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Walter H. Flood
& Co., Inc.
ENGINEERS

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STATE OF ILLINOIS

Soil Investigation No. 74050138-5

Monitoring Well Installation

Solid Waste Disposal Facility

Richton Park, Illinois

Prepared For

John Sexton Contractors Company

900 Jorie Boulevard

Oak Brook, Illinois 60521

November 2, 1977

US EPA RECORDS CENTER REGION 5
414114

Walter H. Flood & Co., Inc.
ENGINEERS
[illegible] HARRISON STREET
HILLSIDE, ILLINOIS [illegible]
TELEPHONE [illegible]
CHICAGO NUMBER [illegible]

ESTABLISHED 1913
WALTER H. FLOOD (1885-1951)
RAYMOND J. FLOOD, P. E.
PAUL E. FLOOD, P. E.

KALAMAZOO OFFICE
[illegible] WEST NEDGE AVENUE
PORTAGE, MICHIGAN 49081
TELEPHONE 616/327-[illegible]

November 2, 1977

John Sexton Contractors Company
900 Jorie Boulevard
Oak Brook, Illinois 60521

Re: Soil Investigation No. 74050138-5
Monitoring Well Installation
Solid Waste Disposal Facility
Richton Park, Illinois

Attn: Mr. Arthur Daniels

Gentlemen:

Enclosed is our report of the investigation for the reference project.

If you have any questions concerning this report, or should we be able to assist you in any way, please call upon us.

The soil samples are being retained in our laboratory for thirty days for your possible future reference.

Respectfully submitted,

WALTER H. FLOOD & CO., INC.

Raymond J. Flood

Raymond J. Flood
Registered Professional Engineer
Illinois 21775

RJF:rs
3-

Enclosures
Report
Location Diagram - 1
Well Logs - 4
Boring Log Explanation - 1

[illegible] • SPECIFICATIONS & REPORTS • PHYSICAL & CHEMICAL TESTS • RESEARCH & CON[illegible]
[illegible] ON • [illegible] INSPECTED BY CEMENT & CONCRETE REFERENCE LABORATORY

[illegible] • AMERICAN PUBLIC WORKS ASSOCIATION • AMERICAN CONCRETE INSTITUTE
[illegible] ENGINEERS COUNCIL • ILLINOIS SOCIETY OF PROFESSIONAL ENG[illegible]
[illegible] ENGINEERS • CHICAGO BUILDING CONGRESS

CONDITIONS OF INVESTIGATION

A. Report Scope, Preparation, and Review

This report has been prepared in accordance with the generally accepted Soil and Foundation Engineering practices. No other warranty, expressed or implied, is intended. The purpose of the investigation is to secure and log subsoil information, to record the geological nature, type, consistency and thicknesses of the various soil strata as encountered in the borings, and to install ground water monitoring wells at locations and to depths as designated by others. No conclusions and recommendations are included with this report. In the event that conclusions and recommendations based upon the data of this report are made by others, such conclusions and recommendations are not our responsibility unless a review is made and a concurring opinion is submitted in writing.

B. Test Boring Logs

Field boring logs were prepared in the field by a qualified driller foreman. These field logs, on file in our office, give pertinent field data including boring number, dates of taking the boring, methods of drilling and sampling, depths of samples, descriptions of the various soils sampled, observed, and estimated between samples, ground water readings, and other observed conditions considered pertinent to the investigation. The soils between samples may have been determined by the drilling foreman based upon "feel" of the drill bit, or wash cuttings. The changes in soil strata may be transitional rather than abrupt, particularly with respect to coloring, weathering, and consistency changes. The amount of large sized gravel or boulders is generally estimated because sampling tubes seldom retain these larger sized soil particles. The field soils descriptions have been reviewed, and reaffirmed or modified by visual examination of soil samples by qualified soils personnel in accordance with the enclosed boring log explanation sheet. Soil consistency classifications are based upon the field penetration tests. The final test boring logs have been prepared from the field data and the sample review, and therefore are based upon both interpretive and factual data.

C. Ground Water

Ground water levels were taken in the test borings and are recorded on the soil boring logs. However, it must be noted that fluctuations in the level and quantity of the ground water may occur due to variations in rainfall, temperature, soil permeability, and other factors not evident at the time of the water level measurements. The probability of ground water level variation is anticipated.

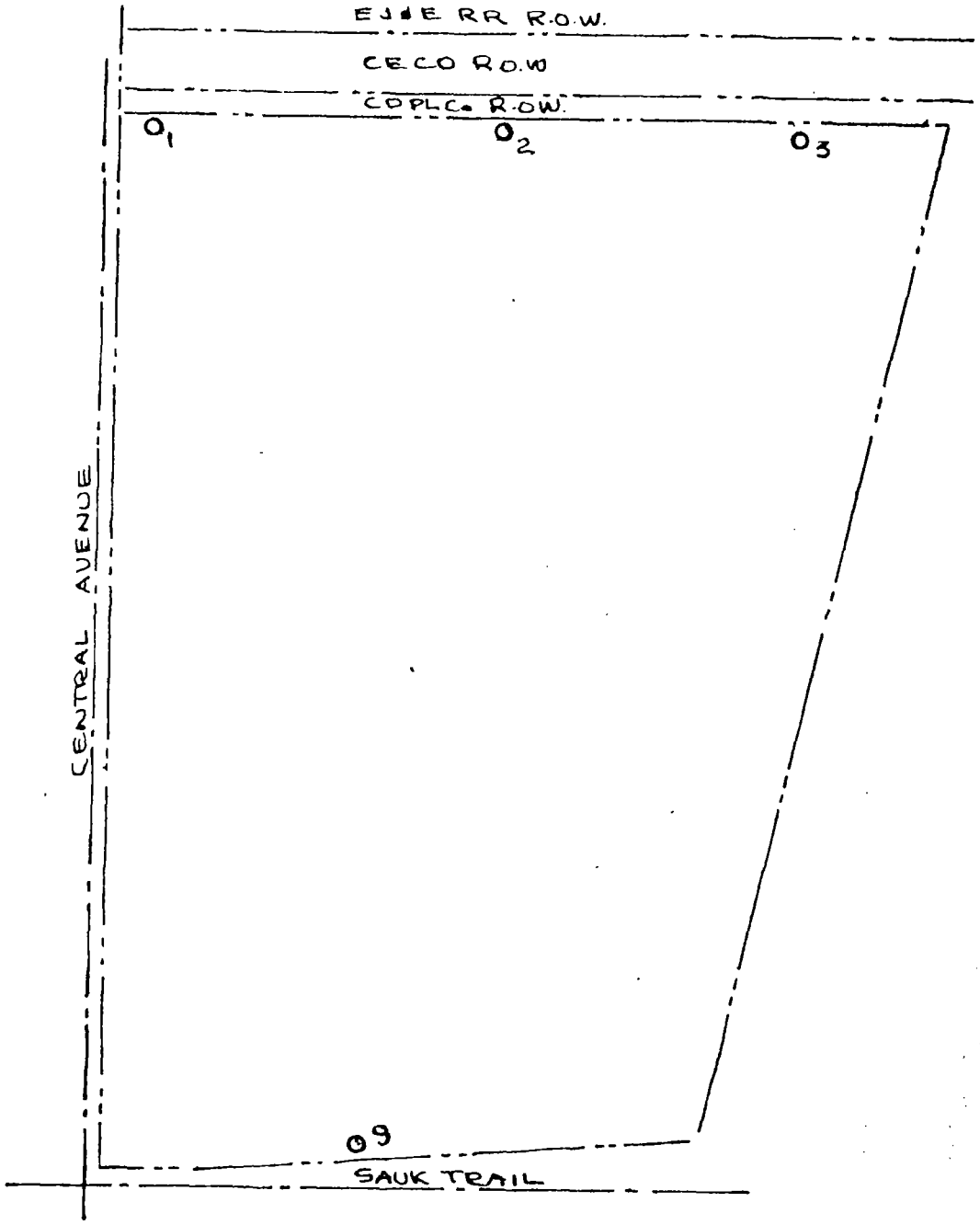
D. Monitoring Well Installation Data

Well Number	1 W	2 W	3 W	9 W
Date Installed	10/13/77	10/14/77	10/14/77	10/6/77
Total Length Installed	51.0'	44.0'	36.0'	18.3'
Ht. Above Grade, Top	1.0'	1.0'	1.0'	1.3'
Well Pipe ID	4.0"	4.0"	4.0"	4.0"
Well Pipe Material	PVC Sch 40	PVC Sch 40	PVC Sch 40	PVC Sch 40
Well Screen Length	5.0'	4.0'	6.0'	7.0'
Well Screen Size	.020"	.020'	.020"	.020"
Ground Water Level*				
at installation	30.0'	Dry	25.0'	Dry
24 hours after install.	42.0'	Dry	23.0'	Dry

*Depth in feet from top of well to ground water surface.

E. Field Investigation

The wells were located in the field at locations stated by your representative. The wells were placed to depths as requested by the Illinois EPA letter of September 20, 1977. The well installation was started on October 6, 1977, and completed on October 14, 1977. A hollow stem auger (truck mounted) type of drilling rig was used to make the borings. Logs of wells were made by the driller in the field based upon auger cuttings from the bore hole. The soil types, consistency and thickness were recorded in the log, with ground water conditions also recorded. Logs of these wells are enclosed. The 4" PVC plastic pipe was lowered into the bore holes to the required depth. Well point screens were cut by hack saw with cuts on each side of the pipe at 2" intervals. The well point was backfilled with #2 torpedoe sand to about a foot above the well point top. Bentonite-soil was backfilled to grade with the upper 5 feet being thoroughly tamped. The wells were pumped, and the rise in water recorded to test the wells. Dry wells were tested by slug testing, with water placed into the well and the drop in level recorded. Water quality test samples will be reported separately.



NOTE:
1 O MONITOR WELL
(LOCATION STAKED BY OTHERS)

N

MONITORING WELLS LOCATION DIAGRAM RICHTON PARK, ILLINOIS	
WALTER H. FLOOD & CO. INC.	
SCALE 1" = 400'	BY RJF
JOB/LAB NO 77050152	DATE 8/15/77

FORM 1 EM 6-67 SSF

Walter H. Flood & Co., Inc.
ENGINEERS
4421 HARRISON STREET
HILLSIDE ILLINOIS 60162
7509 S. WESTNEDGE AVENUE
PORTAGE MICHIGAN 49081

SOIL BORING LOG NO. 1 W

FOR: John Sexton Contractors Company

PROJECT: Solid Waste Management Facility

LOCATION: Richton Park, Illinois

METHOD OF BORING HS & A	WATER LEVEL READINGS		DRILLING DATA		BACKFILLING DATA
S.S. O.D. 2" 140# HAMMER 30" DROP	26.0'	W.D.	DATE	10/13/77	DATE
SHELBY TUBE SIZE	Dry	B.C.R.	FOREMAN	RF	BY
CASING SIZE 3 3/4" IDHS	30.0'	A.C.R.	CREW NO.	2	METHOD
CORE SIZE	42' 4-24	HRS. A.D.	JOB NO.	74050138-5	GROUT
		HRS. A.D.	VERT. SCALE	1" = 10'	QUANTITY

DEPTH	S	T	N	L	R	DD	DESCRIPTION
							Ground surface
0.0							Black silty clay
1.0							Brown and gray silty clay, trace of small gravel, very tough
45.0							Gray fine to medium sand, some silt
55.0							End of boring Note: 2" PVC well installed this bore hole, see text for well data

QU ● LABORATORY X 1000 PSF — O PENETROMETER

2 4 6 8 10

10 20 30 40 50

WC ▲ NATURAL %

LEGEND:
A—AUGER
ACR—AFTER CASING REMOVAL
AD—AFTER DRILLING
BCR—BEFORE CASING REMOVAL
C—CORE
DCI—DRY CAVE IN
DD—DRY DENSITY LB PER CU FT
DEPTH—FEET BELOW GROUND SURFACE
FT—FISHTAIL
HA—HAND AUGER
HS—HOLLOW STEM AUGER
L—SAMPLE LENGTH
N—PENETRATION BLOWS PER FT
QU—UNCON COMP STRENGTH LBS. PER SQ. FT.
R—LENGTH OF SAMP. RECOVERED
S—SAMPLE NUMBER
SS—SPLIT SPOON
ST—SHELBY TUBE
T—TYPE OF SAMPLE
WC—WATER CONTENT %
WCI—WET CAVE IN
WD—WHILE DRILLING
WO—WASHOUT

Walter H. Flood & Co., Inc.
ENGINEERS
4421 HARRISON STREET
HILLSIDE ILLINOIS 60162
7509 S WESTNEDGE AVENUE
PORTAGE, MICHIGAN 49081

SOIL BORING LOG NO. 2 W

FOR: John Sexton Contractors Company

PROJECT: Solid Waste Management Facility

LOCATION: Richton Park, Illinois

METHOD OF BORING	HS	WATER LEVEL READINGS		DRILLING DATA		BACKFILLING DATA
S.S. O.D. 2" 140# HAMMER 30" DROP		Dry	W.D.	DATE	10/13/77	DATE
SHELBY TUBE SIZE		Dry	B.C.R.	FOREMAN	RF	BY
CASING SIZE	45' - 3¼" IDHS	Dry	A.C.R.	CREW NO.	2	METHOD
CORE SIZE		Dry @ 24	HRS. A.D.	JOB NO.	74050138-5	GROUT
			HRS. A.D.	VERT. SCALE	1" = 10'	QUANTITY

DEPTH	S	T	N	L	R	DD	DESCRIPTION
0.0							Ground surface
1.5							Black loam
							Brown to gray silty clay, trace of small gravel, very tough
40.0							Gray silty clay, trace of small gravel, occasional thin sand and ~~silt seam, very tough~~
45.0							End of boring
							Note: 4" PVC well installed this bore hole, see text for well installation data

QU ● LABORATORY X 1000 PSF 2 4 6 8 10 O PENETROMETER

WC ▲ NATURAL % 10 20 30 40 50

LEGEND:
A—AUGER
ACR—AFTER CASING REMOVAL
AD—AFTER DRILLING
BCR—BEFORE CASING REMOVAL
C—CORE
DCI—DRY CAVE IN
DD—DRY DENSITY LB. PER CU FT
DEPTH—FEET BELOW GROUND SURFACE
FT—FISHTAIL
HA—HAND AUGER
HS—HOLLOW STEM AUGER
L—SAMPLE LENGTH
N—PENETRATION, BLOWS PER FT.
QU—UNCON. COMP. STRENGTH LBS. PER SQ. FT.
R—LENGTH OF SAMP. RECOVERED
S—SAMPLE NUMBER
SS—SPLIT SPOON
ST—SHELBY TUBE
T—TYPE OF SAMPLE
WC—WATER CONTENT %
WCI—WET CAVE IN
WD—WHILE DRILLING
WO—WASHOUT

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ENGINEERS
4421 HARRISON STREET
HILLSIDE, ILLINOIS 60162
7509 S. WESTNEDGE AVENUE
PORTAGE, MICHIGAN 49081

SOIL BORING LOG NO. 3 W

FOR: John Sexton Contractors Company

PROJECT: Solid Waste Management Facility

LOCATION: Richton Park, Illinois

METHOD OF BORING HS	WATER LEVEL READINGS		DRILLING DATA		BACKFILLING DATA
S.S. O.D. 2" 140# HAMMER 30" DROP	Dry	W.D.	DATE	10/14/77	DATE
SHELBY TUBE SIZE	10'	B.C.R.	FOREMAN	RF	BY
CASING SIZE 40' - 3 3/4" IDHS	37'	A.C.R.	CREW NO.	2	METHOD
CORE SIZE	23.0' @ 24	HRS. A.D.	JOB NO.	74050138-5	GROUT
		HRS. A.D.	VERT. SCALE	1" = 10'	QUANTITY

DEPTH	S	T	N	L	R	DD	DESCRIPTION
							Ground surface
0.0							Black loam
3.0							Brown and gray silty clay, trace of small gravel, very tough
35.0							Gray silty clay, trace of small gravel, occasional sand and silt ~~seam, very tough~~
40.0							End of boring Note: 4" PVC pipe installed in this bore hole, see text for well installation data

QU ● LABORATORY X 1000 PSF — O PENETROMETER

2 4 6 8 10

10 20 30 40 50

WC ▲ NATURAL %

LEGEND:
A—AUGER
ACR—AFTER CASING REMOVAL
AD—AFTER DRILLING
BCR—BEFORE CASING REMOVAL
C—CORE
DCI—DRY CAVE IN
DD—DRY DENSITY, LB. PER CU. FT.
DEPTH—FEET BELOW GROUND SURFACE
FT—FISHTAIL
HA—HAND AUGER
HS—HOLLOW STEM AUGER
L—SAMPLE LENGTH
N—PENETRATION, BLOWS PER FT.
QU—UNCON. COMP. STRENGTH LBS. PER SQ. FT.
R—LENGTH OF SAMP. RECOVERED
S—SAMPLE NUMBER
SS—SPLIT SPOON
ST—SHELBY TUBE
T—TYPE OF SAMPLE
WC—WATER CONTENT %
WCI—WET CAVE IN
WD—WHILE DRILLING
WO—WASHOUT

Walter H. Flood & Co., Inc.
ENGINEERS
4421 HARRISON STREET
HILLSIDE, ILLINOIS 60162
7509 S. WESTNEDGE AVENUE
PORTAGE, MICHIGAN 49081

SOIL BORING LOG NO. 9 W

FOR: John Sexton Contractors Company

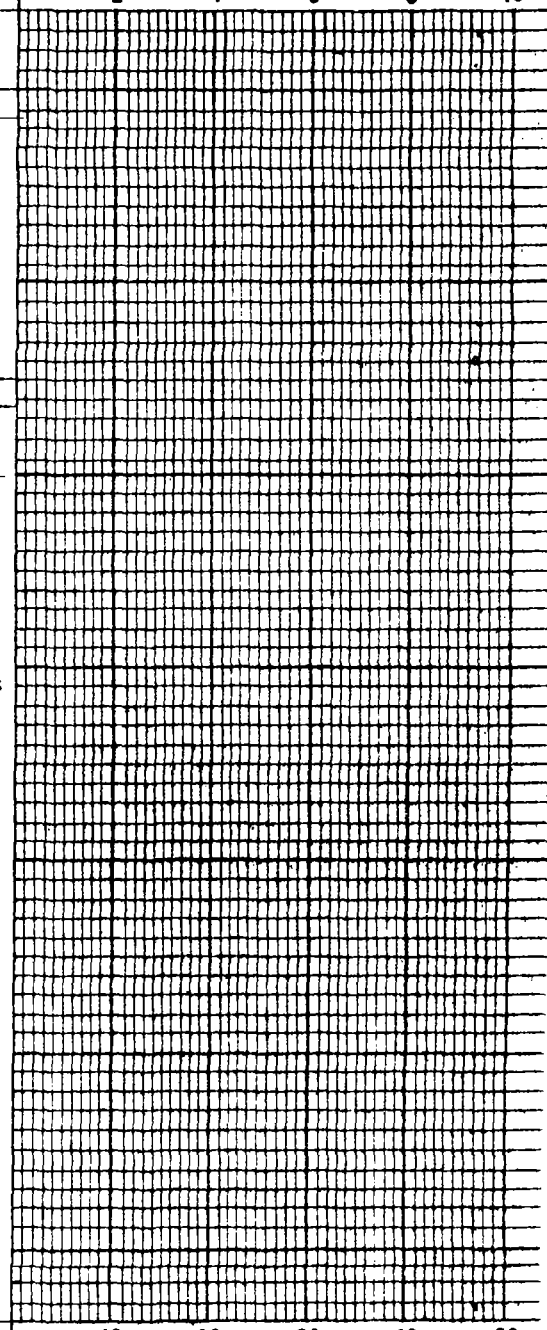
PROJECT: Solid Waste Management Facility

LOCATION: Richton Park, Illinois

METHOD OF BORING HS	WATER LEVEL READINGS	DRILLING DATA	BACKFILLING DATA
S.S. O.D. 2" 140# HAMMER 30" DROP	Dry W.D.	DATE 10/6/77	DATE
SHELBY TUBE SIZE	Dry B.C.R.	FOREMAN RF	BY
CASING SIZE 20' - 3 3/4" IDHS	Dry A.C.R.	CREW NO. 2	METHOD
CORE SIZE	Dry 0 24 HRS. A.D.	JOB NO. 74050138-5	GROUT
	HRS. A.D.	VERT. SCALE 1" = 10'	QUANTITY

DEPTH	S	T	N	L	R	DD	DESCRIPTION
0.0							Ground surface
1.5							Black loam
							Brown and gray silty clay, trace of small gravel, very tough
15.0							
16.5							See note 1
							Gray silty clay, trace of small gravel, very tough
20.0							
							End of boring
							Note 1: Gray fine medium sand, some silt
							Note: 4" PVC pipe installed this bore hole, see text for well installation data

QU ● LABORATORY X 1000 PSF — 2 4 6 8 10
O PENETROMETER



DEPTH	S	T	N	L	R	DD	DESCRIPTION

10 20 30 40 50
WC ▲ NATURAL %

LEGEND:
A—AUGER
ACR—AFTER CASING REMOVAL
AD—AFTER DRILLING
BCR—BEFORE CASING REMOVAL
C—CORE
DCI—DRY CAVE IN
DD—DRY DENSITY, LB. PER CU. FT
DEPTH—FEET BELOW GROUND SURFACE
FT—FISHTAIL
HA—HAND AUGER
HS—HOLLOW STEM AUGER
L—SAMPLE LENGTH
N—PENETRATION, BLOWS PER FT.
QU—UNCON. COMP. STRENGTH LBS. PER SQ. FT.
R—LENGTH OF SAMP. RECOVERED
S—SAMPLE NUMBER
SS—SPLIT SPOON
ST—SHELBY TUBE
T—TYPE OF SAMPLE
WC—WATER CONTENT %
WCI—WET CAVE IN
WD—WHILE DRILLING
WO—WASHOUT

WALTER H. FLOOD & CO., INC.

SOIL BORING LOG EXPLANATION

TEXTURAL CLASSIFICATION

Texture	Symbol	Abbreviation	Size	Abbreviation	Soil Particle Size
Boulder		Bo			over 3.0"
Gravel		Gr	Large	L	1.0" to 3.0"
			Medium	M	.38" to .99"
			Small	Sm	2.0mm to .38"
Sand		S	Coarse	Co	.75mm to 1.99mm
			Medium	M	.25mm to .74mm
			Fine	F	.074mm to .24mm
Silt		Si			.005mm to .073mm
Clay		C			Smaller than .005mm

COHESIVE SOIL CLASSIFICATION

Class	Symbol	Abbreviation	Major Soil Constituent, % of Dry Weight: Sand	Silt	Clay
Clay		C	less than 50	less than 50	20–100
Silty Clay		SiC	less than 20	50–80	20–50
Sandy Clay		SC	50–80	less than 20	20–50

Consistency	Abbreviation	N	Qu
Very Soft	VS	0–2	Less than 700
Soft	S	3–4	700–1200
Stiff	St	5–8	1201–2000
Tough	T	9–16	2001–4000
Very Tough	VT	17–30	4001–8000
Hard	H	over 30	over 8000

If the clay content of a soil is great enough the clay characteristics dominate the soil mass. Clay becomes the soil classification with the other constituents being modifying.

NON-COHESIVE SOIL CLASSIFICATION

Class	Symbol	Abbreviation	Major Soil Constituent, % of Dry Weight: Sand	Silt	Clay
Silt		Si	less than 20	80–100	less than 20
Sand		S	80–100	less than 20	less than 20

Density	Abbreviation	N
Very Loose	VL	0–4
Loose	L	5–9
Medium Dense	MD	10–29
Dense	D	30–49
Very Dense	VD	50 and over

If the sand or silt content of a soil is great enough the soil becomes non-cohesive or semi-cohesive. The soil classification becomes sand or silt with the other soil constituents being modifying.

QUANTITY MODIFIERS

Term	Abbreviation	% of Dry Weight
Trace or occasional	Tr or oc	0–10
Little	Li	11–20
Some	So	21–35
And or with	& or w/	36–50

WATER LEVELS

Symbol	Explanation
—▽—	Final water level
WCI	Wet cave in
DCI	Dry cave in
WD	While drilling

DRILLING AND SAMPLING SYMBOLS AND ABBREVIATIONS

ST	Shelby tube or thin wall tube (ASTM D-1587)	WO	Washout
SS	Split spoon or split tube (ASTM D-1586)	C	Core
A	Auger boring or auger sample	HA	Hand auger
HS	Hollow stem auger		
Qu	Unconfined compressive strength, pounds per square foot		
N	Standard penetration, blows per foot of 140# hammer, 30" drop, 2" O.D. SS		