Chemical and Physical Properties of Fairfax County Soils

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CHEMICAL AND PHYSICAL PROPERTIES

OF

FAIRFAX COUNTY SOILS*

Introduction

A soil survey was completed in Fairfax County in August 1955. With the idea of getting the greatest value from this survey, detailed studies were made of the physical and chemical properties of the soils.

The completed soil survey map shows the extent and location of the various kinds of soil in the county. The soil survey report classifies the kinds of soils and groups them according to use and management classes for specific purposes. These groupings are based on interpretations of certain soil characteristics, such as their morphological, genetic, physical and chemical properties. As a help in classifying the different soils and in making interpretations for use and management, laboratory studies were made in conjunction with the survey. On completion of the field mapping, soil samples were collected for physical and chemical analyses. The data presented here supplements that included in the soil survey report and related publications.

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Data Sheets

Each data sheet carries a brief description of the soil analyzed, and tables which show chemical, physical and engineering properties of the soil described.

Chemical Properties

When a proper balance of plant food and organic matter is maintained in the surface 7 inches of a well-drained soil, optimum plant growth may be expected. Certain properties of the soil profile such as effective depth, structure, texture, and consistency are also quite important. These characteristics largely determine water relationships and crop adaptation to the soil. The parent material, designated by the C horizon, is in some cases quite important as a source of plant nutrients. Examples of this are found in some of the younger soils occurring in the Piedmont such as Brandywine, Wilkes, Bremo, and Catoctin. The A_0 horizon is not true soil but consists of partly decomposed plant remains. The A horizon, sometimes called the surface soil, includes that portion of the soil which is plowed and, in Virginia, is the layer of the soil which is affected most by leaching and erosion. Horizons B_1, B_2, and B_3 are subdivisions representing layers of the subsoil. The B_2 ordinarily contains more clay and is finer textured than the other layers of the soil. Soil parent material is the C horizon, and where this is layered, C_1, C_2, etc., are used.

Degree of soil acidity is expressed by pH. The following descriptive designations have been applied to pH values:

Extremely acid	Below 4.5
Very strongly acid	4.5 - 5.0
Strongly acid	5.1 - 5.5
Medium acid	5.6 - 6.0
Slightly acid	6.1 - 6.5
Neutral (essentially)	6.6 - 7.3
Mildly alkaline	7.4 - 7.8
Moderately alkaline	7.9 - 8.4
Strongly alkaline	8.5 - 9.0
Very strongly alkaline	9.1+

Truog phosphorus which is dilute acid soluble phosphorus, is an estimate of the amount of phosphorus readily available to plants in acid soils. Generally, it is considered that 25 ppm. (50 lbs. per acre) is adequate for most crops grown in Virginia.

Calcium, magnesium, and potassium, which are exchangeable cations, are important plant nutrients. When these elements are in exchangeable form, they are available to plants to varying degrees. Potassium is generally more available and calcium less available than magnesium. As these bases are removed by plants, aluminum and hydrogen ions take their place. Because aluminum acts as an acid, like hydrogen, the exchangeable hydrogen reported includes exchangeable aluminum. The percent base saturation is the proportion of the total cations that is made up of exchangeable calcium, magnesium, and potassium. For Virginia conditions a fertile soil usually has a high percent base saturation.

The sum of the exchangeable cations, including aluminum and hydrogen, is equal to the total cation exchange capacity of the soil. The value is usually high when there is higher clay or organic matter content in the soil. Certain types of clay yield a higher value than others, but with few exceptions, humus or organic matter give a higher value, pound for pound, than clay. The higher the cation exchange capacity, the greater the nutrient holding capacity of the soil. Soils with low cation exchange capacities release stored nutrients to plants more easily at lower total nutrient content. It is much easier to raise the pH of a low exchange capacity soil.

The notation milli-equivalents per 100 grams of soil can be converted to pounds per acre of soil on the basis that an acre of soil 6 or 7 inches deep weighs approximately 2,000,000 pounds. One milli-equivalent per 100 grams of soil is equivalent to 940 lbs. of potash or 1,000 lbs. of limestone ($CaCO_3$) per acre furrow slice.

In Virginia a condition of at least 50 percent base saturation is desired in the surface 6 to 7 inches. These bases should be present in a proportion of about ten times as much calcium and two times as much magnesium as potassium as long as there is a minimum of 0.3 m.e. of potassium. A soil with a total of 10 m.e. of exchangeable cations would have a good nutrient condition if there were 5 m.e. hydrogen, 4 m.e. calcium, 0.7 m.e. magnesium and 0.3 m.e. potassium. If the soil has a high cation exchange capacity, it would be important to have much more calcium and slightly more potassium and magnesium. If the soil has a smaller cation exchange capacity, the calcium requirement is less, but the magnesium and, most important, the potassium level should be the same. Many cultivated soils in parts of Virginia contain a high proportion of magnesium as a result of the widespread use of dolomitic limestone. This may be unfavorable if the build-up of magnesium continues.

Results of the chemical analyses made in the Soils Laboratory at VPI are shown under Chemical Characteristics on the data sheets.

Physical Properties

Particle size distribution is shown in the table on the data sheets designated Physical Characteristics. Analyses for

this table were made in the Soil Survey Laboratory, Lincoln, Nebraska.

Under Engineering Characteristics on the data sheets results of tests made by the U. S. Bureau of Public roads are given. These analyses were run according to the standard procedure of the American Association of State Highway Officials. The results differ somewhat from those reported under Physical Characteristics. In the A.A.S.H.O. procedure, the fine material is analyzed by the hydrometer and the various grain-size fractions are calculated on the basis of all the material including that which is coarser than 2 millimeters in diameter. Results obtained by this method are, therefore, not suitable for use in designating soil textural classes. In the system used by the soil survey laboratory, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions.

The system approved by the American Association of State Highway Officials recognizes seven main groups. These groups range from stone fragments through highly plastic clays and are designated as follows: A-1 (stone fragments, gravel and sand) to A-4 (nonplastic to moderately plastic silty soils) to A-6 (medium plastic clays) and A-7-6 (highly plastic clays).

The unified classification system is made up of 15 classes. Of these 8 are coarse grained, 6 are fine grained and 1 highly organic. In the fine grained classes over 50 percent of the soil material passes the No. 200 sieve. ML includes inorganic silts and very fine sands, silty or clayey fine sands and clayey silts of slight plasticity. CL is comprised of inorganic clays of low to medium plasticity, gravelly clays, sandy clays and silty clays. Both ML and CL have liquid limits below 50. MH includes inorganic silts, micaceous fine sandy or silty soils. CH includes inorganic clays of high plasticity.

Classes in both systems have general interpretations as to their rating for subgrade, foundation material, embankment and other engineering uses.

Additional Publications

Other information concerning the soils of Fairfax County may be found in the following publications:

Soils of Fairfax County, 2nd edition; Virginia Agricultural Experiment Station,

Use of Soil Survey in Designing Sewage Disposal Systems, Virginia Agricultural Experiment Station Bulletin 509; August 1959,

Use of Soil Survey Information in An Area of Rapid Urban Development, Soil Science Society of America Proceedings, Vol. 19, October 1955, pages 502-505.

A_1	0-1"	Dark gray (10YR 4/1) very friable loam; weak fine granular structure.
A_2	1-7"	Light yellowish brown (2.5Y 6/4) very friable coarse loam; weak fine granular structure; a few small angular quartz particles and numerous roots occur in layer.
B_1	7-12"	Reddish yellow to strong brown (7.5YR 6/6 - 5/6) friable loam; moderate fine to medium subangular blocky structure; grit size quartz common. Some mixing of darker soil from above horizon along root channels and on soil peds observed.
B_2	12-20"	Yellowish red (5YR 5/6) clay faintly mottled with clay skins of reddish yellow (7.5YR 6/6) and strong brown (7.5YR 5/6); moderate fine to medium subangular blocky structure; many small quartz gravels present; tree roots are common.
B_3	20-32"	Mottled yellowish red, strong brown, reddish yellow and red friable clay; weak medium angular blocky structure.
C_1	32-40"	Mottled yellowish red, red, strong brown, brownish yellow and reddish yellow very friable clay soil material with structure similar to that of the underlying gneiss rock. Many clay skins of brown and strong brown; mica flakes and quartz gravel present.
C_2	40" +	Distinctly mottled yellowish red, strong brown, red, brownish yellow and reddish yellow gritty clay loam soil material; structure similar to unweathered rock materials below.

Chemical Characteristics

Horizon	pH	Truog P (ppm.)	Organic Matter (Percent)	Organic Nitrogen [1/1] (Percent)	Exchangeable Manganese (ppm.)	Exchangeable Cations (Milli-equivalents per 100 grams of soil) Ca	Mg	K	Na	H	Total [2/]	Base Saturation (Percent)
A_2	4.52	5.8	4.90	0.150	9.16	1.80	0.48	0.18		9.35	11.81	20.83
B_1	4.60	2.9	0.91	0.047	0.04	0.22	0.24	0.34		6.95	7.75	10.32
B_2	4.47	1.9	0.34	0.014	0.18	0.56	1.04	0.42		12.18	14.20	14.23
B_3	4.48	3.9	0.30	0.012	0.04	0.40	1.46	0.30		11.73	13.89	15.55
C_1	4.66	1.0	0.17	———	0.07	0.16	1.18	0.20		9.81	11.35	13.57
C_2	4.71	1.2	0.11	———	0.04	0.12	0.92	0.18		8.02	9.24	13.20

Physical Characteristics

Horizon	Particle Size Distribution (Percent—In Millimeters) Very Coarse Sand 2.0 to 1.0	Coarse Sand 1.0 to .5	Medium Sand .5 to .25	Fine Sand .25 to .10	Very Fine Sand .10 to .05	Silt .05 to .002	Clay Less Than .002	.2 to .02	.02 to .002	Textural Class
A_2	1.4a	13.0b	9.8b	11.4b	4.4b	48.9	11.1	32.8	25.7	1
B_1	———	10.6b	8.2b	10.0b	3.8b	47.1	20.3	19.7	35.6	1
B_2	———	8.6	6.2	8.5	4.7	19.6	52.4	13.2	15.4	c
B_3	———	5.8	5.1	8.6	7.2	22.0	51.3	17.6	16.2	c
C_1	———	9.0	6.9	11.6	9.6	20.8	42.1	21.6	15.4	c
C_2	———	9.9	7.2	13.7	13.2	27.0	29.0	29.8	18.4	cl

Engineering Characteristics

Horizon	Percentage Passing Sieve Size In Inches 2.0	1.5	1.0	.75	.375	In Millimeters 4.7	2.0	.42	.25	.074	.05 [3/]	Percentage Smaller Than In Millimeters .02	.005	.002	.001	L.L. [4/]	P.I. [5/]	Maximum Dry Density [6/] (Pounds per Cubic Foot)	Optimum H_2O [6/] (Percent)	Classification Unified	A.A.S.H.O.
A_2	---	---	---	---	---	100	98	86	74	59	56	44	21	14	12	22	3	116	12	ML	A-4(5)
B_2	---	---	---	---	100	99	93	82	74	64	61	56	46	39	37	54	26	106	18	MH-CH	A-7-6(14)
C_1	---	---	---	---	100	98	89	76	68	55	52	43	29	25	25	54	20	106	18	MH	A-7-5(9)

1/ Numbers refer to references in back of report.

a. Common, organic matter.
b. Few, iron and black concr. (Mn-Fe)

BELTSVILLE LOAM

A_p	0-8"	Brown (10YR 5/3) friable loam; weak fine granular structure; few faint mottles of dark grayish brown present.
A_3	8-11"	Light yellowish brown (10YR 6/4) friable silt loam faintly mottled with yellowish brown; weak fine subangular blocky structure.
B_{21}	11-16"	Yellowish brown (10YR 5/6) friable loam with moderate fine subangular blocky structure; few faint mottles of light yellowish brown present and ped faces have a strong brown coating.
B_{22}	16-19"	Mottled yellowish brown and pale brown friable loam with weak fine subangular blocky structure.
B_{m1}	19-27"	Mottled strong brown and light gray extremely hard but brittle loam; moderate coarse angular blocky structure; strong brown coatings prevalent on the faces of broken peds; contains a few roundish quartzite pebbles.
B_{m2}	27-56"	Strong brown (7.5YR 5/6) faintly mottled with yellowish brown extremely hard but brittle sandy clay loam; structure is moderate medium angular blocky; contains few small roundish quartzite fragments.
C_1	56-74"	Yellowish brown very friable sandy clay loam faintly mottled with strong brown; structure is weak fine subangular blocky.
C_2	74-82"	Mottled strong brown, light brownish gray and very pale brown very friable fine sandy loam with very weak fine subangular blocky to massive structure; mottles are common, medium and distinct.

Chemical Characteristics

Horizon	pH	Truog P (ppm.)	Organic Matter (Percent)	Organic Nitrogen (Percent) [1]	Exchangeable Manganese (ppm.)	Exchangeable Cations (Milli-equivalents per 100 grams of soil) Ca	Mg	K	Na	H	Total [2]	Base Saturation (Percent)
A_p	5.57	4.1	1.17	0.053	2.69	2.12	0.34	0.06		3.02	5.54	45.49
A_3	5.37	2.2	0.38	0.025	0.04	2.44	0.68	0.06		3.73	6.91	46.02
B_{21}	4.73	0.5	0.35	0.021	0.00	1.76	0.60	0.08		6.62	9.06	26.93
B_{22}	4.70	1.2	0.39	0.024	0.04	1.64	0.74	0.08		6.19	8.65	28.44
B_{m1}	4.88	0.5	0.05	0.007	0.26	0.22	0.64	0.06		4.65	5.57	16.52
B_{m2}	4.97	2.2	0.07	-----	0.04	0.00	0.96	0.06		8.02	9.04	11.28
C_1	5.12	0.5	0.08	-----	0.04	0.10	0.58	0.04		7.08	7.80	9.23
C_2	5.03	1.0	0.06	-----	0.07	0.10	0.40	0.04		5.08	5.62	9.61

Physical Characteristics

Horizon	Particle Size Distribution (Percent—In Millimeters) Very Coarse Sand 2.0 to 1.0	Coarse Sand 1.0 to .5	Medium Sand .5 to .25	Fine Sand .25 to .10	Very Fine Sand .10 to .05	Silt .05 to .002	Clay Less Than .002	.2 to .02	.02 to .002	Textural Class
A_p	-	6.1a	9.9a	18.4a	5.8a	49.5	10.3	31.0	32.1	l
A_3	-	4.4a	7.6a	13.6a	4.4a	51.1	18.9	24.0	37.6	sil
B_{21}	-	4.6a	8.0a	15.5a	5.0a	43.1	23.8	23.6	31.2	l
B_{22}	-	6.4a	10.0a	18.2a	5.6a	41.4	18.4	25.5	29.4	l
B_{m1}	-	7.4	12.2	22.8	7.3	34.5	15.8	27.0	24.8	l
B_{m2}	-	8.2	12.2	21.2	6.0	25.5	26.9	22.2	18.2	scl
C_1	-	7.2	18.1	28.9	5.4	16.0	24.4	21.1	11.1	scl
C_2	-	5.2	19.8	33.2	6.0	17.0	18.8	23.8	11.9	fsl

Engineering Characteristics

Horizon	Percentage Passing Sieve Size In Inches 2.0	1.5	1.0	.75	.375	In Millimeters 4.7	2.0	.42	.25	.074	.05 [3]	Percentage Smaller Than In Millimeters .02	.005	.002	.001	L.L. [4]	P.I. [5]	Maximum Dry Density [6] (Pounds per Cubic Foot)	Optimum H_2O [6] (Percent)	Classification Unified	A.A.S.H.O.
A_p	---	---	---	---	---	---	100	95	84	64	61	46	21	12	8	20	2	116	13	ML	A-4(6)
A_3, B_{21} & B_{22}	---	---	---	---	---	---	100	96	87	70	67	52	34	24	20	30	12	116	15	CL	A-6(8)
B_{m1}	---	---	---	---	---	---	100	93	79	52	48	38	22	15	11	17	4	125	10	ML-CL	A-4(3)
B_{m2}	---	---	---	---	---	---	100	92	78	54	51	44	33	27	24	30	11	117	14	CL	A-6(4)
C_1	---	---	---	---	---	---	100	94	76	44	41	37	29	26	24	32	12	113	15	SC	A-6(2)

a. Few, smooth lt. brown and black concr. (Fe-Mn?)

BIRDSBORO SILT LOAM

A_p 0-7" Dark yellowish brown (10YR 4/4) to brown very friable silt loam; weak fine granular structure.

B_1 7-12" Yellowish red (5YR 4/6) friable silt loam (slightly sticky when wet); weak fine to medium subangular blocky structure; contains a few small black iron concretions.

B_{21} 12-20" Yellowish red (5YR 4/6) friable heavy silty clay loam (slightly plastic when wet); weak fine to medium subangular blocky structure.

B_{22} 20-50" Yellowish red faintly mottled with very pale brown, strong brown, red and light gray compact, friable silty clay loam; gray mottles and compaction increase with depth; this horizon is relatively dry and slightly indurated and contains a few small roundish gravel.

D 50-68" Mottled red, light brownish gray and light gray plastic clay; mottles common, large and distinct.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen percent [1]	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total [2]	Base Saturation percent
A_p	6.43	6.5	1.75	0.090	5.48	5.50	0.36	0.12	3.54	9.52	62.82
B_1	5.37	1.9	0.46	0.038	2.21	3.58	0.80	0.10	4.42	8.90	50.34
B_{21}	5.10	1.7	0.24	0.023	2.80	3.46	1.56	0.12	5.99	11.13	46.18
B_{22}	4.71	3.4	0.14	0.018	2.87	0.96	1.18	0.16	9.89	12.19	18.87
D	4.41	0.2	0.14	-----	0.29	1.16	3.36	0.26	16.80	21.58	22.15

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_p	0.1a	2.1a	2.4a	5.2a	7.4a	66.1	16.7	34.6	41.6	sil
B_1	----	1.4a	1.6a	3.7a	5.7a	63.0	24.6	28.3	42.4	sil
B_{21}	----	1.4b	1.5b	3.7b	5.7b	56.7	31.0	27.1	37.4	sicl
B_{22}	----	1.7b	1.7b	4.3b	6.8b	51.9	33.6	28.9	32.2	sicl
D	----	0.4b	0.6b	2.0b	4.4b	39.5	53.1	21.2	23.9	c

a. Many, smooth lt. brown and black concr. (Fe-Mn?) Also, few, white flakes (Mica?)

b. Many, smooth lt. brown and black concr. (Fe-Mn?)

BRECKNOCK LOAM

A_p 0-6" Very dark grayish brown to dark grayish brown (10YR 3/2 - 3/3) very friable loam with moderate fine granular structure; the upper one inch layer of this horizon is slightly darker in color and contains many grass roots.

B_{21} 6-13" Dark grayish brown (10YR 4/2) friable loam with moderate medium to coarse subangular blocky structure; contains a few small sandstone fragments and small roots.

B_{22} 13-20" Dark grayish brown (10YR 4/2) faintly mottled with dark brown, yellowish brown and dark gray heavy loam with moderate medium to coarse subangular blocky structure; contains a noticeable amount of sandstone fragments.

B_3 20-27" Mottled dark grayish brown, strong brown friable loam; sandstone fragments up to 2 inches in size make up about 25 percent of this layer.

C 27-37" Partly decomposed rock mixed with a small proportion of loamy soil materials.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_p	6.53	3.1	1.55	0.077	2.35	5.76	0.52	0.58	2.49	9.35	73.37
B_{21}	5.29	0.0	0.37	0.021	0.04	3.82	1.12	0.74	3.60	9.28	61.21
B_{22}	4.49	1.9	0.17	0.011	0.29	2.52	2.50	0.34	7.78	13.14	40.79
B_3	4.71	0.5	0.12	0.010	0.59	1.98	2.88	0.24	7.53	12.63	40.38
C	4.69	1.0	0.06	-----	0.70	0.88	2.58	0.24	8.56	12.26	30.18

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_p	-	3.2a	7.0a	22.6a	12.7a	44.9	9.6	42.4	28.3	1
B_{21}	-	2.9a	5.8a	18.9a	11.8a	45.2	15.4	37.1	31.0	1
B_{22}	-	1.2a	3.7a	19.0a	14.1a	41.1	20.9	40.3	26.7	1
B_3	-	1.3a	5.2a	23.9a	14.7a	36.7	18.2	42.5	22.6	1
C	-	3.1a	6.3a	19.4a	15.2a	40.8	15.2	42.1	24.7	1

a. Many, smooth lt. brown and black concr. (Fe-Mn?) Also, few white flakes (Mica?)

BUCKS LOAM

A_p	0-9"	Reddish brown (5YR 5/3) very friable loam with weak fine granular structure.
B2	9-19"	Reddish brown (2.5YR 4/4) friable sandy clay loam with moderate fine to medium subangular blocky structure; gradual boundary.
B_3	19-54"	Reddish brown (2.5YR 4/4) friable fine sandy loam; weak fine subangular blocky structure; abrupt boundary.
C	54-74"	Mostly dark reddish brown (2.5YR 3/4) very fine to fine grained Triassic sandstone fragments mixed with a small proportion of silt loam soil material of similar color.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_p	6.22	38.1	1.36	0.078	5.83	6.50	0.58	0.16	3.00	10.24	70.70
B_2	6.28	3.4	0.34	0.026	0.90	8.24	1.28	0.14	3.25	12.91	74.83
B_3	4.53	2.4	0.16	0.017	5.39	2.62	2.14	0.12	5.61	10.49	46.52
C_2	4.55	2.4	0.10	-----	0.39	0.66	6.18	0.26	8.56	15.66	45.34

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_p	-	2.4a	6.0a	25.6a	17.0a	37.6	12.3	49.2	19.3	l-fsl
B_2	-	3.5a	7.1a	27.2a	14.6a	27.2	20.4	40.9	16.7	scl
B_3	-	4.9a	10.4a	32.0a	15.1a	23.4	14.2	42.0	13.8	fsl
C_2	-	3.7b	3.8b	7.7b	11.4b	50.4	23.0	37.4	28.7	sil

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] per-cent	Classification unified	A.A.S.H.O.
A_p	---	---	---	---	---	---	100	98	92	60	51	35	22	16	14	23	3	116	13	ML	A-4(5)
B_2	---	---	---	---	---	---	100	98	92	62	55	43	29	23	21	29	9	116	14	CL	A-4(5)
B_3	---	---	---	---	---	---	100	97	89	52	45	34	23	16	14	28	7	114	15	ML-CL	A-4(3)
C_2	---	---	---	---	---	---	100	97	95	88	83	63	35	26	23	38	11	107	19	ML	A-6(8)

a. Common, smooth lt. brown and black concr. (Fe-Mn?) Few, white flakes (Mica?)
b. Many, smooth lt. brown and black concr. (Fe-Mn?) Few, white flakes (Mica?)

BUCKS SILT LOAM

A_p 0-8" Reddish brown (5YR 4/3 - 4/4) very friable weak fine granular silt loam; many weeds, grass and scrub pine roots present; gradual boundary.

B_2 8-40" Reddish brown to dark reddish brown (2.5YR 4/3 - 4/4) firm silty clay (slightly plastic when wet); structure is moderate medium to coarse subangular blocky; gradual boundary.

B_3 40-55" Dark reddish brown (2.5YR 3/4) firm weak silty clay loam; fine to medium subangular blocky; fine reddish shaly sandstone particles are common in lower part.

C 55-57" Yellowish brown and reddish very friable sandstone and shaly sandstone materials mixed with a small portion of reddish silty clay loam soil material.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_p	4.55	5.8	1.72	0.067	14.96	0.96	0.44	0.22	8.05	9.67	16.75
B_2	4.68	3.4	0.26	0.012	0.15	0.28	1.52	0.24	11.60	13.64	14.96
B_3	4.59	1.9	0.23	-----	0.15	0.10	1.42	0.16	12.37	14.05	11.96
C	4.54	2.4	0.26	-----	0.33	0.14	1.26	0.16	12.10	13.66	11.42

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_p	0.1	1.8a	1.1a	1.9a	3.5a	69.6	22.0	32.0	42.1	sil
B_2	---	0.7a	0.6a	1.6a	3.6a	47.8	45.7	21.1	31.2	sic
B_3	---	0.2b	0.3b	1.8b	7.8b	52.5	37.4	29.6	32.0	sicl
C	---	2.1b	1.6b	4.1b	9.5b	48.8	33.9	36.0	24.8	sicl

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] per-cent	Classification Unified	A.A.S.H.O.
A_p	---	---	---	---	---	100	95	86	86	83	81	59	31	23	15	32	9	111	16	ML-CL	A-4(8)
B_2 and B_3	---	---	---	---	---	---	100	98	98	97	95	77	53	41	34	54	24	101	22	MH-CH	A-7-5(16)

a. Many, smooth lt. brown and black concr. (Fe-Mn?) Few, white flakes (Mica?)
b. Common, smooth lt. brown and black concr. (Fe-Mn?) Few, white flakes (Mica?)

CALVERTON SILT LOAM

A_p 0-9" Yellowish brown (10YR 5/4) very friable silt loam; moderate very fine to fine granular structure; contains many grass roots in upper part; abrupt boundary.

B_{21} 9-20" Strong brown (7.5YR 5/6) friable heavy silty clay loam with moderate medium subangular blocky structure; topmost 2 inches slightly lighter in color and texture; A few fragments of red shaly sandstones occur in the lower part; gradual boundary.

B_{22} 20-24" Strong brown (7.5YR 5/6) faintly mottled with reddish yellow and light yellowish brown friable silty clay with moderate medium subangular blocky structure; mottles mostly clay skins; small red shaly sandstone particles present throughout the horizon.

B_{2m} 24-30" Mottled brownish yellow, light brownish gray, strong brown and gray firm silty clay mixed with many small reddish shaly sandstone particles having fine to medium weak platy structure.

C 30-37" Mottled dark red, gray plastic clay mixed with red to dark red horizontally bedded shaly sandstone.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_p	5.78	5.3	2.20	0.112	9.99	4.98	0.46	0.10	4.93	10.47	52.91
B_{21}	4.54	1.9	0.65	0.045	1.23	3.92	0.98	0.10	12.60	17.60	28.41
B_{22}	4.50	1.9	0.39	0.035	0.88	2.46	1.58	0.14	16.51	20.69	20.20
B_{2m}	4.30	2.4	0.32	-----	1.03	2.58	2.04	0.14	18.05	22.81	20.87
C	4.28	1.2	0.33	-----	1.78	3.84	4.78	0.22	17.71	26.55	33.30

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_p	-	0.7a	0.5a	0.8ab	2.0ab	74.4	21.6	27.7	49.2	sil
B_{21}	-	0.3a	0.2a	0.3ab	1.3ab	59.1	38.8	17.3	43.3	sicl
B_{22}	-	0.2a	0.2a	0.3ab	1.5ab	54.4	43.4	17.8	38.3	sic
B_{2m}	-	0.8a	0.5a	1.0ab	1.9ab	47.0	48.8	14.6	34.9	sic
C	-	4.7a	3.9a	6.1ab	4.3ab	32.4	48.6	13.9	26.1	c

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	Percentage Passing Sieve Size in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] per-cent	Classification Unified	A.A.S.H.O.
A_p	---	---	---	---	---	---	100	97	96	95	92	73	37	24	19	33	8	104	18	ML-CL	A-4(8)
B_{21} and B_{22}	---	---	---	---	---	---	100	98	98	97	96	82	57	44	38	50	23	102	23	MH-CH	A-7-6(15)
B_{2m}	---	---	---	---	---	100	98	93	92	91	90	81	63	51	44	58	28	97	26	MH-CH	A-7-5(19)
C	---	100	97	94	86	74	52	48	47	45	44	40	30	23	22	48	22	100	23	SM-SC	A-7-6(6)

a. Common, smooth lt. brown and black concr. (Fe-Mn?)
b. Few, white flakes (Mica?)

CATLETT GRAVELLY SILT LOAM

A_1	0-1"	Very dark brown (10YR 2/2) to dark reddish brown (5YR 2/2) very friable silt loam with weak fine to medium granular structure; many small roots and partly decomposed leaf litter are present together with numerous small angular shale fragments.
A_2	1-7"	Dark gray (5YR 4/1) very friable silt loam mixed with small angular shaly sandstone fragments; the structure is weak fine sub-angular blocky which crushes readily to weak fine granular; roots are numerous.
C_1	7-13"	Dark gray (5YR 4/1) friable shaly silt loam; contains abundant gray to dark gray angular shale particles up to 1-1/2 inches in diameter.
C_2	13-20"	Very dark grayish brown to dark gray silt loam material mixed with dark brown and gray weathered rock fragments.

Chemical Characteristics

Horizon	pH	Truog P (ppm.)	Organic Matter (Percent)	Organic Nitrogen 1/ (Percent)	Exchangeable Manganese (ppm.)	Exchangeable Cations (Milli-equivalents per 100 grams of soil) Ca	Mg	K	Na	H	Total 2/	Base Saturation (Percent)
A_2	4.58	7.7	4.63	0.130	16.24	1.26	0.60	0.20		14.26	16.32	12.62
C_1	4.73	7.5	3.75	0.113	17.53	0.24	0.30	0.14		12.49	13.17	5.16
C_2	4.93	1.4	0.41	0.022	0.07	0.06	2.10	0.12		6.51	8.79	25.94

Physical Characteristics

Horizon	Particle Size Distribution (Percent—In Millimeters) Very Coarse Sand 2.0 to 1.0	Coarse Sand 1.0 to .5	Medium Sand .5 to .25	Fine Sand .25 to .10	Very Fine Sand .10 to .05	Silt .05 to .002	Clay Less Than .002	.2 to .02	.02 to .002	Textural Class
A_2	—	3.4a	2.1a	3.5a	3.2a	68.2	19.6	19.1	54.1	sil
C_1	0.1	3.6a	1.8a	2.5a	2.9a	69.4	19.7	20.0	53.6	sil
C_2	—	4.5a	4.0a	5.5a	4.0a	69.1	12.9	20.0	55.9	sil

a. Few, lt. brown concr. (Fe?)

ELBERT SILTY CLAY LOAM

A_p 0-5" Dark grayish brown (10YR 4/2) friable heavy silty clay loam (slightly plastic when wet); moderate medium granular structure; fine faint mottles of white, gray and yellowish brown are common; gradual boundary.

A-B 5-10" Mottled white, light gray, and pale brown firm plastic silty clay loam; mottles are many, medium and prominent; structure is moderate medium to coarse subangular blocky; small round mineral concretions are common; boundary abrupt.

B_{2m} 10-20" Light olive brown (2.5Y 5/4) very plastic sticky massive clay with a few faint medium mottles of yellowish brown and grayish brown; few roots and small mineral concretions occur in the upper part of this horizon.

B_{3m} 20-32" Mottled yellowish brown, strong brown and light olive brown very plastic massive clay loam; mottles common, fine and distinct; black mineral materials of iron and manganese are plentiful, causing black and brown streaks on cut surfaces; boundary gradual.

C 32-36" Friable fine sandy loam mixed with partially decomposed diabase having mottled yellowish brown and light olive brown colors.

Chemical Characteristics

Horizon	pH	Truog P (ppm.)	Organic Matter (Percent)	Organic Nitrogen[1] (Percent)	Exchangeable Manganese (ppm.)	Exchangeable Cations (Milli-equivalents per 100 grams of soil) Ca	Mg	K	Na	H	Total[2]	Base Saturation (Percent)
A_p	6.08	11.1	2.35	0.115	9.18	8.40	2.22	0.18		5.64	16.44	65.69
A-B	5.47	2.7	1.27	0.063	5.32	6.14	2.86	0.10		6.04	15.14	60.11
B_{2m}	5.88	3.1	0.79	0.032	0.86	8.60	13.38	0.36		6.73	29.07	76.85
B_{3m}	7.12	14.5	0.31	0.015	0.06	12.05	16.48	0.26		2.80	31.59	91.14
C	7.34	24.4	0.13	-----	0.02	11.85	16.38	0.20		2.31	30.74	92.49

Physical Characteristics

Horizon	Particle Size Distribution (Percent—In Millimeters) Very Coarse Sand 2.0 to 1.0	Coarse Sand 1.0 to .5	Medium Sand .5 to .25	Fine Sand .25 to .10	Very Fine Sand .10 to .05	Silt .05 to .002	Clay Less Than .002	.2 to .02	.02 to .002	Textural Class
A_p	0.2a	2.6b	1.7b	4.3b	3.6b	58.7	28.9	22.9	41.9	sicl
A-B	---	1.6c	1.2c	3.1c	2.9c	58.5	32.7	20.2	43.0	sicl
B_{2m}	---	1.2d	1.4d	4.9d	4.9d	27.8	59.8	16.6	19.1	c
B_{3m}	---	6.8d	7.0d	16.8d	12.9d	26.9	29.6	33.8	15.5	cl
C	---	11.8d	11.0d	21.8d	13.6d	22.1	19.7	34.8	12.6	fsl

Engineering Characteristics

Horizon	Percentage Passing Sieve Size In Inches 2.0	1.5	1.0	.75	.375	In Millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than In Millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Maximum Dry Density[6] (Pounds per Cubic Foot)	Optimum H_2O[6] (Percent)	Classification Unified	A.A.S.H.O.
A_p	---	---	---	---	---	100	97	90	88	83	81	68	45	32	26	40	17	106	19	CL	A-6(11)
A-B	---	---	---	---	---	100	96	89	87	82	79	70	44	30	23	40	18	106	18	CL	A-6(11)
B_{2m}	---	---	---	---	---	---	100	99	98	91	89	82	70	62	57	94	60	88	29	CH	A-7-5(20)
B_{3m}	---	---	---	---	---	---	100	93	86	67	62	50	41	34	29	57	29	96	25	MH-CH	A-7-6(17)
C	---	---	---	---	---	100	97	78	69	46	40	29	24	17	14	40	15	107	20	SM-SC	A-6(4)

a. Common, organic matter
b. Few, lt. brown concr. (Fe-Mn?)
c. Common, lt. brown concr. (Fe-Mn?)
d. Common, lt. brown concr. (Fe-Mn?)

ELIOAK SILT LOAM

A_0 1-0" Dark reddish brown (5YR 3/2) partially decomposed forest litter and leaf mold.

A_2 0-6" Yellowish brown (10YR 5/4) friable silt loam with weak fine granular structure; roots and root holes are numerous.

A_3 6-9" Strong brown (7.5YR 5/6) friable silt loam with very weak fine subangular blocky structure; contains many small pores and numerous roots.

B_{21} 9-12" Yellowish red (5YR 5/6) friable silty clay loam with moderate medium to fine subangular blocky structure; contains a few small roots.

B_{22} 12-35" Red (2.5YR 4/6) friable clay with moderate medium subangular blocky structure; contains numerous small mica flakes.

C_1 35-50" Mottled red, reddish yellow and yellow very friable micaceous clay loam with very weak fine subangular blocky structure; contains many soft schist fragments.

C_2 50-55" Reddish yellow (5YR 6/6) very friable loamy soft micaceous soil material. About half of this layer consists of moderately hard finely laminated schist.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_2	4.42	2.9	2.50	0.064	2.56	0.16	0.14	0.14	8.50	8.94	4.92
A_3	4.53	4.8	2.74	0.071	4.97	0.14	0.14	0.18	8.78	9.24	4.98
B_{21}	4.40	4.3	0.92	0.032	0.70	0.04	0.14	0.18	8.22	8.58	4.20
B_{22}	4.85	2.2	0.36	0.018	0.35	0.10	1.44	0.42	11.37	13.33	14.70
C_1	5.09	2.7	0.23	-----	0.22	0.06	0.62	0.26	7.84	8.78	10.71
C_2	5.23	1.7	0.16	-----	0.11	0.12	0.32	0.12	4.94	5.50	10.18

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_2	0.1a	1.5b	1.7b	5.9b	9.7b	63.0	18.1	34.2	42.2	sil
A_3	0.1a	1.8b	1.8b	5.7b	9.2b	63.5	17.9	31.2	45.0	sil
B_{21}	---	1.5b	1.5b	4.6b	7.2b	56.8	28.4	27.6	39.2	sicl
B_{22}	---	0.9b	1.1b	3.8b	6.2b	39.1	48.9	20.1	27.6	c
C_1	---	2.9c	3.1c	10.4c	15.3c	37.2	31.1	36.8	22.3	cl
C_2	0.2	5.0c	4.6c	16.8c	22.7c	33.4	17.3	46.7	19.9	l

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] per-cent	Classification unified	A.A.S.H.O.
A_2 and A_3	---	---	100	98	97	96	94	91	89	82	77	60	33	21	14	30	6	106	17	ML-CL	A-4(8)
B_{22}	---	100	99	98	97	95	93	91	90	84	83	72	54	46	42	55	22	100	23	MH	A-7-5(16)
C_2	100	98	93	88	81	76	70	66	63	50	45	34	18	13	11	42	2	103	21	SM	A-5(3)

a. Common, organic matter

b. Few, smooth lt. brown concr. (Fe-Mn?) Few, white flakes (Mica?)

c. Few, smooth lt. brown concr. (Fe-Mn?) Many, white flakes (Mica?)

ENON SILT LOAM

A_p 0-6" Dark yellowish brown (10YR 4/4) very friable silt loam; weak fine granular structure; contains many grass roots and a few small quartz gravel.

B_1 6-9" Strong brown (7.5YR 5/8) silty clay loam with moderate medium subangular blocky structure; contains a few roots and small quartz gravel.

B_2 9-20" Strong brown (7.5YR 5/6) friable silty clay (plastic when wet); moderate medium to coarse subangular blocky structure; peds contain thin clay coatings that are slightly lighter in color than broken peds; boundary gradual.

B_3 20-32" Strong brown (7.5YR 5/6) mingled with yellowish red and reddish yellow plastic clay with weak fine subangular blocky structure.

C 32-42" Mottled yellow, brownish yellow, red, strong brown, pale brown and light gray very compact silty clay loam; contains a few small quartz gravel and partly weathered basic rock fragments; layer is underlaid by hard greenish basic rock.

Chemical Characteristics

Horizon	pH	Truog P (ppm.)	Organic Matter (Percent)	Organic Nitrogen (Percent) [1]	Exchangeable Manganese (ppm.)	Exchangeable Cations (Milli-equivalents per 100 grams of soil) Ca	Mg	K	Na	H	Total [2]	Base Saturation (Percent)
A_p	5.98	4.6	2.05	0.079	3.79	4.46	0.64	0.06		3.40	8.56	60.28
B_1	5.17	2.9	0.61	0.021	0.04	4.42	1.34	0.06		6.10	11.92	48.83
B_2	4.69	1.9	0.41	0.013	0.09	2.74	2.58	0.08		9.63	15.03	35.93
B_3	4.68	2.4	0.26	0.008	0.04	1.16	3.24	0.10		16.14	20.64	21.80
C	4.87	1.9	0.21	———	0.04	0.60	2.10	0.06		10.29	13.05	21.15

Phraical Characteristics

Horizon	Particle Size Distribution (Percent—In Millimeters) Very Coarse Sand 2.0 to 1.0	Coarse Sand 1.0 to .5	Medium Sand .5 to .25	Fine Sand .25 to .10	Very Fine Sand .10 to .05	Silt .05 to .002	Clay Less Than .002	.2 to .02	.02 to .002	Textural Class
A_p	0.1a	2.5b	2.6b	10.2b	11.0b	60.4	13.2	40.2	37.6	sil
B_1	———	1.1b	1.2b	4.7b	6.4b	53.2	33.4	24.7	37.9	sicl
B_2	———	0.8b	1.0b	4.8b	7.3b	43.9	42.2	23.0	31.4	sic
B_3	———	0.7b	0.8b	3.6b	5.6b	32.4	56.9	16.2	24.2	c
C	———	1.4b	1.4b	6.4b	8.1b	53.0	29.7	27.3	37.9	sicl

Engineering Characteristics

Horizon	Percentage Passing Sieve Size In Inches 2.0	1.5	1.0	.75	.375	In Millimeters 4.7	2.0	.42	.25	.074	.05 [3]	Percentage Smaller Than In Millimeters .02	.005	.002	.001	L.L. [4]	P.I. [5]	Maximum Dry Density [6] (Pounds per Cubic Foot)	Optimum H_2O [6] (Percent)	Classification Unified	A.A.S.H.O.
A_p	100	97	92	91	88	86	78	70	68	58	52	38	18	12	8	27	5	114	14	ML-CL	A-4(5)
B_2	---	---	---	---	---	100	98	92	91	84	81	68	49	35	28	48	24	108	19	CL	A-7-6(15)
C	---	---	100	99	98	97	93	88	87	81	78	63	39	25	19	35	13	112	16	ML-CL	A-6(9)

a. Common, organic matter
b. Common, smooth lt. brown and black concr. (Fe-Mn?)

FAIRFAX SILT LOAM

A_0 1/2-0" Very dark gray and black partly decomposed forest litter.

A_1 0-1" Very dark grayish brown (10YR 3/2) very friable light silt loam with very fine weak granular structure; many small subangular quartzite gravel are scattered over the surface and imbedded in the horizon.

A_2 1-7" Light yellowish brown (10YR 6/4) very friable light silt loam with weak very fine granular structure.

B_1 7-10" Yellowish brown (10YR 5/8) friable silt loam with weak fine to medium subangular blocky structure; contains a few roots and small subangular quartz gravel.

B_{21} 10-15" Strong brown (7.5YR 5/6) friable loam with moderate medium to coarse subangular blocky structure; contains a few small mica flakes and small quartz gravel.

B_{22} 15-28" Strong brown (7.5YR 5/6) mottled with red firm clay loam; moderate medium subangular blocky structure; mottles common and distinct; contains many gravel and a few mica scales.

C_1 28-42" Mottled strong brown, yellowish brown, reddish yellow and red compact clay loam; contains numerous small roundish gravel; mottles are more prominent in lower part.

D_1 42-60" Distinctly mottled red, brown, light gray, white, and weak red highly micaceous loam mixed with quartz sericite schist.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_1	3.70	7.0	7.65	0.120	1.09	0.16	0.26	0.14	12.01	12.57	4.46
A_2	4.20	4.1	2.20	0.033	0.00	0.06	0.06	0.08	7.25	7.45	2.68
B_1	4.22	5.5	0.90	0.023	0.00	0.00	0.06	0.06	6.76	6.88	1.74
B_{21}	4.21	3.4	0.88	0.019	0.00	0.00	0.08	0.08	7.96	8.12	1.97
B_{22}	4.45	2.7	0.48	0.014	0.26	0.00	0.36	0.10	11.75	12.21	3.77
C_1	4.87	2.7	0.11	-----	0.00	0.00	0.70	0.10	11.46	12.26	6.53
D_1	4.42	3.6	0.12	-----	0.07	0.00	0.64	0.08	14.94	15.66	4.60

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_1	---	4.9a	3.6a	12.8a	21.3a	50.2	7.2	49.9	29.8	sil
A_2	---	2.4a	2.4a	9.5a	20.6a	54.0	11.1	47.5	33.5	sil
B_1	---	2.4a	2.0a	7.8a	17.3a	51.5	19.0	41.7	32.4	sil
B_{21}	---	2.1a	1.9a	7.3a	16.1a	49.9	22.7	39.0	31.9	l
B_{22}	---	1.9a	1.7a	7.2a	16.6a	39.6	33.0	39.2	22.0	cl
C_1	---	1.9a	1.9a	8.0a	17.9a	40.1	30.2	39.5	24.1	cl
D_1	0.1	0.4a	0.9a	9.7a	25.3a	37.8	25.8	49.5	21.5	l

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	Percentage Passing Sieve Size in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] per-cent	Classification unified	A.A.S.H.O.
A_2	---	100	96	94	91	87	83	79	76	63	53	35	19	12	7	23	3	112	13	ML	A-4(6)
B_{21} & B_{22}	100	99	97	97	96	94	91	89	74	67	54	43	37	32	51	23	107	18	MH-CH	A-7-6(15)
C_1	---	---	100	98	93	89	85	82	80	69	62	48	35	28	24	42	16	110	16	ML-CL	A-7-6(10)
D_1	---	---	---	---	---	---	---	100	99	81	69	54	39	32	24	49	18	105	19	ML	A-7-5(13)

a. Few, irregular lt. brown concr. (Fe?) Few, white flakes (Mica?)

GLENELG LOAM

A_0	2-0"	Dark reddish brown (5YR 2/2) well decomposed forest debris and roots.
A_1	0-2"	Dark brown (7.5YR 4/2) friable loam with weak fine granular structure; contains many roots.
A_2	2-7"	Yellowish brown (10YR 5/4) friable loam with weak fine granular structure; contains numerous small roots.
B_1	7-13"	Strong brown (7.5YR 5/6) friable, moderate fine subangular blocky loam, faintly mottled with light brown and yellowish red.
B_2	13-22"	Yellowish red (5YR 5/6) friable clay loam with moderate fine subangular blocky structure; mica flakes are common and roots numerous; contains few small angular quartz and small schist fragments.
B_3	22-28"	Yellowish red (5YR 5/6) very friable micaceous loam with weak fine to very fine subangular blocky structure.
C	28-72"	Mottled light reddish brown, light gray, gray, pink and yellowish red soft micaceous silt loam soil material; no definite structure; some of the freshly weathered schist present has fine laminated rock structure.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_1	3.82	5.5	5.55	0.116	0.07	0.12	0.24	0.16	14.80	15.32	3.39
A_2	4.12	5.3	2.06	0.049	0.22	0.08	0.12	0.12	8.47	8.79	3.64
B_1	4.32	2.7	1.38	0.043	0.22	0.08	0.10	0.18	8.50	8.86	4.06
B_2	4.30	3.1	1.26	0.044	0.22	0.06	0.16	0.20	10.01	10.43	4.03
B_3	4.85	1.7	0.21	0.013	0.11	0.00	0.64	0.14	6.22	7.00	11.14
C	4.96	2.4	0.08	-----	0.15	0.02	0.10	0.06	2.90	3.08	5.84

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_1	0.3a	1.6b	2.5b	11.8b	22.2b	49.2	12.4	50.6	28.8	l
A_2	0.1	1.4b	2.4b	11.4b	21.5b	49.1	14.1	48.4	29.8	l
B_1	---	0.9b	1.8b	8.2b	16.3b	48.4	24.4	37.1	33.2	l
B_2	---	1.0b	1.4b	6.6b	13.8b	45.6	31.6	33.4	30.4	cl
B_3	0.1	1.3b	1.7b	8.4b	19.4b	48.4	20.7	44.4	29.3	l
C	0.1	0.8b	1.1b	8.3b	30.1b	54.4	5.2	68.9	21.9	sil

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	Percentage Passing Sieve Size in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] per-cent	Classification unified	A.A.S.H.O.
A_2	---	100	99	97	94	91	89	87	85	70	62	42	24	16	13	30	5	108	16	ML	A-4(7)
B_2	---	100	98	98	98	97	96	94	92	80	74	57	38	29	26	48	17	102	21	ML	A-7-5(12)
C	---	---	---	---	---	100	99	98	97	82	72	41	15	8	5	46	5	99	20	ML	A-5(8)

a. Common, organic matter
b. Few, irregular lt. brown concr. (Fe?) Few, white flakes (Mica?)

IREDELL SILT LOAM

A_p	0-7"	Brown (10YR 4/3) very friable silt loam with weak fine granular structure; roots are numerous.
A_3	7-11"	Dark yellowish brown (10YR 4/4) friable silt loam mottled with dark grayish brown and very dark grayish brown; abrupt boundary.
B_2	11-26"	Dark brown (10YR 3/4) extremely plastic clay; massive; some black mineral specks in the lower part of this horizon.
B_3	26-29"	Predominantly dark yellowish brown (10YR 4/4) plastic sticky sandy clay loam; mottled with yellowish brown; massive structure.
C	29-32"	Mottled olive brown, dark yellowish brown, white and black compact sandy loam.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_p	5.12	2.7	1.50	0.056	22.53	2.46	1.54	0.10	8.27	12.37	33.14
A_3	4.91	1.9	0.68	0.031	12.25	3.22	3.02	0.06	9.06	15.36	41.02
B_2	5.84	1.9	0.85	0.031	2.63	15.14	19.32	0.34	7.56	42.36	82.15
B_3	6.47	28.9	0.32	-----	1.29	8.64	19.12	0.20	4.19	32.15	86.97
C	6.51	47.7	0.14	-----	0.40	12.70	10.82	0.12	2.94	26.58	88.94

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_p	-	6.6a	3.1a	6.4a	7.8a	60.7	15.4	33.1	39.5	sil
A_3	-	3.7a	2.4a	5.0a	6.2a	59.0	23.7	27.8	40.5	sil
B_2	-	3.0a	1.8a	4.4a	5.2a	24.1	61.5	15.3	16.7	c
B_3	-	12.2a	8.0a	14.7a	12.5a	23.7	28.9	31.2	13.3	scl
C	-	21.9a	11.7a	17.6a	14.2a	22.2	12.4	34.2	11.9	sl

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] per-cent	Classification Unified	A.A.S.H.O.
A_p	---	100	99	98	98	98	98	86	83	76	72	54	28	17	14	27	5	111	16	ML-CL	A-4(8)
B_2	---	---	---	---	---	---	100	94	91	84	81	73	63	57	53	80	50	93	26	CH	A-7-5(20)
C	---	---	---	---	---	100	97	69	59	43	35	26	17	14	12	36	15	120	15	SC	A-6(3)

a. Few, lt. brown and black concr. (FeMn?)

A_p 0-7" Grayish brown to dark grayish brown (10YR 5/2 - 4/2) very friable silt loam with weak very fine granular structure.

B_{21} 7-16" Light yellowish brown (2.5Y 6/4) friable silty clay loam with weak fine to medium subangular blocky structure.

B_{22} 16-25" Yellowish brown (10YR 5/4) plastic silty clay faintly mottled with pale brown, light gray and strong brown; the structure is moderate medium subangular blocky; angular quartz gravel from 1/4 to 1 inch common in lower part.

B_{m1} 25-34" Light olive brown (2.5Y 5/4) very plastic and sticky massive clay; contains a few small black mineral concretions; faintly mottled shades of light gray, yellow, black and reddish yellow in lower part.

B_{m2} 34-39" Light olive brown (2.5Y 5/4) mottled with gray, light gray and yellowish brown very plastic massive clay; abrupt boundary.

D 39-41" Gray (2.5Y 6/0) sandy loam mixed with partly weathered baked shaly sandstone.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_p	5.53	8.2	3.02	0.080	4.82	4.16	0.34	0.12	4.73	9.35	49.41
B_{21}	4.42	1.0	0.37	0.021	0.02	0.84	0.96	0.10	11.38	13.28	14.31
B_{22}	4.50	1.9	0.28	0.016	0.04	0.26	2.66	0.10	13.20	16.22	18.62
B_{m1}	4.41	1.0	0.32	-----	0.06	0.18	6.12	0.18	20.16	26.64	24.32
B_{m2}	4.41	1.7	0.22	-----	0.07	0.14	7.92	0.20	19.13	27.39	30.16
D	5.20	1.0	0.05	-----	0.07	0.46	3.10	0.04	6.10	9.70	37.11

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-.10	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_p	0.1a	2.2ab	1.8b	2.9b	3.3b	75.2	14.5	34.0	46.1	sil
B_{21}	---	1.5b	1.4b	2.7b	2.9b	60.1	31.4	24.1	40.4	sicl
B_{22}	---	0.8c	0.8c	2.1c	2.9c	52.1	41.3	23.2	33.1	sic
B_{m1}	---	0.3c	0.3c	0.8c	1.6c	31.6	65.4	13.5	20.2	c
B_{m2}	---	0.7c	0.5c	0.9c	0.9c	35.7	61.3	9.6	27.5	c
D	---	19.3	10.5	11.4	9.2	44.7	4.9	34.9	24.6	sl

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] per-cent	Classification unified	A.A.S.H.O.
A_p	---	---	---	---	---	100	99	95	93	89	87	67	31	18	14	27	4	107	17	ML-CL	A-4(8)
B_{21}	---	---	---	---	---	100	98	94	93	90	89	73	44	30	26	38	14	109	18	ML-CL	A-6(10)
B_{22}	---	---	---	---	---	100	99	97	96	94	92	79	56	48	44	60	33	101	22	CH	A-7-6(20)
B_{m1} and B_{m2}	---	---	---	---	---	---	100	99	99	98	97	89	75	69	67	98	64	87	30	CH	A-7-5(20)

a. Mostly organic matter
b. Common, smooth lt. and dk. brown concr. (Fe?)
c. Few, smooth lt. and dk. brown concr. (Fe?)

LENOIR SILT LOAM

A_1 0-1" Light brownish gray to light olive brown friable silt loam with weak very fine granular structure.

A_2 1-6" Light yellowish brown (10YR 6/4) friable weak very fine granular silt loam; contains numerous roots.

B_{21} 6-15" Pale yellow (2.5Y 7/4) silt loam with many faint mottles of light gray; structure is moderate to strong coarse subangular blocky; mottles become more prominent with depth.

B_{22} 15-40" Gray (10YR 5/1) plastic clay containing numerous coarse mottles of brownish yellow and white; structure is strong coarse angular blocky; brownish yellow mottles increase with depth.

B_3 40-47" Light gray to white mottled with brownish yellow heavy clay loam; contains many gray skins and streaks along root channels.

C 47-67" Light gray mottled with brownish yellow loam interspersed with strata of sandy clay loam soil material; many thin clay skins of gray present on faces of soil peds.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_1	4.42	11.6	6.04	0.169	26.95	0.10	0.26	0.22	15.15	15.73	3.69
A_2	4.37	6.0	2.79	0.093	17.84	0.12	0.16	0.10	11.81	12.19	3.12
B_{21}	4.30	3.9	0.79	0.038	6.18	0.00	0.24	0.08	9.10	9.42	3.40
B_{22}	4.51	1.9	0.23	0.056	0.02	0.00	1.44	0.16	27.20	28.80	5.56
B_3	4.30	2.7	0.11	-----	0.04	0.00	1.36	0.18	13.38	14.92	10.32
C	4.48	1.4	0.12	-----	0.02	0.00	1.12	0.14	9.89	11.15	11.30

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_1	0.1	0.7a	0.8a	2.6a	3.0a	70.2	22.6	23.4	51.4	sil
A_2	---	0.5a	0.8a	2.2a	2.5a	70.4	23.6	22.9	51.4	sil
B_{21}	---	0.4a	0.6a	1.7a	2.2a	69.7	25.4	21.8	51.2	sil
B_{22}	---	0.1a	0.2a	1.5a	2.5a	39.1	56.6	11.6	31.1	c
B_3	---	0.6	1.7	10.7	14.0	40.7	32.3	36.0	26.3	cl
C	---	0.8	2.8	22.6	23.6	29.0	21.2	52.9	15.8	l

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	Percentage Passing Sieve Size in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] per cent	Classification unified	A.A.S.H.O.
A_2	---	---	---	---	---	---	100	99	98	94	92	73	40	25	19	36	8	101	20	ML	A-4(8)
B_{21}	---	---	---	---	---	---	---	---	100	97	95	76	47	30	22	33	10	108	18	ML-CL	A-4(8)
B_{22}	---	---	---	---	---	---	---	---	100	96	94	82	66	53	46	59	30	99	23	MH-CH	A-7-6(20)
C	---	---	---	---	---	---	100	99	96	65	50	30	22	18	17	26	8	116	14	CL	A-4(6)

a. Common, smooth lt. and dk. brown concr. (Fe?)

LUNT COARSE SANDY LOAM

A_p	0-9"	Dark brown (7.5YR 4/4) very friable moderate granular coarse sandy loam; contains a profuse mat of grass roots in upper 4 inches.
B_1	9-12"	Strong brown (7.5YR 5/6) sticky, slightly plastic loam with weak medium subangular blocky structure; gradual boundary.
B_{21}	12-26"	Strong brown (7.5YR 5/6) to brown (7.5YR 5/4) friable, heavy clay loam, sticky and plastic when wet; weak medium subangular blocky structure; few black mineral specks and small quartz gravel.
B_{22}	26-33"	Strong brown (7.5YR 5/6) friable sandy clay loam (sticky and plastic when wet); weak medium subangular blocky structure; contains many black mineral specks and few small roots; gradual boundary.
B_3	33-45"	Strong brown (7.5YR 5/6) slightly plastic sandy clay loam, mottled with yellowish brown and reddish yellow; contains some small roundish gravel.
C	45-60"	Mottled strong brown, dark brown, reddish yellow, light olive brown, light yellowish brown and light gray, friable sandy clay loam material mixed with many small roundish gravel and iron concretions.

Chemical Characteristics

Horizon	pH	Truog P (ppm.)	Organic Matter (Percent)	Organic Nitrogen 1/ (Percent)	Exchangeable Manganese (ppm.)	Exchangeable Cations (Milli-equivalents per 100 grams of soil) Ca	Mg	K	Na	H	Total 2/	Base Saturation (Percent)
A_p	5.12	1.0	1.59	0.065	8.31	1.92	0.30	0.16		4.94	7.32	32.51
B_1	5.36	2.9	0.48	0.021	0.04	4.80	1.54	0.22		4.59	11.15	58.83
B_{21}	4.82	3.1	0.46	0.029	0.00	5.38	2.60	0.28		9.39	17.65	46.80
B_{22}	4.61	5.5	0.17	----	0.07	4.10	3.54	0.26		9.69	17.59	44.91
B_3	4.54	3.1	0.12	----	0.00	3.62	3.26	0.26		10.84	17.98	39.71
C	4.61	4.6	0.12	----	1.25	3.56	3.98	0.28		10.24	18.06	43.30

Physical Characteristics

Horizon	Particle Size Distribution (Percent—In Millimeters) Very Coarse Sand 2.0 to 1.0	Coarse Sand 1.0 to .5	Medium Sand .5 to .25	Fine Sand .25 to .10	Very Fine Sand .10 to .05	Silt .05 to .002	Clay Less Than .002	.2 to .02	.02 to .002	Textural Class
A_p	0.1a	35.2a	11.8a	7.5a	4.6a	31.3	9.5	19.7	19.6	cosl
B_1	----	25.3a	6.7a	3.7a	2.0a	39.5	22.8	12.5	30.6	l
B_{21}	0.1a	15.0a	4.3a	3.0a	1.8a	39.5	36.3	11.5	31.2	cl
B_{22}	0.1	29.1	10.8	7.6	3.6	18.1	30.7	12.7	12.5	scl
B_3	0.1	27.8	9.9	6.7	3.8	20.3	31.4	13.1	14.1	scl
C	0.1	23.6	10.4	12.1	6.0	20.0	27.8	18.5	13.2	scl

Engineering Characteristics

Horizon	Percentage Passing Sieve Size In Inches 2.0	1.5	1.0	.75	.375	In Millimeters 4.7	2.0	.42	.25	.074	.05 3/	Percentage Smaller Than In Millimeters .02	.005	.002	.001	L.L. 4/	P.I. 5/	Maximum Dry Density 6/ (Pounds per Cubic Foot)	Optimum H_2O 6/ (Percent)	Classification Unified	A.A.S.H.O.
A_p	---	---	---	---	---	---	100	64	50	41	39	31	20	13	7	29	6	120	12	SM-SC	A-4(1)
B_{21}	---	---	---	---	---	---	100	85	79	75	75	66	46	35	28	55	28	106	18	CH	A-7-6(18)
C	100	89	88	85	76	69	62	43	34	27	25	22	19	15	12	49	24	116	13	SC	A-2-7(2)

a. Few, irregular black concr. (Mn?)

LUNT SANDY LOAM

A_1 0-1" Dark grayish brown (10YR 4/2) very friable sandy loam with weak very fine to fine granular structure.

A_2 1-9" Dark yellowish brown (10YR 4/4) very friable sandy loam (slightly sticky when wet); very fine weak granular structure.

B_2 9-18" Brown to dark brown (7.5YR 5/4 - 4/4) to dark yellowish brown plastic and sticky heavy sandy clay loam having weak fine to medium subangular blocky structure; roots and worm holes common.

B_3 18-21" Yellowish brown (10YR 5/6) friable (slightly sticky and plastic when wet) heavy sandy clay loam to sandy loam with weak fine very fine subangular blocky structure. Black mineral streaks show on cut surfaces.

C_1 21-46" Yellow, mottled and streaked with yellowish brown, strong brown, white and pale brown very friable sandy clay loa- soil material; when wet this material is somewhat sticky.

C_2 46" + White, pale brown and brownish yellow very friable coarse sandy loam; roundish gravel up to 1 inch occur in lower part.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic[1] Nitrogen percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_1	5.09	7.2	2.87	0.108	5.96	4.86	1.90	0.30	6.34	13.40	52.69
A_2	4.83	2.9	1.25	0.054	4.07	3.46	1.74	0.22	6.50	11.92	45.47
B_2	4.61	6.3	0.49	0.029	1.77	4.76	3.60	0.26	12.03	20.65	41.74
B_3	4.67	6.3	0.23	0.016	7.10	3.02	3.80	0.18	10.87	17.87	39.17
C_1	4.51	6.8	0.19	-----	0.02	1.48	2.62	0.12	11.84	16.06	26.28
C_2	4.40	10.4	0.05	-----	0.29	0.52	2.38	0.10	11.60	14.60	20.55

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_1	0.2	18.0	23.0	26.1	4.4	13.7	14.6	18.0	8.8	sl
A_2	0.1	17.5	23.1	26.3	4.1	13.0	15.9	17.6	8.2	sl
B_2	---	20.7	22.1	15.2	2.2	7.3	32.5	8.6	5.3	scl
B_3	---	17.9	24.1	19.8	2.5	6.8	28.9	10.2	4.7	scl
C_1	---	9.8	22.2	35.3	3.0	7.1	22.6	16.5	4.7	scl
C_2	---	27.5	20.2	23.9	3.2	6.6	18.6	13.4	4.5	cosl

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] per-cent	Classification unified	A.A.S.H.O.
A_2	---	---	---	---	---	---	100	85	59	33	31	27	21	17	14	27	9	113	14	SC	A-2-4(0)
B_2	---	---	---	---	---	---	100	86	62	44	42	37	35	31	30	54	28	101	19	SC	A-7-6(8)
C_1	---	---	---	---	---	---	100	90	66	30	29	27	25	22	21	42	16	106	17	SM-SC	A-2-7(1)

MANASSAS SILT LOAM

A_p	0-10"	Dark reddish brown (5YR 3/4) very friable silt loam with moderate fine granular structure; contains many grass roots.
B_2	10-19"	Reddish brown (5YR 4/4) friable loam with moderate fine subangular blocky structure, slightly sticky and plastic when wet.
B_3	19-34"	Dark reddish brown (5YR 3/4) very friable fine sandy loam with weak fine subangular blocky structure; numerous small black concretions of soft weathered mineral materials present.
C	34-37"	Reddish brown (2.5YR 4/4) and dark reddish brown (2.5YR 3/4) loam mixed with soft friable shaly sandstone material.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil)					Base Saturation percent
						Ca	Mg	K	H	Total[2]	
A_p	5.68	3.9	1.66	0.086	16.67	4.40	0.42	0.12	6.18	11.12	44.42
B_2	4.66	1.7	0.15	0.014	1.18	3.02	1.22	0.14	6.79	11.17	39.21
B_3	4.67	2.2	0.09	0.012	8.46	1.96	1.88	0.18	6.75	10.77	37.33
C	4.71	3.4	0.07	-----	9.16	1.44	1.58	0.20	5.33	8.55	37.66

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters)									Textural Class
	Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	
A_p	---	2.3a	2.5a	8.6a	9.6a	59.8	17.2	38.8	35.8	sil
B_2	---	4.6a	5.2a	14.1a	12.7a	42.8	20.6	38.0	25.7	l
B_3	0.1	5.1a	7.1a	25.5a	15.2a	29.0	18.0	46.7	15.8	fsl
C	---	6.9a	5.9a	13.0a	17.5a	41.5	15.2	47.1	19.7	l

a. Many, smooth lt. brown and reddish concr. (Fe?)

MANOR LOAM

A_p 0-8" Light yellowish brown (10YR 6/4) friable loam faintly mottled with yellowish brown and strong brown; structure is very weak fine granular; contains numerous small mica flakes.

C 8-36" Mottled reddish yellow, pale yellow, pink, strong brown, pale brown and very dark grayish brown soft floury micaceous friable silt loam to very fine sandy loam with weak fine subangular blocky structure; mica content increases with depth. In the lower part of the horizon the material is stratified and distinctly laminated showing the original skeletal structure of the deeply weathered schist soil material.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_p	5.64	2.7	1.08	0.055	2.02	2.70	0.26	0.10	2.93	5.99	51.09
C	5.07	0.7	0.11	-----	0.04	0.78	0.20	0.06	1.85	2.89	35.99

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_p	0.1a	1.1a	1.3a	12.6a	28.7a	43.0	13.2	57.3	24.2	l
C	0.1a	1.2a	1.2a	10.6a	31.6a	50.2	5.1	61.8	28.7	sil-vfsl

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max.Dry Dens. lb./cu. ft.[6]	Opt. H_2O percent[6]	Classification unified	A.A.S.H.O.
A_p	---	---	---	100	99	98	96	95	94	72	60	40	21	15	12	34	4	107	17	ML	A-4(7)
C	---	---	---	---	---	---	100	99	98	73	61	37	14	6	2	35	1	102	19	ML	A-4(8)

a. Few, irregular lt. brown concr. (Fe?)

MATAPEAKE SILT LOAM

A_1	0-2"	Dark brown to very dark yellowish brown (10YR 4/3 - 4/4) friable silt loam; moderate medium to fine granular structure.
A_2	2-8"	Yellowish brown to dark yellowish brown (10YR 5/4 - 4/4) very friable weak fine granular silt loam; contains many roots.
B_1	8-14"	Strong brown (7.5YR 5/6) silt loam; moderate medium subangular blocky structure; contains a few small black mineral specks.
B_{21}	14-22"	Strong brown (7.5YR 5/6) to yellowish red friable clay loam (slightly plastic when wet); structure is weak moderate medium subangular blocky.
B_{22}	22-38"	Strong brown (7.5YR 5/6) clay loam, faintly splotched with yellowish red and pale brown in lower part; structure is moderate medium subangular blocky; contains many black mineral skins and black concretions.
B_{31}	38-44"	Strong brown (7.5YR 5/6) mottled with pale brown, friable loam to sandy clay loam; the very weak medium platy structure crushes easily to weak fine angular blocky; this layer is slightly compacted.
C_1	44-52"	Strong brown (7.5YR 5/6) slightly compact loam mottled with yellowish red, pale brown and light brown; mottles are common, medium and distinct.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_1	4.24	7.5	4.61	0.119	28.24	0.42	0.22	0.20	10.72	11.56	7.27
A_2	4.62	2.2	1.19	0.056	24.65	0.24	0.16	0.16	6 33	6.89	8.13
B_1	4.62	3.6	0.57	0.036	13.69	0.54	0.64	0.24	7.75	9.17	15.49
B_{21}	4.78	3.4	0.23	0.029	5.33	0.24	1.54	0.30	8.07	10.15	20.49
B_{22}	4.64	4.6	0.21	0.032	1.03	0.16	1.38	0.36	9.56	11.46	16.58
B_{31}	4.79	1.9	0.17	-----	0.77	0.10	1.16	0.24	7.72	9.22	16.27
C_1	4.72	2.9	0.17	-----	1.18	0.08	1.08	0.18	8.02	9.36	14.32

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_1	0.1	0.8a	1.6a	13.0a	14.8a	56.5	13.2	44.0	36.3	sil
A_2	---	0.6a	1.6a	11.9a	14.0a	56.7	15.2	41.6	37.4	sil
B_1	---	0.5a	1.2a	9.1a	11.1a	53.1	25.0	35.0	35.8	sil
B_{21}	---	0.3a	1.0a	9.8a	13.2a	46.2	29.5	36.0	30.8	cl
B_{22}	---	0.2a	0.8a	16.3a	18.8a	32.7	31.2	45.4	19.2	cl
B_{31}	---	---	0.4a	22.8a	27.4a	28.0	21.4	61.3	14.0	l/scl
C_1	---	0.2a	2.5a	17.7a	23.2a	35.6	20.8	52.1	18.6	l

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] percent	Classification unified	A.A.S.H.O.
A_2	---	---	---	---	---	---	100	99	97	79	73	54	29	20	15	23	4	111	15	ML-CL	A-4(8)
B_{22}	---	---	---	---	---	---	---	100	99	77	69	55	41	33	29	37	15	111	17	CL	A-6(10)
C_1	---	---	---	---	---	---	---	100	98	68	58	40	29	24	22	29	9	114	15	CL	A-4(7)

a Common, smooth lt. brown concr. (Fe?)

MAYODAN SILT LOAM

A_2	0-7"	Light yellowish brown (10YR 6/4) very friable silt loam with weak fine to medium subangular blocky structure; contains much roundish quartz gravel up to 3 inches in diameter.
B_1	7-12"	Yellowish brown (10YR 5/6) friable loam with moderate medium subangular blocky structure; boundary gradual.
B_{21}	12-20"	Strong brown (7.5YR 5/6) friable clay with moderate medium subangular blocky structure; small angular and roundish gravel common.
B_{22}	20-32"	Strong brown (7.5YR 5/8) friable clay with moderate fine subangular blocky structure; faint mottles of brownish yellow; some small mica flakes and partly weathered red and brownish shaly sandstone particles present.
B_3	32-36"	Mottled strong brown, yellowish red and brownish yellow friable clay; weak fine to medium subangular blocky structure; contains many partly weathered and shaly sandstone fragments; roundish and subangular quartz gravel also present.
C	36-42"	Mottled red, brownish yellow, pink, and reddish brown friable loam soil material mixed with red and brownish weathered shaly sandstone fragments (50% or more).

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_2	4.35	3.1	1.67	0.046	1.10	0.30	0.08	0.20	6.78	7.36	7.88
B_1	4.28	2.9	0.76	0.033	0.00	0.18	0.12	0.10	8.96	9.36	4.27
B_{21}	4.32	2.2	0.72	0.029	0.52	0.18	0.76	0.18	13.11	14.23	7.87
B_{22}	4.58	1.0	0.28	-----	0.00	0.02	1.26	0.20	17.68	19.16	7.72
B_3	4.77	0.2	0.18	-----	0.00	0.02	1.04	0.14	15.89	17.09	7.02
C	4.72	1.0	0.11	-----	0.00	0.00	0.66	0.08	8.62	9.36	7.91

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_2	---	3.9a	4.7a	11.9a	10.3a	55.4	13.8	34.2	38.2	sil
B_1	---	3.2a	3.7a	9.9a	9.2a	47.1	26.9	28.7	33.3	l
B_{21}	---	2.6a	3.0a	8.5a	8.5a	36.0	41.4	24.1	25.4	c
B_{22}	---	2.5b	2.6b	7.4b	8.1b	23.2	56.2	21.6	14.1	c
B_3	---	4.8b	4.0b	10.4b	11.7b	28.0	41.1	29.6	16.2	c
C	---	6.0b	5.0b	15.5b	20.5b	38.1	14.9	50.7	17.5	l

a. Common, smooth lt. brown concr. (Fe?)
b. Few, smooth lt. brown concr. (Fe?) Few, white flakes (Mica?)

MECKLENBURG SILT LOAM

A_p 0-8" Yellowish brown (10YR 5/4) friable silt loam with moderate medium granular structure; contains many grass roots.

B_2 8-22" Strong brown (7.5YR 5/6) firm clay with moderate to strong medium subangular blocky structure; lower part of this horizon is faintly specked with reddish yellow, dark brown and brownish yellow; gradual boundary.

B_3 22-32" Strong brown (7.5YR 5/6) mottled with yellowish brown and reddish yellow friable sandy clay loam (slightly plastic when wet); moderate medium to coarse subangular blocky structure; contains small fragments of basic rock materials in the lower part.

C 32-48" Mottled brownish yellow, pale brown and yellow loamy coarse sand soil material mixed with many diabase rock fragments; black specks and concretions are common; hard rock of diabase or syenite is usually less than 5 feet beneath the surface.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_p	5.86	2.9	2.06	0.089	14.75	6.94	3.42	0.12	6.85	17.33	60.47
B_2	6.10	0.0	0.83	0.037	5.85	13.74	7.88	0.18	7.45	29.25	74.53
B_3	6.46	17.6	0.47	0.017	2.39	9.86	4.94	0.12	4.54	19.46	76.67
C	6.30	64.9	0.08	-----	0.44	7.06	3.86	0.06	2.23	13.21	83.12

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_p	0.1	4.0a	3.2a	8.6a	8.1a	54.6	21.4	30.6	37.2	sil
B_2	---	5.6a	2.9a	6.9a	7.1a	37.1	40.4	21.5	26.7	c
B_3	---	17.9a	7.6a	14.3a	11.9a	25.0	23.3	30.0	14.9	scl
C	0.2	34.5a	12.0a	20.6a	10.9a	15.4	6.4	28.7	8.3	leos

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] percent	Classification Unified	A.A.S.H.O.
A_p	---	---	---	100	99	98	98	90	87	75	71	56	34	22	18	35	11	107	19	ML-CL	A-6(8)
B_2 and B_3	---	---	---	---	---	---	100	92	89	79	75	63	48	40	37	61	28	93	27	MH	A-7-5(19)
C	---	---	---	---	100	99	86	59	52	35	30	22	18	13	11	34	12	119	15	SM-SC	A-2-6(0)

a. Common, smooth lt. brown concr. (Fe?)

MONTALTO LOAM

A_p 0-7" Dark reddish brown to reddish brown (5YR 3/4 - 4/4) very friable moderate medium granular loam; contains a profuse mat of small grass roots and a few small pieces of dark colored rock fragments and black mineral concretions; abrupt boundary.

B_2 7-18" Red to dark red (2.5YR 4/6 - 3/6) friable clay loam; moderate medium to coarse subangular blocky structure which crushes sily to strong very fine and fine subangular blocky; contains a few Egyptian tumble bug larvae, red worms and some darker soil materials infiltrated from above.

B_3 18-27" Mottled red, black, reddish yellow and yellowish brown friable clay loam; structure is weak fine to medium subangular blocky that becomes less distinct in lower part; contains many black concretions and partly weathered small rock fragments. This layer varies in thickness from 9 to 20 inches.

C 27-37" Mottled red, black and yellow very friable sandy loam soil material mixed with many fine to coarse weathered fragments of diabase rock; structure is similar to structure of the weathered rock.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_p	5.58	10.4	3.64	0.179	12.36	5.60	1.46	1.40	6.84	15.30	55.29
B_2	5.86	6.0	0.78	0.038	2.83	6.58	2.28	0.44	10.03	19.33	48.11
B_3	5.07	4.8	0.29	0.017	6.81	6.82	5.18	0.26	12.37	24.63	49.78
C	4.92	17.4	0.24	----	5.41	6.22	3.78	0.32	13.12	23.44	44.03

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_p	0.1	7.7a	4.9a	10.6a	10.0a	41.1	25.6	29.7	27.4	l
B_2	---	6.9a	5.2a	10.4a	8.8a	31.3	37.4	26.4	19.7	cl
B_3	---	12.2a	7.0a	13.1a	10.0a	24.2	33.5	26.4	15.1	cl
C	0.1	23.4a	10.9a	17.1a	10.5a	19.4	18.6	28.1	10.7	sl

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	Percentage Passing Sieve Size in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] per-cent	Classification unified	A.A.S.H.O.
A_p	---	100	97	95	93	93	93	82	78	66	61	48	32	22	17	40	12	103	22	ML	A-6(7)
B_2	---	100	99	98	98	98	98	92	88	76	72	61	49	42	38	52	22	96	27	MH-CH	A-7-5(15)
B_3	---	---	---	---	---	---	100	89	83	68	63	52	41	36	33	52	22	97	26	MH-CH	A-7-5(13)
C	---	---	100	99	97	96	94	73	67	52	48	37	27	24	21	45	16	104	21	ML	A-7-6(6)

a. Common, smooth lt. brown concr. (Fe?)

MONTALTO LOAM

A_p 0-6" Brown (7.5YR 4/3) to dark reddish brown (5YR 3/6) very friable loam with moderate medium granular structure; contains many small diabase fragments and black concretions.

C_1 6-12" Dark red (2.5Y 3/6) to yellowish red (5YR 4/6) friable loam with very weak fine subangular blocky structure; soil is mixed with about 40% diabase rock fragments of yellowish red, black, reddish yellow, strong brown, white and pale brown colors.

C_2 12-24" Yellowish red (5YR 4/6) mottled with black, dark red, yellowish red, reddish yellow, strong brown and pale brown, very friable sandy loam from weathered diabase materials; depth to hard rock varies from a few inches to 4 feet.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_p	5.71	35.9	3.51	0.179	7.36	11.00	2.36	0.38	11.37	25.11	54.72
C_1	4.72	11.1	0.45	0.029	12.88	8.04	4.34	0.22	18.80	31.40	40.13
C_2	4.83	8.0	0.26	0.011	10.37	12.74	8.08	0.18	18.59	39.59	53.04

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_p	0.1	9.9a	6.4a	12.4a	10.3a	38.4	22.5	30.4	25.3	l
C_1	---	11.0a	8.2a	14.4a	9.4a	30.2	26.8	27.5	19.9	l
C_2	---	26.8a	12.1a	22.6a	4.2a	20.6	13.7	21.1	12.5	sl

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] percent	Classification unified	A.A.S.H.O.
A_p	100	93	87	84	81	78	71	58	54	44	41	32	21	16	12	38	11	108	20	SM	A-6(2)
C_1 and C_2	---	100	99	99	97	95	83	70	62	42	37	28	19	14	13	40	7	100	23	SM	A-4(1)

a. Common, smooth lt. brown concr. (Fe?)

ORANGE SILT LOAM

A_1 0-1" Grayish brown (10YR 5/2) very friable silt loam with weak very fine granular structure.

A_2 1-9" Light yellowish brown (2.5Y 6/4) very friable silt loam with weak very fine granular structure.

B_{21} 9-15" Light yellowish brown (10YR 5/4) to light olive brown friable silt loam with weak medium subangular blocky structure; a few small concretions occur in the lower part of this horizon.

B_{22} 15-23" Yellowish brown (10YR 5/6) mottled with strong brown and light gray plastic, heavy silt loam; the structure is strong to moderate fine to medium subangular blocky; gray mottles are most prevalent in the lower three inches just above the clay pan; abrupt boundary.

B_{2m} 23-41" Extremely plastic, massive yellowish brown (10YR 5/6) clay with a few mottles of light brownish gray, pale olive and strong brown (very hard when dry).

C 41-42" Black, white, green and gray weathered clay loam soil mixed with partly weathered dark colored rock.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_2	4.54	1.4	0.77	0.022	3.72	0.16	0.12	0.04	5.30	5.62	5.69
B_{21}	4.70	2.7	0.50	0.028	0.00	0.18	0.60	0.04	6.90	7.72	10.62
B_{22}	4.88	1.0	0.25	0.011	0.00	0.28	1.90	0.06	8.24	10.48	21.37
B_{2m}	4.82	1.0	0.37	0.014	0.00	3.96	10.08	0.14	11.90	26.08	54.37
C	5.19	1.0	0.32	-----	0.04	3.52	7.98	0.12	4.19	15.81	73.50

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_2	---	1.4a	1.4a	4.3a	6.1a	71.8	15.0	31.6	49.0	sil
B_{21}	---	1.4a	1.3a	4.0a	6.0a	68.5	18.8	29.9	47.2	sil
B_{22}	---	1.3a	1.2a	4.6a	7.5a	61.7	23.7	30.0	42.2	sil
B_{2m}	---	---	0.3b	2.3b	6.2b	27.3	63.9	18.7	16.5	c
C	---	8.0	4.9	10.7	14.9	29.2	32.3	36.5	14.2	cl

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] per-cent	Classification unified	A.A.S.H.O.
A_1&A_2	---	---	---	---	---	100	96	88	86	81	77	60	30	17	10	23	3	113	14	ML	A-4(8)
B_{21} and B_{22}	---	---	---	---	100	99	92	84	83	77	72	54	30	19	16	29	9	116	15	CL	A-4(8)
B_{2m}	---	---	---	---	---	100	97	93	93	90	87	77	65	60	58	86	53	91	28	CH	A-7-5(20)

a. Few, smooth lt. brown concr. (Fe?)
b. Few, smooth black concr. (Mn-Fe?)

PENN SILT LOAM

A_p 0-8" Dark reddish brown (2.5YR 2/4) very friable silt loam with moderate medium fine granular structure; a few small red soft shaly sandstone or silt stone fragments present in this horizon; also contains a few small mica flakes.

C_1 8-19" Dark reddish brown (2.5YR 3/4) friable silt loam soil material mixed with 10-50% of angular shaly sandstone fragments up to 2 inches in size; the rock fragments are soft and can easily be bored out with an auger; some pieces can be crushed between the fingers.

C_2 19-29" Red to dark reddish brown shaly sandstone fragments (75-90%) mixed with dark reddish brown loam soil material which grades into solid rock material at 29 inches.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_p	5.79	11.3	1.49	0.077	3.94	4.82	0.52	0.10	4.17	9.61	56.61
C_1	6.12	6.8	0.61	0.040	0.63	4.76	0.40	0.10	3.00	8.26	63.68
C_2	4.71	3.4	0.17	0.017	2.32	1.10	1.58	0.12	5.36	8.16	34.31

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_p	0.1a	3.3a	1.9a	4.9a	15.0a	60.6	14.2	47.9	31.1	sil
C_1	---	6.2a	3.0a	6.2a	15.0a	56.1	13.5	45.2	29.9	sil
C_2	---	7.3a	4.1a	8.9a	17.8a	47.9	14.0	47.0	24.3	l

Engineering Characteristics

Horizon	Percentage Passing Sieve Size in inches 2.0	1.5	1.0	.75	.375	Percentage Passing Sieve Size in millimeters 4.7	2.0	.42	.25	.074	Percentage Smaller Than in millimeters .05[3]	.02	.005	.002	.001	L.L.[4]	P.I.[5]	Max. Dry Dens.[6] lb./cu. ft.	Opt. H_2O[6] percent	Classification unified	A.A.S.H.O.
A_p	---	---	---	---	---	100	99	93	92	84	78	50	26	16	12	27	4	113	14	ML-CL	A-4(8)
C_1	---	---	---	---	---	---	100	98	97	87	77	46	22	15	10	26	3	115	14	ML	A-4(8)

a. Irregular porous dk. brown material. (Sandstone fragments?)

RARITAN SILT LOAM

A_p 0-8" Dark brown (10YR 4/3) very friable silt loam with weak very fine to fine granular structure.

B_1 8-11" Yellowish brown (10YR 5/6) mottled with dark yellowish brown, pale brown and very pale brown friable silt loam; strong medium angular blocky structure; mottles are many, prominent and large.

B_{21} 11-18" Mottled dark yellowish brown, very pale brown and light brownish gray silty clay loam with strong medium subangular blocky structure.

B_{22} 18-32" Mottled strong brown, dark reddish gray and light gray heavy silty clay loam with moderate medium subangular blocky structure; plastic clay with massive structure in lower part; abrupt boundary.

D_1 32-50" Dusky red (10R 3/3) mottled with strong brown heavy silty clay loam; angular blocky structure; few particles of red shaly sandstone rock material.

D_2 50-55" Mottled dusky red, reddish brown, yellowish red, reddish yellow, black, pinkish gray and pink silty clay loam soil material similar to that under Bucks soil.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_p	5.22	4.3	1.67	0.077	2.46	3.96	0.36	0.06	5.68	10.06	43.54
B_1	4.63	1.4	0.39	0.024	0.04	1.70	0.66	0.06	9.66	12.08	20.03
B_{21}	4.64	1.0	0.35	0.025	0.04	1.36	1.04	0.08	11.72	14.20	17.46
B_{22}	4.66	1.0	0.18	0.018	0.07	1.96	2.40	0.14	13.01	17.51	25.70
D_1	5.63	0.5	0.13	-----	0.04	5.76	6.74	0.16	3.14	15.80	80.13
D_2	6.81	1.4	0.12	-----	0.04	6.40	6.06	0.16	1.66	14.28	88.36

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_p	---	0.6a	0.5a	1.2a	4.1a	75.2	18.4	30.3	49.8	sil
B_1	---	0.3b	0.3b	0.8b	4.2a	69.6	24.8	29.2	45.2	sil
B_{21}	---	0.3c	0.3c	1.0c	4.3c	65.1	29.0	29.2	4C.9	sicl
B_{22}	---	0.3c	0.3c	1.4c	6.9c	57.8	33.3	29.7	36.1	sicl
D_1	---	0.1c	0.1c	4.8c	13.4c	51.5	30.1	34.9	34.1	sicl
D_2	---	0.1c	0.2c	3.6c	12.0c	57.0	27.1	38.9	33.2	sicl

a. Common, smooth lt. and dk. brown concr. (Fe-Mn?)
b. Few, smooth lt. and dk. brown concr. (Fe-Mn?)
c. Common, smooth lt. brown concr. (Fe?)

READINGTON SILT LOAM

A_p	0-6"	Reddish brown (5YR 4/3) friable silt loam with weak fine subangular blocky structure that crushes easily to moderate fine granular; contains many grass roots in upper part.
B_1	6-9"	Reddish brown (5YR 4/4) silty clay loam with weak medium subangular blocky structure.
B_2	9-16"	Yellowish red (5YR 4/6) firm silty clay loam (slightly plastic when wet); weak medium subangular blocky structure; few small roots.
B_3	16-19"	Reddish brown (5YR 4/4) plastic light silty clay loam faintly mottled with pinkish gray and red; weak medium to fine subangular blocky structure.
C	19-25"	Reddish brown to dark reddish brown clay loam mottled with gray and pinkish gray soil material mixed with firm to hard red shaly sandstone rock materials (50-75%).
D	25-31"	Reddish brown (2.5YR 4/4) loam mixed with horizontally bedded shaly sandstone material; can be cut with a knife or spade and contains pinkish gray, gray and black skins between the rock faces.

Chemical Characteristics

Horizon	pH	Truog P ppm.	Organic Matter percent	Organic Nitrogen[1] percent	Exch. Mn ppm.	Exchangeable Cations (milli-equivalents per 100 grams of soil) Ca	Mg	K	H	Total[2]	Base Saturation percent
A_p	6.59	5.3	1.95	0.106	4.93	8.52	0.48	0.08	4.44	13.52	67.16
B_1	4.51	2.2	0.50	0.036	0.85	4.42	1.48	0.12	12.43	18.45	32.63
B_2	4.55	1.7	0.21	0.024	0.07	2.32	2.70	0.14	14.15	19.31	26.72
B_3	4.56	1.4	0.26	0.024	0.11	2.10	3.14	0.14	13.95	19.33	27.83
C	4.49	1.0	0.21	0.018	0.48	3.84	4.78	0.20	11.18	20.00	44.10
D	4.60	2.7	0.19	-----	0.00	4.68	5.30	0.22	5.99	16.19	63.00

Physical Characteristics

Horizon	Particle Size Distribution (percent--in millimeters) Very Coarse Sand 2.0-1.0	Coarse Sand 1.0-.5	Medium Sand .5-.25	Fine Sand .25-.10	Very Fine Sand .10-.05	Silt .05-.002	Clay Less Than .002	.2-.02	.02-.002	Textural Class
A_p	---	1.5a	0.8a	1.0a	2.5a	71.4	22.8	23.8	50.7	sil
B_1	---	0.6a	0.8a	2.3a	2.5a	57.6	36.2	17.3	44.2	sicl
B_2	---	1.0b	1.8b	4.7b	3.5b	50.6	38.4	17.0	39.8	sicl
B_3	---	1.1b	2.2b	6.2b	3.9b	49.0	37.6	16.8	39.9	sicl
C	---	2.6c	4.3c	9.9c	6.1c	38.3	38.8	18.7	31.0	cl
D	---	11.2c	8.1c	11.2c	6.2c	36.6	26.7	19.1	29.3	l

a. Common, smooth brown coner. (Fe?)
b. Many, smooth brown coner. (Fe?)
c. Mostly, smooth brown-red coner. (Fe-sandstone fragments?)

1/ Analyses made by the Soil Survey Laboratory, Lincoln, Nebraska.
2/ Summation of exchangeable cations.
3/ Used No. 270 sieve and 1-minute hydrometer reading.
4/ Liquid limit.
5/ Plasticity index.
6/ Compaction on material passing No. 4 sieve (A.A.S.H.O. Designation: T 99).

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