

McDowell & Associates

Geotechnical, Environmental & Hydrogeological Services • Materials Testing & Inspection

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www.mcdowasc.com

May 19, 2025

Atwell, LLC
Two Towne Square
Suite 700
Southfield, Michigan 48076

Job No. 25-198

Attention: Ms. Jillian Benaglio

Subject: Preliminary Soils Investigation
Latson and Sweet Roads
Genoa Township, Michigan

Dear Ms. Benaglio:

In accordance with your request, we have conducted a Preliminary Soils Investigation at the subject project. It should be noted that analyses and recommendations are beyond the scope of this report.

Field Work and Laboratory Testing

Nine Soil Test Borings, designated as 1 through 9, were performed at the subject property at the approximate locations shown on the Soil Boring Location Plan which accompanies this report. The boring locations were selected by the client and field located by our drillers. The borings were advanced to depths ranging from nineteen feet six inches (19'6") to forty feet six inches (40'6") below the existing ground surface at the boring locations.

Soil descriptions, groundwater observations and the results of field and laboratory tests are to be found on the accompanying Logs of Soil Test Borings and summary sheet of Sieve Analysis results.

The borings encountered three inches (3") to one foot one inch (1'1") of surficial topsoil. Borings 1 and 3 encountered two feet (2') of fill consisting of sand-type soils. The apparent native soils encountered in Borings 1, 2, 3, 5, 6, and 7 encountered primarily firm to extremely stiff clay-type soils with some strata of sand-type soils encountered at depths of nine feet (9') and below. Underlying the topsoil in Borings 4 and 8 were alternating strata of stiff to extremely stiff clay-type soils and medium compact to compact sand-type soils with primarily sand-type soils encountered at respective depths of nine feet (9') and twenty-four feet six inches (24'6") through remaining extent of boring until boring completion. The apparent native soils encountered in Boring 9 were medium compact to very compact sand-type soils with varying amounts of silt and clay to a depth of twenty-eight feet (28') followed by very stiff to extremely stiff clay-type soils which were encountered through boring completion at forty feet six inches (40'6").

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Soil descriptions and depths shown on the boring logs are approximate indications of change from one soil type to another and are not intended to represent an area of exact geologic change or stratification. The transition from one soil type to the next may be gradual rather than abrupt and subsurface conditions may be different from those found by the borings at locations between or beyond the actual boring locations. Also, the site shows some signs of modification which could indicate fill and soil conditions different from those encountered at the boring locations.

Groundwater was encountered in each of the borings at initial depths ranging from ten inches (10") to sixteen feet three inches (16'3") below the existing ground surface. Upon completion of drilling, groundwater levels were recorded in Borings 1, 2, 3, and 5 through 9 at depths ranging from one foot nine inches (1'9") to sixteen feet two inches (16'2") below the existing ground surface. Boring 4 was dry upon completion of drilling. It should be noted that short-term groundwater observations may not provide a reliable indication of the depth of the water table. In soils with significant fines content (clay and/or silt), this is due to the slow rate of infiltration of water into the borehole as well as the potential for water to become trapped in overlying layers of granular soils during periods of heavy rainfall. Water levels in granular soils fluctuate with seasonal and climatic changes as well as the amount of rainfall in the area immediately prior to the measurements. It should be expected that groundwater fluctuations could occur on a seasonal basis and that seams of water-bearing sands or silts could be found within the various clay strata at the site.

Standard Penetration Tests (SPTs) performed during the sampling operation indicate that the site soils have poor to very good strengths and densities. The tests at a depth of two feet six inches (2'6") resulted in penetration indices ranging from 5 to 17 blows per foot. The five-foot (5') test values varied from 8 to 28 blows per foot. At a depth of seven feet six inches (7'6"), the results ranged from 9 to 28 blows per foot. At ten feet (10') to twenty feet (20'), penetration indices varied from 6 blows per foot to 40 blows for the initial six-inch (6") drive. In Borings 8 and 9, at depths of twenty-five feet and below, the penetration indices ranged from 5 blows per foot to 35 blows for the initial six-inch (6") drive. All SPTs were performed with a rope and cathead safety hammer.

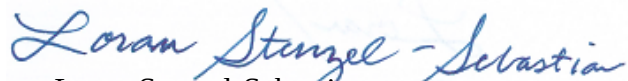
Closing

Experience indicates that actual subsurface conditions at the site could vary from those found at the nine test borings performed at specific locations.

If we can be of any further service, please feel free to call.

Very truly yours,

McDOWELL & ASSOCIATES



Loran Stenzel-Sebastian
Staff Geologist



David Quintal, P.E.
Senior Engineer

LS/mr

McDowell & Associates

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General Notes

1. Terminology - Unless otherwise noted, all terms used herein refer to standard definitions presented in ASTM D653 and NAVFAC DM-7.1 Table 2 (Pages 7.1-8)
2. Particle Size

Boulder	Greater than 12"
Cobble	3" to 12"
Gravel	#4 Sieve to 3"
Stone	¾" to 3"
Pebble	#4 Sieve to ¾"

Coarse Sand	#10 Sieve to #4 Sieve
Medium Sand	#40 Sieve to #10 Sieve
Fine Sand	#200 Sieve to #40 Sieve
Silt	0.005mm to #22 Sieve
Clay	Less than 0.005mm

3. Classification of Constituents

-Major soil constituent or soil property is the principal noun (i.e. clay, silt, sand, etc.)
-Second and third major constituents (percent by weight) are reported as follows:

Trace	2% to 12%
Adjective (clayey, silty, etc.)	Over 12%

-Minor constituents (percent by weight) are reported as follows:

Occasional	Sporadic
Trace	2% to 12%
Little	13% to 22%
Some	23% to 33%

4. Stratified Descriptions

Streak	0" to 1/16" thickness
Parting	1/16" to ¼" thickness
Lense	¼" to 1" thickness
Seam	1" to 3" thickness
Layer	3" to 9" thickness

5. Soil Consistency – If clay content is sufficient so that clay dominates the soil properties, then clay becomes the principal noun with the other major constituent as modifier (i.e. silty clay, sandy clay, etc.). Relative density of granular soils is based upon the evaluation of the standard penetration resistance modified as required for depth effects, sampling effects, etc.
6. Unified Soil Classifications – Soils have been classified utilizing the Unified Soil Classification System (ASTM D2487) based on visual characteristics, particle size distributions, liquid limits, and plasticity index information. Unified Soil Classifications are shown as CL, ML, SW, SM, etc.

Cohesive Consistency	Approximate Unconfined Compressive Strength (psf)	Granular Consistency	Approximate Relative Density (%)	Range of Penetration (N)
Extremely Soft	Below 250	Very Loose	0 to 5	Less than 1
Very Soft	250 to 500	Loosely Compact	5 to 10	1 to 1.5
Soft	500 to 1000	Slightly Compact	10 to 20	2 to 4.5
Firm	1000 to 2000	Medium Compact	20 to 30	5 to 7.5
Stiff	2000 to 4000	Compact	30 to 45	8 to 16.5
Very Stiff	4000 to 8000	Very Compact	45 to 60	17 to 25
Extremely Stiff	Over 8000	Extremely Compact	60 to 100	Over 25

7. Sample Designations

D	Disturbed Sample – Directly from auger
SS	Split Spoon Sample – Without liner inserts
UL	Undisturbed Liner – Split Spoon Sample with liner inserts
ST	Shelby Tube Sample – 3" diameter unless otherwise noted
RC	Rock Core – NX core unless otherwise noted

8. Standard Penetration Test (ASTM D1586) – A 2.0" outside diameter, 1 ⅜" inside diameter split barrel sampler is driven into soil by means of a 140-pound weight falling freely through a vertical distance of 30". The sampler is normally driven in three successive 6" increments with the number of blows required to drive the sampler through each increment recorded. The sum of the second and third increment is termed the Standard Penetration Resistance (N).

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LOG OF SOIL
BORING NO. 1

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

LOCATION Genoa Township, Michigan

JOB NO. 25-198

SURFACE ELEVATION DATE 5/6/2025

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %	
	1		1'1" Moist dark brown clayey TOPSOIL with vegetation, fill							
A	2		2'0" Wet brown fine SAND with trace of topsoil, fill	2						
UL				3	16.9	129				
	3		Stiff moist variegated silty CLAY with traces of sand and pebbles	8			*	(3500)		
	4									
B			4'0"	7						
UL	5		Extremely silty moist variegated silty CLAY with traces of sand and pebbles	13	15.2	133				
	6			15			*	(9000+)		
C	7		6'6"	3						
UL				4	12.7	135				
	8		Stiff moist variegated silty CLAY with wet brown silty fine sand seams	5			*	(2000)		
	9									
D			9'0"	10						
UL	10			16						
			Extremely stiff moist brown silty CLAY with traces of sand and pebbles	10/3"						
	11									
	12									
	13									
			13'0"							
	14									
E			Extremely stiff moist variegated sandy CLAY with wet brown silty fine sand seams to layers	8						
UL	15			12						
				14						
	16		16'0"							
	17		Extremely compact wet brown gravelly fine SAND with trace of silt and moist sandy clay seams							
	18									
	19		19'0" Extremely compact moist brown fine SAND with trace of gravel							
F			19'6"	40						
UL	20			---						

	21									
	22									
	23									
	24									
	25									
TYPE OF SAMPLE			Note: SPT Hammer: Safety Crew Chief: DA Standard Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer Falling 30": Count Made at 6" Intervals		GROUND WATER OBSERVATIONS					
D. - DISTURBED		G.W. ENCOUNTERED AT			1	FT.	1	INS.		
U.L. - UNDIST. LINER		G.W. ENCOUNTERED AT			16	FT.	0	INS.		
S.T. - SHELBY TUBE		G.W. AFTER COMPLETION			6	FT.	6	INS.		
S.S. - SPLIT SPOON		G.W. AFTER			HRS.		FT.		INS.	
R.C. - ROCK CORE										
* - CALIBRATED										
PENETROMETER					G.W. VOLUMES Medium to Heavy					
(POCKET PENETROMETER)										



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LOG OF SOIL
BORING NO. 2

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

LOCATION Genoa Township, Michigan

JOB NO. 25-198

SURFACE ELEVATION DATE 5/6/2025

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %	
			0'3" Moist dark brown clayey TOPSOIL with vegetation							
	1		Very compact moist to wet brown clayey SAND							
A	2									
UL					6					
	3				7	9.7	126			
			3'0"	10						
	4		Stiff moist brown silty CLAY with traces of sand and pebbles and wet brown silty fine sand and clayey sand seams							
B										
UL	5				3					
					3	17.5	125			
	6				5			*	(2000)	
C	7				5					
UL					6	12.6	136			
	8				9			*	(2500)	
	9		9'0"							
D					6					
UL	10				10					
					13					
	11			Very stiff moist brown silty CLAY with traces of sand and pebbles						
	12									
	13									
	14									
E			14'6"	7						
UL	15				10					
					13					
	16		Very compact wet brown fine SAND with trace of gravel and moist sandy clay seams							
	17									
	18									
	19		18'0"							
F			Extremely compact moist brown fine SAND with traces of silt and gravel							
UL	20		19'9"	30						
					20/3"					
	21				---					
	22									
	23									
	24									
	25									
TYPE OF SAMPLE				Note:	GROUND WATER OBSERVATIONS					
D. - DISTURBED					G.W. ENCOUNTERED AT 1 FT. 6 INS.					
U.L. - UNDIST. LINER			G.W. ENCOUNTERED AT 14 FT. 6 INS.							
S.T. - SHELBY TUBE			G.W. AFTER COMPLETION 14 FT. 8 INS.							
S.S. - SPLIT SPOON			G.W. AFTER HRS. FT. INS.							
R.C. - ROCK CORE										
* - CALIBRATED			SPT Hammer: Safety	Crew Chief: DA						
PENETROMETER			Standard Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer							
(POCKET PENETROMETER)			Falling 30": Count Made at 6" Intervals							
			G.W. VOLUMES				Light to Medium			



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LOG OF SOIL
BORING NO. 3

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

LOCATION Genoa Township, Michigan

JOB NO. 25-198

SURFACE ELEVATION DATE 5/5/2025

Sample & Type	Depth	Legend	SOIL DESCRIPTION		Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %		
			0'8"	Moist dark brown clayey TOPSOIL with trace of vegetation, fill								
	1											
A	2		2'0"	Moist brown fine SAND with traces of clay, silt and pockets of topsoil and sandy clay, fill	3							
UL							3	18.0	127			
	3			Firm moist brown sandy CLAY with wet brown silty fine sand seams	4			*	(3000)			
	4		4'0"									
B							4					
UL	5				4	18.3	127					
							8			*	(3500)	
	6											
C	7				4							
UL							4	12.2	138			
	8			Stiff moist variegated silty CLAY with traces of sand and pebbles and wet brown silty fine sand seams	5			*	(3000)			
	9											
D							7					
UL	10				8	9.9	137					
							9			*	(3500)	
	11											
	12		12'3"									
	13			Compact wet brown silty fine SAND layer								
	14		14'0"									
E							5					
UL	15				6							
							7					
	16			Stiff moist variegated silty CLAY with wet brown fine sand seams								
	17											
	18		18'0"									
	19			Stiff moist blue silty CLAY with traces of sand and pebbles and wet gray silty fine sand seams								
F							4					
UL	20				5							
							5					
	21		20'6"									
	22											
	23											
	24											
	25											
TYPE OF SAMPLE			Note:		GROUND WATER OBSERVATIONS							
D. - DISTURBED												
U.L. - UNDIST. LINER					G.W. ENCOUNTERED AT 1 FT. 6 INS.							
S.T. - SHELBY TUBE					G.W. ENCOUNTERED AT 12 FT. 3 INS.							
S.S. - SPLIT SPOON					G.W. AFTER COMPLETION 7 FT. 9 INS.							
R.C. - ROCK CORE					G.W. AFTER HRS. FT. INS.							
* - CALIBRATED			SPT Hammer: Safety Crew Chief: DA									
PENETROMETER			Standard Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer		G.W. VOLUMES Medium to Heavy							
(POCKET PENETROMETER)			Falling 30": Count Made at 6" Intervals									



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LOG OF SOIL
BORING NO. 4

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

LOCATION Genoa Township, Michigan

JOB NO. 25-198

SURFACE ELEVATION DATE 5/6/2025

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %	
	1		1'0" Moist dark brown clayey TOPSOIL with vegetation							
A	2			Stiff moist variegated silty CLAY with traces of sand and pebbles and wet brown silty fine SAND seams	3					
UL					5	18.2	122			
	3				6			*	(3000)	
	4									
B	5		4'0" Very compact moist brown fine to medium SAND with traces of gravel and silt and moist brown sandy clay seams	9						
UL				8	11.0	123				
	6			9						
	7			6'6" Stiff moist brown sandy CLAY	4					
C			6							
UL	8		8							
	9									
D	10		9'0" Compact moist brown fine SAND	8						
UL				9	4.5	98				
	11			8						
	12									
	13									
	14		14'0" Extremely compact moist brown fine SAND with trace of gravel							
E				12						
UL	15			24						
	16	---								
	17									
	18									
	19									
F	20		20'0"	20						
UL				30						
	21			---						
	22									
	23									
	24									
	25									
TYPE OF SAMPLE			Note:	GROUND WATER OBSERVATIONS						
D. - DISTURBED				G.W. ENCOUNTERED AT 1 FT. 6 INS.						
U.L. - UNDIST. LINER				G.W. ENCOUNTERED AT FT. INS.						
S.T. - SHELBY TUBE				G.W. AFTER COMPLETION Dry						
S.S. - SPLIT SPOON				G.W. AFTER HRS. FT. INS.						
R.C. - ROCK CORE										
* - CALIBRATED			SPT Hammer: Safety	Crew Chief: DA						
PENETROMETER			Standard Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer			G.W. VOLUMES				
(POCKET PENETROMETER)			Falling 30": Count Made at 6" Intervals			Light				



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LOG OF SOIL

BORING NO. 5

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

LOCATION Genoa Township, Michigan

JOB NO. 25-198

SURFACE ELEVATION DATE 5/6/2025

Sample & Type	Depth	Legend	SOIL DESCRIPTION		Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %		
			1'0"	Moist dark brown clayey TOPSOIL with vegetation								
	1											
A	2			Stiff moist variegated silty CLAY with moist brown clayey sand seams	4							
UL					5	17.4	124					
	3				8			*	(4000)			
			3'6"	Stiff moist brown silty CLAY with traces of sand and pebbles and wet brown silty fine sand seams								
	4											
B												
UL	5				3							
			6'0"	Very stiff moist variegated silty CLAY with traces of sand and pebbles	5	11.7	138					
	6								*	(3500)		
C	7				9							
UL												
	8											
			9'0"	Very compact wet brown fine SAND with traces of silt and gravel								
	9											
D												
UL	10				5							
	11											
	12											
	13											
	14											
E			15'6"		5							
UL	15											
	16			Stiff moist blue silty CLAY with wet gray silty fine sand seams	6							
	17											
	18											
	19		19'0"	Very stiff moist brown sandy CLAY								
F												
UL	20											
			20'0"	Very compact moist brown fine SAND with trace of silt	11							
			20'6"									
	21											
	22											
	23											
	24											
	25											
TYPE OF SAMPLE			Note:		GROUND WATER OBSERVATIONS							
D. - DISTURBED					G.W. ENCOUNTERED AT 4 FT. 0 INS.							
U.L. - UNDIST. LINER					G.W. ENCOUNTERED AT 9 FT. 0 INS.							
S.T. - SHELBY TUBE					G.W. AFTER COMPLETION 7 FT. 9 INS.							
S.S. - SPLIT SPOON					G.W. AFTER HRS. FT. INS.							
R.C. - ROCK CORE												
* - CALIBRATED			SPT Hammer: Safety Crew Chief: DA									
PENETROMETER			Standard Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer		G.W. VOLUMES Medium to Heavy							
(POCKET PENETROMETER)			Falling 30": Count Made at 6" Intervals									



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LOG OF SOIL

BORING NO. 6

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

LOCATION Genoa Township, Michigan

JOB NO. 25-198

SURFACE ELEVATION DATE 5/6/2025

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
			0'6" Moist dark brown clayey TOPSOIL with vegetation						
	1								
A	2		Stiff moist brown sandy CLAY with wet brown silty fine sand seams	3					
UL				4	16.6	132			
	3			5			*	(4000)	
	4		4'0"						
B	5		Stiff moist variegated silty CLAY with wet brown silty fine sand seams	3					
UL				6	12.6	137			
	6			9			*	(5000)	
	7		6'6"						
C	8		Extremely stiff moist brown silty CLAY with traces of sand and pebbles and wet brown silty fine sand seams	8					
UL				13	11.0	140			
	9			15			*	(9000+)	
	10		9'0"						
D	11		Very stiff moist brown silty CLAY with traces of sand and pebbles and wet brown silty fine sand seams	9					
UL				9					
	12			10					
	13		12'0"						
	14		Very compact wet brown fine SAND with wet brown fine to medium sand seams						
E	15			8					
UL				11					
	16			12					
	17								
	18		18'0"						
	19		Firm moist blue silty CLAY with wet gray silty fine sand seams						
F	20			3					
UL				3					
	21		20'6"	3					
	22								
	23								
	24								
	25								
TYPE OF SAMPLE			Note:	GROUND WATER OBSERVATIONS					
D. - DISTURBED				G.W. ENCOUNTERED AT 1 FT. 6 INS.					
U.L. - UNDIST. LINER				G.W. ENCOUNTERED AT 12 FT. 0 INS.					
S.T. - SHELBY TUBE				G.W. AFTER COMPLETION 3 FT. 3 INS.					
S.S. - SPLIT SPOON				G.W. AFTER HRS. FT. INS.					
R.C. - ROCK CORE									
* - CALIBRATED			SPT Hammer: Safety	Crew Chief: DA					
PENETROMETER			Standard Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer		G.W. VOLUMES Heavy				
(POCKET PENETROMETER)			Falling 30": Count Made at 6" Intervals						



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LOG OF SOIL
BORING NO. 7

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

LOCATION Genoa Township, Michigan

JOB NO. 25-198

SURFACE ELEVATION DATE 5/6/2025

Sample & Type	Depth	Legend	SOIL DESCRIPTION		Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %	
			0'2"	Moist dark brown clayey TOPSOIL							
	1		4'6"	Firm moist brown silty CLAY with traces of sand and pebbles and occasional moist sand lenses							
A	2										
UL	3				2	17.9	124				
	4				3			*	(2500)		
	5		6'0"	Stiff moist brown silty CLAY with traces of sand and pebbles							
B	6										
UL	7				3	11.8	136		*	(4000)	
	8				5						
	9		13'0"	Very stiff moist brown silty CLAY with traces of sand and pebbles and occasional stones							
C	10										
UL	11				5	12.3	135		*	(6000)	
	12				7						
	13		16'3"	Extremely stiff moist brown silty CLAY with traces of sand and pebbles and occasional stones							
	14										
E	15				11						
UL	16				16						
	17		19'6"	Stiff moist blue silty CLAY with traces of sand and pebbles							
	18										
	19										
F	20				3	10.5	145		*	(2500)	
UL	21		20'6"		4						
	22										
	23										
	24										
	25										
TYPE OF SAMPLE			Note:		GROUND WATER OBSERVATIONS						
D. - DISTURBED			Used track rig.		G.W. ENCOUNTERED AT 16 FT. 3 INS.						
U.L. - UNDIST. LINER					G.W. ENCOUNTERED AT FT. INS.						
S.T. - SHELBY TUBE					G.W. AFTER COMPLETION 16 FT. 2 INS.						
S.S. - SPLIT SPOON					G.W. AFTER HRS. FT. INS.						
R.C. - ROCK CORE											
* - CALIBRATED			SPT Hammer: Safety Crew Chief: TC								
PENETROMETER			Standard Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer		G.W. VOLUMES Heavy						
(POCKET PENETROMETER)			Falling 30": Count Made at 6" Intervals								



McDOWELL & ASSOCIATES
Geotechnical, Environmental, & Hydrogeologic Services
21355 Hatcher Avenue • Ferndale, MI 48220
Phone: (248) 399-2066 • Fax: (248) 399-2157

LOG OF SOIL

BORING NO. 8

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

LOCATION Genoa Township, Michigan

JOB NO. 25-198

SURFACE ELEVATION DATE 5/5/2025

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
			0'5" Moist dark brown sandy TOPSOIL						
	1								
A	2		Medium compact moist brown silty fine SAND	2					
UL				2	9.9	118			
	3			3					
	4		3'6"						
B			Very stiff moist brown sandy CLAY with trace of silt	4					
UL	5			8	11.4	140			
			5'0" Very stiff moist variegated silty CLAY with traces of sand and pebbles	10			*	(5000)	
	6		5'10"						
C	7		Compact wet brown silty SAND with occasional moist brown silty clay lenses	5					
UL				6	11.9	139			
	8			8			*	(6000)	
	9		8'6"						
D			Extremely compact wet brown silty SAND with occasional stones	10					
UL	10			10	12.6	---			
			10'0" Extremely stiff moist blue silty CLAY with traces of sand and pebbles	16					
	11								
			11'6"						
	12								
	13								
	14								
E				3					
UL	15			4	10.1	141			
				5			*	(2500)	
	16								
	17								
	18		Stiff moist blue silty CLAY with traces of sand and pebbles and occasional stones						
	19								
F				4					
UL	20			5					
				7					
	21								
	22								
	23								
	24								
G			24'6" Very compact wet gray silty fine to medium SAND	3					
UL	25			7					
				13					
TYPE OF SAMPLE			Note: Used track rig.	GROUND WATER OBSERVATIONS					
D. - DISTURBED				G.W. ENCOUNTERED AT 5 FT. 10 INS.					
U.L. - UNDIST. LINER				G.W. ENCOUNTERED AT FT. INS.					
S.T. - SHELBY TUBE				G.W. AFTER COMPLETION 7 FT. 0 INS.					
S.S. - SPLIT SPOON				G.W. AFTER HRS. FT. INS.					
R.C. - ROCK CORE									
* - CALIBRATED			SPT Hammer: Safety Crew Chief: TC						
PENETROMETER			Standard Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer	G.W. VOLUMES Medium to Heavy					
(POCKET PENETROMETER)			Falling 30": Count Made at 6" Intervals						



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LOG OF SOIL

BORING NO. 8 (continued)

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

LOCATION Genoa Township, Michigan

JOB NO. 25-198

SURFACE ELEVATION DATE 5/5/2025

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	26		Very compact wet gray silty fine to medium SAND						
	27								
	28								
	29								
H UL	30		Medium compact wet gray silty fine to medium SAND with occasional stones	2	16.7	---			
	31			2					
	32			3					
	33								
	34		Extremely compact wet gray silty fine to medium SAND						
	35								
	36								
	37								
	38		39'6"						
	39								
J UL	40			32					
	41			---					
	42			---					
	43								
	44								
	45								
	46								
	47								
	48								
	49								
	50								
TYPE OF SAMPLE			Note: Used track rig.	GROUND WATER OBSERVATIONS					
D. - DISTURBED				G.W. ENCOUNTERED AT 5 FT. 10 INS.					
U.L. - UNDIST. LINER				G.W. ENCOUNTERED AT FT. INS.					
S.T. - SHELBY TUBE				G.W. AFTER COMPLETION 7 FT. 0 INS.					
S.S. - SPLIT SPOON				G.W. AFTER HRS FT. INS.					
R.C. - ROCK CORE									
* - CALIBRATED			SPT Hammer: Automatic	Crew Chief: TC					
PENETROMETER			Standard Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer		G.W. VOLUMES Medium to Heavy				
(POCKET PENETROMETER)			Falling 30": Count Made at 6" Intervals						



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LOG OF SOIL
BORING NO. 9

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

LOCATION Genoa Township, Michigan

JOB NO. 25-198

SURFACE ELEVATION DATE 5/6/2025

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %	
			0'10" Moist dark brown sandy TOPSOIL							
	1									
A	2			Medium compact wet brown silty fine SAND	2					
UL					3	21.6	125			
	3		4							
	4									
B			4'6" Compact wet brown fine SAND with traces of silt and gravel	2						
UL	5			6	16.1	124				
				7						
	6		6'0"							
C	7		Compact wet brown silty fine to medium SAND with trace of gravel and occasional stones	4						
UL				4	17.3	126				
	8			5						
	9		8'6"							
D			Medium compact wet brown silty fine to medium SAND	3						
UL	10			3	15.0	137				
				4						
	11									
	12									
	13		13'0"							
	14		Compact wet gray fine SAND with traces of silt and gravel and occasional wet silt lenses							
E				4						
UL	15			4	17.1	---				
				4						
	16									
	17									
	18		17'6"							
	19		Very compact wet gray silty fine to medium SAND with occasional wet silt lenses and occasional moist blue silty clay seams							
F				8						
UL	20			10						
				11						
	21									
	22		22'0"							
	23									
	24		Very compact wet brown silty fine SAND							
G				8						
UL	25			10						
				11						
TYPE OF SAMPLE			Note:		GROUND WATER OBSERVATIONS					
D. - DISTURBED			Used track rig.		G.W. ENCOUNTERED AT 0 FT. 10 INS.					
U.L. - UNDIST. LINER					G.W. ENCOUNTERED AT FT. INS.					
S.T. - SHELBY TUBE					G.W. AFTER COMPLETION FT. INS.					
S.S. - SPLIT SPOON					G.W. AFTER HRS. 1 FT. 9 INS.					
R.C. - ROCK CORE										
* - CALIBRATED			SPT Hammer: Safety Crew Chief: TC							
PENETROMETER			Standard Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer Falling 30": Count Made at 6" Intervals		G.W. VOLUMES Heavy					
(POCKET PENETROMETER)										



BORING NO. 9 (continued)

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

LOCATION Genoa Township, Michigan

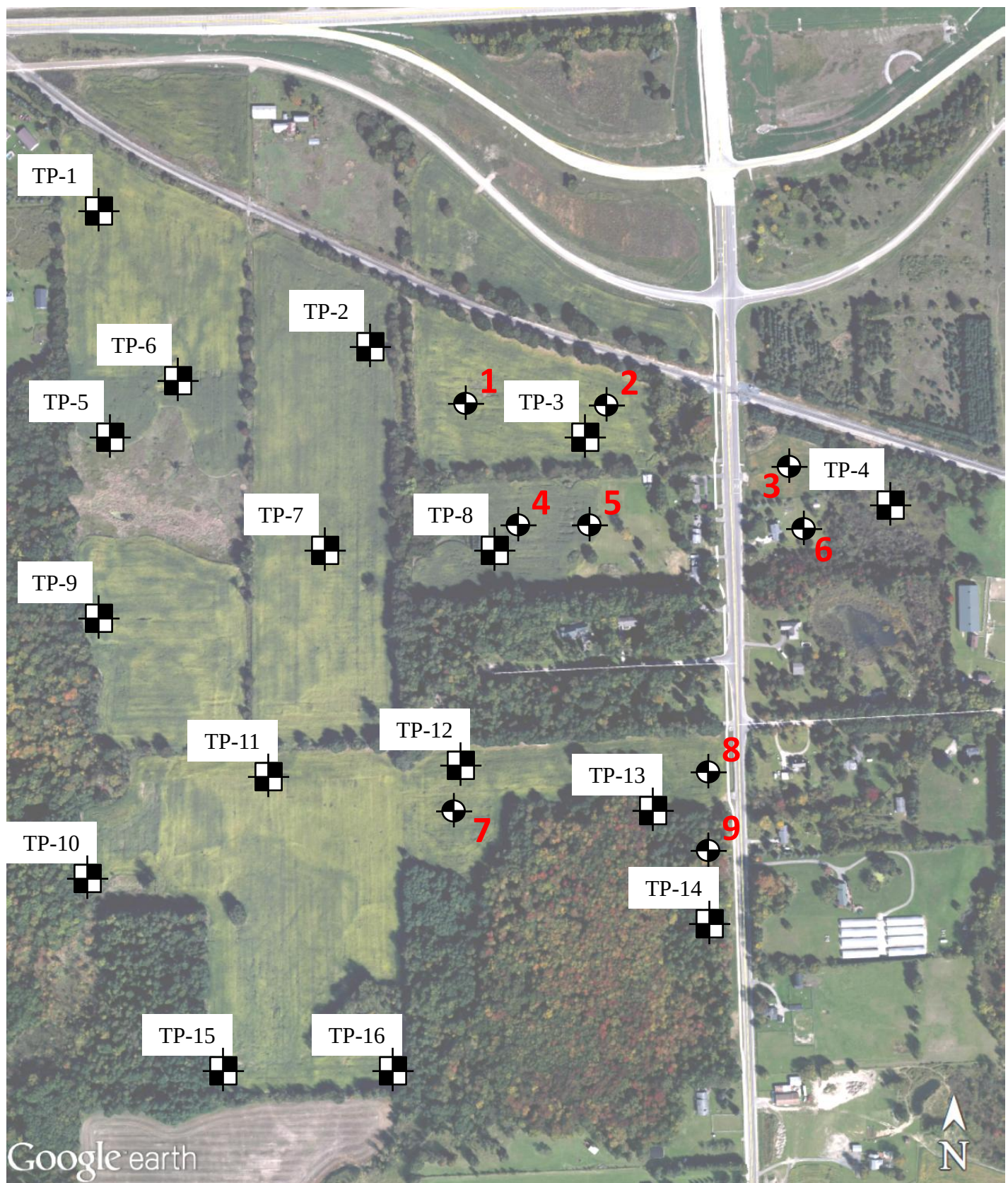
JOB NO. 25-198

SURFACE ELEVATION **DATE** 5/6/2025

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %	
	26		Very compact wet brown silty fine SAND							
	27									
	28									
	29		Very stiff moist brown silty CLAY with traces of sand and pebbles							
H	30			6						
UL				8						
	31			10						
	32									
	33		Extremely stiff moist blue silty CLAY with traces of sand and pebbles and occasional moist brown silty clay seams							
	34									
I	35			10						
UL				17						
	36			20						
	37		Very stiff moist blue silty CLAY with traces of sand and pebbles							
	38									
	39									
J	40			7						
UL				11						
	41		40'6"	12						
	42									
	43									
	44									
	45									
	46									
	47									
	48									
	49									
	50									
TYPE OF SAMPLE			Note: Used track rig.	GROUND WATER OBSERVATIONS						
D. - DISTURBED U.L. - UNDIST. LINER S.T. - SHELBY TUBE S.S. - SPLIT SPOON R.C. - ROCK CORE * - CALIBRATED PENETROMETER (POCKET PENETROMETER)				G.W. ENCOUNTERED AT 0 FT. 10 INS. G.W. ENCOUNTERED AT FT. INS. G.W. AFTER COMPLETION 1 FT. 9 INS. G.W. AFTER HRS FT. INS. G.W. VOLUMES						
			SPT Hammer: Safety Crew Chief: TC							
			Standard Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer Falling 30": Count Made at 6" Intervals							

SIEVE ANALYSIS

<u>Boring</u>	<u>Sample</u>	<u>% Passing #4 Sieve</u>	<u>% Passing #10 Sieve</u>	<u>% Passing #40 Sieve</u>	<u>% Passing #100 Sieve</u>	<u>% Passing #200 Sieve</u>
4	B	93.3	87.6	67.3	16.4	8.2
5	D	100.0	99.9	94.6	34.7	10.4
8	H	95.8	90.7	62.6	20.4	15.3
9	B	95.0	90.5	78.7	19.4	8.2
9	E	97.7	94.9	86.9	30.3	11.6



LEGEND



Approximate Soil Boring Locations drilled by McDowell & Associates 2025 – 1 through 9



Test Pit Locations by McDowell & Associates TP-1 through TP-16 (M&A Job No. 16-376, performed 2016)



McDowell & Associates
21355 Hatcher Avenue
Ferndale, Michigan 48220
Phone: (248) 399-2066
Fax: (248) 399-2157

Soil Boring and Test Pit Location Plan

Job No. 25-198