



May 5, 2021
Project Number 2021-0217

via email: mark@wolverinebuildingcompany.com

Mr. Mark Gesuale
Wolverine Building Company
14955 Technology Drive
Shelby Township, Michigan 48315

Re: Test Pit Observation
Proposed Camden Crossing Residential Development
W. Hamlin Road and Crestline Street
Rochester Hills, Michigan

Dear Mr. Gesuale:

In accordance with your request, an engineer made a visit to the subject site on March 26, 2021 for the purpose of witnessing and logging five shallow backhoe test pit excavations that were excavated with the use of a small excavator supplied by the client. The test pit locations are shown on the attached Test Pit Location Plan.

Test Pit TP-1 encountered about 6 inches of moist dark brown clay, topsoil and vegetation followed by moist silty clay with occasional pebbles, stones and cobbles that continued to the bottom of the test pit at about 7 feet below the existing grade.

Test Pit TP-2 also encountered about 6 inches of moist dark brown clay, topsoil and vegetation, followed by variegated silty clay with occasional pebbles, stones and cobbles that continued to the bottom of the test pit at about the 8 foot depth.

Test Pit TP-3 encountered approximately 1.5 feet of black clay, topsoil and vegetation, followed by brown silty, sandy clay with occasional pebbles and stones that continued to the bottom of the test pit at about the 8-foot depth.

Test Pit TP-4 encountered about 1 foot of black clay, topsoil and vegetation followed by moist brown sandy, silty, gravelly clay that continued to the 5 foot depth. The sandy, silty, gravelly clay was underlain by moist variegated clay that continued to the bottom of the test pit.

No ground water was observed in the above test pits.

Test Pit TP-5 which is located in the proposed storm water basin, encountered approximately 1 foot of moist brown clay, topsoil and vegetation followed by about 5 feet of moist brown variegated silty sandy clay with some gravel and occasional wet sand seams. The silty, sandy clay was underlain by moist variegated clay

with occasional pebbles, stones and cobbles that continued to the bottom of the test pit at about the 8-foot depth. Water was observed at about the 3-foot depth where the wet sand seams commenced. The water flow volume could be described as medium from the sand seam.

A soils infiltration test utilizing the double ring methodology was scheduled for Test Pit No. 5, at a depth of 3 feet below existing grade. After one hour of presoak no drop in water was noted indicating a very low rate of infiltration of the clay soil (clays generally has an infiltration rate of less than 0.001 inch per hour). The test was then aborted.

We recommend performing test borings so that formal foundation, floor slab and pavement recommendations can be provided.

We are pleased to be of service. Feel free to contact us if you have any questions or need additional information.

Respectfully submitted,

PEA Group

A handwritten signature in blue ink, appearing to read 'D. Jack Sattelmeier', with a stylized, flowing script.

D. Jack Sattelmeier, PE
Director of Geotechnical Engineering



Test Pit No.: TP-1		Job No.: 61626		Project: Proposed Camden Crossing, Hamlin Road			
Client: Wolverine Building Company		Location: Rochester Hills, Michigan					
Type of Rig:		Logged By: S. Pelto, PE					
Drilling Method: Test Pit		Started: 3/26/2021					
Ground Surface Elevation:		Completed: 3/26/2021					

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5			.5	Moist Dark Brown CLAY, Topsoil & Vegetation (6")			
5.0				Moist Brown Silty CLAY With Occasional Pebbles, Stones & Cobbles			
7.5			7	Bottom of Test Pit at 7'			
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							

"N" - Standard Penetration Resistance
 SS - 2" J.D. Split Spoon Sample
 LS - Sectional Liner Sample
 ST - Shelby Tube Sample
 AS - Auger Sample

w - H2O, % of dry weight
 d - Bulk Density, pcf
 qu - Unconfined Compression, tsf
 DP - Direct Push
 RC - Rock Core

Water Encountered: None

At Completion: None

Test Pit No. TP-1

PEA GROUP

Test Pit No.: TP-2		Job No.: 61626		Project: Proposed Camden Crossing, Hamlin Road			
Client: Wolverine Building Company				Location: Rochester Hills, Michigan			
Type of Rig:				Logged By: S. Pelto, PE			
Drilling Method: Test Pit				Started: 3/26/2021			
Ground Surface Elevation:				Completed: 3/26/2021			

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
<div style="text-align: center;"> <div style="width: 100%; height: 100%; border-left: 1px solid black; border-right: 1px solid black; position: relative;"> <div style="position: absolute; top: 0; left: 0; right: 0; height: 100%; border-left: 1px solid black; border-right: 1px solid black;"></div> </div> </div>			.5	<div style="border: 1px solid black; padding: 2px; margin-bottom: 10px;">Moist Dark Brown CLAY, Topsoil & Vegetation (6")</div> <div>Moist Variegated Silty CLAY With Occasional Pebbles, Stones & Cobbles</div>			
<div style="text-align: center;"> <div style="width: 100%; height: 100%; border-left: 1px solid black; border-right: 1px solid black; position: relative;"> <div style="position: absolute; top: 0; left: 0; right: 0; height: 100%; border-left: 1px solid black; border-right: 1px solid black;"></div> </div> </div>			8	<div style="border: 1px solid black; padding: 2px;">Bottom of Test Pit at 8'</div>			

<p>"N" - Standard Penetration Resistance SS - 2" .D. Split Spoon Sample LS - Sectional Liner Sample ST - Shelby Tube Sample AS - Auger Sample</p> <p>w - H₂O, % of dry weight d - Bulk Density, pcf qu - Unconfined Compression, tsf DP - Direct Push RC - Rock Core</p>	<p>Water Encountered: None</p> <p>At Completion: None</p> <p>Test Pit No. TP-2</p>
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Test Pit No.: TP-3		Job No.: 61626		Project: Proposed Camden Crossing, Hamlin Road			
Client: Wolverine Building Company		Location: Rochester Hills, Michigan					
Type of Rig:		Logged By: S. Pelto, PE					
Drilling Method: Test Pit		Started: 3/26/2021					
Ground Surface Elevation:		Completed: 3/26/2021					

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
1.5			1.5	Moist Black CLAY, Topsoil & Vegetation			
2.5				Moist Brown Silty Sandy CLAY With Occasional Pebbles & Stones			
5.0							
7.5			8				
10.0				Bottom of Test Pit at 8'			
12.5							
15.0							
17.5							
20.0							
22.5							

"N" - Standard Penetration Resistance
 SS - 2" J.D. Split Spoon Sample
 LS - Sectional Liner Sample
 ST - Shelby Tube Sample
 AS - Auger Sample

w - H2O, % of dry weight
 d - Bulk Density, pcf
 qu - Unconfined Compression, tsf
 DP - Direct Push
 RC - Rock Core

Water Encountered: None

At Completion: None

Test Pit No. TP-3



Test Pit No.: TP-4

Job No.: 61626

Project: Proposed Camden Crossing, Hamlin Road

Client: Wolverine Building Company

Location: Rochester Hills, Michigan

Type of Rig:

Logged By: S. Pelto, PE

Drilling Method: Test Pit

Started: 3/26/2021

Ground Surface Elevation:

Completed: 3/26/2021

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5			1	Moist Black CLAY, Topsoil & Vegetation			
				Moist Brown Silty Sandy Gravelly CLAY			
5.0			5	Moist Variegated CLAY			
7.5			7.5	Bottom of Test Pit at 7.5'			
10.0							
12.5							
15.0							
17.5							
20.0							
22.5							

"N" - Standard Penetration Resistance
 SS - 2").D. Split Spoon Sample
 LS - Sectional Liner Sample
 ST - Shelby Tube Sample
 AS - Auger Sample

w - H₂O, % of dry weight
 d - Bulk Density, pcf
 qu - Unconfined Compression, tsf
 DP - Direct Push
 RC - Rock Core

Water Encountered: None

At Completion: None

Test Pit No. TP-4

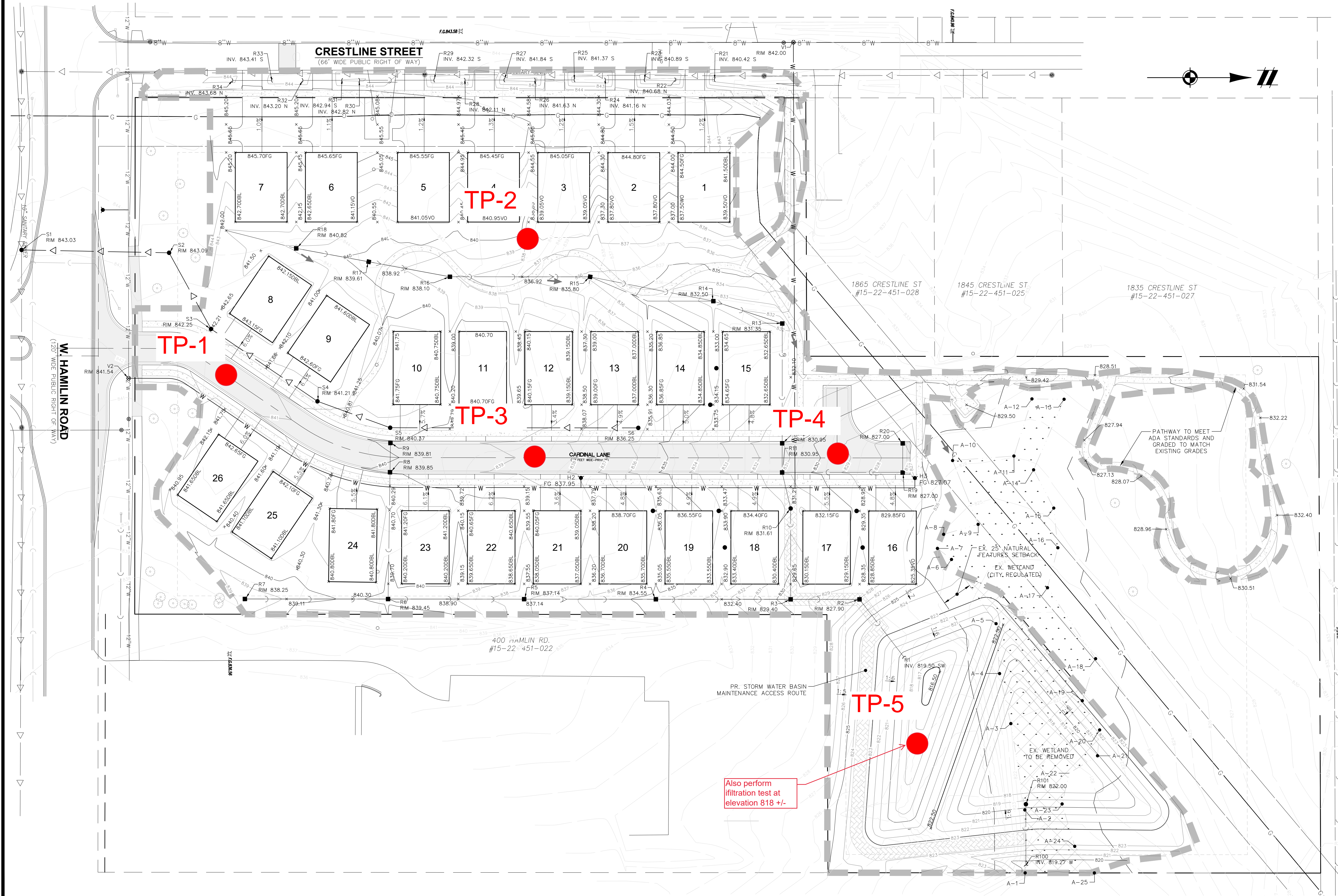


Test Pit No.: TP-5		Job No.: 61626		Project: Proposed Camden Crossing, Hamlin Road			
Client: Wolverine Building Company				Location: Rochester Hills, Michigan			
Type of Rig:				Logged By: S. Pelto, PE			
Drilling Method: Test Pit				Started: 3/26/2021			
Ground Surface Elevation:				Completed: 3/26/2021			

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">2.5</div> <div style="margin-bottom: 10px;">5.0</div> <div style="margin-bottom: 10px;">7.5</div> <div style="margin-bottom: 10px;">10.0</div> <div style="margin-bottom: 10px;">12.5</div> <div style="margin-bottom: 10px;">15.0</div> <div style="margin-bottom: 10px;">17.5</div> <div style="margin-bottom: 10px;">20.0</div> <div style="margin-bottom: 10px;">22.5</div> </div>			<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">1</div> <div style="margin-bottom: 10px;">6</div> <div style="margin-bottom: 10px;">8</div> </div>	<div style="margin-bottom: 10px;">Moist Brown CLAY, Topsoil & Vegetation</div> <div style="margin-bottom: 10px;">Moist Brown Variegated Silty Sandy CLAY With Some Gravel & Occasional Wet Seams</div> <div style="margin-bottom: 10px;">Moist Variegated CLAY With Occasional Pebbles, Stones & Cobbles</div> <div>Bottom of Test Pit at 8'</div>			

<p>"N" - Standard Penetration Resistance SS - 2").D. Split Spoon Sample LS - Sectional Liner Sample ST - Shelby Tube Sample AS - Auger Sample</p>	<p>w - H₂O, % of dry weight d - Bulk Density, pcf qu - Unconfined Compression, tsf DP - Direct Push RC - Rock Core</p>	<p>Water Encountered: 3'0"</p> <p>At Completion: None</p> <p>Test Pit No. TP-5</p>
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K:\18001982\DWG\PLAN SETS\SITE-PRELIMINARY\18001982 C-04 - G.DWG / 21/2021 5:40 PM JARED HIME



LEGEND

- 588 PR. 1' CONTOUR
- 590 PR. 5' CONTOUR
- 590 EX. 1' CONTOUR
- 590 EX. 5' CONTOUR
- < PROPERTY LINE
- < CENTERLINE OF SWALE
- < PROPOSED R.O.W. LINE
- LIMITS OF GRADING
- EX. MANHOLE / CATCH BASIN
- PR. MANHOLE / CATCH BASIN
- EX. HYDRANT
- PR. HYDRANT
- EX. GATE VALVE & WELL
- PR. GATE VALVE & WELL
- EX. WATER MAIN MANHOLE
- PR. SANITARY SEWER MANHOLE
- EX. SANITARY SEWER MANHOLE
- OVERLAND OVERFLOW ROUTE
- EX. WETLAND
- EX. WETLAND TO BE REMOVED
- PR. MAINTENANCE ACCESS ROUTE

SPOT GRADE DESIGNATIONS

- FG = FINISH GRADE
- DBL = DROP BRICK LEDGE
- WO = WALKOUT
- VO = VIEWOUT
- RIM = RIM GRADE/FLOW LINE

WO = FG - 8'
VO = FG - 4.5'

NOTES

1. FOR ALL TEMPORARY GRADING IMPACTS TO THE NATURAL FEATURE BUFFERS, BMPs WILL BE IMPLEMENTED DURING THE CONSTRUCTION PHASE OF THE PROJECT. ANY TEMPORARY IMPACTED AREA IS TO BE RESTORED TO ORIGINAL GRADE WITH ORIGINAL SOILS OR EQUIVALENT SOILS AND SEEDING WITH A CITY-APPROVED WETLAND SEED MIX.

2. DRIVE SLOPES ARE FROM FINISHED GRADE TO BACK OF WALK. AN ADDITIONAL 4" WILL BE ADDED TO THE FINISHED GRADE ELEVATION TO ESTABLISH GARAGE FLOOR ELEVATION AND AN ADDITIONAL 1.5% FOR DRIVE SLOPES.

3. WETLANDS WERE DELINEATED BY M.McCONNELL, ATWELL LLC, ON 11-27-18. THE ALPHA-NUMERIC WETLAND FLAGGING (A-1 - A-25) IS PROVIDED AS APPLIED IN THE FIELD.

NATURAL FEATURES SETBACK IMPACT

WETLAND SETBACK IMPACTED	519 LF
SETBACK UNDISTURBED	487 LF
TOTAL NATURAL FEATURE SETBACK	1,006 LF

WETLAND IMPACTS

WETLAND AREA TO BE FILLED	10,862 SF
AREA TO BE UNDISTURBED	11,547 SF
TOTAL WETLAND	22,409 SF

TEST PIT LOCATION PLAN

NOT FOR CONSTRUCTION

Know what's below.
Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE: CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK OF PERSONS ENGAGED IN THE WORK OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

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ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 22

TOWN 3 NORTH, RANGE 11 EAST

CITY OF ROCHESTER HILLS

OAKLAND COUNTY, MICHIGAN

M2J1, LLC

CARDEN CROSSING

PRELIMINARY SITE PLAN

GRADING PLAN

DATE: AUG. 16, 2019

2020-06-15 PER CITY

2021-01-21 PER CITY

REVISIONS

0 20 40

SCALE: 1" = 40 FEET

DRAWN BY: KS

CHECKED BY: JA

P.M.: JACKERMAN

JOB #: 18001982

FILE CODE: -

SHEET NO. C-03

CAD FILE: 18001982 C-04 - G.DWG