McDowell & Associates

Geotechnical, Environmental & Hydrogeological Services • Materials Testing & Inspection

21355 Hatcher Avenue, Ferndale, MI 48220 Phone: (248) 399-2066 • Fax: (248) 399-2157 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").

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

Juni David Quintal, P.E.

Loran Stenzel - Sebastian

Loran Stenzel - Sebastian

Staff Geologist

LS/mr

Senior Engineer

McDowell & Associates

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General Notes

- 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	³ / ₄ " to 3"
Pebble	#4 Sieve to 3/4"

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. <u>Stratified Descriptions</u>

Streak	0" to 1/16" thickness
Parting	1/16" to 1/4" thickness
Lense	¹ / ₄ " to 1" thickness
Seam	1" to 3" thickness
Layer	3" to 9" thickness

- 5. <u>Soil Consistency</u> 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. <u>Unified Soil Classifications</u> 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	Approximate Unconfined	Granular Consistency	Approximate Relative	Range of
Consistency	Compressive Strength (psf)		Density (%)	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

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. <u>Standard Penetration Test (ASTM D1586)</u> – A 2.0" outside diameter, 1 %" 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).

3730 James Savage Road, Midland, MI 48642 Phone: (989) 496-3610 • Fax: (989) 496-3190



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LOG OF SOIL	
BORING NO.	1

PROJECT Preliminary Soils Investigation

atson and	Sweet	Roads	

LOCATION Genoa Township, Michigan

JOB NO. 25-198

SURFACE ELEVATION DATE 5/6/2025

SURFACE ELEVATION		EVATION	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			Moist dark brown clayey TOPSOIL with vegetation, fill						
Α	2		1'1"	Wet brown fine SAND with trace of topsoil, fill						
UL			2'0"		3	16.9	129			
	3	-/////		Stiff moist variegated silty CLAY with traces of sand and pebbles	8			*	(3500)	
	4		4'0"							
B UL	5	' /////		Extremely silty moist variegated silty CLAY with traces of	13	15.2	133			
	6	~/////		sand and pebbles	15			*	(9000+)	
			6'6"							
C UL	7	<i>\\\\\\</i>		Stiff moist variegated silty CLAY with wet brown silty fine	3 4	12.7	135			
	8			sand seams	5			*	(2000)	
	9		9'0"							
UL	10	-/////			10 16					
	11			Extremely stiff moist brown silty CLAY with traces of sand and pebbles	10/3"					
				and peoples						
	12	-/////								
	13		13'0"							
	14			Extremely stiff maint variance and analy CLAV with yest brown						
E UL	15	-/////		Extremely stiff moist variegated sandy CLAY with wet brown silty fine sand seams to layers	8 12					
		*/////			14					
	16		16'0"							
	17			Extremely compact wet brown gravelly fine SAND with trace						
	18	_		of silt and moist sandy clay seams						
	19	-	19'0"	Extremely compact moist brown fine SAND with trace of						
F UL	20		19'6"	gravel	40					
		1								
	21	-								
	22]								
	23	_								
	24	-								
	25	7								
		_								
TYPE OF SAMPLE Note: D DISTURBED		Note:			GROUN	D WATER	OBSERV.	ATIONS		
U.L UNDIST. LINER				G.	.W. ENCOUI	NTERED AT	1	FT. 1	INS.	
S.T SHELBY TUBE						NTERED AT	16		INS.	
	PLIT SPO						OMPLETION HRS.	6	FT. 6 FT.	INS.
	OCK COF		S	PT Hammer: Safety Crew Chief: DA	1 '	G.W. AFTER	, onto		1.1.	V.O.
	ENETROM			Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer	G.W	. VOLUMES	i	Medium	to Heavy	
(POCKET PENETROMETER)			Falling 30": Count Made at 6" Intervals							



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JOB NO. 25-198

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LOG OF SOIL	
BORING NO.	2
20.1	

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

LOCATION

Genoa Township, Michigan

	SUR	RFACE EL	EVATION	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 .0.1 .		
	1									
Α	2			Very compact moist to wet brown clayey SAND	6					
UL					7	9.7	126			
	3		3'0"		10					
	.						ļ			
В	4				3		<u> </u>			
UL	5			Oliff we sight house with Ol AV with two see of seed and	3	17.5	125			
				Stiff moist brown silty CLAY with traces of sand and pebbles and wet brown silty fine sand and clayey sand	5			*	(2000)	
	6			seams						
С	7				5		1			
UL	,				6	12.6	136			
	8				9			*	(2500)	
	—						-			-
D	9		9'0"		6					
UL	10				10					
				Very stiff moist brown silty CLAY with traces of sand and	13					
	11			pebbles						
	12						<u> </u>			
	13									
	14									
Е	14		4.41011	4.4101	7					
UL	15		14'6"		10					
	4.0			Very compact wet brown fine SAND with trace of gravel and	13					
	16			moist sandy clay seams						
	17									<u> </u>
	18		18'0"							
	19			Extremely compact moist brown fine SAND with traces of						
F	19			silt and gravel	30					
UL	20]]	19'9"		20/3"					
\vdash	04									1
\vdash	21	1							1	+
	22]								
		1								
	23	}								1
	24	1								
]								
	25									-
TY	PE OF SAI	MPIF	Note:			GROUN	<u>l</u> D WATER	OBSERV	ATIONS	
	ISTURBED					5,1001		V.		
					_ G	.W. ENCOLI	NTERED AT	1	FT. 6	INS.
U.L UNDIST. LINER S.T SHELBY TUBE						NTERED AT	14	FT. 6	INS.	
	PLIT SPOC						OMPLETION	14	FT. 8	INS.
	OCK CORE					G.W. AFTER		•	FT.	INS.
	ALIBRATE		SF	PT Hammer: Safety Crew Chief: DA	1					
PENETROMETER		•			G.W	. VOLUMES	;	Light to	Medium	



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JOB NO. 25-198

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LOG OF SOIL	
BORING NO.	3

PROJECT	Preliminary	Soils	Investigation
INCOLO	i i Cili i ili i ai y	OUIIS	mvestigation

Latson and Sweet Roads

LOCATION

Genoa Township, Michigan

	SUR	FACE EL	EVATION	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.
		外距鏡		Moist dark brown clayey TOPSOIL with trace of vegetation,						
	1		0'8"	fill						
				Moist brown fine SAND with traces of clay, silt and pockets						
UL	2	,,,,,,,,	2'0"	of topsoil and sandy clay, fill	3	10 0	127			
UL	3		1	Firm moist brown sandy CLAY with wet brown silty fine	3 4	18.0	127	*	(3000)	
	3		1	sand seams			1		(3000)	
	4		4'0"							
В			40		4					
UL	5		1		4	18.3	127			
			1		8			*	(3500)	
	6		1							
С	7		1		4					
UL	•		1		4	12.2	138			
	8		1	Stiff moist variegated silty CLAY with traces of sand and	5			*	(3000)	
			1	pebbles and wet brown silty fine sand seams						
	9		1				ļ			
D UL	10		1		7	0.0	137			
UL	10		}		8	9.9	137	*	(3500)	
	11		}				1		(0000)	
			}							
	12		}							
			12'3"							
	13			Compact wet brown silty fine SAND layer			-			
	14			Compact wet brown sitty line CAND layer			<u> </u>			
Е	14	//////	14'0"		5					
UL	15		1		6					
			1		7					
	16		1	Stiff moist variegated silty CLAY with wet brown fine sand						
	47		1	seams						
	17		1							
	18		1							
	10		18'0"							
	19		1	Stiff moist blue silty CLAY with traces of sand and pebbles						
F			1	and wet gray silty fine sand seams	4					
UL	20		1	and not gray only mile came coams	5					
	21		20'6"		5					
	21									
	22	1								
		1								
	23	1								
	-	4								
	24	-					-	-	-	-
	25	-								-
	20	-								
TY	PE OF SA	MPLE	Note:			GROUN	D WATER	OBSERV	ATIONS	•
D D	ISTURBED									
	NDIST. LIN	ER			G	.W. ENCOU	NTERED AT	1	FT. 6	INS.
	HELBY TUI						NTERED AT		FT. 3	INS.
	PLIT SPOC						OMPLETION		FT. 9	INS.
	OCK COR					G.W. AFTER			FT.	INS.
	ALIBRATEI		Q	PT Hammer: Safety Crew Chief: DA	† `	J. VV. AL LED	, , , , , , , , , , , , , , , , , , , ,			
	ENETROME			Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer		. VOLUMES		Medium	ı to Heavy	
1 75		- 1 - 1 \	Localidato	Transmitter 1 Color Test - Driving 2 O.D. Gamplet I With 140b Hallitter	I G.W	. VOLUIVIES	,	wiculuil	. w i leavy	



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LOG OF SOIL	
BORING NO.	4

PROJECT PreliminarySoils Investigation

Latson and Sweet Roads

JOB NO.25-198LOCATIONGenoa Township, Michigan

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	对是		Moist dark brown clayey TOPSOIL with vegetation						
	1	//////	1'0"	,,						
Α	2			Oliff and interesting and a deliber OLAV with transport for and and	3					
UL				Stiff moist variegated silty CLAY with traces of sand and pebbles and wet brown silty fine SAND seams	5	18.2	122		(0.000)	
	3	•		possies and wet brown sitty fine only scams	6			*	(3000)	
	4		4'0"							
В			40		9					
UL	5			Very compact moist brown fine to medium SAND with	<u>8</u> 9	11.0	123			
	6	-		traces of gravel and silt and moist brown sandy clay seams						
			6'6"							
C UL	7	<i>\\\\\\</i>			6					
	8			Stiff moist brown sandy CLAY	8					
D	9		9'0"		8					
UL	10				9	4.5	98			
					8					
	11			Compact moist brown fine SAND						
	12	-					-			
	13	-								
	14	_	14'0"							
Е			140		12					
UL	15	-			24					
	16	-								
				Extremely compact moist brown fine SAND with trace of						
	17			gravel						
	18	-								
		_								
	19									
F UL	20				30					
	20		20'0"							
	21]								
	22	-								
		1								
	23									
	24	1					-			
	<u> </u>	1								
	25]								
TVI	PE OF SA	MPI F	Note:			GROUN	<u> </u> D WATER	OBSERV	ATIONS	Ь
	ISTURBED		. 1010.			0.10011		JUSTICA		
	NDIST. LIN				G	.W. ENCOU	NTERED AT	1	FT. 6	INS.
	HELBY TU						NTERED AT		FT.	INS.
	PLIT SPO						OMPLETION	_		
R.C R	OCK COR	E				G.W. AFTER	HRS.	-	FT.	INS.
* - C	ALIBRATE	D	S	SPT Hammer: Safety Crew Chief: DA]					
PE	NETROM	ETER	Standar	d Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer	G.W	. VOLUMES		L	ight	
(POCKE	T PENET	ROMETER)		Falling 30": Count Made at 6" Intervals						



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LOG OF SOIL	
BORING NO.	5

PROJ	ECT	Preliminary	/ Soils	Investigatio

Latson and Sweet Roads

LOCATION Genoa

Genoa Township, Michigan

	SUR	FACE EL	EVATION	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		41011	Moist dark brown clayey TOPSOIL with vegetation						
			1'0"							
Α	2			Stiff moist variegated silty CLAY with moist brown clayey	4	47.4	404			
UL	3			sand seams	5 8	17.4	124	*	(4000)	₩
			3'6"		_ <u> </u>		1		(1000)	
	4		30	000						
B UL	5			Stiff moist brown silty CLAY with traces of sand and pebbles and wet brown silty fine sand seams	<u>3</u> 5	11.7	138		 	-
02				possion and not storm only into daria country	7		100	*	(3500)	
	6		6'0"							
С	7				9		-			┼
UL	,			Very stiff moist variegated silty CLAY with traces of sand	10		1			
	8			and pebbles	11					
-	9						-			-
D	3		9'0"		5					
UL	10				9	18.2	124			
	11				9					-
	 ''			Very compact wet brown fine SAND with traces of silt and						+-
	12			gravel						
-	13						-		 	-
	13									+
	14									
UL	15				5 5					
OL.	13		4.5101		6					+
	16		15'6"							
-	17									-
	17			Stiff moist blue silty CLAY with wet gray silty fine sand						+
	18			seams						
	19									
F	19		19'0"	Very stiff moist brown sandy CLAY	10					+
UL	20		20'0"		11					
	21	 	20'6"	Very compact moist brown fine SAND with trace of silt	11					—
	21									+
	22									
	23									┼
	25									+
	24									
-	25									
	25								 	
TYF	PE OF SAI	MPLE	Note:			GROUN	D WATER	OBSERV	ATIONS	•
D DI	ISTURBED									
	NDIST. LIN				1		NTERED AT		FT. 0	INS.
	HELBY TUE						NTERED AT		FT. 0	INS.
	PLIT SPOO						OMPLETION	7	FT. 9	INS.
-	OCK CORE		_	PT Hammer: Safety Crew Chief: DA	-	G.W. AFTER	HRS.		FT.	INS.
	ALIBRATEL ENETROME			PT Hammer: Safety Crew Chief: DA Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer	GW	. VOLUMES	:	Medium	to Heavy	
1 70	-14-11/01/16		Localidat	a chemanon rest - Driving 2 O.D. Gampler i vvitti 140D Halliller	I G.W	. VOLUIVIES	,	wicalall	o i icavy	



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BORING NO 6	

PROJE	CT Pre	eliminary	Soils	Investia	atio
	.	ini ini idi y	COIIO	III V COLIG	uuo

Latson and Sweet Roads

LOCATION Genoa Township, Michigan

JOB NO. 25-198

 SURFACE ELEVATION
 DATE
 5/6/2025

	501	RFACE EL	EVAIION	DATE5/6/2025						
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	<i>\\\\\\</i>					1			
Α	2			Stiff moist brown sandy CLAY with wet brown silty fine sand	3					
UL				seams	4	16.6	132		(1222)	
	3	•			5		1	*	(4000)	
	4		4'0"							
В			40		3					
UL	5	•		Stiff moist variegated silty CLAY with wet brown silty fine sand seams	<u>6</u> 9	12.6	137	*	(5000)	
	6			Saliu Seallis	9				(3000)	
			6'6"							
С	7		00		8	44.0	140			
UL	8	<i>{/////</i>		Extremely stiff moist brown silty CLAY with traces of sand	13 15	11.0	140	*	(9000+)	
				and pebbles and wet brown silty fine sand seams	10				(00001)	
	9		9'0"							
D	40	•			9					
UL	10	<i>\\\\\\</i>		Very stiff moist brown silty CLAY with traces of sand and	9 10		1			
	11			pebbles and wet brown silty fine sand seams	10					
-	12		12'0"							
-	13	-								
	14			Very compact wet brown fine SAND with wet brown fine to						
UL	15			medium sand seams	8 11					
	13	_			12					
	16									
	17	-					-			
	1'	-								
	18		18'0"							
	10	<i>\\\\\\</i>	100							
F	19	•		Firm moist blue silty CLAY with wet gray silty fine sand	3					
ÜL	20			seams	3					
			20'6"		3					
	21	4								
	22	1								
	23	4								
	24	1								
		1								
	25]								
TV	PE OF SA	MDI E	Note:			CPOLIN	D WATER	ORSEDV	ATIONS	<u> </u>
	ISTURBED		11016.			GROOM	PWIEK	ODSERV	TIONS	
	NDIST. LIN					W ENCOLL	NTERED AT	1	FT. 6	INS.
	HELBY TU						NTERED AT	12	FT. 0	INS.
	PLIT SPO						OMPLETION	3	FT. 3	INS.
	OCK COR					.W. AFTER		5	FT.	INS.
	ALIBRATE		S	PT Hammer: Safety Crew Chief: DA	1					
	ENETROM			Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer	G.W	. VOLUMES	;	He	eavy	
		ROMETER)		Falling 30": Count Made at 6" Intervals					•	
		·			•					



(POCKET PENETROMETER)

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.	7

Latson and Sweet Roads

LOCATION

Genoa Township, Michigan

		JOB NO.	2	25-198			LOCATION	Genoa 10	wnsnip, i	viicnigan			
	0115		-\/A-TION		DATE	F 10 1000F							
	5UR	RFACE ELE	EVAIION		DATE	5/6/2025	_						
Sample & Type	Depth	Legend			SOIL DESCR	IPTION		Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF	Str. . %
	4	/////	0'2"	Moist dark brow	n clayey TC	PSOIL							
	11												
Α	2			Firm moist brov				2					
UL				pebbles and oc	casional mo	ist sand lenses		3 4	17.9	124	*	(2500)	
	3							4				(2300)	
	4												
B UL	5		4'6"					3 5	11.8	136			
OL	<u> </u>			Stiff moist brow pebbles	n silty CLAY	with traces of s	sand and	9	11.0	130	*	(4000)	
	6		6'0"	pennies								, , ,	
С	7							5					
UL								7	12.3	135			
	8							10			*	(6000)	
	9			Very stiff moist			s of sand and						
D				pebbles and oc	casional sto	nes		5					
UL	10							7					
	11							11					
	12												
	13		13'0"										
			130										
E	14			Extremely stiff r			traces of sand	11					
UL	15			and pebbles an	d occasiona	l stones		16					
	16							16					
	10		16'3"										
	17												
	18			Compact wet bi	rown silty fin	e SAND							
	10												
	19												
F UL	20	//////	19'6"					3 4	10.5	145			
- OL			20'6"	Stiff moist blue	silty CLAY w	vith traces of sa	nd and pebbles	4	10.0	110	*	(2500)	
	21]	_0 0										
	22	-											
]											
	23												
	24	1											
]											
	25	-											
TYPE OF SAMPLE		Note:						GROUN	D WATER	OBSERV	ATIONS	1	
D DIS	TURBED			Used track rig.									
U.L UNI										NTERED AT	16	FT. 3	INS.
S.T SHE								1		NTERED AT		FT.	INS.
S.S SPL								1		OMPLETION	16	FT. 2	INS.
R.C RO * - CAL			919	PT Hammer: Safet	v	Crew Chief	: TC	9	G.W. AFTER	HRS.		FT.	INS.
	IETROM		SPT Hammer: Safety Crew Chief: TC Standard Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer				G.W	. VOLUMES		He	eavy		



McDOWELL & ASSOCIATES

JOB NO. 25-198

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LOG OF SOIL	
BORING NO.	8

DDO IECT	Droliminary	Soile	Investigation
PROJECT	rieiiiiiiiaiy	SUIIS	investigation

Latson and Sweet Roads

LOCATION

Genoa Township, Michigan

	SUF	RFACE EL	EVATION	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. %
		STREET,	0'5"	Moist dark brown sandy TOPSOIL						
	1	-								
Α	2				2					
UL				Medium compact moist brown silty fine SAND	2	9.9	118			
	3									
		,,,,,,	3'6"							
В	4	<i>{//////</i>		Very stiff moist brown sandy CLAY with trace of silt	4					
UL	5		51011	· · · · · · · · · · · · · · · · · · ·	8	11.4	140			
			5'0"	Very stiff moist variegated silty CLAY with traces of sand	10			*	(5000)	
	6	/////	5'10"	and pebbles						
	7	-								
C UL	7	-		Compact wet brown silty SAND with occasional moist brown	5 6	11.9	139			
- 01	8			silty clay lenses	8	11.0	100	*	(6000)	
			8'6"						, ,	
	9		00	Extremely compact wet brown silty SAND with occasional						
D UL	10			stones	10 10	12.6				
OL	10	//////	10'0"		16	12.0				
	11	/////		Extremely stiff moist blue silty CLAY with traces of sand and	"					
			11'6"	pebbles						
	12	<i>{/////</i>	110							
	13	•								
	10									
	14									
E					3					
UL	15	<i>{/////</i>			4	10.1	141	*	(2500)	
	16	•			5				(2500)	
	1.0									
	17									
	1.0	<i>!/////</i>		0						
	18			Stiff moist blue silty CLAY with traces of sand and pebbles and occasional stones						
	19			and occasional stories						
F					4					
UL	20				5					
	04	•/////			7					
	21	•/////								
 	22	<i>{/////</i> }								
	23	<i>{/////</i>								
	24	<i>{/////</i> }								
G	24	/////			3					
UL	25		24'6"	Vary compact wat grow silty fine to madium SAND	7					
				Very compact wet gray silty fine to medium SAND	13					
	E OF SA		Note:	Used track rig.		GROUN	D WATER	OBSERV.	ATIONS	
D DIS	STURBED)								
U.L UNDIST. LINER					G.	W. ENCOU	NTERED AT	5	FT. 10	INS.
S.T SHELBY TUBE					G.	W. ENCOU	NTERED AT		FT.	INS.
S.S SP	LIT SPO	NC			G.W	. AFTER CO	OMPLETION	7	FT. 0	INS.
R.C RC	OCK COR	E				G.W. AFTER	HRS.		FT.	INS.
* - CA	LIBRATE	D		PT Hammer: Safety Crew Chief: TC	1					
	NETROM		Standard	Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer	G.W	. VOLUMES		Medium	to Heavy	
(POCKE	T PENETI	ROMETER)		Falling 30": Count Made at 6" Intervals	I					



PENETROMETER

(POCKET PENETROMETER)

McDOWELL & ASSOCIATES

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BORING NO. 8 (continued)

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

Medium to Heavy

G.W. VOLUMES

LOCATION Genoa Township, Michigan

JOB NO. 25-198

SURFACE ELEVATION _____ DATE ___ 5/5/2025 Dry Den Penetration Unc. Comp. Sample Moisture Natural Wt SOIL DESCRIPTION Depth Legend Wt & Type Blows for 6" Strength PSF. P.C.F 26 27 Very compact wet gray silty fine to medium SAND 28 28'6" 29 Η 2 UL 2 16.7 30 Medium compact wet gray silty fine to medium SAND with occasional stones 31 32 32'0" 33 34 32 UL 35 ---36 Extremely compact wet gray silty fine to medium SAND 37 38 39 J 28 39'6" UL 40 ---41 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 G.W. ENCOUNTERED AT FT. 10 INS. S.T. - SHELBY TUBE FT. INS. G.W. ENCOUNTERED AT S.S. - SPLIT SPOON G.W. AFTER COMPLETION FT. INS. FT. INS R.C. - ROCK CORE G.W. AFTER - CALIBRATED SPT Hammer: Automatic Crew Chief: TC

Standard Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer



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BORING NO. 9	

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

LOCATION Genoa Township, Michigan

JOB NO	25-198	-		LOCATION	Genoa Township, Michigan
SURFACE ELEVA	TION	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	到原致	0140"	Moist dark brown sandy TOPSOIL						
\vdash	1		0'10"	·			 			
Α	2				2					
UL	2	_		Medium compact wet brown silty fine SAND	3	21.6	125			
\vdash	3				4		-			
	4									
B UL	5		4'6"		6	16.1	124			
				Compact wet brown fine SAND with traces of silt and gravel	7	10.1	127			
	6		6'0"							
С	7			Compact wet brown silty fine to medium SAND with trace of	4					
UL	0			gravel and occasional stones	<u>4</u> 5	17.3	126			
	8	-	8'6"							
	9	_	00							
D UL	10				3	15.0	137		1	
				Medium compact wet brown silty fine to medium SAND	4					
\vdash	11	-					-		-	
	12									
	13	_								
			13'0"							
	14				4					
UL	15	_		Compact wet gray fine SAND with traces of silt and gravel	4	17.1				
				and occasional wet silt lenses	4					
\vdash	16	-					-			
	17									
	18		17'6"							
				Vory compact vict grove little fire to meedium CANID with						
F	19	_		Very compact wet gray silty fine to medium SAND with occasional wet silt lenses and occasional moist blue silty	-					
UL	20	-		clay seams	8 10		-			
					11					
\vdash	21	-					-			
	22		22'0"							
	23	_								
G	24			Very compact wet brown silty fine SAND	8					
UL	25	-			10					
			. .		11					
	PE OF SA		Note:	Lload track rig		GROUN	D WATER	OBSERV	ATIONS	
D DISTURBED			Used track rig.		.W. ENCOUI	NTERED AT	0	FT. 10	INS.	
U.L UNDIST. LINER S.T SHELBY TUBE					.W. ENCOUI			FT.	INS.	
S.S SPLIT SPOON								FT.	INS.	
	OCK COF					G.W. AFTER			FT. 9	INS.
* - C	ALIBRATE	ED		PT Hammer: Safety Crew Chief: TC						
	ENETROM		Standard	d Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer Falling 30": Count Made at 6" Intervals						
(POCKE	I PENET	ROMETER)		. daming 50 . South made at 0 intervals	l					



McDOWELL & ASSOCIATES

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BORING NO. 9 (continued)

PROJECT Preliminary Soils Investigation

Latson and Sweet Roads

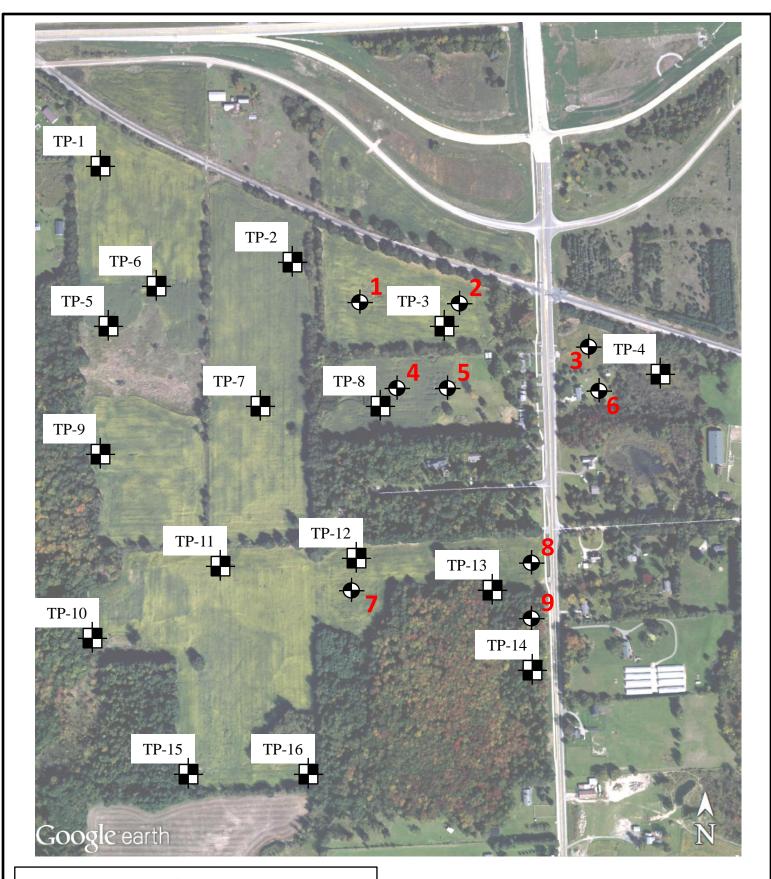
LOCATION Genoa Township, Michigan

JOB NO. 25-198

SURFACE ELEVATION _____ DATE _ 5/6/2025 Dry Den Penetration Unc. Comp. Sample Moisture Natural Wt Str. SOIL DESCRIPTION Depth Legend Wt & Type Blows for 6" P.C.F. Strength PSF. P.C.F 26 Very compact wet brown silty fine SAND 27 28 28'0" 29 Η 6 Very stiff moist brown silty CLAY with traces of sand and UL 8 30 pebbles 10 31 32'0" 33 Extremely stiff moist blue silty CLAY with traces of sand and 34 pebbles and occasional moist brown silty clay seams 10 UL 17 35 20 36 37'6" 38 Very stiff moist blue silty CLAY with traces of sand and 39 pebbles UL 40 11 12 40'6" 41 42 43 44 45 46 47 48 49 50 **TYPE OF SAMPLE** Note: **GROUND WATER OBSERVATIONS** D. - DISTURBED Used track rig. U.L. - UNDIST. LINER G.W. ENCOUNTERED AT FT. 10 INS. S.T. - SHELBY TUBE FT. INS. G.W. ENCOUNTERED AT S.S. - SPLIT SPOON G.W. AFTER COMPLETION FT. INS. FT. INS. R.C. - ROCK CORE G.W. AFTER - CALIBRATED SPT Hammer: Safety Crew Chief: TC Standard Penetration Test - Driving 2" O.D. Sampler 1' With 140lb Hammer PENETROMETER G.W. VOLUMES

SIEVE ANALYSIS

Boring	Sample	% Passing #4 Sieve	% Passing #10 Sieve	% Passing #40 Sieve	% Passing #100 Sieve	% Passing #200 Sieve
4	В	93.3	87.6	67.3	16.4	8.2
5	D	100.0	99.9	94.6	34.7	10.4
8	Н	95.8	90.7	62.6	20.4	15.3
9	В	95.0	90.5	78.7	19.4	8.2
9	Е	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)



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Soil Boring and Test Pit Location Plan

Job No. 25-198