Engineering Index Properties
Shiawassee County, Michigan

(Absence of an entry indicates that the data were not estimated.)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Ah:												
Algansee--------	0-10	Sandy loam	CL-ML, ML, SC-SM, SM	A-2-4, A-4	0	0	100	100	60-90	30-65	15-25	NP-7
	10-60	Stratified sand to loamy sand	SM, SP-SM	A-2-4, A-3	0	0	100	100	50-80	5-35	0-14	NP
Ba:												
Barry----------	0-10	Loam	CL, CL-ML, ML	A-4	0	0-3	90-100	75-100	70-100	55-90	20-30	NP-10
	10-36	Loam, sandy clay loam, sandy loam	CL, SC	A-2-6, A-6	0	0-3	90-100	75-100	45-95	20-75	25-35	10-15
	36-60	Sandy loam	CL, ML, SC, SM	A-1-b, A-2-4, A-4	0	0-3	90-100	75-100	45-95	20-75	15-30	NP-10
Bb:												
Barry Variant---	0-11	Sandy loam	ML, SC-SM, SM	A-4	0	0-3	100	100	60-90	30-65	15-25	NP-7
	11-38	Fine sandy loam, sandy clay loam, sandy loam	CL, ML, SC, SM	A-2-4, A-2-6, A-6	0	0-3	90-100	75-100	45-95	20-75	25-35	10-15
	>38	Unweathered bedrock			---	---	---	---	---	---	---	---
Bc:												
Barry----------	0-10	Loam	CL, CL-ML, ML	A-4	0	0-3	90-100	75-100	70-100	55-90	20-30	NP-10
	10-36	Sandy loam	CL, SC	A-2-6, A-6	0	0-3	90-100	75-100	45-95	20-75	25-35	10-15
	36-60	Sandy loam, fine sandy loam, loam	CL, ML, SC, SM	A-1-b, A-2-4, A-4	0	0-3	90-100	75-100	45-95	20-75	15-30	NP-10
BeA:												
Belding---------	0-9	Sandy loam	SC-SM, SM	A-2, A-4	0	0-5	95-100	95-100	60-80	25-45	15-25	NP-7
	9-26	Sandy loam, loamy sand	SC-SM, SM	A-2, A-4	0	0-5	95-100	85-100	50-80	15-45	15-25	NP-7
	26-36	Clay loam, loam, sandy clay loam	CL, CL-ML	A-4, A-6, A-7	0	0	95-100	85-100	80-100	60-85	20-45	5-25
	36-60	Clay loam, loam, silty clay loam	CL, CL-ML	A-4, A-6, A-7	0	0	95-100	85-100	80-100	60-85	20-45	5-25
Bh:												
Berville--------	0-10	Loam	CL-ML, ML, CL	A-4	0	0-5	85-95	75-90	60-90	50-70	15-25	NP-10
	10-15	Gravelly loam, sandy loam, loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0-5	80-95	70-85	50-75	25-60	20-35	5-15
	15-37	Gravelly sandy clay loam, gravelly clay loam	CL, SC	A-6	0	0-5	80-95	65-85	60-85	45-75	25-40	10-20
	37-60	Loam, clay loam	CL	A-6	0	0-5	95-100	90-100	75-100	65-95	25-40	10-20
BmA:												
Boyer----------	0-8	Loamy sand	SM, SP-SM	A-1, A-2	0	0-5	95-100	75-95	30-80	10-35	15-20	NP-4
	8-12	Loamy sand, gravelly loamy sand, fine sandy loam	CL-ML, ML, SC-SM, SM	A-1-b, A-2, A-4	0	0-5	85-100	60-95	30-85	10-55	15-20	NP-4
	12-32	Sandy loam, gravelly sandy clay loam	CL, CL-ML, SC, SC-SM	A-1-b, A-2, A-4	0	0-5	80-100	60-95	35-90	15-75	20-30	5-10
	32-60	Gravelly sand, coarse sand, gravel	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0	0-10	40-95	30-85	20-60	0-10	0-14	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
BmB:												
Boyer----------	0-8	Loamy sand	SM, SP-SM	A-1, A-2	0	0-5	95-100	75-95	30-80	10-35	15-20	NP-4
	8-12	Loamy sand, gravelly loamy sand, fine sandy loam	CL-ML, ML, SC-SM, SM	A-1-b, A-2, A-4	0	0-5	85-100	60-95	30-85	10-55	15-20	NP-4
	12-32	Sandy loam, gravelly sandy clay loam	CL, CL-ML, SC, SC-SM	A-1-b, A-2, A-4	0	0-5	80-100	60-95	35-90	15-75	20-30	5-10
	32-60	Gravelly sand, coarse sand, gravel	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0	0-10	40-95	30-85	20-60	0-10	0-14	NP
BmC:												
Boyer----------	0-8	Loamy sand	SM, SP-SM	A-1, A-2	0	0-5	95-100	75-95	30-80	10-35	15-20	NP-4
	8-12	Loamy sand, gravelly loamy sand, fine sandy loam	CL-ML, ML, SC-SM, SM	A-1-b, A-2, A-4	0	0-5	85-100	60-95	30-85	10-55	15-20	NP-4
	12-32	Sandy loam, gravelly sandy clay loam	SC, SC-SM, CL-ML, CL	A-1-b, A-2, A-4	0	0-5	80-100	60-95	35-90	15-75	20-30	5-10
	32-60	Gravelly sand, coarse sand, gravel	SP-SM, SP, GP-GM, GP	A-1, A-2, A-3	0	0-10	40-95	30-85	20-60	0-10	0-14	NP
BmD:												
Boyer----------	0-8	Loamy sand	SP-SM, SM	A-1, A-2	0	0-5	95-100	75-95	30-80	10-35	15-20	NP-4
	8-12	Loamy sand, gravelly loamy sand, fine sandy loam	ML, CL-ML, SM, SC-SM	A-1-b, A-2, A-4	0	0-5	85-100	60-95	30-85	10-55	15-20	NP-4
	12-32	Sandy loam, gravelly sandy clay loam	CL-ML, SC, SC-SM, CL	A-1-b, A-2, A-4	0	0-5	80-100	60-95	35-90	15-75	20-30	5-10
	32-60	Gravelly sand, coarse sand, gravel	GP, GP-GM, SP, SP-SM	A-3, A-1, A-2	0	0-10	40-95	30-85	20-60	0-10	0-14	NP
BmE:												
Boyer----------	0-8	Loamy sand	SM, SP-SM	A-1, A-2	0	0-5	95-100	75-95	30-80	10-35	15-20	NP-4
	8-12	Loamy sand, gravelly loamy sand, fine sandy loam	CL-ML, SC-SM, SM, ML	A-1-b, A-2, A-4	0	0-5	85-100	60-95	30-85	10-55	15-20	NP-4
	12-32	Sandy loam, gravelly sandy clay loam	CL-ML, SC, SC-SM, CL	A-1-b, A-2, A-4	0	0-5	80-100	60-95	35-90	15-75	20-30	5-10
	32-60	Gravelly sand, coarse sand, gravel	GP, SP, SP-SM, GP-GM	A-1, A-2, A-3	0	0-10	40-95	30-85	20-60	0-10	0-14	NP
BoB:												
Boyer----------	0-8	Gravelly loamy sand	SP-SM, SM	A-1, A-2, A-3	0	0-5	65-85	55-75	30-60	5-25	15-20	NP-4
	8-12	Loamy sand, gravelly loamy sand, fine sandy loam	SC-SM, SM, SP-SM	A-1-b, A-2, A-4	0	0-5	85-100	60-95	30-85	10-50	15-20	NP-4
	12-32	Sandy loam, gravelly sandy clay loam	CL, CL-ML, SC, SC-SM	A-1-b, A-2, A-4	0	0-5	80-100	60-95	35-90	15-75	20-30	5-10
	32-60	Gravelly sand, coarse sand, gravel	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0	0-10	40-95	30-85	20-60	0-10	0-14	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
BrA:												
Boyer----------	0-8	Sandy loam	SM, SC-SM	A-1, A-2, A-4	0	0-5	90-100	75-95	45-85	20-50	15-25	NP-7
	8-12	Loamy sand, gravelly loamy sand, fine sandy loam	ML, SC-SM, SM, CL-ML	A-1-b, A-2, A-4	0	0-5	85-100	60-95	30-85	10-55	15-20	NP-4
	12-32	Sandy loam, gravelly sandy clay loam	CL, SC, SC-SM, CL-ML	A-1-b, A-2, A-4	0	0-5	80-100	60-95	35-90	15-75	20-30	5-10
	32-60	Gravelly sand, coarse sand, gravel	GP-GM, SP, SP-SM, GP	A-1, A-2, A-3	0	0-10	40-95	30-85	20-60	0-10	0-14	NP
BrB:												
Boyer----------	0-8	Sandy loam	SC-SM, SM	A-1, A-2, A-4	0	0-5	90-100	75-95	45-85	20-50	15-25	NP-7
	8-12	Loamy sand, gravelly loamy sand, fine sandy loam	CL-ML, ML, SC-SM, SM	A-1-b, A-2, A-4	0	0-5	85-100	60-95	30-85	10-55	15-20	NP-4
	12-32	Sandy loam, gravelly sandy clay loam	CL-ML, SC, SC-SM, CL	A-1-b, A-2, A-4	0	0-5	80-100	60-95	35-90	15-75	20-30	5-10
	32-60	Gravelly sand, coarse sand, gravel	GP, SP, SP-SM, GP-GM	A-1, A-2, A-3	0	0-10	40-95	30-85	20-60	0-10	0-14	NP
BrC:												
Boyer----------	0-8	Sandy loam	SC-SM, SM	A-1, A-2, A-4	0	0-5	90-100	75-95	45-85	20-50	15-25	NP-7
	8-12	Loamy sand, gravelly loamy sand, fine sandy loam	CL-ML, ML, SC-SM, SM	A-1-b, A-2, A-4	0	0-5	85-100	60-95	30-85	10-55	15-20	NP-4
	12-32	Sandy loam, gravelly sandy clay loam	CL, CL-ML, SC, SC-SM	A-1-b, A-2, A-4	0	0-5	80-100	60-95	35-90	15-75	20-30	5-10
	32-60	Gravelly sand, coarse sand, gravel	GP-GM, SP, SP-SM, GP	A-1, A-2, A-3	0	0-10	40-95	30-85	20-60	0-10	0-14	NP
BrD:												
Boyer----------	0-8	Sandy loam	SM, SC-SM	A-1, A-2, A-4	0	0-5	90-100	75-95	45-85	20-50	15-25	NP-7
	8-12	Loamy sand, gravelly loamy sand, fine sandy loam	SM, SC-SM, ML, CL-ML	A-1-b, A-2, A-4	0	0-5	85-100	60-95	30-85	10-55	15-20	NP-4
	12-32	Sandy loam, gravelly sandy clay loam	CL, SC-SM, CL-ML, SC	A-1-b, A-2, A-4	0	0-5	80-100	60-95	35-90	15-75	20-30	5-10
	32-60	Gravelly sand, coarse sand, gravel	SP-SM, GP, GP-GM, SP	A-1, A-2, A-3	0	0-10	40-95	30-85	20-60	0-10	0-14	NP
Bt:												
Breckenridge----	0-10	Sandy loam	SC, SC-SM, SM	A-2, A-4	0	0-5	95-100	85-100	50-70	25-40	15-30	NP-10
	10-26	Sandy loam, loamy sand, loam	CL-ML, SC-SM, SM	A-1-b, A-2-4, A-4	0	0-5	90-100	85-100	35-85	20-60	15-25	NP-10
	26-60	Clay loam, loam, sandy clay loam	SC, CL	A-4, A-6, A-7	0	0	95-100	85-100	80-100	30-80	25-45	11-25
Bv:												
Brevort---------	0-8	Loamy sand	SP-SM, SC-SM, SM	A-1-b, A-2-4	0	0	95-100	90-100	45-85	10-35	15-20	NP-6
	8-28	Sand, loamy sand	SC-SM, SM, SP-SM	A-1-b, A-2-4, A-3	0	0-3	95-100	90-100	45-85	5-35	15-20	NP-6
	28-60	Clay loam, silty clay loam, loam	CL	A-6, A-7	0	0-3	95-100	90-100	75-100	55-95	30-45	10-25

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
Bw:												
Brookston-------	0-13	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	85-100	60-90	20-30	5-15
	13-42	Clay loam, silty clay loam	CL	A-4, A-6	0	0	98-100	85-100	75-95	60-85	25-40	8-20
	42-60	Loam	CL-ML, CL	A-4, A-6	0-1	0-3	90-100	85-95	78-90	55-70	20-30	5-15
Cg:												
Carlisle--------	0-60	Muck	PT	A-8	0	0	---	---	---	---	---	---
ChB:												
Celina----------	0-10	Loam	CL, CL-ML	A-4	0	0-5	95-100	85-95	70-95	50-90	20-30	4-10
	10-15	Sandy loam, loam, silty clay loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4, A-6, A-7	0	0-5	95-100	85-95	50-95	30-90	20-45	4-25
	15-30	Clay loam, silty clay loam	CL	A-6, A-7	0	0-5	95-100	85-95	80-95	55-90	30-45	11-25
	30-60	Loam, clay loam	CL	A-4, A-6	0	0-5	95-100	85-95	75-95	50-75	25-40	7-20
ChB2:												
Celina----------	0-10	Loam	CL-ML, CL	A-4	0	0-5	95-100	85-95	70-95	50-90	20-30	4-10
	10-15	Sandy loam, loam, silty clay loam	SC, SC-SM, CL, CL-ML	A-2-4, A-4, A-6, A-7	0	0-5	95-100	85-95	50-95	30-90	20-45	4-25
	15-30	Clay loam, silty clay loam	CL	A-6, A-7	0	0-5	95-100	85-95	80-95	55-90	30-45	11-25
	30-60	Loam, clay loam	CL	A-4, A-6	0	0-5	95-100	85-95	75-95	50-75	25-40	7-20
Cm:												
Ceresco---------	0-7	Loam	CL-ML, CL	A-4	0	0	100	100	85-100	60-90	20-30	4-10
	7-34	Sandy loam, loamy fine sand, fine sandy loam	SC-SM, CL, CL-ML, SC	A-2, A-4	0	0	100	100	60-95	20-70	20-30	4-10
	34-60	Sandy loam, fine sandy loam	SC-SM, CL, CL-ML, SC	A-2, A-4	0	0	100	100	60-100	30-90	20-30	4-10
Cn:												
Cohoctah--------	0-8	Loam	CL, CL-ML, ML	A-4	0	0	100	100	85-95	50-85	15-30	NP-10
	8-28	Loam, fine sandy loam, sandy loam	SM, CL, ML, SC	A-2, A-4	0	0	95-100	85-100	70-90	30-70	15-30	NP-10
	28-60	Loam, sandy loam, loamy sand	CL-ML, SC-SM, SM	A-1-b, A-2-4, A-4	0	0	90-100	85-100	35-85	20-60	15-25	NP-10
Cs:												
Colwood---------	0-7	Loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	85-100	60-90	15-35	2-12
	7-38	Loam, silty clay loam, sandy clay loam	CL	A-4, A-6, A-7	0	0	95-100	90-100	85-100	55-95	25-45	8-20
	38-60	Stratified silt loam to fine sand	SM, CL, ML, SC	A-2, A-4	0	0	100	95-100	70-100	30-80	15-25	NP-10
CtA:												
Conover---------	0-13	Loam	CL, CL-ML, ML	A-4	0	0-5	95-100	90-100	75-95	55-75	20-30	3-10
	13-36	Clay loam, silty clay loam	CL	A-6	0	0-5	95-100	90-100	80-95	50-90	29-40	15-25
	36-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	85-95	75-95	50-75	25-34	5-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
CtB:												
Conover---------	0-13	Loam	CL, CL-ML, ML	A-4	0	0-5	95-100	90-100	75-95	55-75	20-30	3-10
	13-36	Clay loam, silty clay loam	CL	A-6	0	0-5	95-100	90-100	80-95	50-90	29-40	15-25
	36-60	Loam, clay loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	85-95	75-95	50-75	25-34	6-14
Ek:												
Edwards---------	0-20	Muck	PT	A-8	0	0	---	---	---	---	---	---
	20-60	Marl			0	0	---	---	---	---	---	---
En:												
Eel----------	0-10	Loam	CL-ML, CL, ML	A-4, A-6	0	0	100	100	90-100	75-85	24-40	3-15
	10-30	Silt loam, loam, clay loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	50-85	20-50	24-40	3-15
	30-60	Stratified sandy loam to silty clay loam	ML, CL, CL-ML	A-4, A-6	0	0	100	90-100	70-80	55-70	24-40	3-15
Abscota---------	0-10	Sandy loam	SC-SM, SC, SM	A-2-4, A-4	0	0	95-100	95-100	55-80	25-50	15-30	NP-10
	10-60	Sand, coarse sand, gravelly sand	SM, SP, SP-SM	A-1, A-2-4, A-3	0	0	85-100	60-100	35-55	0-15	0-14	NP
Landes----------	0-7	Sandy loam	SC, SC-SM, SM	A-2, A-4	0	0	100	95-100	85-95	20-50	15-25	NP-10
	7-24	Sandy loam, fine sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	100	85-100	70-95	20-70	15-25	NP-10
	24-60	Stratified sand to silt loam	SP-SM, ML, SC, SM	A-2, A-4	0	0	100	95-100	60-95	10-70	15-30	NP-10
FoB:												
Fox----------	0-11	Sandy loam	SC-SM, SM	A-2, A-4	0	0	95-100	95-100	55-80	20-50	15-25	2-7
	11-36	Sandy clay loam, gravelly loam, gravelly clay loam	SC, CL, GC	A-2, A-6, A-7	0-1	0-5	55-100	55-100	40-100	30-90	22-45	10-25
	36-60	Sand and gravel, sand, gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0-3	0-10	30-100	30-100	10-95	2-10	0-14	NP
FoC:												
Fox----------	0-11	Sandy loam	SC-SM, SM	A-2, A-4	0	0	95-100	95-100	55-80	20-50	15-25	2-7
	11-36	Sandy clay loam, gravelly loam, gravelly clay loam	CL, GC, SC	A-2, A-6, A-7	0-1	0-5	55-100	55-100	40-100	30-90	22-45	10-25
	36-60	Sand and gravel, sand, gravelly coarse sand	SP-SM, GP, GP-GM, SP	A-1, A-2, A-3	0-3	0-10	30-100	30-100	10-95	2-10	0-14	NP
FoD:												
Fox----------	0-11	Sandy loam	SM, SC-SM	A-2, A-4	0	0	95-100	95-100	55-80	20-50	15-25	2-7
	11-36	Sandy clay loam, gravelly loam, gravelly clay loam	GC, SC, CL	A-2, A-6, A-7	0-1	0-5	55-100	55-100	40-100	30-90	22-45	10-25
	36-60	Sand and gravel, sand, coarse sand	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0-3	0-10	30-100	30-100	10-95	2-10	0-14	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Gg:												
Gilford---------	0-10	Sandy loam	SM, SC, SC-SM	A-2-4, A-4	0	0	95-100	95-100	60-80	30-45	15-25	2-10
	10-36	Sandy loam, fine sandy loam	SC-SM, SC, SM	A-2-4	0	0	95-100	95-100	55-70	20-35	15-30	NP-8
	36-60	Sand, coarse sand	SP, SP-SM	A-1, A-2, A-3	0	0	95-100	75-100	35-70	0-15	0-14	NP
Gh:												
Gilford---------	0-10	Sandy loam	SC, SC-SM, SM	A-2-4, A-4	0	0	95-100	90-100	60-70	30-40	20-30	2-10
	10-36	Sandy loam, fine sandy loam	SC, SC-SM, SM	A-2-4	0	0	90-100	90-100	55-70	25-35	20-30	NP-8
	36-60	Sand, coarse sand	GP, GP-GM, SP, SP-SM	A-1	0	0-15	40-85	35-75	20-50	3-10	0-14	NP
GmA:												
Gladwin---------	0-7	Loamy sand	SM	A-2	0	0-5	85-100	75-95	50-65	15-30	0-14	NP
	7-22	Loamy sand	SP-SM, SM	A-1-b, A-2	0	0-5	85-100	75-95	35-70	10-25	0-14	NP
	22-32	Sandy loam, gravelly sandy loam	SC, SC-SM, SM	A-2, A-4	0	0-5	80-100	75-95	40-70	20-40	15-25	NP-10
	32-60	Sand, gravelly sand, coarse sand	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0	0-10	40-80	35-75	30-60	0-10	0-14	NP
Gn:												
Glendora--------	0-8	Sandy loam	SC, SC-SM, SM	A-2-4, A-4	0	0-5	95-100	90-100	55-85	25-50	15-25	2-10
	8-60	Stratified sand to loamy fine sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0	0-5	95-100	90-100	45-85	0-35	0-14	NP
Go:												
Granby----------	0-9	Loamy sand	SM	A-2	0	0	100	100	50-80	15-35	0-14	NP
	9-12	Sand, fine sand, loamy sand	SM, SP-SM	A-1, A-2, A-3	0	0	100	95-100	45-80	5-35	0-14	NP
	12-60	Sand	SP-SM, SM	A-1, A-2, A-3	0	0	100	95-100	45-80	5-35	0-14	NP
Gp:												
Gravel Pits-----	---	---	---	---	---	---	---	---	---	---	---	---
IsA:												
Iosco-----------	0-8	Loamy sand	SM	A-2-4, A-4	0	0	95-100	90-100	50-90	15-50	0-14	NP
	8-27	Loamy sand, sand	SM, SP-SM, SC-SM	A-2-4, A-3, A-4	0	0	95-100	90-100	50-95	5-50	15-25	NP-7
	27-60	Silty clay loam, loam, clay loam	CL	A-6	0	0	90-95	85-95	80-95	80-95	25-45	12-25
ItA:												
Iosco-----------	0-8	Loamy sand	SM	A-2-4, A-4	0	0	95-100	90-100	50-90	15-50	0-14	NP
	8-27	Loamy sand, sand	SC-SM, SM, SP-SM	A-2-4, A-3, A-4	0	0	95-100	90-100	50-95	5-50	15-25	NP-7
	27-60	Silty clay loam, loam, clay loam	CL	A-6	0	0	90-95	85-95	80-95	80-95	25-45	12-25
Iv:												
Iosco Variant---	0-9	Loamy sand	SM, SP-SM	A-1, A-2-4	0	0	95-100	85-100	40-80	10-35	0-14	NP
	9-24	Loamy sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	85-100	40-90	5-30	0-14	NP
	24-50	Loamy sand, gravelly sand	SM, SP-SM, SP	A-1, A-2-4, A-3	0	0	55-100	50-100	15-75	2-35	0-14	NP
	50-60	Clay loam, loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	90-100	85-100	70-100	50-90	20-45	5-20

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
KhB:												
Kendallville----	0-12	Sandy loam	SM	A-4	0	0-5	90-100	80-100	60-70	35-50	15-20	1-4
	12-33	Gravelly clay loam, sandy clay loam	CL-ML, GC, SC, CL	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	25-40	5-15
	33-60	Loam, clay loam	ML, CL, CL-ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-35	3-15
KhB2:												
Kendallville----	0-12	Sandy loam	SM	A-4	0	0-5	90-100	80-100	60-70	35-50	15-20	1-4
	12-33	Gravelly clay loam, sandy clay loam	CL, CL-ML, GC, SC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	25-40	5-15
	33-60	Loam, clay loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-35	3-15
KhC:												
Kendallville----	0-12	Sandy loam	SM	A-4	0	0-5	90-100	80-100	60-70	35-50	15-20	1-4
	12-33	Gravelly clay loam, sandy clay loam	SC, CL, CL-ML, GC	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	25-40	5-15
	33-60	Loam, clay loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-35	3-15
KhC2:												
Kendallville----	0-12	Sandy loam	SM	A-4	0	0-5	90-100	80-100	60-70	35-50	15-20	1-4
	12-33	Gravelly clay loam, sandy clay loam	CL-ML, GC, SC, CL	A-4, A-6	0	0-5	70-100	60-95	50-80	45-75	25-40	5-15
	33-60	Loam, clay loam	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	80-95	60-90	55-75	20-35	3-15
KnA:												
Kibbie----------	0-11	Loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	85-100	60-95	15-35	NP-15
	11-26	Loam, silty clay loam	CL	A-6, A-7	0	0	100	100	85-100	60-90	30-50	9-25
	26-60	Stratified silt loam to fine sand	SM, CL, ML, SC	A-2, A-4	0	0	100	95-100	70-95	30-80	15-30	NP-10
KnB:												
Kibbie----------	0-11	Loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	85-100	60-95	15-35	NP-15
	11-26	Loam, silty clay loam	CL	A-6, A-7	0	0	100	100	85-100	60-90	30-50	9-25
	26-60	Stratified silt loam to fine sand	CL, ML, SC, SM	A-2, A-4	0	0	100	95-100	70-95	30-80	15-30	NP-10
LmB:												
Lapeer----------	0-11	Sandy loam	CL, SM, SC, ML	A-2, A-4	0	0-5	90-100	85-100	50-85	25-55	18-30	3-9
	11-36	Sandy loam, sandy clay loam	SC-SM, SC, CL-ML, CL	A-2, A-4, A-6	0	0-5	90-100	85-100	50-90	25-55	20-35	4-15
	36-60	Sandy loam	SC, SC-SM, SM	A-1, A-2, A-4	0	0-5	90-100	85-100	50-85	25-55	20-30	NP-10
LmC2:												
Lapeer----------	0-11	Sandy loam	SM, CL, ML, SC	A-2, A-4	0	0-5	90-100	85-100	50-85	25-55	18-30	3-9
	11-36	Sandy loam, sandy clay loam	CL-ML, CL, SC, SC-SM	A-2, A-4, A-6	0	0-5	90-100	85-100	50-90	25-55	20-35	4-15
	36-60	Sandy loam	SC, SC-SM, SM	A-1, A-2, A-4	0	0-5	90-100	85-100	50-85	25-55	20-30	NP-10
Ln:												
Lenawee---------	0-9	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	80-100	65-90	20-35	6-15
	9-25	Silty clay loam, silty clay, silt loam	CH, CL	A-7	0	0	100	95-100	90-100	70-95	40-55	20-30
	25-60	Silty clay loam, clay loam	CL	A-6, A-7	0	0	100	95-100	90-100	70-95	25-50	10-25

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Lo:												
Linwood---------	0-10	Muck	PT	A-8	0	0	---	---	---	---	---	---
	10-32	Muck	PT	A-8	0	0	---	---	---	---	---	---
	32-60	Loam, silty clay loam, clay loam	CL	A-6, A-7	0	0-10	100	90-100	85-95	80-90	30-50	15-30
LsA:												
Locke----------	0-7	Sandy loam	CL, ML, SC, SM	A-2-4, A-4	0	0-7	95-100	75-95	60-90	25-60	15-30	3-9
	7-30	Sandy loam	CL, SC	A-6	0	0-7	95-100	75-95	65-85	35-55	20-30	10-15
	30-60	Sandy loam, fine sandy loam	SM, SC, SC-SM	A-2-4, A-4	0	0-7	95-100	75-95	60-85	30-50	15-30	NP-10
LsB:												
Locke----------	0-7	Sandy loam	ML, CL, SC, SM	A-2-4, A-4	0	0-7	95-100	75-95	60-90	25-60	15-30	3-9
	7-30	Sandy clay loam, sandy loam, loam	CL, SC	A-6	0	0-7	95-100	75-95	65-85	35-55	20-30	10-15
	30-60	Sandy loam	SM, SC, SC-SM	A-2-4, A-4	0	0-7	95-100	75-95	60-85	30-50	15-30	NP-10
MaA:												
Macomb----------	0-12	Loam	SC-SM, SC, CL, CL-ML	A-4, A-6	0	0-5	90-100	75-100	65-95	45-75	20-30	4-11
	12-26	Gravelly sandy clay loam, loam, gravelly clay loam	SC, CL	A-2, A-4, A-6, A-7	0	0-5	90-100	70-100	55-95	30-80	25-45	9-22
	26-60	Clay loam, loam	CL-ML, CL	A-4, A-6	0	0-5	95-100	85-95	75-95	50-75	25-40	5-20
MbB:												
Macomb----------	0-12	Sandy loam	CL, CL-ML, SC, SC-SM	A-1, A-2, A-4, A-6	0	0-5	90-100	75-100	45-85	20-55	20-30	4-11
	12-26	Gravelly sandy clay loam, loam, gravelly clay loam	CL, SC	A-7, A-4, A-6, A-2	0	0-5	90-100	70-100	55-95	30-80	25-45	9-22
	26-60	Clay loam, loam	CL	A-6, A-4	0	0-5	95-100	85-95	75-95	50-75	25-40	5-20
Md:												
Made Land-------	---	---	---	---	---	---	---	---	---	---	---	---
MeA:												
Mancelona-------	0-7	Loamy sand	SP-SM, SM	A-1, A-2	0	0-5	95-100	75-95	30-80	10-35	15-20	NP-4
	7-20	Loamy sand	SP-SM, SM	A-1, A-2	0	0-5	95-100	75-95	30-80	10-35	15-20	NP-4
	20-28	Sandy loam, gravelly sandy loam	SC-SM, CL, CL-ML, SC	A-4, A-2, A-1-b	0	0-5	80-100	60-95	35-90	15-75	20-30	5-10
	28-60	Gravelly sand, gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0	0-10	40-95	30-85	20-60	0-10	0-14	NP
MeB:												
Mancelona-------	0-7	Loamy sand	SM, SP-SM	A-2, A-1	0	0-5	95-100	75-95	30-80	10-35	15-20	NP-4
	7-20	Loamy sand	SM, SP-SM	A-2, A-1	0	0-5	95-100	75-95	30-80	10-35	15-20	NP-4
	20-28	Sandy loam, gravelly sandy loam	CL, CL-ML, SC, SC-SM	A-1-b, A-2, A-4	0	0-5	80-100	60-95	35-90	15-75	20-30	5-10
	28-60	Gravelly sand, gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1, A-3, A-2	0	0-10	40-95	30-85	20-60	0-10	0-14	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
MmA:												
Matherton-------	0-11	Sandy loam	SC-SM, SM	A-4, A-2, A-1	0	0-5	90-100	75-100	45-70	20-40	15-25	NP-7
	11-35	Sandy clay loam, gravelly clay loam	CL, SC	A-7, A-2, A-6	0	0-5	85-95	60-90	50-90	30-75	30-45	10-25
	35-60	Gravelly sand, sand, very gravelly coarse sand	GM, GP, SM, SP	A-1, A-2-4, A-3	0	0-10	40-100	25-75	20-55	0-15	0-14	NP
MmB:												
Matherton-------	0-11	Sandy loam	SC-SM, SM	A-2, A-4, A-1	0	0-5	90-100	75-100	45-70	20-40	15-25	NP-7
	11-35	Sandy clay loam, gravelly clay loam	CL, SC	A-2, A-6, A-7	0	0-5	85-95	60-90	50-90	30-75	30-45	10-25
	35-60	Gravelly sand, sand, very gravelly coarse sand	GM, GP, SM, SP	A-3, A-2-4, A-1	0	0-10	40-100	25-75	20-55	0-15	0-14	NP
MnA:												
Matherton-------	0-12	Sandy loam	SC-SM, SM	A-4, A-2	0	0	95-100	90-100	55-70	25-40	15-25	NP-7
	12-35	Sandy clay loam, gravelly clay loam	CL, SC	A-7, A-6	0	0	95-100	90-100	80-100	35-75	30-45	10-20
	35-48	Gravelly sand, very gravelly coarse sand, sand	GP, GP-GM, SP, SP-SM	A-2, A-1, A-3	0	0-10	40-80	35-70	30-55	0-10	0-14	NP
	48-60	Stratified silty clay to silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	40-60	15-25
MnB:												
Matherton-------	0-12	Sandy loam	SC-SM, SM	A-2, A-4	0	0	95-100	90-100	55-70	25-40	15-25	NP-7
	12-35	Sandy clay loam, gravelly clay loam	CL, SC	A-6, A-7	0	0	95-100	90-100	80-100	35-75	30-45	10-20
	35-48	Gravelly sand, very gravelly coarse sand, sand	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0	0-10	40-80	35-70	30-55	0-10	0-14	NP
	48-60	Stratified silty clay to silty clay loam	CH, CL	A-7	0	0	100	100	95-100	85-95	40-60	15-25
MoB:												
Menominee-------	0-10	Loamy sand	SM	A-2-4	0	0	100	100	50-80	15-35	0-14	NP
	10-24	Loamy sand, loamy fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	100	100	50-80	5-35	0-14	NP
	24-28	Sandy clay loam, clay loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	95-100	85-100	45-95	45-75	20-40	5-20
	28-60	Loam, clay loam	CL	A-6	0	0-3	95-100	85-90	75-90	50-80	30-40	10-15
MoC:												
Menominee-------	0-10	Loamy sand	SM	A-2-4	0	0	100	100	50-80	15-35	0-14	NP
	10-24	Loamy sand, loamy fine sand, sand	SM, SP-SM	A-2-4, A-3	0	0	100	100	50-80	5-35	0-14	NP
	24-28	Sandy clay loam, clay loam, sandy loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	95-100	85-100	45-95	25-75	20-40	5-20
	28-60	Loam, clay loam	CL	A-6	0	0-3	95-100	85-90	75-90	50-80	30-40	10-15

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
MrA:												
Metamora--------	0-9	Loamy sand	SM	A-2	0	0-5	95-100	90-100	50-75	15-30	0-14	NP
	9-28	Sandy loam, loamy sand	SC-SM, SM	A-2, A-4	0	0-5	95-100	85-100	50-80	15-45	15-25	NP-7
	28-36	Clay loam, sandy clay loam	CL, SC	A-4, A-6, A-7	0	0	95-100	85-100	60-100	40-85	20-45	15-25
	36-60	Clay loam, loam	CL, SC	A-4, A-6, A-7	0	0	95-100	85-100	60-100	40-85	20-45	15-25
MsA:												
Metamora--------	0-9	Sandy loam	SC-SM, SM	A-2, A-4	0	0-5	95-100	95-100	60-80	25-45	15-25	NP-7
	9-28	Sandy loam, loamy sand	SC-SM, SM	A-2, A-4	0	0-5	95-100	85-100	50-80	15-45	15-25	NP-7
	28-36	Clay loam, sandy clay loam	CL, SC	A-4, A-6, A-7	0	0	95-100	85-100	60-100	40-85	20-45	15-25
	36-60	Clay loam, loam	CL, SC	A-4, A-6, A-7	0	0	95-100	85-100	60-100	40-85	20-45	15-25
MsB:												
Metamora--------	0-9	Sandy loam	SC-SM, SM	A-2, A-4	0	0-5	95-100	95-100	60-80	25-45	15-25	NP-7
	9-28	Sandy loam, loamy sand	SC-SM, SM	A-2, A-4	0	0-5	95-100	85-100	50-80	15-45	15-25	NP-7
	28-36	Clay loam, sandy clay loam	CL, SC	A-4, A-6, A-7	0	0	95-100	85-100	60-100	40-85	20-45	15-25
	36-60	Clay loam, loam	SC, CL	A-4, A-6, A-7	0	0	95-100	85-100	60-100	40-85	20-45	15-25
MuB:												
Miami----------	0-11	Loam	CL, CL-ML, ML	A-4	0	0	100	95-100	80-100	50-90	15-30	3-10
	11-30	Clay loam	CL, SC	A-6	0	0	90-100	85-100	70-95	40-95	30-40	15-25
	30-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-3	85-100	85-100	70-90	45-70	20-40	5-20
MuB2:												
Miami----------	0-11	Loam	CL, CL-ML, ML	A-4	0	0	100	95-100	80-100	50-90	15-30	3-10
	11-30	Clay loam	CL, SC	A-6	0	0	90-100	85-100	70-95	40-95	30-40	15-25
	30-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-3	85-100	85-100	70-90	45-70	20-40	5-20
MuC:												
Miami----------	0-11	Loam	CL, CL-ML, ML	A-4	0	0	100	95-100	80-100	50-90	15-30	3-10
	11-30	Clay loam	CL, SC	A-6	0	0	90-100	85-100	70-95	40-95	30-40	15-25
	30-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-3	85-100	85-100	70-90	45-70	20-40	5-20
MuC2:												
Miami----------	0-11	Loam	CL, CL-ML, ML	A-4	0	0	100	95-100	80-100	50-90	15-30	3-10
	11-30	Clay loam	CL, SC	A-6	0	0	90-100	85-100	70-95	40-95	30-40	15-25
	30-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-3	85-100	85-100	70-90	45-70	20-40	5-20
MuD2:												
Miami----------	0-11	Loam	CL, CL-ML, ML	A-4	0	0	100	95-100	80-100	50-90	15-30	3-10
	11-30	Clay loam	CL, SC	A-6	0	0	90-100	85-100	70-95	40-95	30-40	15-25
	30-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-3	85-100	85-100	70-90	45-70	20-40	5-20
MuE2:												
Miami----------	0-11	Loam	CL, CL-ML, ML	A-4	0	0	100	95-100	80-100	50-90	15-30	3-10
	11-30	Clay loam	CL, SC	A-6	0	0	90-100	85-100	70-95	40-95	30-40	15-25
	30-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-3	85-100	85-100	70-90	45-70	20-40	5-20
MvD3:												
Miami----------	0-11	Clay loam	CL	A-6	0	0	100	90-100	75-95	65-95	30-40	15-20
	11-30	Clay loam	CL, SC	A-6	0	0	90-100	85-100	70-95	40-95	30-40	15-25
	30-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-3	85-100	85-100	70-90	45-70	20-40	5-20
Mw:												
Mine Pits-------	---	---	---	---	---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
NyB:												
Newaygo---------	0-18	Sandy loam	SC-SM, SM	A-2, A-4	0	0	95-100	95-100	55-80	20-50	15-25	2-7
	18-34	Loam, sandy clay loam, sandy loam	CL, SC, SC-SM	A-2, A-6, A-7	0-1	0-5	75-100	75-100	45-95	20-50	22-45	10-25
	34-60	Sand, gravelly coarse sand	SM, SP, SP-SM	A-1-b, A-2-4, A-3	0-3	0-10	90-100	55-100	40-80	0-20	0-14	NP
OkA:												
Ottokee---------	0-9	Loamy sand	SM	A-2, A-4	0	0	100	90-100	55-80	15-45	0-14	NP
	9-50	Sand, loamy sand	SM	A-2	0	0	100	90-100	65-80	20-35	0-14	NP
	50-60	Sand	SM, SP-SM, SW-SM	A-3, A-2	0	0	100	95-100	70-80	5-25	0-14	NP
OmB:												
Owosso----------	0-8	Sandy loam	SC, SC-SM, SM	A-2, A-4	0	0-5	95-100	75-100	50-70	20-45	12-29	NP-10
	8-30	Sandy loam, loam, fine sandy loam	SC, SC-SM, SM	A-2, A-4	0	0-5	95-100	75-100	60-90	25-45	15-30	NP-10
	30-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-95	85-95	45-70	25-40	6-21
Miami----------	0-11	Sandy loam	SC, SC-SM, SM	A-2-4, A-4	0	0	100	95-100	60-85	30-50	15-25	3-10
	11-30	Clay loam	CL, SC	A-6	0	0	90-100	85-100	70-95	40-95	30-40	15-25
	30-60	Loam, clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-3	85-100	85-100	70-90	45-70	20-40	5-20
OmC:												
Owosso----------	0-8	Sandy loam	SC, SC-SM, SM	A-2, A-4	0	0-5	95-100	75-100	50-70	20-45	12-29	NP-10
	8-30	Sandy loam, loam, fine sandy loam	SC, SC-SM, SM	A-2, A-4	0	0-5	95-100	75-100	60-90	25-45	15-30	NP-10
	30-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-95	85-95	45-70	25-40	6-21
Miami----------	0-11	Sandy loam	SC, SC-SM, SM	A-2-4, A-4	0	0	100	95-100	60-85	30-50	15-25	3-10
	11-30	Clay loam	CL, SC	A-6	0	0	90-100	85-100	70-95	40-95	30-40	15-25
	30-60	Loam, clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-3	85-100	85-100	70-90	45-70	20-40	5-20
OmD2:												
Owosso----------	0-8	Sandy loam	SC, SC-SM, SM	A-2, A-4	0	0-5	95-100	75-100	50-70	20-45	12-29	NP-10
	8-30	Sandy loam, loam, fine sandy loam	SC, SC-SM, SM	A-2, A-4	0	0-5	95-100	75-100	60-90	25-45	15-30	NP-10
	30-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-95	85-95	45-70	25-40	6-21
Miami----------	0-11	Sandy loam	SC, SC-SM, SM	A-2-4, A-4	0	0	100	95-100	60-85	30-50	15-25	3-10
	11-30	Clay loam	CL, SC	A-6	0	0	90-100	85-100	70-95	40-95	30-40	15-25
	30-60	Loam, clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-3	85-100	85-100	70-90	45-70	20-40	5-20
PfB:												
Plainfield Variant--------	0-8	Loamy sand	SM, SP-SM	A-1, A-2, A-4	0	0	75-100	75-100	40-90	12-40	0-14	NP
	8-28	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	75-100	75-100	40-70	1-15	0-14	NP
	28-60	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	75-100	75-100	40-90	1-15	0-14	NP
PfC:												
Plainfield Variant--------	0-8	Loamy sand	SM, SP-SM	A-1, A-2, A-4	0	0	75-100	75-100	40-90	12-40	0-14	NP
	8-28	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	75-100	75-100	40-70	1-15	0-14	NP
	28-60	Sand	SM, SP, SP-SM	A-1, A-2, A-3	0	0	75-100	75-100	40-90	1-15	0-14	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
RhA:												
Richter---------	0-13	Loamy very fine sand	ML, SM	A-4	0	0	95-100	90-100	75-100	35-90	15-20	NP-4
	13-26	Loamy very fine sand, silt loam, fine sandy loam	ML, SM	A-4	0	0	95-100	90-100	65-95	35-90	15-20	NP-4
	26-60	Loamy fine sand, fine sandy loam, silt loam	ML, SM	A-2, A-4	0	0	95-100	90-100	60-100	20-90	15-20	NP-4
Sd:												
Sebewa----------	0-11	Loam	CL, CL-ML	A-4, A-6	0	0	95-100	75-100	65-95	50-75	20-35	4-15
	11-30	Sandy clay loam, clay loam, gravelly clay loam	CL, SC	A-2, A-6, A-7	0	0	95-100	60-90	50-90	25-75	25-45	10-25
	30-60	Very gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0	0-5	40-95	25-90	20-60	0-10	0-14	NP
Sh:												
Shoals----------	0-7	Loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	65-90	20-35	6-15
	7-20	Silt loam, loam, clay loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	75-85	25-40	5-15
	20-60	Stratified silt loam to sandy loam	CL, CL-ML, ML	A-4	0	0-3	90-100	85-100	60-80	50-70	15-30	4-10
Sn:												
Sloan----------	0-12	Loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	85-100	70-95	20-40	3-15
	12-34	Loam, silt loam	CL, CL-ML	A-4, A-6	0	0	100	90-100	85-100	60-90	15-35	8-18
	34-60	Silty clay loam, loam, clay loam	CL	A-4, A-6	0	0	90-95	85-95	80-95	80-95	25-40	12-25
SpA:												
Spinks----------	0-8	Loamy sand	SC-SM, SM, SP-SM	A-1-b, A-2-4	0	0	95-100	75-100	35-90	10-30	15-25	NP-7
	8-29	Sand	SC-SM, SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-90	5-35	15-25	NP-7
	29-44	Loamy sand, sand	SC-SM, SM, SP-SM	A-1-b, A-2-4	0	0	95-100	75-100	40-90	10-35	15-25	NP-7
	44-60	Sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-90	5-35	15-20	NP-4
SpB:												
Spinks----------	0-8	Loamy sand	SC-SM, SM, SP-SM	A-1-b, A-2-4	0	0	95-100	75-100	35-90	10-30	15-25	NP-7
	8-29	Sand	SC-SM, SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-90	5-35	15-25	NP-7
	29-44	Loamy sand, sand	SC-SM, SM, SP-SM	A-2-4, A-1-b	0	0	95-100	75-100	40-90	10-35	15-25	NP-7
	44-60	Sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-90	5-35	15-20	NP-4
SpC:												
Spinks----------	0-8	Loamy sand	SC-SM, SM, SP-SM	A-1-b, A-2-4	0	0	95-100	75-100	35-90	10-30	15-25	NP-7
	8-29	Sand	SP-SM, SC-SM, SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-90	5-35	15-25	NP-7
	29-44	Loamy sand, sand	SC-SM, SM, SP-SM	A-1-b, A-2-4	0	0	95-100	75-100	40-90	10-35	15-25	NP-7
	44-60	Sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-90	5-35	15-20	NP-4

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SpD:												
Spinks----------	0-8	Loamy sand	SC-SM, SM, SP-SM	A-1-b, A-2-4	0	0	95-100	75-100	35-90	10-30	15-25	NP-7
	8-29	Sand	SC-SM, SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-90	5-35	15-25	NP-7
	29-44	Loamy sand, sand	SC-SM, SM, SP-SM	A-1-b, A-2-4	0	0	95-100	75-100	40-90	10-35	15-25	NP-7
	44-60	Sand	SM, SP-SM	A-1-b, A-2-4, A-3	0	0	95-100	75-100	35-90	5-35	15-20	NP-4
TsB:												
Tuscola---------	0-12	Loam	CL, CL-ML, ML	A-4	0	0	100	100	85-100	60-90	20-30	3-10
	12-34	Loam, silt loam, fine sandy loam	CL, CL-ML, ML	A-4	0	0	100	100	80-95	50-90	15-25	NP-7
	34-60	Stratified fine sand to silt loam	ML, SM	A-4	0	0	100	95-100	75-90	40-90	15-25	NP-4
Tw:												
Tawas----------	0-31	Muck	PT	A-8	---	---	---	---	---	---	---	---
	31-60	Sand	SM, SP	A-1, A-2, A-3	0	0	80-100	60-100	30-80	0-35	0-14	NP
Wa:												
Wallkill--------	0-8	Loam	ML, OL, SM	A-5, A-7	0	0	95-100	90-100	70-100	40-90	40-50	5-15
	8-20	Clay loam	CL	A-6	0	0	90-100	90-100	95-100	80-90	30-40	10-25
	20-60	Muck	PT	A-8	0	0	---	---	---	---	---	---
WeA:												
Wasepi----------	0-8	Sandy loam	SC-SM, SM	A-2, A-4	0	0-5	85-100	75-95	60-90	25-50	15-27	NP-7
	8-33	Sandy loam, sandy clay loam, gravelly sandy clay loam	SC, SC-SM, SM	A-2, A-4, A-6	0	0-5	85-100	60-95	55-85	20-45	15-35	2-16
	33-60	Sand, gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0	0-10	40-80	35-75	30-60	0-10	0-14	NP
WeB:												
Wasepi----------	0-8	Sandy loam	SC-SM, SM	A-2, A-4	0	0-5	85-100	75-95	60-90	25-50	15-27	NP-7
	8-33	Sandy loam, sandy clay loam, gravelly sandy clay loam	SC, SC-SM, SM	A-2, A-4, A-6	0	0-5	85-100	60-95	55-85	20-45	15-35	2-16
	33-60	Sand, gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1, A-2, A-3	0	0-10	40-80	35-75	30-60	0-10	0-14	NP

Engineering Index Properties--Continued

ENDNOTE--ENGINEERING PROPERTIES

TEXTURE is given in standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soils that is less than 2 millimeters in diameter. Loam, for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, gravelly.

CLASSIFICATION of the soils is determined according to the Unified soil classification system (ASTM, 2001) and system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2000).

The unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM and SC; silty and clayey soils as ML, CL, OL, MH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soil in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection. If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6.

ROCK FRAGMENTS larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

PERCENTAGE (OF SOIL PARTICLES) PASSING DESIGNATED SIEVES is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4. 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soil sampled in the survey area and in nearby areas and on estimates made in the field.

LIQUID LIMIT and PLASTICITY INDEX (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area of from nearby areas and on field examination. The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.