



FIGURE 1.—Index map of Delaware showing location of the Sharptown area

TABLE 1.—Explanation of letter symbols

Symbol	Explanation
AM	Surficial alluvial material, Pleistocene age
AR	Recent alluvial deposit
Z	Swamp deposit

SOIL SYMBOLS

The map symbols used in this report to designate the various types of soils are a modification of the system used in the engineering soil survey of New Jersey (Rogers, 1955). The first part of the symbol is a letter, or group of letters, which identifies the parent material according to the classification developed by Lozier (1950) (see table 1). The second part of the symbol is a number which identifies the soil group according to the classification system adopted by the Highway Research Board (Allen and others, 1945) and used with some modifications by the Delaware State Highway Department (see table 2). A two-digit number indicates that two soil types are present within the same soil profile; for example, the symbol AM23 implies that both A-2 and A-3 soils are present in the same soil profile, by usually in different horizons.

Two different soil symbols may be combined by a diagonal bar (AM2/24). A diagonal bar indicates that two soil types (AM2 and AM24) are present within the same area, but not necessarily within the same profile. The two soils are so finely intermingled that they cannot be mapped separately.

REFERENCES

Allen, Harold, and others, 1945, Report of committee on classification of materials for subgrade and granular type roads: Highway Research Board, 25th Ann. Mtg. (Oakhurst City, 1945, Highway Research Board Proc., v. 25, p. 371-388, Washington).

Lozier, D. R., 1950, A system for designating map units on engineering soil maps in soil exploration and mapping: Highway Research Board Bull. 28, p. 17-35, Washington.

Rogers, F. C., 1955, Engineering soil survey of New Jersey, Report No. 1, Rutgers Univ. Eng. Research Bull. 15, 114 p., New Brunswick, N. J.

TABLE 2.—Soils classification

General classification	Granular materials (55 percent or less passing a No. 200 sieve)	Silt-clay materials (more than 35 percent passing a No. 200 sieve)
Group classification	A-1 a b	A-2 4 5 6 7 A-4 A-5 A-6 s ¹ s ² A-8
Sieve analysis		
Percent passing		
No. 10 sieve	50 max.	40 max.
No. 40 sieve	30 max.	10 max.
No. 200 sieve	15 max.	5 max.
Characterization of fraction passing No. 40 sieve		
Liquid limit	6 max.	40 max.
Plasticity index	6 max.	10 max.
Group index ³	0	0
General subgrade rating	Excellent	Good
Material	Well-graded gravel and sand	Poorly graded, silty or clayey sand and gravel

¹ Plasticity index of A-7-5 subgroup is equal to or less than the liquid limit minus 30.

² Plasticity index of A-7-6 subgroup is greater than the liquid limit minus 30.

³ The group index is calculated according to the following formula: Group index = $0.2a + 0.005ac + 0.01bd$

a = That portion of the percentage passing No. 200 sieve greater than 35 percent and not exceeding 75 percent, expressed as a positive whole number (1 to 40).

b = That portion of the percentage passing No. 200 sieve greater than 15 percent and not exceeding 55 percent, expressed as a positive whole number (1 to 40).

c = That portion of the numerical liquid limit greater than 40 and not exceeding 60, expressed as a positive whole number (1 to 20).

d = That portion of the numerical plasticity index greater than 10 and not exceeding 30, expressed as a positive whole number (1 to 20).

Sample pit and site numbers	Depth of interval sampled (inches)	Mechanical analyses					Liquid limit ¹	Plasticity index ²	Moisture-density ³	Classification	Map symbol ⁴		
		Cumulative percent by weight passing sieve—				Silt (0.002 to 0.009mm.)							
		3/4 in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.425 mm.)							No. 200 (0.075 mm.)	
272	0-7	100	99.9	99.8	95.7	75.1	42	33	52	22	A-7-5 (15)	AM7	
	7-34	100	99.9	99.4	89.0	74.9	34	18	53	25	A-7-6 (16)		
	34-12	100	99.9	99.7	88.0	72.8	34	57	28	108	18		A-7-8 (17)
273	0-4	100	100	100	75.4	7.6	-----	-----	NL	NP	-----	AM3	
	4-8	100	100	100	99.9	63.7	6.3	-----	NL	NP	-----	A-3 (0)	
	8-100	100	100	100	99.9	88.7	28.7	-----	NL	NP	-----	A-3 (0)	
274	0-8	100	100	100	99.9	77.7	12.2	-----	NL	NP	129	6	A-2-4 (0)
	8-30	100	100	100	99.9	72.3	22.8	-----	NL	NP	133	9	A-2-4 (0)
	30-36	100	100	100	100	81.5	20.9	-----	NL	NP	133	8	A-2-4 (0)
275	0-5	100	100	100	99.9	77.7	12.2	-----	NL	NP	-----	A-3 (0)	AM25
	5-40	100	100	100	99.4	73.3	23.6	-----	NL	NP	-----	A-3 (0)	
	40-50	100	97.6	95.5	78.2	6.2	-----	-----	NL	NP	-----	A-3 (0)	
276	0-8	100	100	100	99.9	77.7	12.2	-----	NL	NP	-----	A-2-4 (0)	
	8-20	100	100	100	99.4	73.3	23.6	-----	NL	NP	126	10	A-2-4 (0)
	20-48	100	96.5	91.2	57.5	20.0	-----	-----	NL	NP	130	8	A-2-4 (0)
277	0-6	100	99.8	99.9	84.6	17.3	-----	-----	NL	NP	-----	A-2-4 (0)	
	6-100	100	99.8	99.9	84.6	17.3	-----	-----	NL	NP	-----	A-2-4 (0)	
	100-100	100	99.8	99.9	84.6	17.3	-----	-----	NL	NP	-----	A-2-4 (0)	
278	0-8	100	100	100	98.4	22.6	-----	-----	NL	NP	134	7	A-2-4 (0)
	8-20	100	100	100	98.4	22.6	-----	-----	NL	NP	134	8	A-2-4 (0)
	20-48	100	99.8	99.5	77.3	20.7	-----	-----	NL	NP	134	7	A-2-4 (0)
1A	0-15	-----	-----	-----	99.4	79.0	10.5	-----	<40	<10	-----	A-2-4 (0)	AM25
	15-56	-----	-----	-----	99.9	80.8	13.7	-----	<40	<10	-----	A-2-4 (0)	
	56-72	-----	-----	-----	99.9	79.7	11.3	-----	<40	<10	-----	A-2-4 (0)	
1B	0-8	-----	-----	-----	99.9	84.2	28.6	-----	<40	<10	-----	A-2-4 (0)	AM36
	8-34	-----	-----	-----	99.8	80.4	42.6	-----	18	4	-----	A-3 (0)	
	34-72	-----	-----	-----	99.8	68.8	44.4	-----	31	12	-----	A-3 (0)	
1C	0-12	-----	-----	-----	99.8	55.9	10.9	-----	<40	<10	-----	A-2-4 (0)	AM12
	12-38	-----	-----	-----	99.8	59.7	12.8	-----	<40	<10	-----	A-2-4 (0)	
	38-72	-----	-----	-----	99.8	43.2	4.9	-----	<40	<10	-----	A-2-4 (0)	
2B	0-12	-----	-----	-----	99.8	79.1	10.3	-----	<40	<10	-----	A-2-4 (0)	AM25
	12-38	-----	-----	-----	99.8	75.5	3.3	-----	<40	<10	-----	A-2-4 (0)	
	38-72	-----	-----	-----	99.4	70.9	11.3	-----	<40	<10	-----	A-2-4 (0)	
3A	0-14	-----	-----	-----	99.8	70.1	5.9	-----	<40	<10	-----	A-2-4 (0)	AM3
	14-48	-----	-----	-----	99.8	70.1	5.9	-----	<40	<10	-----	A-3 (0)	
	48-72	-----	-----	-----	99.1	53.8	11.1	-----	<40	<10	-----	A-2-4 (0)	
3C	0-14	-----	-----	-----	99.1	49.3	13.7	-----	<40	<10	-----	A-2-4 (0)	AM12
	14-38	-----	-----	-----	99.0	52.6	24.8	-----	<40	<10	-----	A-2-4 (0)	
	38-72	-----	-----	-----	99.0	59.6	24.8	-----	25	9	-----	A-2-4 (0)	
4A	0-14	-----	-----	-----	99.3	68.8	8.0	-----	<40	<10	-----	A-2-4 (0)	AM25
	14-38	-----	-----	-----	99.5	65.1	9.8	-----	<40	<10	-----	A-2-4 (0)	
	38-72	-----	-----	-----	99.9	63.8	10.6	-----	<40	<10	-----	A-2-4 (0)	
4B	0-14	-----	-----	-----	99.9	65.1	9.8	-----	<40	<10	-----	A-3 (0)	AM3
	14-38	-----	-----	-----	99.4	55.8	2.0	-----	<40	<10	-----	A-3 (0)	
	38-72	-----	-----	-----	99.3	70.3	13.8	-----	<40	<10	-----	A-2-4 (0)	
4C	0-6	-----	-----	-----	99.3	54.6	10.8	-----	<40	<10	-----	A-2-4 (0)	AM3
	6-40	-----	-----	-----	99.1	79.1	3.2	-----	<40	<10	-----	A-2-4 (0)	
	40-70	-----	-----	-----	100	71.9	10.9	-----	<40	<10	-----	A-2-4 (0)	
5A	0-12	-----	-----	-----	100	71.9	10.9	-----	<40	<10	-----	A-2-4 (0)	AM2
	12-40	-----	-----	-----	100	71.9	10.9	-----	<40	<10	-----	A-2-4 (0)	
	40-72	-----	-----	-----	99.8	67.7	-----	-----	<40	<10	-----	A-2-4 (0)	
5B	0-15	-----	-----	-----	99.8	63.9	13.3	-----	<40	<10	-----	A-2-4 (0)	AM24
	15-40	-----	-----	-----	99.0	71.0	20.7	-----	<40	<10	-----	A-2-4 (0)	
	40-72	-----	-----	-----	99.0	82.2	33.0	-----	22	8	-----	A-2-4 (0)	
5C	0-10	-----	-----	-----	99.8	75.8	13.7	-----	<40	<10	-----	A-2-4 (0)	AM24
	10-48	-----	-----	-----	99.8	68.8	20.6	-----	<40	<10	-----	A-2-4 (0)	
	48-72	-----	-----	-----	100	97.0	37.4	-----	19	NP	-----	A-2-4 (0)	
6A	0-10	-----	-----	-----	99.5	75.1	23.5	-----	<40	<10	-----	A-2-4 (0)	AM2
	10-42	-----	-----	-----	99.6	73.1	10.8	-----	2	<10	-----	A-2-4 (0)	
	42-60	-----	-----	-----	99.6	65.0	25.8	-----	25	<10	-----	A-2-4 (0)	
6B	0-12	-----	-----	-----	99.9	75.1	18.0	-----	<40	<10	-----	A-2-4 (0)	AM25
	12-38	-----	-----	-----	99.7	74.7	8.0	-----	<40	<10	-----	A-2-4 (0)	
	38-72	-----	-----	-----	99.8	71.6	23.8	-----	<40	<10	-----	A-2-4 (0)	
6C	0-10	-----	-----	-----	99.5	64.0	11.1	-----	<40	<10	-----	A-2-4 (0)	AM34
	10-38	-----	-----	-----	99.9	92.1	62.9	-----	NL	NP	-----	A-2-4 (0)	
	38-72	-----	-----	-----	99.4	70.9	30.0	-----	29	29	-----	A-2-4 (0)	
7A	0-6	-----	-----	-----	97.0	76.9	10.0	-----	<40	<10	-----	A-2-4 (0)	AM2
	6-29	-----	-----	-----	99.7	77.3	28.1	-----	<40	<10	-----	A-2-4 (0)	
	29-72	-----	-----	-----	97.2	82.0	23.5	-----	<40	<10	-----	A-2-4 (0)	
7B	0-6	-----	-----	-----	100	79.1	5.6	-----	<40	<10	-----	A-3 (0)	AM25
	6-58	-----	-----	-----	100	79.1	5.6	-----	<40	<10	-----	A-3 (0)	
	58-72	-----	-----	-----	98.9	68.0	20.0	-----	20	1	-----	A-2-4 (0)	
8A	0-7	-----	-----	-----	99.7	74.1	22.1	-----	<40	<10	-----	A-2-4 (0)	AM2
	7-38	-----	-----	-----	97.8	67.2	22.0	-----	<40	<10	-----	A-2-4 (0)	
	38-72	-----	-----	-----	98.1	66.6	23.4	-----	<40	<10	-----	A-2-4 (0)	