February 9, 2022

City of Northville
Department of Public Works
215 W Main St,
Northville, MI 48167

Attn: Mr. Michael Domine, DPS Director

Re: The Downs - Preliminary Site Plan, Additional Items, Engineering aspects
OHM Job No. 0152-21-1020

Dear Mr. Domine,

On behalf of the City of Northville, we had previously reviewed the Preliminary Site Plan and TIS as submitted by Seiber Keast Lehner, and dated December 5, 2021, and revised plans dated January 20, 2022, for the above-referenced project. After the initial preliminary site plan meeting with the Planning Commission held on February 2, 2022, we were asked to review several additional items. Our supplemental comments our below:

Preliminary Site Plan Additional Item Engineering Comments

1. **Transfer of Griswold parcels and future ROW.** Griswold between Cady and Beal is currently located within three parcels, each owned by the City. Each parcel has a different width but a common Easterly boundary line, from south to north (57x 144, 75x 134, 73 x 194). We would recommend that these parcels be converted into a City public Right of Way having a width of 60 ft from the existing easterly property line. The City parcel remaining width could be exchanged with the Applicant for small sections of their property to make abutting adjacent streets a 50 ft ROW (Cady) or 60 ft ROW (Beal and Griswold) width. Details could be resolved during the final site plan process, but we anticipate dedicated Rights of Way to be on Cady (+/-5 ft x 260 ft), Griswold (3 ft x 130 ft), and Beal (North 5ft x 104 ft, South 5 ft x 288 ft). There are no existing public utilities within the portion of the two parcels the City would exchange with the Applicant. Making these parcel revisions and dedications will clean up these oddities in the parcel fabric and provide a consistent right of way widths moving forward. The proposed development along Griswold falls within the Cady Overlay District and therefore is not required to meet a prescribed setback from the property line, so these changes to the property line along Griswold should not impact the available buildable area.
2. **Site groundwater elevation in the lower portion of the development impacting proposed housing unit types.** We have reviewed the McDowell Geotechnical report dated March 16, 2018, and compared that to the currently proposed finish grade elevations for the building units in this area of the development. We supplemented the similar comparison prepared by Don Webb and submitted to the PC in the Feb 2 PC agenda package. Based on current information provided, it appears there is a very little vertical separation between the proposed FG minus a 12 ft basement excavation depth

OHM Advisors
34000 PLYMOUTH ROAD
LIVONIA, MICHIGAN 48150
T 734.522.6711
F 734.522.6427
OHM-Advisors.com

(10 ft basement, 1 ft footing, 1 ft separation from GW) and the observed groundwater elevation, as documented during the soil boring activity of March 8th and 12th, 2018. This supports the applicants proposed housing unit type to multi-family with no basement where exiting ground water depth is shallow relative to existing surface. Groundwater elevations are variable but typically they are at higher elevations in the early spring and late fall. Given the timing of observation, the groundwater elevation in March should be suitable for this assessment, although we recommend that the Applicant's Geotechnical Consultant install piezometers in this southern area to allow for further tracking of the seasonality and variability of the groundwater elevation.

Additionally, we were notified that the Applicant's Engineer has completed a preliminary import fill calculation and we understand the site currently requires a considerable amount of imported fill material be placed. Currently they a proposing 8-9 ft of fill depth for the single family homes along the south side of Fairbrook. The Applicant's Engineer may choose to expand on the effort and cost for importing fill to the Planning Commission. A few other concerns to note related to constructing basement footings near the groundwater table are as follows:

- Having a groundwater table too close to the basement footing elevation may cause sump pumps to run more frequently than normal and during storm events they may not be able to keep up with precipitation percolating through the granular soils backfilled against the foundation.
- Raising the FG's south of Fairbrook would require additional fill material and will result in steeper slopes adjacent to the River Park. This may be problematic but will be looked at more closely during final site plan review.
- Groundwater suppression systems exits but are costly to construct and have a high maintenance cost as they tend to buildup mineral deposits within the collection system, which could ultimately become an HOA long term maintenance responsibility, or the responsibility of the homeowner. We recommend these systems be avoided if possible.

3. **Site soil contamination concerns**. OHM Advisors recommends that the contaminated soils remediation plan be reviewed by the Brownfield Redevelopment Authority as it relates to the Tax Increment Funding (TIF) eligibility. Additionally, and if desired by the City, a geotechnical consultant that specializes in soil contamination and remediation could be secured to provide a further review of the report, although we are of the opinion that SME, Inc could provide necessary guidance regarding remediation of contaminated soils on this site as the process moves ahead, in coordination with City, Brownfield Redevelopment Authority, and OHM.

4. **Rouge River daylighting permitting and construction timeline**. OHM has reviewed the proposed timeline prepared by SKL in the memo dated January 20, 2022, regarding river daylighting permitting and construction. The permitting process involves several government agencies; the City of Northville, EGLE, FEMA, and Wayne County, and although it is hard to predict their relative workloads and permit review response time, the proposed project timeline appears reasonable, 85 weeks for permitting and 6 months for construction. Construction activities within the flow line of the river may be restricted between April and July in observation of the fish spawning season.

5. **Engineering review of proposed grading**. OHM had originally requested sufficient grading be provided in the preliminary site plans, PSP Item #3, so that a cursory review could be done ahead of the final site plan, but this is contingent on land use. Therefore, we recommend delaying the timeline for receipt of additional detailed grading until the final site plan submittal, once land use is more defined and grading data provided by Applicant's Engineer would be more comprehensive.

6. **Phasing of construction as it relates to utilities**. The PSP phasing indicates a north and south split between the utility construction, and within the south phase, east and west split about Center Street. This phasing of the utilities will become more defined once final site plans are submitted. The currently proposed phasing appears reasonable. The Applicant is expected to participate in the cost for replacement of water mains along, Cady, Beal, and River Street and in the extension of the water main along Griswold between Main and Beal.

Should you have any questions regarding our review comments outlined above, please do not hesitate to contact Nicholas at (734) 466-4538 or via email at nicholas.bayley@ohm-advisors.com.

Sincerely,
OHM Advisors

Nicholas Bayley, PE
Client Representative

George Tsakoff, PE
Principal

Attachment: OHM modified Don Webb Groundwater Elevation Graph, and excerpts of the 2018 McDowell Soils Investigations Report

cc: Patrick Sullivan, City Manager, via email
Sally Elmiger, CWA, City of Northville Planner, via email
Dianne Massa, City Clerk, via email
Brent Strong, City Chief Building Official, via email
Matthew Samhat, City Fire Marshall, via email
Stephen Dearing, OHM, via email

P:\0126_0165\SITE_NorthvilleCity\2021\0152-21-1020 Northville Downs Redevelopment\Muni\Preliminary Site Plan\2022.01.20 The Down\2022.02.07B Northville Downs PSP Additional Items OHM Review.docx

From: Thomas Barry
To: Dianne Massa
Cc: selmiger; Donna Tinberg; Patrick Sullivan
Subject: Downs Ground Water Report
Date: Monday, January 31, 2022 4:04:29 PM
Attachments: The Downs Groundwater Study 01.31.22.pdf
Soil Boring Location Plan 01.31.22 DJW.pdf

Dianne

Per Sally Elmiger's instructions; I am sending you a copy of an engineering observation report provided to me by Don Webb PE who upon my request reviewed the soil boring report and compared them with the current finished floor elevations from the most recent Downs Grading and Utility Plan (Sheet 9).

Don compared the soil borings report taken in 2018 by McDowell & Associates and transferred to an attached Water Table Data Plan presented by Seiber, Keast Engineering to the Commission with their Grading and Utility plan (Sheet 9 in our packet).

He surmises that when the soil borings were taken in 2018 there was no knowledge by the testing engineer what the new finished floor levels would be after the site was balanced . He would have no knowledge that the grade levels would be raises by 5 to 8 ft. The Siebert, Keast Engineering drawings titled Water Table Data furnished comparing the level of ground water also show old baseline elevations or elevations as they exist now. The Grading and Utility Plan shows the revised finished floor levels which will be 5 to 8 ft higher. These new raised building ground elevations would keep the basements above water levels.

Per his findings; Don concludes that there should be no restrictions to providing buildings with full basements in most of the areas East of Cady Street. The West portion should probably remain as is.

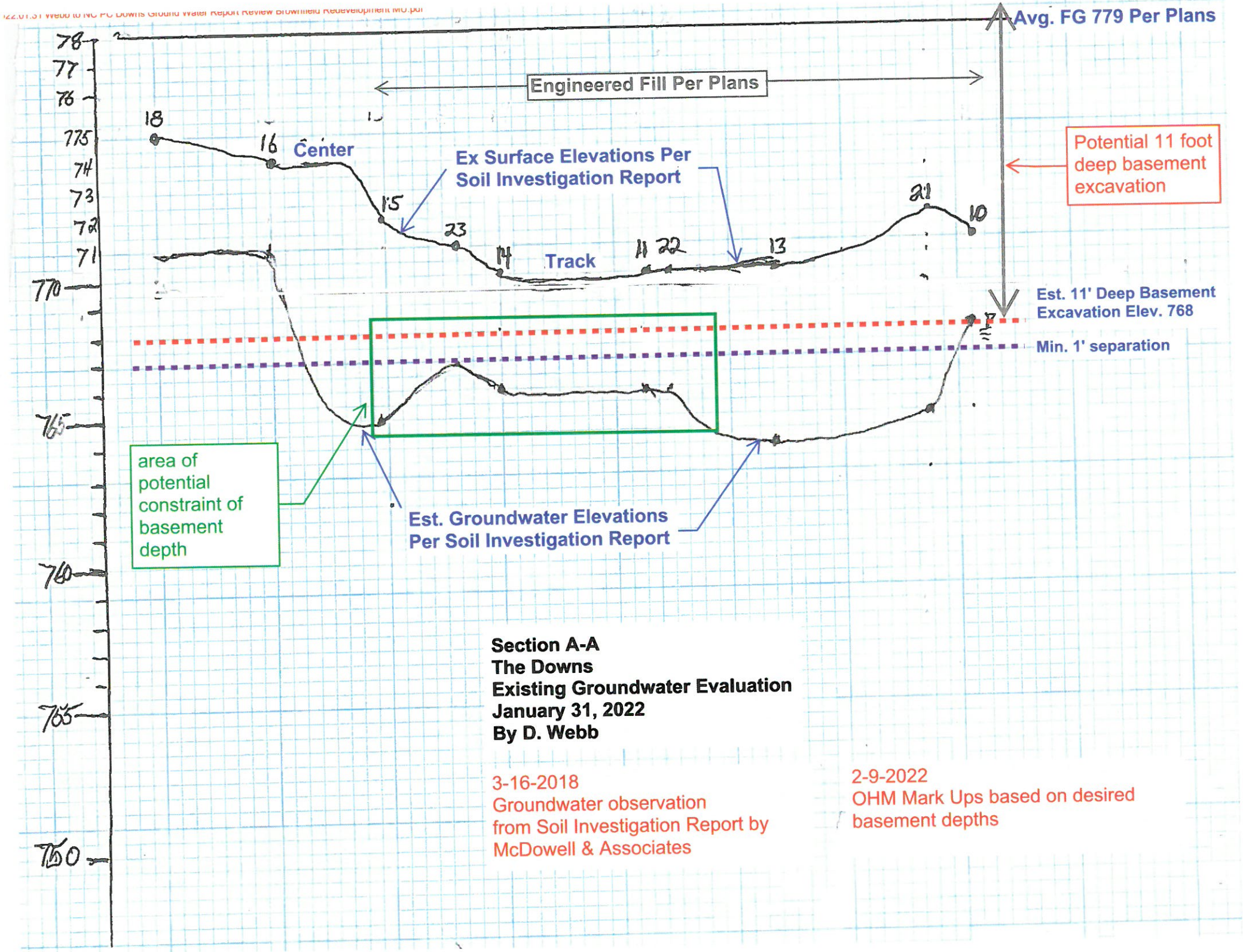
I have given this information to Sally who will be forwarding it onto our DPW and City engineer for their review of his findings. If they have any questions they can contact myself or Don Webb directly to discuss. **Please forward this information to the Planning Commissioners.**

Ps. Don Webb is a Civil Engineer who lives in Northville and is currently on our Brownfield Development Team.

Thank you,

Thom Barry

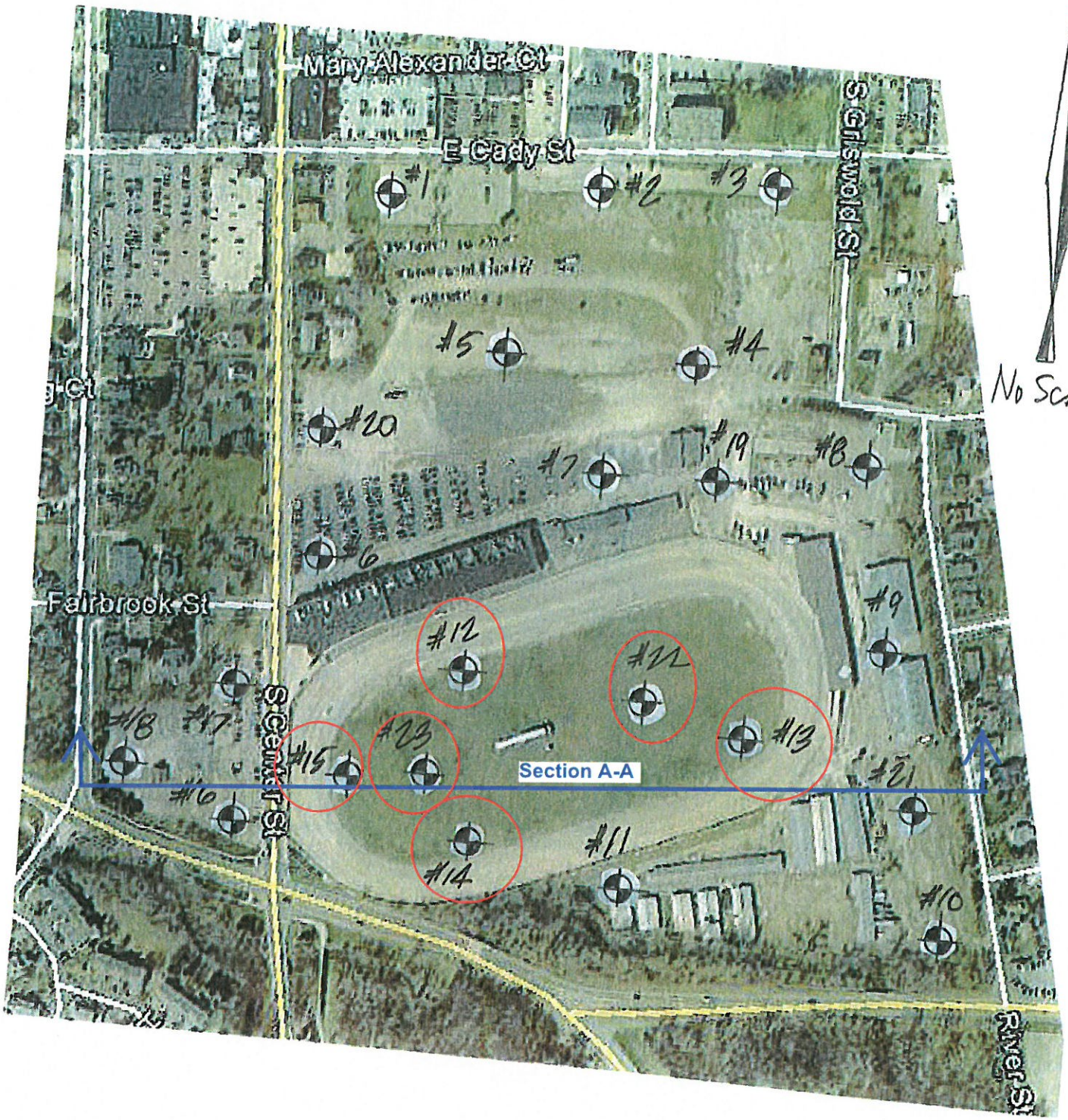
(See enclosed)



Section A-A
The Downs
Existing Groundwater Evaluation
January 31, 2022
By D. Webb

3-16-2018
Groundwater observation from Soil Investigation Report by McDowell & Associates

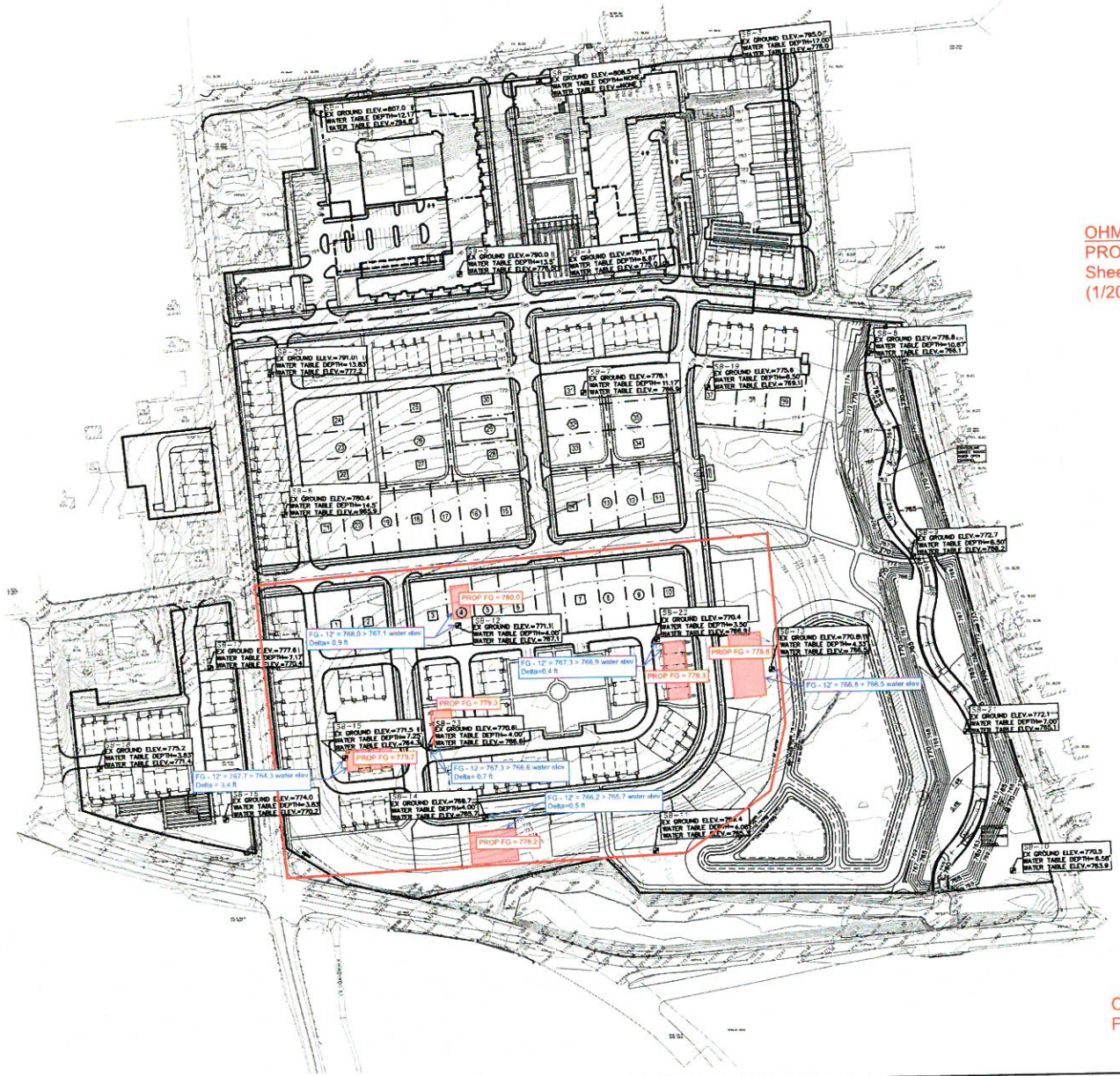
2-9-2022
OHM Mark Ups based on desired basement depths



No Scale

Soil Boring Location Plan

#18-053



OHM Markup
PROP FG = proposed finish grade from Sheet 9 Grading and Utility Plan (1/20/2022 Preliminary Site Plan Rev 1)

OHM Mark up to include proposed Finish Grades of building units

SCALE
(IN FEET)
Scale: 1 inch = 100 ft.

NOTE:
WATER TABLE DEPTH INFORMATION PER MCDOWELL & ASSOCIATES SOILS INVESTIGATION REPORT, MARCH 16, 2018

LEGEND

EXISTING	PROPOSED	
		PAVEMENT (ASPHALT)
		SIDE WALK (CONCRETE)
		CONCRETE CURB AND GUTTER
		STORM SEWER
		SANITARY SEWER
		WATER MAIN
		MANHOLE
		CATCH BASIN W/STREAM GUARD
		CURB INLET W/SILT SAC
		END SECTION
		GATE VALVE
		HYDRANT
		FLOOD PLAIN
1000	1000	CONTOURS
1000.00	1000.00	SPOT ELEVATION
		SURFACE DRAINAGE
		OVERFLOW ROUTE
		TREE FENCE
		SILT FENCE
		PROPOSED DRIVEWAY LOCATION
		LIMIT OF DISTURBANCE

P.U.D. PRELIMINARY SITE PLAN

SECTION 5, T1S, R8E, CITY OF NORTHVILLE
WAYNE COUNTY, MICHIGAN

REVISIONS

NO.	ITEM	DATE

UTILITY WARNING

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THIS PLAN WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

811 Know what's below. Call before you dig.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES WHICH MAY INTERFERE WITH CONSTRUCTION.

DATE: 11-15-21 | DESIGNED BY: A.A. | JOB NUMBER: 21-001 | CHECKED BY: S.S. | DRAWING FILE: 21001LT-SP.DWG

WATER TABLE DATA

SEIBER, KEAST ENGINEERING, L.L.C.
CONSULTING ENGINEERS
39205 COUNTRY CLUB DRIVE • SUITE C8 • FARMINGTON HILLS, MI • 48331
PHONE: 248.308.3331 EMAIL: info@sekeast.com

SHEET 1

Boring	Surf El.	Fin Depth	Fin El	Water	Water El
1	805	6'-8	798.3	12'-2"	792.8
2	808	1'-0	807	None	-
3	794	8'-6	785.5	17'-0	777
4	781	5'-0	776	6'-8	774.3
5	788	2'-4	785.7	13'-6	774.5
6	779	6'-4	772.7	14'-6	764.5
7	778	3'-6	774.5	11'-2	766.8
8	776	13'-0	763	10'-4	765.7
9	772	6'-6	765.5	6'-6	765.5
10	771	6'-7	764.4	6'-7	764.4
11	770	7'-6	762.5	4'-1	765.9
12	771	6'-0	765	4'-0	767
13	771	6'-0	765	4'-4	766.7
14	770	6'-6	763.5	4'-0	766
15	772	12'-4	759.7	7'-3	764.8
16	774	3'-10	770.2	3'-10	770.2
17	777	3'-6	773.5	7'-2	769.8
18	775	6'-0	769	3'-10	771.2
19	775	1'-6	773.5	6'-6	768.5
20	789	13'-10	775.2	13'-10	775.2
21	772	4'-6	767.5	7'-0	765.0
22	771	3'-6	767.5	3'-6	767.5
23	771	14'-0	757	4'-0	767

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. 12

PROJECT Preliminary Soils Investigation
Proposed Mixed Use Development

LOCATION Former Northville Downs
301 South Center Street
Northville, Michigan

JOB NO. 18-053

SURFACE ELEV. _____ DATE 3-8-18

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 discolored brown silty CLAY with trace of topsoil and sand seams, fill						
			1'6"						
A SS	2		Very stiff moist brown silty CLAY with trace of topsoil and moist to wet brown sand and gravel seams, fill	8 9 16	21.9	121	*	(3000)	
	3								
	4								
			4'0"						
B SS	5		Extremely compact wet brown silty fine to medium SAND with trace of brick and wet brown sand and gravel seams, fill	8 12 15	32.8				
	6								
			6'0"						
C SS	7		Compact wet brown gravelly SAND with trace of silt and wet silty fine to medium sand seams	6 8 8	12.0				
	8								
	9			9					
D SS	10			16 16	9.8				
	11		Extremely compact wet SAND & GRAVEL with wet fine to medium sand seams						
			11'6"						
	12								
	13								
	14								
E SS	15			6 10 14					
	16		Very stiff moist blue silty CLAY with sand and pebbles						
	17								
	18								
	19								
F SS	20			5 10 12					
			20'6"						
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS: *Calibrated Penetrometer

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	2	FT.	10	INS.
G.W. ENCOUNTERED AT	4	FT.	0	INS.
G.W. AFTER COMPLETION	3	FT.	0	INS.
G.W. AFTER HRS.		FT.		INS.
G.W. VOLUMES	Heavy			

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. 13

PROJECT: Preliminary Soils Investigation
Proposed Mixed Use Development

LOCATION: Former Northville Downs
301 South Center Street
Northville, Michigan

JOB NO. 18-053

SURFACE ELEV. _____ DATE 3-8-18

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 gravel, fill						
	1								
A	2		Extremely stiff moist brown silty CLAY with topsoil streaks, pebbles and stones, fill	3					
SS				7	19.8				
	3			12					
	4								
B			4'4"	7					
SS	5		Very compact wet brown fine to medium SAND with gravel, stones and topsoil streaks, fill	8	7.3	126			
				6					
	6		6'0"						
C	7		Compact wet brown silty SAND & GRAVEL with occasional stones and cobbles	4					
SS				5	10.3				
	8			5					
			8'6"						
	9								
D			Very compact wet brown medium SAND & GRAVEL with occasional stones	7					
SS	10			7					
				8					
	11								
			11'6"						
	12								
			Medium compact wet brown fine SAND with trace of gravel						
	13								
	14								
E			14'6"	2					
SS	15			3					
				3					
	16								
			Compact wet gray fine SAND with trace of gravel						
	17								
	18								
			18'6"						
	19								
F			Compact wet gray SAND & GRAVEL with occasional stones	2					
SS	20			3					
			20'6"	3					
	21								
	22								
	23		Note: Used automatic hammer.						
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.I. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	4	FT.	4	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION		FT.		INS.
G.W. AFTER HRS.	1	FT.	5	INS.
G.W. VOLUMES	Heavy Cave-in at 1'5"			

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. 14

PROJECT: Preliminary Soils Investigation
Proposed Mixed Use Development

LOCATION: Former Northville Downs
301 South Center Street
Northville, Michigan

JOB NO. 18-053

SURFACE ELEV. _____ DATE 3-8-18

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. %
			0'4" Moist dark brown clayey TOPSOIL with vegetation, fill						
	1								
			Moist brown sandy CLAY with sand and trace of vegetation, fill						
A SS	2		2'0"	2					
				3	22.5				
	3		Stiff moist discolored brown sandy CLAY with topsoil seams	5			*	(3000)	
	4		4'0"						
B SS	5		Very compact wet discolored brown SAND & GRAVEL with trace of silt and wet brown fine seams, fill	7 12 10	9.0	138			
	6		6'6"						
C SS	7			8					
	8		Compact wet brown silty fine to medium SAND with wet brown sand and gravel seams	8 7	9.4	130			
	9		9'0"						
D SS	10			3 6 6	7.7	136			
	11		Compact wet brown SAND & GRAVEL with occasional stone						
	12		12'0"						
	13		Stiff moist brown silty CLAY						
	14								
E SS	15		14'6"	8 11 10					
	16		Very compact wet brown SAND & GRAVEL with occasional stones and wet gray fine to medium sand seams						
	17								
	18		18'0"						
	19								
F SS	20		Compact wet gray SAND & GRAVEL	7 7 8					
			20'6"						
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS: *Calibrated Penetrometer

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	4	FT.	0	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	3	FT.	0	INS.
G.W. AFTER HRS.		FT.		INS.
G.W. VOLUMES	Heavy			

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. 15

PROJECT: Preliminary Soils Investigation
Proposed Mixed Use Development
Former Northville Downs

LOCATION: 301 South Center Street
Northville, Michigan

JOB NO. 18-053

SURFACE ELEV. _____ DATE 3-8-18

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 with trace of gravel, fill						
	1								
			1'7" Moist brown sandy CLAY with sand and pebbles and little topsoil streaks, fill						
A SS	2			5					
				4	19.5	111			
	3		Firm to stiff moist dark brown silty CLAY with sand and pebbles, trace of topsoil, occasional stones and moist brown sand and gravel seams, fill	2			*	(2500)	
	4								
B SS	5			1					
			5'0"	2	22.1	102			
	6		Medium compact moist discolored brown SAND & GRAVEL with some cinders, fill	3			*	(2000)	
			6'4"						
C SS	7		Soft moist dark brown clayey TOPSOIL with trace of gravel, fill	2					
			7'3"	1	18.5	111			
	8		Slightly compact wet brown clayey fine SAND with traces of gravel and silt, fill	1			*	(2000)	
	9								
			9'0"						
D SS	10		Compact wet brown silty SAND with traces of gravel and organics and gray fine sand lenses, fill	4					
				5	11.7				
	11		10'8"	5					
	12		Firm moist dark brown clayey MARL with organics and shells						
			12'4"						
	13								
	14								
E SS	15		Compact wet gray fine to medium SAND with trace of gravel	2					
				3	12.8	136			
	16		16'0"	3					
	17								
	18		Very compact wet gray SAND & GRAVEL						
	19								
F SS	20			3					
				6					
	21		20'6"	6					
	22								
	23								
	24		Note: Used automatic hammer.						
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.I. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS: *Calibrated Penetrometer

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	7	FT.	3	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION		FT.		INS.
G.W. AFTER HRS.	9	FT.	0	INS.
G.W. VOLUMES	Heavy			

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. 22

PROJECT Preliminary Soils Investigation
Proposed Mixed Use Development

LOCATION Former Northville Downs
301 South Center Street
Northville, Michigan

JOB NO. 18-053

SURFACE ELEV. _____ DATE 3-8-18

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		0'6" Moist dark brown sandy TOPSOIL with vegetation and clay, fill						
A SS	2		Very stiff moist discolored brown silty CLAY with traces of sand and topsoil, fill	6					
	3			9	16.1				
				8			*	(4000)	
	4		3'6"						
B SS	5			7					
				8	10.7				
	6			11					
C SS	7		Very compact wet brown gravelly SAND with little silt and occasional stones	6					
	8			12	7.2	132			
	9		9'0"	12					
D SS	10			6					
	11		Compact wet brown SAND & GRAVEL with trace of silt and occasional stones	7	6.7	117			
	12			8					
	13								
	14		14'0"						
E SS	15			6					
	16		Very compact wet gray silty fine to medium SAND	9					
	17			14					
	18								
	19		18'6"						
F SS	20		Extremely stiff moist blue silty CLAY with sand and pebbles	10					
	21		20'6"	13					
	22			18					
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS: *Calibrated Penetrometer

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	3	FT.	6	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	3	FT.	4	INS.
G.W. AFTER HRS.		FT.		INS.
G.W. VOLUMES	Heavy	Cave-in at 3'4"		

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. 23

PROJECT Preliminary Soils Investigation
Proposed Mixed Use Development

LOCATION Former Northville Downs
301 South Center Street
Northville, Michigan

JOB NO. 18-053

SURFACE ELEV. _____ DATE 3-8-18

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, fill						
	1		1'6" Moist brown and discolored brown CLAY with topsoil, fill						
A	2			2					
SS				2	38.4	112			
	3		Soft moist brown silty CLAY with moist dark brown clayey topsoil seams, fill	2					
	4								
			4'0"						
B				2					
SS	5		Compact wet discolored brown gravelly SAND with trace of silt, fill	5	16.1				
	6			5					
			6'6"						
C	7			7					
SS			Compact wet brown SAND & GRAVEL with wet gray silty sand seams, fill	9	10.6				
	8			7					
	9		9'0"						
D				2					
SS	10			2	18.4	125			
				4			*	(2000)	
	11		Firm moist blue and discolored brown sandy CLAY with trace of peat and wet gray silty sand seams, fill						
	12								
	13								
	14		14'0"						
E				4					
SS	15			4	11.5	137			
				3					
	16		Compact wet gray silty fine to medium SAND with trace of clay						
	17								
	18								
	19		19'0"						
F				8					
SS	20		Very compact wet gray fine to medium SAND	9	14.0				
			20'6"	10					
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS: *Calibrated Penetrometer

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	4	FT.	0	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	2	FT.	8	INS.
G.W. AFTER HRS.		FT.		INS.
G.W. VOLUMES	Heavy			