposed Location: SWM
Excavation / Test Method: Visual Observation
Date Started: 9/23/25
Date Completed: 9/23/25
Logged by: B. Peschel
Contractor: Neighbors Property Management
Rig Type: Bobcat E60

Groundwater Data	Depth (ft)	El. (ft)	Groundwater Comments
Seepage	NE	-	
Groundwater	9.8	316.6	
Seasonal High Groundwater	9.8	316.6	

DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS		MOTTLING			SAMPLING			LAB RESULTS
							Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography			Quantity	Size	Contrast	Type	Depth (in)	No.	
			GRAVEL	COBBLES	STONES	BOULDERS																		
0-3	ASPHALT		0	0	0	0								CLEAR <2.5"		NONE		NONE						
3-7	SUBBASE Very Dark Gray (7.5YR 3/1)	EXTREMELY GRAVELLY LOAMY SAND	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	WEAK	VERY FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE						
			90	0	0	0																		
7-19	FILL Brown (7.5YR 5/4)	GRAVELLY SILT LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE			BAG TUBE	12 12	S-1 T-1	A < 0.2 iph B < 0.2 iph
			25	10	0	0																		
19-40	Brown (7.5YR 5/2)	SILT LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	NONE		NONE			BAG TUBE	36 36	S-2 T-2	A < 0.2 iph B < 0.2 iph
			5	0	0	0																		
40-60	Brown (7.5YR 5/2)	SILT LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE			BAG	42	S-3	
			5	0	0	0																		
60-118	Dark Reddish Gray (5YR 4/2)	VERY GRAVELLY LOAMY SAND	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE			BAG TUBE	78 78	S-4 T-3	A = 4.1 iph B = 5.7 iph
			25	15	0	0																		
118-132	Dark Reddish Gray (5YR 4/2)	VERY GRAVELLY SANDY LOAM	GRAVEL	COBBLES	STONES	BOULDERS	SUBANGULAR BLOCKY	WEAK	FINE	WET	FRIABLE	NONSTICKY	NONPLASTIC			NONE		NONE			BAG	120	S-5	
			25	15	0	0																		

Additional Remarks: Existing fill material encountered to approximately 19 inches below the ground surface. Soil profile pit SPP-1 was terminated at approximately 11 feet below the ground surface.

DYNAMIC EARTH

SOIL PROFILE PIT LOG

Soil Profile Pit: SPP-2

Project: Proposed Multi-Family Residential Development
Project No.: 0922 25-03661
Location: 251 Grove Avenue, Township of Verona, Essex County, New Jersey
Client: JMF Properties

Surface Elevation (ft):	320.3	**Date Started:**	9/23/25	**Groundwater Data**	**Depth (ft)** / **El. (ft)**
Termination Depth (ft):	4.5	**Date Completed:**	9/23/25		
Proposed Location:	SWM	**Logged by:**	B. Peschel	**Seepage**	NE / -
Excavation / Test Method:	Visual Observation	**Contractor:**	Neighbors Property Management	**Groundwater**	3.9 / 316.4
		Rig Type:	Bobcat E60	**Seasonal High Groundwater**	3.9 / 316.4

Groundwater Comments

DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS		MOTTLING			SAMPLING			LAB RESULTS
							Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography			Quantity	Size	Contrast	Type	Depth (in)	No.	
			GRAVEL	COBBLES	STONES	BOULDERS																		
0-3	ASPHALT		0	0	0	0								ABRUPT <1"		NONE		NONE						
3-12	FILL Very Dark Gray (7.5YR 3/1)	GRAVELLY LOAMY SAND	GRAVEL 25	COBBLES 5	STONES 0	BOULDERS 0	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE						
12-27	GLEY1 6/10GY	SANDY LOAM	GRAVEL 10	COBBLES 0	STONES 0	BOULDERS 0	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE			BAG TUBE	18 18	S-1 T-1	A = 0.4 iph B = 0.6 iph
27-47	Brown (7.5YR 5/3)	SANDY LOAM	GRAVEL 10	COBBLES 0	STONES 0	BOULDERS 0	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	SMOOTH	NONE		NONE			BAG	36	S-2	
47-54	Brown (7.5YR 5/3)	LOAMY SAND	GRAVEL 10	COBBLES 0	STONES 0	BOULDERS 0	SUBANGULAR BLOCKY	WEAK	FINE	WET	FRIABLE	NONSTICKY	NONPLASTIC			NONE		NONE			BAG	52	S-3	

Additional Remarks: Existing fill material encountered to approximately 12 inches below the ground surface. Soil profile pit SPP-2 was terminated due to sidewall collapse at approximately 4.5 feet below the ground surface.

DYNAMIC EARTH

SOIL PROFILE PIT LOG

Soil Profile Pit: SPP-3

Project: Proposed Multi-Family Residential Development
Project No.: 0922 25-03661
Location: 251 Grove Avenue, Township of Verona, Essex County, New Jersey
Client: JMF Properties

Surface Elevation (ft):	320.0	**Date Started:**	9/23/25	**Groundwater Data**	**Depth (ft)** / **El. (ft)**
Termination Depth (ft):	7.0	**Date Completed:**	9/23/25		
Proposed Location:	SWM	**Logged by:**	B. Peschel	**Seepage**	NE / -
Excavation / Test Method:	Visual Observation	**Contractor:**	Neighbors Property Management	**Groundwater**	6.0 / 314.0
		Rig Type:	Bobcat E60	**Seasonal High Groundwater**	**6.0** / 314.0

Groundwater Comments

DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS		MOTTLING			SAMPLING			LAB RESULTS
							Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography			Quantity	Size	Contrast	Type	Depth (in)	No.	
			GRAVEL	COBBLES	STONES	BOULDERS																		
0-12	FILL Very Dark Gray (7.5YR 3/1)	VERY GRAVELLY SANDY LOAM	50	0	0	0	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE						
12-24	Reddish Yellow (7.5YR 6/6)	GRAVELLY LOAM	25	0	0	0	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE			BAG	18	S-1	
24-72	Brown (7.5YR 4/4)	SILTY CLAY LOAM	5	0	0	0	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE			BAG TUBE	36 36	S-2 T-1	A < 0.2 iph B < 0.2 iph
72-84	Brown (7.5YR 4/3)	GRAVELLY SILTY CLAY LOAM	15	5	0	0	SUBANGULAR BLOCKY	MODERATE	MEDIUM	WET	FRIABLE	SLIGHTLY STICKY	SLIGHTLY PLASTIC			NONE		NONE			BAG	84	S-3	

Additional Remarks: Existing fill material encountered to approximately 12 inches below the ground surface. Soil profile pit SPP-3 encountered refusal on apparent bedrock at approximately 7 feet below the ground surface.

DYNAMIC EARTH

SOIL PROFILE PIT LOG

Soil Profile Pit: SPP-4

Project: Proposed Multi-Family Residential Development
Project No.: 0922 25-03661
Location: 251 Grove Avenue, Township of Verona, Essex County, New Jersey
Client: JMF Properties

Surface Elevation (ft):	318.2	**Date Started:**	9/23/25	**Groundwater Data**	**Depth (ft)**	**El. (ft)**
Termination Depth (ft):	5.0	**Date Completed:**	9/23/25		NE	-
Proposed Location:	SWM	**Logged by:**	B. Peschel		NE	-
Excavation / Test Method:	Visual Observation	**Contractor:**	Neighbors Property Management	**Groundwater**	NE	-
		Rig Type:	Bobcat E60	**Seasonal High Groundwater**		

Groundwater Comments: Seepage encountered within stone fill layer at 1.5 feet.

DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS		MOTTLING			SAMPLING			LAB RESULTS
							Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography			Quantity	Size	Contrast	Type	Depth (in)	No.	
			GRAVEL	COBBLES	STONES	BOULDERS																		
0-7	ASPHALT		0	0	0	0								ABRUPT <1"		NONE		NONE						
7-18	FILL Dark Gray (5YR 4/1)	EXTREMELY GRAVELLY SANDY LOAM	GRAVEL 75	COBBLES 0	STONES 0	BOULDERS 0	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE						
18-40	FILL Reddish Brown (5YR 5/4)	VERY GRAVELLY SANDY LOAM	GRAVEL 25	COBBLES 15	STONES 0	BOULDERS 0	SUBANGULAR BLOCKY	WEAK	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE			BAG	24	S-1	
40-60	Gray (7.5YR 6/1)	GRAVELLY SILTY CLAY LOAM	GRAVEL 15	COBBLES 5	STONES 0	BOULDERS 0	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FRIABLE	NONSTICKY	NONPLASTIC			NONE		NONE			BAG TUBE	54 54	S-2 T-1	A < 0.2 iph B < 0.2 iph

Additional Remarks: Existing fill material encountered to approximately 40 inches below the ground surface. Debris encountered included asphalt and wood. Soil profile pit SPP-4 encountered refusal at approximately 5 feet below the ground surface.

DYNAMIC EARTH

SOIL PROFILE PIT LOG

Soil Profile Pit: SPP-5

Project: Proposed Multi-Family Residential Development
Project No.: 0922 25-03661
Location: 251 Grove Avenue, Township of Verona, Essex County, New Jersey
Client: JMF Properties

Surface Elevation (ft):	318.0	**Date Started:**	9/23/25	**Groundwater Data**	**Depth (ft)** / **El (ft)**
Termination Depth (ft):	9.2	**Date Completed:**	9/23/25		
Proposed Location:	SWM	**Logged by:**	B. Peschel	**Seepage**	NE / -
Excavation / Test Method:	Visual Observation	**Contractor:**	Neighbors Property Management	**Groundwater**	8.0 / 310.0
		Rig Type:	Bobcat E60	**Seasonal High Groundwater**	**8.0** / 310.0

Groundwater Comments

DEPTH (IN)	COLOR	SOIL TEXTURE	COARSE FRAGMENTS (%)				STRUCTURE			WATER CONTENT	CONSISTENCY			BOUNDARY		ROOTS		MOTTLING			SAMPLING			LAB RESULTS
							Shape	Grade	Size		Resistance to Rupture	Stickiness	Plasticity	Distinctness	Topography			Quantity	Size	Contrast	Type	Depth (in)	No.	
			GRAVEL	COBBLES	STONES	BOULDERS																		
0-40	FILL Very Dark Gray (7.5YR 3/1)	GRAVELLY LOAM	30	0	0	0	SUBANGULAR BLOCKY	MODERATE	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE			BAG	18	S-1	
40-72	FILL Dark Gray (7.5YR 4/1)	VERY GRAVELLY CLAY LOAM	30	10	0	0	SUBANGULAR BLOCKY	MODERATE	MEDIUM	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE			BAG TUBE	54 54	S-2 T-1	A < 0.2 iph B < 0.2 iph
72-96	Dark Gray (7.5YR 4/1)	SILT LOAM	10	0	0	0	SUBANGULAR BLOCKY	MODERATE	FINE	MOIST	FRIABLE	NONSTICKY	NONPLASTIC	CLEAR <2.5"	WAVY	NONE		NONE			BAG TUBE	84 84	S-3 T-2	A < 0.2 iph B < 0.2 iph
96-110	Very Dark Gray (7.5YR 3/1)	GRAVELLY SANDY LOAM	20	5	0	0	SUBANGULAR BLOCKY	WEAK	FINE	WET	FRIABLE	NONSTICKY	NONPLASTIC			NONE		NONE			BAG	104	S-4	

Additional Remarks: Existing fill material encountered to approximately 72 inches below the ground surface. Debris encountered included brick, glass, asphalt, concrete, plastic and wood. Soil profile pit SPP-5 was terminated at approximately 9.2 feet below the ground surface.

Laboratory Test Results

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-1 **Sample No.:** S-1 **Depth:** 12"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-1 Replicate (letter) A Date Collected 9/23/2025

2. Material Tested: x Fill _____ Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed _____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
   Length of Sample, L, in inches 4.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 463.0984

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No _____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		>240
		>240
		>240

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= >240

    K = <0.2 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

    x NONE

    _____ Soil/Tube Contact _____Large Gravel _____ Large Roots

    _____ Dry Soil _____Smearing _____ Compaction

    _____ Other - Specify _____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-1 **Sample No.:** S-1 **Depth:** 12"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-1 Replicate (letter) B Date Collected 9/23/2025

2. Material Tested: x Fill _____ Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed _____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
Length of Sample, L, in inches 2.50

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 289.4365

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No _____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

At the Beginning of Each Test Interval, H1 5.00
At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		>240
		>240
		>240

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= >240

K = <0.2 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

x NONE

_____ Soil/Tube Contact _____Large Gravel _____ Large Roots

_____ Dry Soil _____Smearing _____ Compaction

_____ Other - Specify _____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-1 **Sample No.:** S-2 **Depth:** 36"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-2 Replicate (letter) A Date Collected 9/23/2025

2. Material Tested: ____ Fill x Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed ____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
Length of Sample, L, in inches 3.50

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 405.2111

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No ____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

At the Beginning of Each Test Interval, H1 5.00
At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		>240
		>240
		>240

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= >240

K = <0.2 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

x NONE

____ Soil/Tube Contact ____Large Gravel ____ Large Roots

____ Dry Soil ____Smearing ____ Compaction

____ Other - Specify ____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-1 **Sample No.:** S-2 **Depth:** 36"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-2 Replicate (letter) B Date Collected 9/23/2025

2. Material Tested: ____ Fill x Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed ____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
   Length of Sample, L, in inches 4.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 463.0984

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No ____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		>240
		>240
		>240

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= >240

    K = <0.2 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

    x NONE

    ____ Soil/Tube Contact ____Large Gravel ____ Large Roots

    ____ Dry Soil ____Smearing ____ Compaction

    ____ Other - Specify ____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-1 **Sample No.:** S-4 **Depth:** 78"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-3 Replicate (letter) A Date Collected 9/23/2025

2. Material Tested: ____ Fill x Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed ____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
   Length of Sample, L, in inches 3.25

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 376.2675

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No ____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 4.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		10.5
		10.5
		10.5

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= 10.5

    K = 4.1 **Classification:** **K3**

13. Defects in the Sample (Check appropriate items):

    x NONE

    ____ Soil/Tube Contact ____Large Gravel ____ Large Roots

    ____ Dry Soil ____Smearing ____ Compaction

    ____ Other - Specify ____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-1 **Sample No.:** S-4 **Depth:** 78"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-3 Replicate (letter) B Date Collected 9/23/2025

2. Material Tested: ____ Fill x Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed ____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
   Length of Sample, L, in inches 3.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 347.3238

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No ____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 4.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		7.1
		7.1
		7.1

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= 7.1

    K = 5.7 **Classification:** **K3**

13. Defects in the Sample (Check appropriate items):

    x NONE

    ____ Soil/Tube Contact ____Large Gravel ____ Large Roots

    ____ Dry Soil ____Smearing ____ Compaction

    ____ Other - Specify ____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-2 **Sample No.:** S-1 **Depth:** 18"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-1 Replicate (letter) A Date Collected 9/23/2025

2. Material Tested: ____ Fill x Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed ____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
   Length of Sample, L, in inches 4.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 463.0984

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No ____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 4.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		151.1
		151.0
		151.4

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= 151.4

    K = 0.4 **Classification:** **K1**

13. Defects in the Sample (Check appropriate items):

    x NONE

    ____ Soil/Tube Contact ____Large Gravel ____ Large Roots

    ____ Dry Soil ____Smearing ____ Compaction

    ____ Other - Specify ____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-2 **Sample No.:** S-1 **Depth:** 18"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-1 Replicate (letter) B Date Collected 9/23/2025

2. Material Tested: ____ Fill x Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed ____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
   Length of Sample, L, in inches 2.50

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 289.4365

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No ____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 4.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		62.3
		61.4
		60.2

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= 60.2

    K = 0.6 **Classification:** **K1**

13. Defects in the Sample (Check appropriate items):

    x NONE

    ____ Soil/Tube Contact ____Large Gravel ____ Large Roots

    ____ Dry Soil ____Smearing ____ Compaction

    ____ Other - Specify ____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-3 **Sample No.:** S-2 **Depth:** 36"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-1 Replicate (letter) A Date Collected 9/23/2025

2. Material Tested: ____ Fill x Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed ____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
   Length of Sample, L, in inches 3.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 347.3238

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No ____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		>240
		>240
		>240

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= >240

    K = <0.2 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

    x NONE

    ____ Soil/Tube Contact ____Large Gravel ____ Large Roots

    ____ Dry Soil ____Smearing ____ Compaction

    ____ Other - Specify ____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-3 **Sample No.:** S-2 **Depth:** 36"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-1 Replicate (letter) B Date Collected 9/23/2025

2. Material Tested: ____ Fill x Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed ____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
   Length of Sample, L, in inches 2.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 231.5492

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No ____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		>240
		>240
		>240

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= >240

    K = <0.2 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

    x NONE

    ____ Soil/Tube Contact ____Large Gravel ____ Large Roots

    ____ Dry Soil ____Smearing ____ Compaction

    ____ Other - Specify ____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-4 **Sample No.:** S-2 **Depth:** 54"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-1 Replicate (letter) A Date Collected 9/23/2025

2. Material Tested: ____ Fill x Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed ____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
   Length of Sample, L, in inches 2.50

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 289.4365

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No ____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		>240
		>240
		>240

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= >240

    K = <0.2 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

    x NONE

    ____ Soil/Tube Contact ____Large Gravel ____ Large Roots

    ____ Dry Soil ____Smearing ____ Compaction

    ____ Other - Specify ____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-4 **Sample No.:** S-2 **Depth:** 54"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-1 Replicate (letter) B Date Collected 9/23/2025

2. Material Tested: ____ Fill x Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed ____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
   Length of Sample, L, in inches 2.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 231.5492

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No ____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		>240
		>240
		>240

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= >240

    K = <0.2 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

    x NONE

    ____ Soil/Tube Contact ____Large Gravel ____ Large Roots

    ____ Dry Soil ____Smearing ____ Compaction

    ____ Other - Specify ____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-5 **Sample No.:** S-2 **Depth:** 54"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-1 Replicate (letter) A Date Collected 9/23/2025

2. Material Tested: ____ Fill x Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed ____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
   Length of Sample, L, in inches 2.75

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 318.3802

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No ____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		>240
		>240
		>240

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= >240

    K = <0.2 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

    x NONE

    ____ Soil/Tube Contact ____Large Gravel ____ Large Roots

    ____ Dry Soil ____Smearing ____ Compaction

    ____ Other - Specify ____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-5 **Sample No.:** S-2 **Depth:** 54"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-1 Replicate (letter) B Date Collected 9/23/2025

2. Material Tested: ____ Fill x Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed ____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
   Length of Sample, L, in inches 2.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 231.5492

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No ____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		>240
		>240
		>240

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= >240

    K = <0.2 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

    x NONE

    ____ Soil/Tube Contact ____Large Gravel ____ Large Roots

    ____ Dry Soil ____Smearing ____ Compaction

    ____ Other - Specify ____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-5 **Sample No.:** S-3 **Depth:** 84"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-2 Replicate (letter) A Date Collected 9/23/2025

2. Material Tested: ____ Fill x Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed ____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
   Length of Sample, L, in inches 2.75

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 318.3802

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No ____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		>240
		>240
		>240

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= >240

    K = <0.2 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

    x NONE

    ____ Soil/Tube Contact ____Large Gravel ____ Large Roots

    ____ Dry Soil ____Smearing ____ Compaction

    ____ Other - Specify ____

Tube Permeameter Test Data

Job Number: 0922 25-03661
Project: Proposed Multi-Family Residential Development
Client: JMF Properties
Lab Tech: K Salmeron

Sample ID: **Boring/Test Pit No.:** SPP-5 **Sample No.:** S-3 **Depth:** 84"

MUNICIPALITY Township of Verona BLOCK 1201 LOT 12

1. Test Number T-2 Replicate (letter) B Date Collected 9/23/2025

2. Material Tested: ____ Fill x Test in Native Soil-Indicate Depth

3. Type of Sample: x Undisturbed ____ Disturbed

4. Sample Dimensions: Inside Radius of Sample Tube, R, in cm 3.81
   Length of Sample, L, in inches 3.00

5. Bulk Density Determination (Disturbed Samples Only): N/A

6. Sample Weight (Wt. Tube Containing Sample-Wt. of Empty Tube), grams N/A

7. Sample Volume (L x 2.54 cm./inch x 3.14R2), cc. 347.3238

8. Bulk Density (Sample Wt./Sample Volume), grams/cc. N/A > 1.2

9. Standpipe Used: x No ____ Yes, Indicate Internal Radius, cm. N/A

10. Height of Water Level Above Rim of Test Basin, in inches:

    At the Beginning of Each Test Interval, H1 5.00
    At the End of Each Test Interval, H2 5.00

11. Rate of Water Level Drop (Add additional lines if needed):

Time, Start of Test Interval, T1	Time End of Test Interval T2	Length of Test Interval, T, Minutes
		>240
		>240
		>240

12. Calculation of Permeability: K, (in/hr) = 60 min/hr x r2/R2 x L(in)/T(min) x ln (H1/H2) T= >240

    K = <0.2 **Classification:** **K0**

13. Defects in the Sample (Check appropriate items):

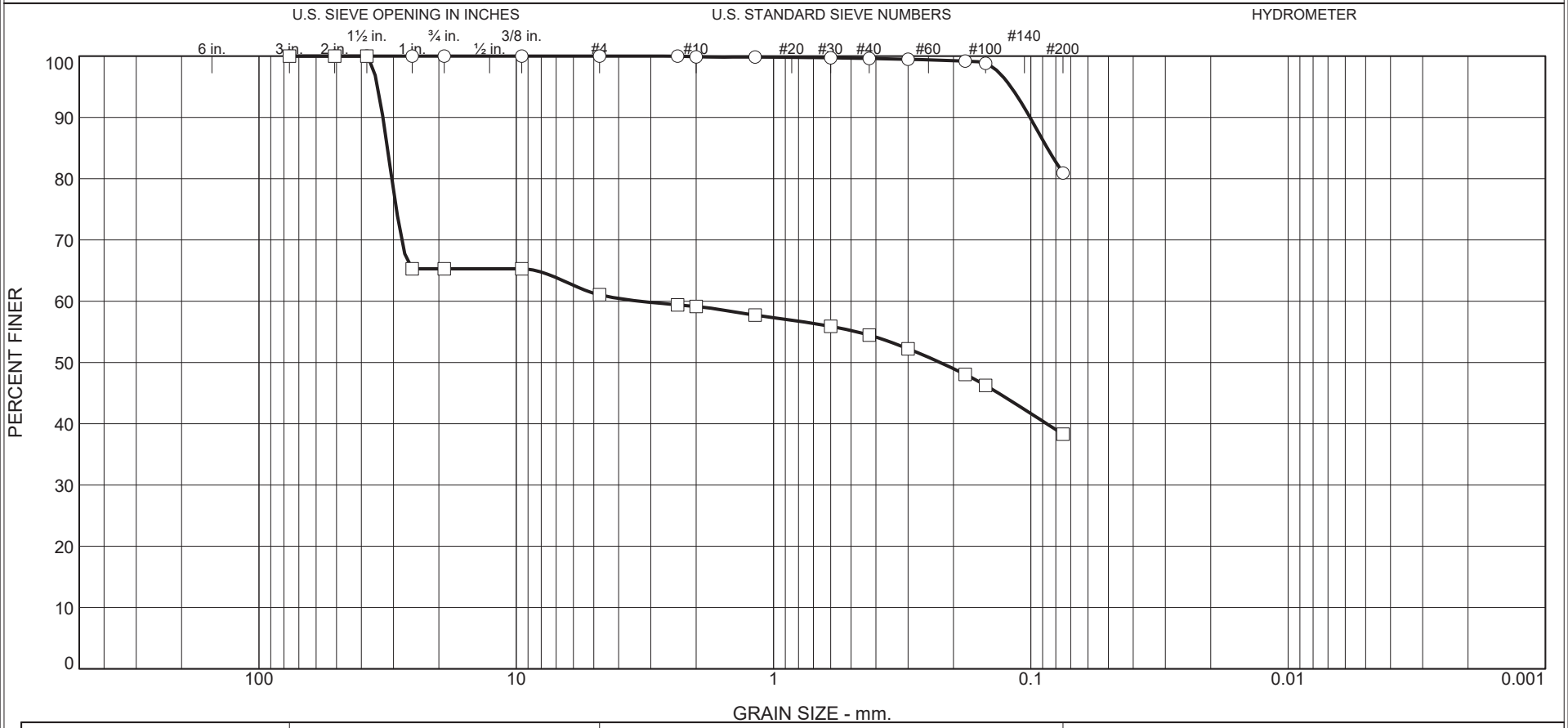
    x NONE

    ____ Soil/Tube Contact ____Large Gravel ____ Large Roots

    ____ Dry Soil ____Smearing ____ Compaction

    ____ Other - Specify ____

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	0.3	18.7	80.9	
□	0.0	34.7	4.2	1.9	4.7	16.2	38.3	

	Source	Sample #	Depth/Elev.	Date Sampled	USCS	Material Description	NM %	LL	PL
○	B-3	S-5	8-10	09/23/2025	ML	Brown silt, some c-f sand	23.4	NV	NP
□	B-5	S-4	6-8	09/24/2025	GC	Bluish gray c-f gravel, and clay, some c-f sand	13.6	29	21

Client JMF Properties

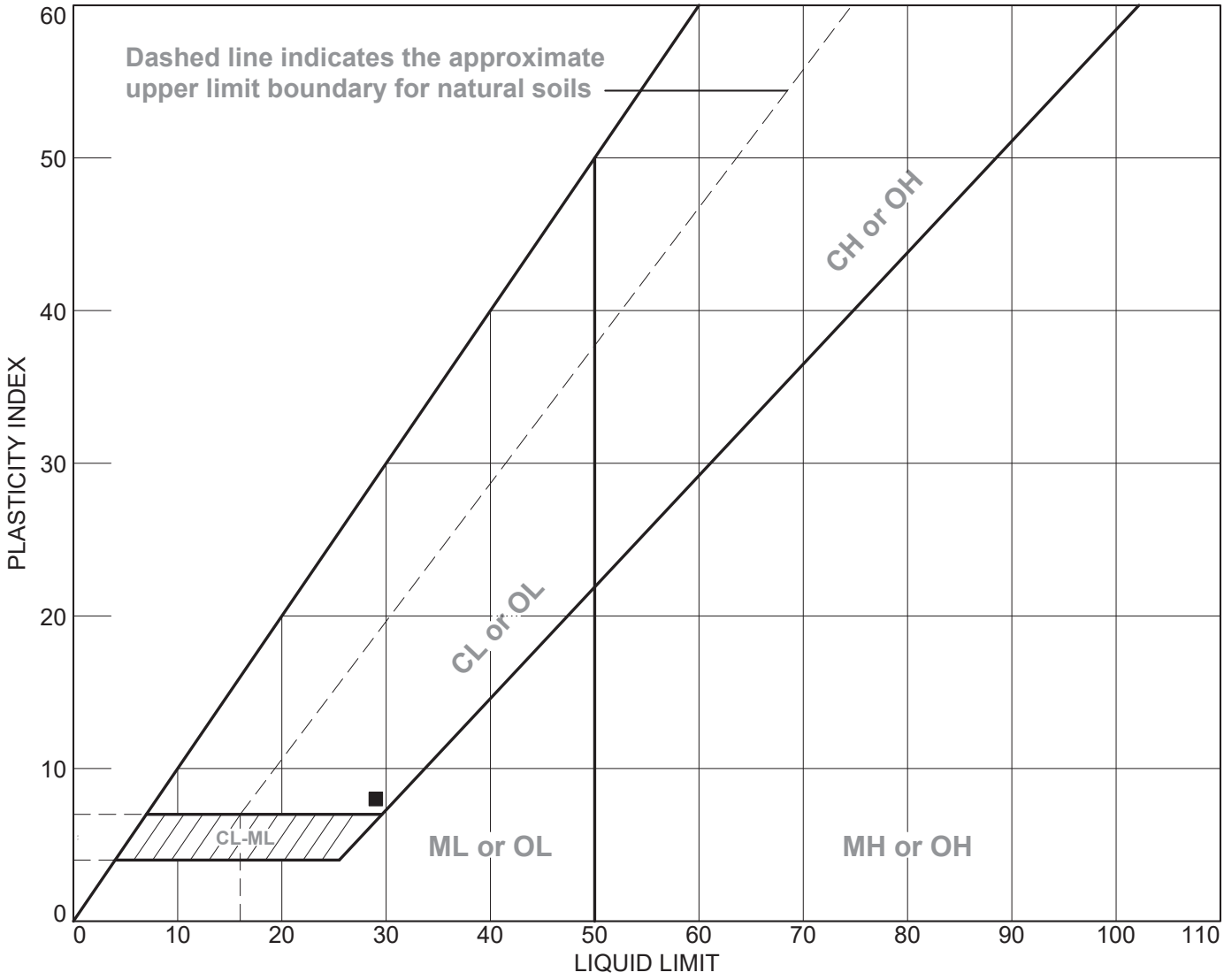
Project Proposed Multi-Family Residential Development

251 Grove Ave, Twp of Verona, Essex County, NJ

Project No. 0922 25-03661 Figure 1

DYNAMIC EARTH

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-3	S-5	8-10	23.4	NP	NV	NP	ML
■	B-5	S-4	6-8	13.6	21	29	8	GC

DYNAMIC EARTH

Client: JMF Properties

Project: Proposed Multi-Family Residential Development
251 Grove Ave, Twp of Verona, Essex County, NJ

Project No.: 0922 25-03661 **Figure** 2

Surface Infiltration Testing



Photo 1: Start of INF-1



Photo 2: End of INF-1



Photo 3: Start of INF-2



Photo 4: End of INF-2



Photo 5: Start of INF-3



Photo 6: End of INF-3

USDA-NRCS Custom Soil Resource Report for Essex County, New Jersey

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Essex County, New Jersey



October 3, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,640 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 20 40 80 120

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 Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:12,000.

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: Essex County, New Jersey
Survey Area Data: Version 21, Aug 28, 2025

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

Date(s) aerial images were photographed: Oct 10, 2022—Oct 16, 2022

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PecuuB	Peckmantown - Urban land, Peckmantown substratum complex, 0 to 8 percent slopes	6.0	100.0%
Totals for Area of Interest		**6.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Essex County, New Jersey

PecuuB—Peckmantown - Urban land, Peckmantown substratum complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: w8qf
Elevation: 260 to 540 feet
Mean annual precipitation: 30 to 64 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 131 to 178 days
Farmland classification: Not prime farmland

Map Unit Composition

Peckmantown and similar soils: 55 percent
Urban land, peckmantown substratum: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peckmantown

Setting

Landform: Outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-silty glaciolacustrine deposits derived from basalt

Typical profile

A - 0 to 2 inches: silt loam
Ap - 2 to 8 inches: loam
BAt - 8 to 14 inches: loam
Bt - 14 to 27 inches: silt loam
Btx1 - 27 to 37 inches: loam
Btx2 - 37 to 40 inches: silt loam
BCtx - 40 to 59 inches: silt loam
2C1 - 59 to 63 inches: gravelly loamy coarse sand
2C2 - 63 to 74 inches: coarse sand
2C3 - 74 to 88 inches: coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to fragipan
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C
Ecological site: F144AY017NH - Well Drained Lake Plain
Hydric soil rating: No

Description of Urban Land, Peckmantown Substratum

Setting

Landform: Outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Typical profile

H1 - 0 to 12 inches: material
H2 - 12 to 59 inches: silt loam
2C1 - 59 to 63 inches: gravelly loamy coarse sand
2C2 - 63 to 74 inches: coarse sand
2C3 - 74 to 88 inches: coarse sand

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Udorthents, peckmantown substratum

Percent of map unit: 5 percent
Landform: Outwash plains
Landform position (three-dimensional): Tread, rise
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

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Geotechnical Terms and Symbols

GEOTECHNICAL TERMS AND SYMBOLS

SAMPLE IDENTIFICATION

The Unified Soil Classification System is used to identify the soil unless otherwise noted.

SOIL PROPERTY SYMBOLS

N:	Standard Penetration Value: Blows per ft. or a 140 lb. hammer falling 30" on a 2" O.D. split-spoon.
Qu:	Unconfined compressive strength, TSF.
Qp:	Penetrometer value, unconfined compressive strength, TSF.
Mc:	Moisture content, %
LL:	Liquid limit, %
PI:	Plasiticity index, %
δd:	Natural dry density, PCF.
▼:	Apparent groundwater level at time noted after completion of boring.
=	

DRILLING AND SAMPLING SYMBOLS

NE:	Not Encountered (Groundwater was not encountered)
SS:	Split-Spoon – 1⅜" I.D., 2" O.D., except where noted
ST:	Shelby Tube – 3" O.D., except where noted
AU:	Auger Sample
OB:	Diamond Bit
CB:	Carbide Bit
WS:	Washed Sample

RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

Term (Non-Cohesive Soils)	Standard Penetration Resistance
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

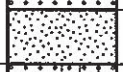
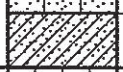
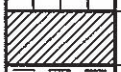
Term (Cohesive Soils)	Qu (TSF)
Very Soft	0-0.25
Soft	0.25-0.50
Firm (Medium)	0.50-1.00
Stiff	1.00-2.00
Very Stiff	2.00-4.00
Hard	4.00 +

PARTICLE SIZE

Boulders	8 in. +	Coarse Sand	5mm-0.6mm	Silt	0.074mm-0.005mm
Cobbles	8 in. – 3 in.	Medium Sand	0.6mm-0.2mm	Clay	- 0.005mm
Gravel	3 in. – 5mm	Fine Sand	0.2mm – 0.074mm		

USCS Standard Classification System

UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2488

MAJOR DIVISION			GROUP SYMBOL	LETTER SYMBOL	GROUP NAME
COARSE GRAINED SOILS CONTAINS MORE THAN 50% FINES	**GRAVEL AND GRAVELLY SOILS** MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVEL WITH * 5% FINES		GW	Well-graded GRAVEL
				GP	Poorly graded GRAVEL
		GRAVEL WITH BETWEEN 5% AND 15% FINES		GW-GM	Well-graded GRAVEL with silt
				GW-GC	Well-graded GRAVEL with clay
				GP-GM	Poorly graded GRAVEL with silt
				GP-GC	Poorly graded GRAVEL with clay
		GRAVEL WITH ≥ 15% FINES		GM	Silty GRAVEL
				GC	Clayey GRAVEL
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SAND WITH * 5% FINES		SW	Well-graded SAND
				SP	Poorly graded SAND
		SAND WITH BETWEEN 5% AND 15% FINES		SW-SM	Well-graded SAND with silt
				SW-SC	Well-graded SAND with clay
				SP-SM	Poorly graded SAND with silt
				SP-SC	Poorly graded SAND with clay
		SAND WITH ≥ 15% FINES		SM	Silty SAND
				SC	Clayey SAND
FINE GRAINED SOILS CONTAINS MORE THAN 50% FINES	SILT AND CLAY	LIQUID LIMIT LESS THAN 50		ML	Inorganic SILT with low plasticity
				CL	Lean inorganic CLAY with low plasticity
				OL	Organic SILT with low plasticity
		LIQUID LIMIT GREATER THAN 50		MH	Elastic inorganic SILT with moderate to high plasticity
				CH	Fat inorganic CLAY with moderate to high plasticity
				OH	Organic SILT or CLAY with moderate to high plasticity
HIGHLY ORGANIC SOILS				PT	PEAT soils with high organic contents

NOTES:

1) Sample descriptions are based on visual field and laboratory observations using classification methods of ASTM D2488. Where laboratory data are available, classifications are in accordance with ASTM D2487.

2) Solid lines between soil descriptions indicate change in interpreted geologic unit. Dashed lines indicate stratigraphic change within the unit.

3) Fines are material passing the U.S. Std. #200 Sieve.