CALL TO ORDER
PLEDGE OF ALLEGIANCE
ROLL CALL
APPROVAL OF AGENDA
APPROVAL OF MINUTES – Meeting minutes of April 26, 2022
COMMUNICATIONS
CITIZEN COMMENTS

OLD BUSINESS

NONE

NEW BUSINESS

1. **PSP-03-22: 1949 Twelve Mile – Lume:** Christopher Enright, on behalf of David Farbman, 1949 Twelve Mile Rd., Parcels #25-17-126-002 and #25-17-126-003, is requesting site plan approval for the conversion of 6,764 square feet of the existing building to a retail marihuana dispensary and office use for the remaining 17,677 square feet.

2. **PSP-09-22: 3916 W. Eleven Mile – Quality Roots:** John Vitale, on behalf of L & L Development LLC, 3916 W. Eleven Mile Rd., Parcels #25-18-353-030 and #25-18-353-027, is requesting site plan approval for the renovation of the existing building to a retail marihuana dispensary and office tenant space.

LIAISON REPORTS
COMMISSIONER / STAFF COMMENTS
ADJOURN

Notice: Official Minutes of the City Planning Commission are stored and available for review at the office of the City Clerk. The City of Berkley will provide necessary reasonable auxiliary aids and services, such as signers for the hearing impaired and audio tapes of printed materials being considered at the meeting, to individuals with disabilities at the meeting upon four working days notice to the city. Individuals with disabilities requiring auxiliary aids or services should contact the city by writing or calling: City Clerk, ADA Contact, Berkley City Hall, 3338 Coolidge, Berkley, Michigan 48072, (248) 658-3300.

You can watch the meeting on Channel 10 for both Comcast and WOW, at http://www.youtube.com/CityofBerkley or http://www.berkleymich.org/livestream.
The minutes from this meeting are in summary form capturing the actions taken on each agenda item. To view the meeting discussions in their entirety, this meeting is broadcasted on the city’s government access channel, WBRK, every day at 9AM and 9PM. The video can also be seen, on-demand, on the city’s YouTube channel: https://www.youtube.com/user/cityofberkley.

Present: Kristen Kapelanski  Martin Smith
        Joe Bartus  Lisa Kempner
        Greg Patterson  Julie Stearn
        Mark Richardson  Shiloh Dahlin

Absent: Daniel Petrosky (Excused)

Also, Present: Megan Masson-Minock, Interim Community Development Director
              Matthew Baumgarten, City Manager

Motion by Commissioner Patterson to excuse the absence of Commissioner Petrosky. Motion supported by Commissioner Stearn.

Voice Vote to approve the absence of Commissioner Petrosky.

AYES: 8
NAYS: 0
ABSENT: Petrosky

Motion Carried

* * * * * * * *

Approval of Agenda

Motion by Commissioner Kempner to approve the agenda supported by Commissioner Bartus.

Voice vote to approve the agenda

AYES: 8
NAYS: 0
ABSENT: Petrosky

Motion Carried

* * * * * * * *

Approval of the Minutes

Motion by Commissioner Kempner to approve the minutes from the regular Planning Commission meeting on March 22, 2022 and supported by Commissioner Patterson.

Voice vote to approve the meeting minutes on March 22, 2022.

AYES: 8
NAYS: 0
ABSENT: Petrosky

Motion Carried

* * * * * * *
COMMUNICATIONS
Community Development Department Report
Emails on Marihuana used in packet
Email from Chuck Tyrell on Lot 53 on Oxford Road
Notification from Huntington Woods with their Master Plan process

CITIZEN COMMENTS
NONE

OLD BUSINESS
1. **DDA Guidelines**: Review of ordinance language to implement the DDA guidelines, based on March 1, 2022 Work Session.

   Interim Community Development Director Masson-Minock reviewed each item with context for the Planning Commission

   The Planning Commission discussed various questions and suggestions. They felt comfortable with some of the items moving forward for a public hearing and other items needed to be discussed further at a future work session.

2. **Capital Improvements Plan**: Presentation and discussion of the proposed Berkley Capital Improvement Plan by City Manager Matt Baumgarten.

   City Manager Matt Baumgarten discussed with the Planning Commission that the CIP requires approval from both the Planning Commission and the City Council to get adopted into the fiscal year budget.

   City Manager Matt Baumgarten presented the draft Capital Improvement Plan with the changes from the last discussion and Commissioners asked questions related to the proposed CIP

   Motion by Commissioner Richardson to approve the City of Berkley 2022-2029 Capital Improvement Plan. Motion supported by Commissioner Kempner.

   AYES: Bartus, Dahlin, Kempner, Patterson, Stearn, Richardson, Smith, Kapelanski
   NAYS: NONE
   ABSENT: Petrosky

   MOTION CARRIED

NEW BUSINESS
1. **PSP-04-21: Lot 53 on Oxford Road - The Ivy**: Site Plan for Phase II of the approved project at 2219 Coolidge for the removal of the existing parking lot and construction of two multiple family buildings with a total of 24 dwelling units and a parking lot.

   Interim Community Development Director Masson-Minock gave a presentation and overview of the Phase I and highlighted points of information to look at for Phase II and the four terms recommended as conditions for approval.
APPLICANT PRESENTATION
Brad Freeman John DePorre
Project Manager DePorre Building, LLC

Mr. Freeman addressed the overall concerns that were recommended to them by staff in the staff review.

Mr. DePorre stated that he spoke with former Community Development Director Erin Schlutow about design and keeping it within the ordinances. Mr. DePorre also asked for clarification from the Carlisle Wortman letter.

Michael Gold
Stonefield Engineering
Civil Engineer

Mr. Gold explained the decision on parking spaces on this site. The applicants discussed green space and pavement with Chair Kapelanski.

PUBLIC COMMENT
Eric Wheeler, 2679 Oxford - Stated that his concern here is having a big impact on residents on that street with traffic and noise. He stated that people divert and travel on Kipling which tends to upset those residents. He suggested that the Commission wait and see what the finished development with the school is going to be. If the result is detrimental, it will result in unhappy residents.

Chair Kapelanski stated that this is a permitted use, and provided that the applicant meets all the requirements the Commission as a body has to approve them, taking in and working with them on tweaks and alterations to address resident and city concerns.

Chris Lattin, 2735 Oxford - Stated that his concern is the increased volume of traffic. This is all being funneled on one access point on Oxford, causing traffic in the neighborhood. He also stated the infrastructure is a dated combined sewage and storm system and will it be able to handle the additional volume getting added to it. Also, will there be a traffic study done on this site?

John Paradise, 2750 Oxford - Stated that he has concerns on the traffic standpoint and knowing where the playground area is with no stop sign. Cars are going through that area at higher rates of speed and can see people cutting through that area.

Pat Meslowsky, 1829 Kipling - Questioned if there is not an exit for those cars to leave on Harvard. She also stated that traffic goes fast on Kipling and if there was an exit on Harvard it would seem that traffic would turn left and go to the light.

Email correspondence from Chuck Tyrell - concerns were centered around how this proposal differs from previous proposals that were talked about for this site, parking was a concern, access by emergency vehicles, context with surrounding neighborhood, and storm and waste drainage.

Chair Kapelanski addressed the questions that were mentioned in public comment and offered a suggestion of an easement to the applicants.

There was discussion with the Commission and applicants on traffic, infrastructure on the storm water detention, access points, additional green space, and parking spaces.

The Commission discussed pedestrian circulation and how to make it less awkward with the sidewalk connections and parking spaces with the applicant.

The Commission discussed the dumpsters that are proposed for this site with the applicant, and suggested the moving of dumpsters or having one dumpster instead of two.

Interim Community Development Director Masson-Minock reiterated to the Commission that they have the authority to grant or deny the requested modification based on finding factors she stated.
The Commission stated to the applicants that they can lose five parking spaces and add bike racks from the current plan and specific areas to add greenery.

There was more discussion amongst the Commission and applicants about designs of the building, open stairwells, sidewalks, and the storm water detention system.

Motion to postpone PSP-04-21 by Commissioner Kempner supported by Commissioner Richardson

AYES: Bartus, Dahlin, Kempner, Patterson, Stearn, Richardson, Smith, Kapelanski
NAYS: NONE
ABSENT: Petrosky

* * * * * * * * *

2. **PSP-05-22: 2576 Coolidge Highway - BP America:** Site Plan for a new canopy, parking reconfiguration, pump island reconfiguration, new landscaping and building facade improvements of the existing gasoline station.

Interim Community Development Director Masson-Minock provided an overview for the application and details for a non-conforming use. The applicant is not increasing the intensity of the use or increasing any dimensional non-conformity. If the Planning Commission grants site plan approval there are seven items in the staff review that would need to be included as conditions.

**APPLICANT PRESENTATION**

Jason Yaldoo          Catie Schmitz  
Owner of the BP gas station                JSN Architecture

Mr. Yaldoo stated that the goal of this is to make the gas station a nice place for the community. With the development of the plaza in front of the gas station, this upgrade hopes to bring back business.

Ms. Schmitz stated that there is agreement on everything in the review letter except for the extending or adding of a stone base to the canopies. Ms. Schmitz stated that it would be a waste of money the way the poles are designed and provided an overview of how the canopies are designed for the space.

**PUBLIC COMMENT**

NONE

The Commissioners provided feedback on the base of the canopy, agreeing that adding masonry on the bottom should not be required.

The Commissioners asked specific questions pertaining to the placement of pumps, canopies, and drives of this site. The Commissioners also discussed with the applicant about the separation between sidewalk and road, for safety concerns of pedestrians and cars, suggesting an easement or a mountable curb. There was also discussion on other landscaping options for this site and retaining the landscape island along Coolidge.

Motion by Commissioner Patterson to approve PSP-05-22 with support from Commissioner Kempner with conditions that:

1. Items 1-7 noted in the staff letter dated April 21, 2022
2. Retain the landscape island on Coolidge
3. Define sidewalks on Catalpa with clear demarcation, such as a mountable curb with distinguishing concrete or a rock garden with perennials
4. Provide planters as can be maintained by the gas station staff
5. Dimensions of the canopy are specified on revised plans
6. Decorative block matching the building on the outside of the dumpster enclosure
AYES: Bartus, Dahlin, Kempner, Patterson, Stearn, Richardson, Smith, Kapelanski
NAYS: NONE
ABSENT: Petrosky

*LIAISON REPORT*
Commissioner Patterson stated that Parks and Recreation is hosting a fundraiser for Jaycee park, for an all-inclusive park. If the city raises 50,000 the State of Michigan will match that. Commissioner Patterson thanked the businesses that donated to the cause already.

* * * * * * * * *

*COMMISSIONER COMMENTS*
Commissioner Richardson thanked Carlisle Wortman for the proposed ordinance amendment language and was impressed with the body of work it presented.

Commissioner Smith stated that he will be resigning after the end of this meeting. After 22 years, he will be resigning from the board. The Commissioners gave their appreciation to Commissioner Smith and all the work he did on the board for 22 years.

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*STAFF COMMENTS*
Interim Community Development Director Masson-Minock discussed with Commissioners and asked for their input on the next two meetings, what the agenda would look like, and changing a work session into a meeting with the amount of agenda items that were submitted on Tuesday, April 26th.

* * * * * * * * *

*ADJOURNMENT*
Motion to adjourn by Commissioner Kempner supported by Commissioner Stearn.

Voice vote for adjournment

AYES: 8
NAYS: 0
ABSENT: Petrosky

With no further business, the meeting was adjourned at 10:45 p.m.
APPLICATION FOR SITE PLAN REVIEW

NOTICE TO APPLICANT: Applications for Site Plan review by the Planning Commission must be submitted to the City of Berkley Building Department in substantially complete form at least 30 days prior to the Planning Commission’s meeting at which the application will be considered. The application must be accompanied by the data specified in the Zoning Ordinance, including fully dimensioned site plans, plus the required review fees.

The Planning Commission meets the fourth Tuesday of the month at 7:00pm in the Council Chambers at the City of Berkley City Hall, 3338 Coolidge Hwy, Berkley, MI 48072.

TO BE COMPLETED BY APPLICANT:

I (We), the undersigned, do hereby respectfully request Site Plan Review and provide the following information to assist in the review:

Project Name: Lume Berkley Provisioning Center

Applicant: Christopher Enright

Mailing Address: [Redacted]

Telephone: [Redacted]

Email: [Redacted]

Property Owner(s), if different from Applicant: David Farbman

Mailing Address: [Redacted]

Telephone: [Redacted]

Email: [Redacted]

Applicant’s Legal Interest in Property: 

LOCATION OF PROPERTY:

Street Address: 1949 Twelve Mile Road

Nearest Cross Streets: Woodward Ave. / Rosemont Road

Sidwell Number(s): 25-17-126-002. 25-17-126-003
PLEASE COMPLETE THE FOLLOWING CHART:

<table>
<thead>
<tr>
<th>Type of Development</th>
<th>Number of Units</th>
<th>Gross Floor Area</th>
<th>Number of Parking Spaces On Site</th>
<th>Number of Employees on Largest Shift</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attached Residential</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office</td>
<td>3</td>
<td>17,677 SF</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>1</td>
<td>6,764 SF</td>
<td>30</td>
<td>APPROX. 9</td>
</tr>
<tr>
<td>Industrial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PROFESSIONALS WHO PREPARED PLANS:

A. Name: Stucky Vitale Architects
   Mailing Address: [redacted]
   Telephone: [redacted]
   Email: [redacted]
   Design Responsibility (engineer, surveyor, architect, etc.): Architect

B. Name: PEA GROUP
   Mailing Address: [redacted]
   Telephone: [redacted]
   Email: [redacted]
   Design Responsibility: Surveyor Civil Engineer

SUBMIT THE FOLLOWING:

1. Fifteen (15) individually folded copies of the site plans, measuring 24" x 36", sealed by a registered architect, engineer, or surveyor.
2. A pdf file of the site plans, submitted to the Community Development Director.
3. Proof of property ownership (title insurance policy or registered deed with County stamp).
4. Review comments or approval received from County, State or Federal agencies that have jurisdiction over the project, including, but not limited to:
   - Road Commission for Oakland County
   - MI Dept. of Transportation
   - Oakland County Health Division
   - MI Dept. of Environment, Great Lakes & Energy
PLEASE NOTE: The applicant, or a designated representative, MUST BE PRESENT at all scheduled meetings, or the Site Plan may be tabled due to lack of representation.

Failure to provide true and accurate information on this application shall provide sufficient grounds to deny approval of a Site Plan Application or to revoke any permits granted subsequent to the site plan approval.

We encourage applicants to make a presentation of the proposed project to the Planning Commission and City Council, as appropriate. To assist in this effort, we have available for your use at meetings a projector, laptop computer and screen. This will allow the Planning Commission and audience to be fully engaged so they can give your project the attention it deserves. Planning Commission meetings are recorded and televised.

PROPERTY OWNER'S APPROVAL: (Initial each line)

[Initial]

I hereby authorize the employees and representatives of the City of Berkley to enter upon and conduct an inspection and investigation of the above-referenced property.

APPLICANT'S ENDORSEMENT: (Initial each line)

CVE All information contained therein is true and accurate to the best of my knowledge.

CVE I acknowledge that the Planning Commission will not review my application unless all information in this application and the Zoning Ordinance has been submitted. I further acknowledge that the City and its employees shall not be held liable for any claims that may arise as a result of acceptance, processing or approval of this site plan application.

CVE I hereby acknowledge that if engineering or other reviews are required, additional fees must be submitted. Should the review fees be greater than the required minimum, sufficient additional charges will be imposed to satisfy the additional review fees. All fee obligations must be satisfied prior to permit approval.

If an application is withdrawn more than three (3) weeks prior to the meeting date, 90% of the fee will be refunded. If the application is withdrawn less than three (3) weeks prior to the meeting, no refund will be given.
Signature of Applicant

CHRISTOPHER ENRIQUEZ

Applicant Name (Print)

Signature of Applicant

Applicant Name (Print)

David Farbman, Manager of Monarch Acquisitions LLC

Property Owner Name (Print)

OFFICE USE ONLY

Received 7-14-21

Revised by: DocuSign by:

Fees: Site Plan Review $350  Façade Change: $200  Revision: $100

Engineering TBD

Updated 02.21.2021
MEMORANDUM

To: Planning Commission

From: Megan A. Masson-Minock, Interim Community Development Director

Subject: PSP-03-22: 1949 Twelve Mile Road – Lume Provisioning Center
        Site Plan Approval
        Plan Date: April 25, 2022

Date: May 19, 2022

Attached are the following reviews for the site plan submitted:

Planning Review from Carlisle Wortman Associates (CWA) dated April 26, 2022

In their review, CWA noted that the Planning Commission should review the landscaping and make a finding as to whether the plans presented meet the standard in Section 130-37.

CWA recommended preliminary site plan approval with the condition that the Shared Parking Agreement be reviewed by the City Attorney.

Review from City of Berkley Department of Public Works (DPW) dated May 9, 2022

DPW had the following comments:

1. In lieu of a parcel combination, the applicant is working with the City Attorney on a perpetual easement to address drainage and stormwater detention, which must be approved by the City Attorney, signed by all parties and recorded with the County, prior to the preconstruction meeting.

2. The replacement of the existing fire hydrant within the Twelve Mile right-of-way must be coordinated with the Department of Public Works, Department of Public Safety and the Road Commission for Oakland County (RCOC).

3. HRC will review the updated Geotechnical Report and revised stormwater detention calculations.

4. Twelve Mile Road is under the jurisdiction of the RCOC. The applicant must share with the Department of Public Works feedback from the RCOC and the approved RCOC plan.

5. A stormwater maintenance agreement and exhibits shall be signed and finalized.

Please note that a copy of the draft easement and water management agreement are included in your packet but have not been approved the City Attorney as of yet.
Review from Hubbell, Roth & Clark (HRC) dated May 9, 2022

HRC recommended approval of the proposed site plan, subject to the applicant submitting the full traffic control plan with sequence of construction, the stormwater maintenance agreement, and any required permits to the City of Berkley. The Planning Commission should note the following requested plan revisions and permits:

1. A permit will be required from the RCOC for proposed work within the 12-Mile Road right-of-way as well as for construction signage.
2. A sequence of construction with lane closure estimates must be submitted prior to construction.
3. The developer will be required to prepare and enter into a perpetuity maintenance agreement with the City for the proposed private stormwater systems. The applicant must contact the City DPW regarding this item prior to commencing construction.

Review from City of Berkley Fire Inspector dated February 3, 2022

Fire Inspector Pete Kelly approved the plans with the following conditions:

1. Sprinkler system modifications are not shown and must be submitted for review.
2. Existing/new fire extinguishers are not shown and must be shown.
3. No processing of marijuana is permitted in the City in buildings within 300 feet of residential property.

Summary and Recommendation

The Planning Commission needs to make the following determination:

1. **Standards for Site Plan Approval – Landscaping:** CWA stated in their review that the applicant was proposing a robust plan with building planting, ROW planting, parking lot planting, and a green roof. The Planning Commission must determine whether the landscaping, as presented, meets the standards for Site Plan approval, per Section 138-678.

If the Planning Commission chooses to grant site plan approval, we recommend that the following items be conditions of approval:

1. The Shared Parking Agreement is reviewed and approved by the City Attorney.
2. A pre-construction meeting is required. Before scheduling of that meeting, all items listed the City’s DPW review letter, dated May 9, 2022, must be received by the City.
3. Approval from the City’s Engineer that the full traffic control plan with sequence of construction, the stormwater maintenance agreement, and any required permits to the City of Berkley, as noted in their review letter dated May 9, 2022, have been submitted and/or met.

4. Approval from the Fire Inspector that the conditions in his letter dated February 3, 2022 have been met.

5. All signs and mural must be approved under a separate permit and meet the requirements of Chapter 94 – Signs of the City of Berkley’s Code of Ordinances.
Site Plan Review
For
City of Berkley, Michigan

Applicant: Monarch Acquisitions LLC

Project Name: Lume Berkley Provisions

Plan Date: July 14, 2021

Location: 1949 Twelve Mile Road

Zoning: Local Business District

Action Requested: Site Plan Approval

SITE DESCRIPTION

The subject site is on the south side of Twelve Mile, south of Roseland Park Cemetary, between Henley Avenue and Brookline Street. The building includes a basement and two stories above grade. The applicant proposes to remodel the existing 24,000 sq/ft and two small staircase, and vestibule additions to the existing office building.

One small addition is located at the northwest corner (adjacent to Twelve Mile) of the building and at the southeast corner of the building. The propose uses include a mix of uses including a
marihuana provisioning center. There are no proposed changes or enlargement to the existing building. Site improvements include:

- Removal of existing asphalt and replacement with pervious pavers
- Installation of rain gardens, and rain cisterns
- Decorative bike rake
- Installation of benches
- Increased landscaping
- Quality architecture improvements
- Green roof:
  - Solar system
  - Wind system
  - Rain capture

The site is zoned Local Business District. Marihuana use is a permitted use but must meet the zoning requirements set forth in Section 138-528 Marihuana Business Regulations.

Site Location:

Proposed Use of Subject Parcel:

24,000 sq/ft mixed tenant commercial building including a marihuana provisioning use.

Current Use of Subject Property:
24,000 sq/ft mixed tenant commercial building

Surrounding Property Details:

<table>
<thead>
<tr>
<th>Direction</th>
<th>Zoning</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>Cemetery District</td>
<td>Roseland Park Cemetery</td>
</tr>
<tr>
<td>South</td>
<td>R1-C, Single Family Residential</td>
<td>Single Family Residential</td>
</tr>
<tr>
<td>East</td>
<td>Office District</td>
<td>Medical Office</td>
</tr>
<tr>
<td>West</td>
<td>Local Business District</td>
<td>Institutional (Legions Club)</td>
</tr>
</tbody>
</table>

*Items to be addressed: None.*

The site has been graded for an office building and parking lot. There are no existing natural resources.

The site and building layout will remain in its current configuration. The square foot arrangement of the building is as follows:

<table>
<thead>
<tr>
<th>Floor</th>
<th>Tenant/Use (square feet)</th>
<th>Total Square Footage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower Level</td>
<td>Lume: 1,075</td>
<td>Vacant: 6,506</td>
</tr>
<tr>
<td>First</td>
<td>Lume: 581</td>
<td>Beaumont Health: 7,357</td>
</tr>
<tr>
<td>Second</td>
<td>Lume: 5,108</td>
<td>Vacant: 2,977</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Items to be addressed: None*
Sec. 138-526. - Schedule of regulations of the Zoning Ordinance establishes the dimensional requirements for the Local Commercial District.

<table>
<thead>
<tr>
<th></th>
<th>Required / Allowed</th>
<th>Provided</th>
<th>Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front (Twelve Mile)</td>
<td>0-feet setback based upon adjacent building to east</td>
<td>5-feet</td>
<td>Complies</td>
</tr>
<tr>
<td>Front yard setbacks shall be ten feet or equal to the setback of the adjacent buildings, whichever is less.</td>
<td>0-feet setback based upon adjacent building to east</td>
<td>5-feet</td>
<td>Complies</td>
</tr>
<tr>
<td>Side (east and west)</td>
<td>0-feet</td>
<td>Greater than 0 feet</td>
<td>Complies</td>
</tr>
<tr>
<td>Rear (South)</td>
<td>10-foot minimum setback</td>
<td>20 feet</td>
<td>Complies</td>
</tr>
<tr>
<td>Building Height</td>
<td>40-feet maximum height</td>
<td>35-8 feet</td>
<td>Complies</td>
</tr>
</tbody>
</table>

**Items to be addressed:** None

**PARKING**

The applicant has provided a parking table on Sheet SP-01. This is a multiple tenant building. The parking required is a total of all uses combined in the building:

<table>
<thead>
<tr>
<th></th>
<th>Required</th>
<th>Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>LUME (Retail) 1 space per 225 usable square feet</td>
<td>3,721 usable sq.ft / 225 = 17 spaces</td>
<td>124 spaces</td>
</tr>
<tr>
<td>BEAUMONT (Medical office) 1 per 100 usable square feet</td>
<td>5, 177 usable sq.ft / 100 = 52</td>
<td>TBD</td>
</tr>
<tr>
<td>Vacant +/- 10,000</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Barrier Free</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>69 spaces + future parking for vacant space (see 124 spaces</strong></td>
<td><strong>124 spaces</strong></td>
</tr>
</tbody>
</table>
Though only required 17 spaces based on the retail parking calculations, Lume from other locations notes an anticipated need of a maximum of 34 spaces. There are a total of 124 spaces at 1949 Twelve Mile Road. Of those 124, 30 spaces are shared with the adjacent American Legion though a shared parking agreement. The remaining 94 spaces are unencumbered for use solely of tenants of 1949 Twelve Mile Road. Based on anticipated need, Beaumont and Lume will need a total of 86 spaces.

Parking is sufficient for the Beaumont and Lume use at this site. However it should be noted that the future use of the vacant space in the building may be limited to uses that do not need a large amount of parking.

The shared parking agreement should be reviewed by the City Attorney to ensure it allows for shared parking in perpetuity.

**Items to be Addressed:** Shared Parking Agreement to be reviewed by the City Attorney.

### SITE ACCESS AND CIRCULATION

Site access and circulation remain as currently situated. There are two points of access off Twelve Mile, and cross-access with adjacent parcels. Furthermore, there is 20-foot alley that runs behind the building. There is an existing 10-foot sidewalk on Twelve Mile and there is direct pedestrian access from Twelve Mile to front entrances.

**Items to be Addressed:** None

### LANDSCAPING AND SITE AMENITIES

A landscaping plan has been provided on sheet L-1.1 and L-1.2. The applicant is proposing a robust plan which includes building planting, ROW planting, parking lot planting, and a green roof. As set forth in section 130-37, when the development of any property requiring site plan approval occurs, the City Planning Commission shall review landscaping plans and may require additional landscaping to be planted on or near the site consistent with the elements of the adopted city master plan.

**Trash Enclosure:**

The existing trash enclosure to remain.

**Items to be Addressed:** Planning Commission to review landscaping.
The applicant is proposing a green roof, which includes
- Solar panels
- Wind turbines
- Water collection

We support the sustainable and creative use of the green roof. Wind turbines are regulated by Section 138-99. Requirements include:

<table>
<thead>
<tr>
<th>Maximum Height from Roof</th>
<th>Setback</th>
<th>Other Regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 feet</td>
<td>No portion of the system's blades, rotor or other exposed moving part shall extend beyond the edge of the building line to which it is attached</td>
<td>Wind energy systems with a rated capacity of up to 2 kilowatts (2 kW) and solar energy systems shall be allowed as an accessory use subject to the required standards of this section; provided they are incidental and subordinate to a use on the same parcel, and shall supply electrical power exclusively for on-site consumption</td>
</tr>
</tbody>
</table>

The roof top wind system has been redesigned to comply with all provisions of Section 138-99

*Items to be Addressed: None*

**PHOTOMETRICS**

The applicant is proposing four 20-foot-tall parking lot poles, each with two lights attached. Applicant notes that they are not providing any external building lighting. Exterior of the building will be lit by the parking lot lights.

*Items to be Addressed: None*

**EXTERIOR APPLIANCES**

Applicant has shown exterior appliances (air conditioners, generators, etc.) on site plan to ensure that they are in compliance with Sec. 138-73.

*Items to be Addressed: None*

Floor plans and elevations have been provided. The applicant is making significant elevation improvements to the existing building including stairwell addition, new stain existing brick, new...
sign lettering (reviewed under separate sign permit), green roof, public art mural, landscape growing cable system, and architectural accent fins.

**Items to be Addressed:** None

**MARIHUANA BUSINESS REGULATIONS**

Section 138-528 Marihuana Business Regulations, the site plan shall be reviewed and approved by the Planning Commission upon finding that:

a) A marihuana business must front on a major thoroughfare with the primary ingress/egress onto a major thoroughfare.

CWA Response: The marihuana business fronts on Twelve Mile Road, with ingress/egress onto a major thoroughfare.

b) The marihuana business must have all applicable state and local licenses and approvals to operate.

CWA Response: The marihuana business will be required to obtain all applicable state license prior to any final approvals.

c) The property where the marihuana business will be located must be entirely within the boundaries of the city and must not be within 1,000 feet of a pre-existing public or private school providing education in kindergarten or any of grades 1 through 12.

CWA Response: The marihuana business will not be located with 1,000 feet of any pre-existing public or private school.

d) Notwithstanding any other provision in the zoning ordinance, a marihuana business must operate within a fully enclosed building.

CWA Response: The marihuana business will operation within a fully enclosed building.

e) Pursuant to article XV of chapter 30 of the Berkley City Code, all marihuana business license approvals are subject to the following:

   i. Public notice requirements as outlined in section 30-806; and
   ii. Site plan approval from the planning commission must be obtained prior to receiving license approval from the city council. Failure to do so will result in license denial as outlined in section 30-813.
CWA Response: 1). Public notice requirement was met; and 2). The applicant is seeking site plan approval from the Planning Commission. If granted site plan approval, the applicant would then seek license approval from the City Council.

**Items to be Addressed:** None

**RECOMMENDATION**

Overall the applicant is making a significant investment into the site as noted in our report. We recommend preliminary site plan approval with the condition that the Shared Parking Agreement be reviewed by the City Attorney.

Sincerely,

[Signature]

CARLISLE/WORTMAN ASSOC., INC.
Benjamin R. Carlisle, LEED AP, AICP
Transmittal Memo

To: Megan Masson-Minock, Interim Community Development Director (via email)
Cc: Kim Anderson, Community Development Department (via email)
    Ric Chalmers, Assistant DPW Director (via email)
    Eddie Zmich, HRC (via email)
From: Shawn Young, DPW Director
Date: May 9th, 2022
Subject: Lume Provisioning Center
        1949 Twelve Mile Road

We have reviewed the revised site plans provided by the Community Development Department on April 25th, 2022. Please find below our comments:

1. In lieu of a parcel combination, we understand the applicant is working with the City Attorney on a perpetual easement to address drainage and stormwater detention. This easement shall be approved, signed and recorded with the County prior to the preconstruction meeting.

2. The revised site plans indicate the removal of the existing fire hydrant near the southwest corner of the building. A new fire hydrant is proposed within the 12 Mile right-of-way. This work will need to be coordinated with the Department of Public Works, the Department of Public Safety, and the Road Commission for Oakland County.

3. The eastern parking lot has now been added to the detention calculations. City’s engineering consultant, Hubbell, Roth & Clark (HRC), will review the recently updated Geotechnical Report and revised stormwater detention calculations.

4. 12 Mile is under the jurisdiction of the Road Commission for Oakland County. The applicant shall share feedback received from the County and/or an approved RCOC plan.

5. A stormwater maintenance agreement shall be signed and finalized. An agreement template, as approved by the City Attorney, was previously provided to the applicant and shall be merged with the Exhibits. Note the porous pavement recommendations from the Geotechnical Report shall be incorporated into the agreement (vacuum sweeping should be performed three to four times per year to remove sediment and fines from the porous pavement).

A response letter from the applicant to the comments noted above would be helpful in subsequent reviews.

Feel free to call with any questions or concerns. Thank you.

Shawn Young
Director of Public Works
TO: John Vitale, Architect  
John Lipchick, Building Official  
Monarch Acquisitions, Owner  

RE: 1949 W. Twelve Mile Rd.  

Dear Interested Parties:  

I have received and reviewed the site plan/conceptual design package for the above address, and approved them subject to the following:

1) Sprinkler system modifications not shown, must be submitted for review.  
2) Existing/new fire extinguishers not shown.  
3) Note that no processing of marijuana is permitted in the City in buildings within 300' of residential property.  

Please contact me if you have any questions regarding this communication.  

Respectfully,  

[Signature]  
Pete Kelly  
Fire Inspector
May 9, 2022

City of Berkley
3338 Coolidge Highway
Berkley, Michigan 48072

Attention:  Ms. Megan Masson-Minock, Community Development Director
Mr. Matthew Baumgarten, City Manager

Re:  Lume
1949 Twelve Mile Road
Engineering Site Plan – Review No. 3
City of Berkley, MI

Dear Ms. Masson-Minock and Mr. Baumgarten:

As Consulting Engineers for the City of Berkley, and in accordance with your request, we have completed the Engineering Site Plan review of the proposed subject development located at 1949 Twelve Mile Road for compliance with the City of Berkley’s engineering and site plan requirements. The plans were prepared by Stucky-Vitale Architects of Royal Oak, Michigan with the engineering site plan created by PEA Group of Brighton, Michigan. The plans have a revision date of April 15, 2022. The proposed project scope includes the renovation of the existing building and replacement of the existing parking lot and other site features. We hereby offer the following comments:

General:

1. A Road Commission for Oakland County (RCOC) permit will be required for proposed work within the 12-Mile Road right-of-way as well as for construction signage. This item is still Applicable.

2. A traffic control, or Maintenance of Traffic (MOT), plan and sequence of construction must be added to the plans, including an estimated duration for any lane closures that may be required. A traffic control plan has been added to the plans. A sequence of construction with lane closure estimates must be submitted prior to construction.

3. A separate demolition sheet must be provided in the plan set that shows all site demolition work including any exterior building work which may impact the site. A demolition sheet has been provided. This item has been satisfactorily addressed.

4. The extent of curb, sidewalk, and pavement removal and replacement must be clearly shown on the plans. In addition, the City may require additional sections of existing curb and gutter and sidewalks along 12 Mile Road to be removed and replaced as part of the proposed project in order to address the current deteriorated conditions and will defer comment to the City. A demolition sheet has been provided as well as further detail on the proposed sheets to clarify the extent of pavement work. This item has been satisfactorily addressed.
Water and Fire Protection Services:

1. The proposed 8” water main has a note stating “connect to existing water service into building”. It appears that this connection would be to the existing 8” main for the south hydrant, not for the building service, and the note must be updated to reflect this. The connection note has been revised. This item has been satisfactorily addressed.

2. The relocation of the 8” water main will require a new connection with a new tapping sleeve, valve and well. This type of connection has been shown for the relocated hydrant. This item has been satisfactorily addressed.

Storm Drainage and Detention/Sanitary Sewer:

1. Stormwater runoff calculations are provided using a 100-year, 24-hour storm event and show the required storage volume for the proposed site. Calculations and details must also be added to the plans demonstrating that the storage volume provided by the proposed stormwater management system meets or exceeds this requirement. Further, sources for the values of the runoff coefficients must be cited on the plans for the proposed permeable pavement areas. Stormwater calculations have been provided; however, the construction limits have been expanded from the previous submittal to include the remainder of the parking lots to the west and east of what was previously shown for replacement. These areas also must included in the stormwater calculations and must have stormwater detention provided for them. The stormwater calculations have been updated to include the eastern lot, and additional stormwater detention measures have been proposed to detain the required storage for the full site. This item has been satisfactorily addressed.

2. A geotechnical investigation must be performed to evaluate the feasibility of the proposed stormwater management system. The report and soil logs must be submitted along with the plans, including the elevation of the groundwater table, soil types encountered, and the design recommendations or comments on the proposed stormwater collection system. The geotechnical report has been submitted which states that the proposed stormwater system and cross sections are feasible in the site soils. Any further changes made to the detention system or site stormwater management as stated in the previous comment must be made in accordance with the recommendations provided in the soils report. An addendum to the geotechnical report has been submitted for the additional site areas. This item has been satisfactorily addressed.

3. Grades must be provided for inverts of proposed storm sewer and structures. Rim and invert grades of structures have been provided. This item has been satisfactorily addressed.

4. Details of the proposed outlet control structure and diversion manholes must be shown on the plans. Details have been shown on the plans. This item has been satisfactorily addressed.

5. Cross-sectional details and proposed composition of the rain gardens must be shown on the plans. These have been provided on the plans. This item has been satisfactorily addressed.

6. The types of pre-treatment proposed for each area of collection must be specified. These have been provided on the plans. This item has been satisfactorily addressed.

7. The developer will be required to prepare and enter into a perpetuity maintenance agreement with the City for the proposed private stormwater systems. The Applicant must contact the City DPW regarding this item prior to commencing construction. This item is still applicable.
8. A note indicates the existing building sanitary lead will remain in place and be re-utilized. The applicant must have the sanitary lead inspected by a licensed contractor/plumber and the video footage submitted to the City verifying the lead is suitable for re-use prior to construction. **The inspection video and report have been submitted and show that the existing lead is in suitable condition for re-use. This item has been satisfactorily addressed.**

Recommendation:

Based on our aforementioned comments, we recommend approval of the proposed Site Plan subject to the Applicant submitting the full traffic control plan with sequence of construction, the stormwater maintenance agreement, and any required permits to the City of Berkley.

If you have any questions or require any additional information, please contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

Edward D. Zmich     Mitch Stark
Project Manager    Review Engineer

EDZ/MAS/mas
pc:    City of Berkley; Mr. Derrick Schueller, Mr. Shawn Young
       HRC; R. Alix, File
       PEA Group; S. Peruski
       Stucky-Vitale; M. Dragan
SITE PLANS
LUME - BERKLEY
1949 12 MILE ROAD
CITY OF BERKLEY, OAKLAND COUNTY, MICHIGAN

INDEX OF DRAWINGS

- C-1.0 TOPOGRAPHIC SURVEY
- C-1.1 DEVELOPMENT PLAN
- C-2.0 DIMENSION AND PAVING PLAN (WEST)
- C-2.1 DIMENSION AND PAVING PLAN (EAST)
- C-3.0 GRADING PLAN (WEST)
- C-3.1 GRADING PLAN (EAST)
- C-4.0 UTILITY PLAN (WEST)
- C-4.1 UTILITY PLAN (EAST)
- C-5.0 STORE WATERS MANAGEMENT PLAN (WEST)
- C-5.1 STORE WATERS MANAGEMENT PLAN (EAST)
- C-5.2 STORE WATERS SYSTEM CALCULATIONS (WEST)
- C-5.3 STORE WATERS SYSTEM CALCULATIONS (EAST)
- C-6.0 NOTES AND DETAILS
- C-7.0 MAINTENANCE OF TRAFFIC CONTROL PLAN
- C-8.0 OVERALL SITE AMENITIES PLAN
- C-9.0 LANDSCAPE PLAN
- C-10 LANDSCAPE DETAILS
- C-11 PHOTOMETRIC SITE PLAN

DESIGN TEAM

OWNER
MONARCH ACQUISITIONS LLC
28400 NORTHWESTERN HIGHWAY
SOUTHFIELD, MI 48034

APPLICANT/LESSEE
ATTITUDE WELLNESS LLC D/B/A LUME CANNABIS CO.
769 CHICAGO ROAD
TROY, MI 48083

ARCHITECT
STUCKY VITALE ARCHITECTS
27172 WOODWARD AVENUE
ROYAL OAK, MI 48067
PHONE: 248.546.6700
EMAIL: MDRAGAN@STUCKYVITALE.COM

LANDSCAPE ARCHITECT
PEA GROUP
7927 NEMCO WAY, STE. 115
BRIGHTON, MI 48116
PHONE: 844.813.2949
EMAIL: JEVANS@PEAGROUP.COM

CIVIL ENGINEER
PEA GROUP
7927 NEMCO WAY, STE. 115
BRIGHTON, MI 48116
PHONE: 844.813.2949
EMAIL: SPERUSKI@PEAGROUP.COM

TOOLBOX
2020-0224
NOT  FOR  CONSTRUCTION

TROY    WASHINGTON TWP
BRIGHTON    DETROIT

t: 844.813.2949

PROJECT TITLE

CLIENT

REVISIONS

CAUTION!!

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

ORIGINAL ISSUE DATE:

DRAWING NUMBER:

PEA JOB NO.

MARCH 4, 2022

SAP

DES.

SAP

DRAWING TITLE

NORTH

2020-0224

LUME

DEVELOPMENT

1949 12 MILE ROAD
BERKLEY, MICHIGAN

STUCKY VITALE
ARCHITECTS
27172 WOODWARD AVENUE
ROYAL OAK, MICHIGAN 48067

FOR OWNER REVIEW

03/04/22

REVISE PER CITY

03/26/22

PROGRESS SET

04/15/22

C-1.0

TOPOGRAPHIC SURVEY

ASPHALT GUARD RAIL
POST INDICATOR VALVE
MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF UNDERGROUND CABLE TV, CATV PEDESTAL
CONCRETE SIGN
STREET LIGHT
FENCE
CONTOUR LINE
SPOT ELEVATION
COMBINED SEWER & MANHOLE
STORM SEWER, CLEANOUT & MANHOLE
SANITARY SEWER, CLEANOUT & MANHOLE
WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
GAS MAIN, VALVE & GAS LINE MARKER
ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
CALCULATED
MEASURED
RECORDED
MONUMENT SET
MONUMENT FOUND
NAIL FOUND
NAIL & CAP SET
IRON SET
IRON FOUND
SEC. CORNER FOUND
UNIDENTIFIED STRUCTURE
GRAVEL SHOULDER
BRASS PLUG SET

REFERENCE DRAWINGS

CABLE
AT&T MAP A1, DATED 10/29/2020
123.NET MAP, EMAIL DATE 1/28/2020

ELECTRIC
DTE ELECTRIC FACILITY MAP #310-366, DATED 11/3/2020

GAS
CONSUMERS QUARTER SECTION MAP 01-61-17-2M DATED 02-22-2019

STORM SEWER
CITY OF BERKLEY GIS MAPS, EMAIL DATED 10/29/2020

WATER MAIN
CITY OF BERKLEY GIS MAPS & SKETCHES, EMAIL DATED 10/29/2020

SCALE: 1" = 20'
PROJECT TITLE
LUME DEVELOPMENT

CLIENT
LUME DEVELOPMENT

DRAWING TITLE
2020-0224

DRAWING NUMBER
P.A.

MARCH 4, 2022

D-1

SCALE: 1" = 20'
NOT FOR CONSTRUCTION
NOT  FOR  CONSTRUCTION

PROJECT TITLE

CLIENT

REVISIONS

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DEVELOPMENT

1949 12 MILE ROAD
BERKLEY, MICHIGAN

LEGEND

STD
DUTY
STD
DUTY
HEAVY
DUTY

---

SCALE: 1" = 10'

C-2.1
DIMENSION AND PAVING PLAN
(EAST)

NOT FOR CONSTRUCTION
NOT  FOR  CONSTRUCTION

TROY    WASHINGTON TWP
BRIGHTON    DETROIT

t: 844.813.2949

PROJECT TITLE

CLIENT

REVISIONS

CAUTION!!

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ORIGINAL ISSUE DATE: MARCH 4, 2022

DRAWING NUMBER:

PEA JOB NO:

LUME DEVELOPMENT
1949 12 MILE ROAD
BERKLEY, MICHIGAN

ASPHALT
GUARD RAIL
POST INDICATOR VALVE
MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
FIBER OPTIC
CONCRETE
SIGN
STREET LIGHT
FENCE
CONTOUR LINE
SPOT ELEVATION
STORM SEWER, CLEANOUT & MANHOLE
SANITARY SEWER, CLEANOUT & MANHOLE
WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
GAS MAIN, VALVE & GAS LINE MARKER
ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
OVERHEAD ELECTRIC, POWER POLE, GUY ANCHOR

MONUMENT SET
MONUMENT FOUND
NAIL FOUND
NAIL & CAP SET
IRON SET
IRON FOUND

LEGEND

STD
DUTY
STD
DUTY
HEAVY
DUTY

SQUARE, ROUND & BEEHIVE CATCH BASIN, YARD DRAIN

PERVIOUS PAVERS
ROADWAY
WALKWAY

FOR OWNER REVIEW
03/04/22
REVISE PER CITY
03/26/22
PROGRESS SET
04/15/22

C-3.1

NOT FOR CONSTRUCTION
NOT FOR CONSTRUCTION

PROJECT TITLE

CLIENT

REVISIONS

CAUTION!!

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ORIGINAL ISSUE DATE: MARCH 4, 2022

DRAWING NUMBER: C-4.0

PEA JOB NO.

SCALE: 1" = 10'

LUME DEVELOPMENT
1949 12 MILE ROAD
BERKLEY, MICHIGAN

STUCKY VITALE ARCHITECTS
27172 WOODWARD AVENUE
ROYAL OAK, MICHIGAN 48067

ASPHALT GUARD RAIL
POST INDICATOR VALVE
MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
FIBER OPTIC
CONCRETE SIGN
STREET LIGHT
FENCE
CONTOUR LINE
SPOT ELEVATION
STORM SEWER, CLEANOUT & MANHOLE
SANITARY SEWER, CLEANOUT & MANHOLE
WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
GAS MAIN, VALVE & GAS LINE MARKER
ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
OVERHEAD ELECTRIC, POWER POLE, GUY ANCHOR
CALCULATED MEASURED RECORDED
MONUMENT SET
MONUMENT FOUND
NAIL FOUND
NAIL & CAP SET
IRON SET
IRON FOUND
SEC. CORNER FOUND
BRASS PLUG SET
LEGEND
STD DUTY
STD DUTY
HEAVY DUTY
SQUARE, ROUND & BEEHIVE CATCH BASIN, YARD DRAIN
PERVIOUS PAVERS
ROADWAY
WALKWAY

FOR OWNER REVIEW
03/04/22
REVISE PER CITY
03/26/22
PROGRESS SET
04/15/22

NOT FOR CONSTRUCTION
NOT FOR CONSTRUCTION

PROJECT TITLE: LUME DEVELOPMENT

CLIENT: LUME DEVELOPMENT

NOT FOR CONSTRUCTION

ORIGINAL ISSUE DATE: MARCH 4, 2022

DRAWING NUMBER: D-4.1

PEA JOB NO.: SAP

DRAWING TITLE: UTILITY PLAN

SCALE: 1" = 10'

LEGEND

- STICKY VITALE ARCHITECTS
  27172 WOODWARD AVENUE
  ROYAL OAK, MICHIGAN 48067

- LUME DEVELOPMENT

- OVERHEAD ELECTRIC, POWER POLE, GUY ANCHOR
- TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
- ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- GAS MAIN, VALVE & GAS LINE MARKER
- SANITARY SEWER, CLEANOUT & MANHOLE
- WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
- FIBER OPTIC
- CONTOUR LINE
- SPOT ELEVATION
- STORM SEWER, CLEANOUT & MANHOLE
- FENCE
- STREET LIGHT
- CONCRETE SIGN
- MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
- WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- POST INDICATOR VALVE
- ASPHALT
- GUARD RAIL
- ASPHALT
- GUARD RAIL
- ASPHALT
- GUARD RAIL

- SEC. CORNER FOUND
- IRON FOUND
- IRON & CAP SET
- NAIL & CAP SET
- NAIL FOUND
- CALLED MEASURED
- CALCULATED
- RECORDED
- MONUMENT FOUND
- MONUMENT SET
- LEGEND

- STD
- STD
- STD
- HEAVY
- HEAVY
- STD
- STD

- SQUARE, ROUND & BEEHIVE CATCH BASIN, YARD DRAIN
- UNIDENTIFIED STRUCTURE

- ROADWAY
- WALKWAY

FOR OWNER REVIEW

03/04/22

REVISE PER CITY

03/26/22

PROGRESS SET

04/15/22

NOT FOR CONSTRUCTION

C-4.1
NOT FOR CONSTRUCTION

TROY WASHINGTON TWP
BRIGHTON DETROIT

www.peainc.com

PROJECT TITLE
CLIENT
REVISIONS
CAUTION!!

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ORIGINAL ISSUE DATE: MARCH 4, 2022
DRAWING NUMBER: D-1000
PEA JOB NO.

NORTH 2020-0224
SCALE: 1" = 10'

LUME
DEVELOPMENT
1949 12 MILE ROAD
BERKLEY, MICHIGAN

ASPHALT
GUARD RAIL
POST INDICATOR VALVE
MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
FIBER OPTIC
CONCRETE
SIGN
STREET LIGHT
FENCE
CONTOUR LINE
SPOT ELEVATION
STORM SEWER, CLEANOUT & MANHOLE
SANITARY SEWER, CLEANOUT & MANHOLE
WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
GAS MAIN, VALVE & GAS LINE MARKER
ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
OVERHEAD ELECTRIC, POWER POLE, GUY ANCHOR

CALCULATED
MEASURED
RECORDED
MONUMENT SET
MONUMENT FOUND
NAIL FOUND
NAIL & CAP SET
IRON SET
SEC. CORNER FOUND

BRASS PLUG SET

LEGEND
STD
DUTY
STD
DUTY
HEAVY
DUTY

SQUARE, ROUND & BEEHIVE CATCH BASIN, YARD DRAIN
STICKY VITALE
ARCHITECTS
27172 WOODWARD AVENUE
ROYAL OAK, MICHIGAN 48067

PREVIOUS PAVERS
ROADWAY
WALKWAY

FOR OWNER REVIEW
03/04/22
REVISE PER CITY
03/26/22
PROGRESS SET
04/15/22

C-5.0
STORM WATER
MANAGEMENT
PLAN (WEST)
NOT FOR CONSTRUCTION

CAUTION!!

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PROJECT TITLE
LUME DEVELOPMENT

STORM WATER MANAGEMENT PLAN (EAST)
NOT FOR CONSTRUCTION
NOT FOR CONSTRUCTION
CAUTION!!

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NOT TO SCALE

CAUTION!!

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ORIGINAL ISSUE DATE: MARCH 4, 2022

PROJECT TITLE: NORTH 2020-0224

CLIENT: LUME DEVELOPMENT

1949 12 MILE ROAD
BERKLEY, MICHIGAN

STUCKY VITALE ARCHITECTS
27172 WOODWARD AVENUE
ROYAL OAK, MICHIGAN 48067

FOR OWNER REVIEW
03/04/22

REVISE PER CITY
03/26/22

PROGRESS SET
04/15/22

C-7.0

MAINTENANCE OF TRAFFIC CONTROL PLAN

ROAD WORK BEGINS
ZONE WORK
W20-1
RIGHT LANE AHEAD
CLOSED

SIGN CLOSEST TO WORK ZONE
WEST

SIGN FURTHEST FROM WORK ZONE
EAST

PLACE SIGNS ON THE SOUTH SIDE OF TWELVE MILE ROAD WEST OF THE WORK AREA

PLACE SIGNS ON THE NORTH SIDE OF TWELVE MILE ROAD EAST OF THE WORK AREA

SCALE: 1" = 30'

ROAD WORK END
G20-2

THE CONTRACTOR SHALL MAINTAIN THE TRAFFIC CONTROL SIGNS AND路 WORK BEGINS
MARKINGS UNTIL THE WORK ZONE WORK
COMPLETELY CLEAR OF MATERIALS.

THE CONTRACTOR SHALL MAINTAIN THE TRAFFIC CONTROL SIGNS AND MARKINGS UNTIL THE WORK ZONE COMPLETELY CLEAR OF MATERIALS.
NOT  FOR  CONSTRUCTION
TROY    WASHINGTON TWP
BRIGHTON    DETROIT
t: 844.813.2949

PROJECT TITLE

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

ORIGINAL ISSUE DATE:  MARCH 4, 2022

DRAWING NUMBER:  2020-0224

PEA JOB NO.

NORTH

SCALE: 1" = 10'

LUME
DEVELOPMENT
1949 12 MILE ROAD
BERKLEY, MICHIGAN

STUCKY VITALE
ARCHITECTS
27172 WOODWARD AVENUE
ROYAL OAK, MICHIGAN 48067

FOR OWNER REVIEW
03/04/22

REVISE PER CITY
03/26/22

PROGRESS SET
04/15/22

L-1.0

OVERALL SITE AMENITIES

PLAN

KEY:

= GENERAL TREES
= PERENNIALS
= ROCK  MAINTENANCE EDGE
= SHRUBS
= IRRIGATED SOD LAWN
= RAIN GARDEN PLANTINGS
= ORNAMENTAL GRASS
SEE SHEET L-1.1

= GENERAL TREES
= PERENNIALS
= EXISTING TREES TO REMAIN WITH TREE PROTECTION FENCE
= REPLACEMENT TREE
= REPLACEMENT TREE
= LUMBER

NOTE:
GREEN ROOF AND 5 GREEN WALLS TO BE DETAILED DURING CONSTRUCTION DWGS.
SEE SHEET L-1.2 FOR CONCEPTUAL DETAILS.
TROY  WASHINGTON TWP  BRIGHTON  DETROIT

t: 844.813.2949

PROJECT TITLE

CLIENT

REVISIONS

CAUTION!!

THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

ORIGINAL ISSUE DATE: MARCH 4, 2022

DRAWING NUMBER: DN.

PEA JOB NO.

SAP

DES.

P.M.

RAW GARDEN PLANT JET:

QUALITY  KEY SYMBOL  COMMON NAME  SCIENTIFIC NAME  SIZE  SPEC

104  AC  Nodding Onion  Allium cernuum  5.0  Std.

1  CP  Pencil Oregonia  OregoniaDentata  1.5  Std.

1  CQ  Purple Dwarves  Polystichumacrostichoides  2.0  Std.

2  CYL  Skyline Hardy  HardyPlantago  2.0  Std.

NOT  FOR  CONSTRUCTION

LUME DEVELOPMENT

1949 12 MILE ROAD
BERKLEY, MICHIGAN

STUCKY VITALE
ARCHITECTS

27172 WOODWARD AVENUE
ROYAL OAK, MICHIGAN 48067

FOR OWNER REVIEW
03/04/22

REVISE PER CITY 03/26/22

PROGRESS SET 04/15/22

L-1.1

TEN-WILE ROAD

(GO® HUKELE)

TREES PLANTS LIST:

QUALITY  KEY SYMBOL  COMMON NAME  SCIENTIFIC NAME  SIZE  SPEC

1  CH  Huthall Red Beech  Fagus sylvatica 'Huthall'  3.5  Std.

14  HP  Japanese Maple  Acer palmatum  3.5  Std.

15  MP  Rober's Low  Cinnamomum Cinna var. Cinnamomum  1.5  Std.

16  PN  Fringe Tree  Chionanthus virginicus  1.5  Std.

12  RH  Pin Oak  Quercus rubra  3.5  Std.

13  BR  Black Gum  Nyssa sylvatica  3.5  Std.

17  BL  Birch  Betula Pendula  3.5  Std.

12  BR  Black Gum  Nyssa sylvatica  3.5  Std.

TOTAL PLANTS

PERENNIAL PLANTS LIST:

QUALITY  KEY SYMBOL  COMMON NAME  SCIENTIFIC NAME  SIZE  SPEC

11  CH  Huthall Red Beech  Fagus sylvatica 'Huthall'  3.5  Std.

14  HP  Japanese Maple  Acer palmatum  3.5  Std.

15  MP  Rober's Low  Cinnamomum Cinna var. Cinnamomum  1.5  Std.

16  PN  Fringe Tree  Chionanthus virginicus  1.5  Std.

12  RH  Pin Oak  Quercus rubra  3.5  Std.

13  BR  Black Gum  Nyssa sylvatica  3.5  Std.

17  BL  Birch  Betula Pendula  3.5  Std.

TOTAL PER.

KEY:

FG = GREENBELT TREE
PG = REPLACEMENT TREE
EG = EXISTING TREES TO REMAIN WITH TREE PROTECTION FENCE
BG = SHRUBS
IJ = IRRIGATED SOD LAWN
NG = ORNAMENTAL GRASS
RM = PERENNIALS
GM = GENERAL TREES
RE = ROCK MAINTENANCE EDGE

NOTE:

GREEN ROOF AND 5 GREEN WALLS TO BE DETAILED DURING CONSTRUCTION DWGS.

SEE SHEET L-1.2 FOR CONCEPTUAL DETAILS.
CAUTION!!

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EXISTING PARKING AND TENANT SPACES ALLOCATION DIAGRAM

TOTAL PARKING EAST AND WEST SIDE 301

REQUIRED PARKING

- Access to lower level: 100 SF
- Main floor: 7,246 SF
- 1st floor: 4,887 SF
- 2nd floor: 430 SF
- Total usable area: 19,583 SF

- LUME (required)
  - Employees: Max. shift: 20
  - In-store customers: 10
  - Curbside: 4

- Total required parking: 1949 12 MILE RD. tenants
  - 69 spaces required
  - 86 spaces anticipated

- Spaces on 1949 12 MILE RD. property for spaces
- Total parking spaces on 1949 12 MILE RD. available for future occupancy
  - 55 spaces required
  - 38 spaces anticipated

TOTAL REQUIRED PARKING 1949 12 MILE RD. TENANTS

- 59 spaces required
- Spaces (anticipated)

- Total parking available 2070 12 MILE RD. parking
- Barrier free: 5
- Standard: 53
- Total: 58

- 1695 12 MILE RD. parking
- Barrier free: 6
- Standard: 113
- Total: 119

- Total parking available 301

TOTAL PARKING EAST AND WEST SIDE 301

- Required parking

- Curbside service

- Standard: 6
- Total: 115

- 2070 -12 MILE RD. PARKING LOT - TOTAL: 58 SPACES  (5 B.F. INCLUDED)
- Existing screen wall to remain.
- Proposed addition
- LUME employee parking area
- 21 spaces
- Exclusive parking from 10AM to 6PM
- Shared with American Legion after 6PM

- 1949-12 MILE RD. PARKING LOT - TOTAL: 124 SPACES  (5 B.F. INCLUDED)

- 1949-12 MILE RD. PARKING LOT - TOTAL: 119 SPACES  (6 B.F. INCLUDED)

2020.154
LUME - BARKLEY - PROVISIONING CENTER
1949-12 MILE ROAD, BARKLEY, MI

SCALE: 1" = 40'

APRIL 25, 2022
SITE PLAN APPROVAL

CONCEPTUAL DESIGN PACKAGE

STUCKY VITALE ARCHITECTS

The proposed use does not require any zoning map amendments or variances at the time of application.

- **SCALE:** 1" = 1000'
- **PROXIMITY MAP**
- **SP1.0**
- **APPLICATION EVALUATION MERIT POINT SYSTEM**

Requirements:
- 5-Acre Pedestrian Friendly Lot
- School
- Existing Zoning
- Off-street parking for retail use has been met, per Section 132-218 of the Zoning Code
- All disclosed setbacks are in line with current standards
- "The proposed use will be considered for the profit evaluation."

Adopted by City Council Resolution R-03-20 on February 3, 2020

**PERMITTED USE**
Envision District: Greenfield District
Downtown District
Gateway District
Industrial District
Twelve Mile District
Woodward District

**ADDITIONAL CONDITION**
As adopted via ordinance amendment 20-18 by City Council on December 16, 2019.
NEW 12" BLOCK SHAFT WALL
NEW ELEVATOR WITH SUMP PIT
NEW 8" BLOCK SHAFT WALL WITH BRICK VENEER
NEW PROVISIONING CENTER MAIN ENTRANCE. NEW EXTERIOR STOREFRONT SYSTEM
PORTION OF EXISTING SHAFT WALL TO BE REMOVED AND A NEW FIRE RATED DOOR TO BE INSTALLED.
INFILL EX. ELEVATOR ACCESS
73'-4"
101'-4"
9'-4"
24" WIDE ARCHITECTURAL / GRAPHIC ACCENT PANELS (TBD) INSTALLED ON EXISTING FACADE
9'-4"
NEW ROOF ASSEMBLY.
ROOF TO BE 60MIL WHITE DUR-O-LAST PVC MEMBRANE
METAL COPING DETAIL TO MATCH EXISTING.
LOCATION OF SCUPPER FOR NEW RAIN BARRELS

SOLAR PANEL AND ROOF MOUNTED SYSTEM

EXISTING ROOF TOP HATCH
EXISTING MECHANICAL UNITS
EXISTING ROOF TOP HATCH
EXISTING MECHANICAL SCREENING

GREEN ROOF AREA = 3266 SF (EXCLUSIVE OF PAVERS)

SCALE: 1/8"=1'-0"

STUCKY VITALE ARCHITECTS
2020.154
LUME - BERKLEY - PROVISIONING CENTER
1949 12 MILE ROAD,
BERKLEY, MI

APRIL 25, 2022

C O N C E P T U A L D E S I G N P A C K A G E
NOTE:
The imagery on this sheet is strictly for graphical representation & meant to convey overall design intent.

Refer to sheet A3.2 for further information on exterior elevations and exterior materials.

Green roof:
- Blended green roof
- Solar panels
- Wind turbines
- Water collection to rain barrels at rain gardens below

24" wide architectural / 'graphic' accent panels (TBD) / installed on existing facade with stainless steel fasteners

Refer to sheet A3.2 for further information on exterior elevations and exterior materials.

Rain garden 'A' (along 12 Mile Rd)

The imagery on this sheet is strictly for graphical representation & meant to convey overall design intent.

Note:
Existing rooftop units to be removed and replaced.

Project area:
Refer to enlarged site plan sheet SP1.1.
Re: Sewer Camera Inspection Report

1949 Twelve Mile Rd
Berkley, MI 48072

To whom it may concern:

We arrived on site April 1, 2022 and accessed the main sewer drain through a 4" cleanout in the alley on the south side of the building. We started the recording at the main sewer tap. The tap appeared to be intact and free of shifting or damage. As the camera was pulled back the entire length of the sewer to the cleanout, we found no major issues, standing water, or causes for concern. The length from the 4" clean out to the sewer main is roughly 80'. The composition of the sewer is believed to be 6" PVC. It is our professional opinion, at the time of the inspection, that the sewer in is good working condition and free of any imperfections. Please contact us with any questions or concerns.

Thank you,

Nicholas Argyris
Master Plumber/Owner
Triton Plumbing LLC
Master Plumber Lic # - 8113234
RECIPROCAL EASEMENT AGREEMENT

THIS RECIPROCAL EASEMENT AGREEMENT ("Agreement") is entered into this 26th day of June 2000, by BERKLEY TWELVE ASSOCIATES II, L.L.C., a Michigan limited liability company, whose address is 28400 Northwestern Highway, Fourth Floor, Southfield, Michigan 48034 ("Berkley Twelve") and BERKLEY POST 374, AMERICAN LEGION, INC., a Michigan nonprofit corporation, whose address is 2079 West Twelve Mile Road, Berkley, Michigan 48072 ("American Legion").

RECITALS:

A. Berkley Twelve owns certain real property and improvements thereon located in the City of Berkley, County of Oakland, State of Michigan, commonly known as 1949 West Twelve Mile Road, which is more particularly described on Exhibit A attached hereto ("Berkley Twelve Property").

B. American Legion owns certain real property and improvements thereon adjacent to and west of the Berkley Twelve Property, located in the City of Berkley, County of Oakland, State of Michigan, commonly known as 2079 West Twelve Mile Road, which is more particularly described on Exhibit B attached hereto ("American Legion Property").

C. The parties desire to grant each other the perpetual, non-exclusive reciprocal easements described herein, for the purpose of: (i) providing common vehicular and pedestrian ingress and egress to and from the Berkley Twelve Property, American Legion Property and Twelve Mile Road; and (ii) providing Berkley Twelve, American Legion and their respective invitees, licensees and guests, with a common parking facility on the Berkley Twelve Property and the American Legion Property.

NOW, THEREFORE, in consideration of the mutual covenants, promises and agreements, the adequacy of which is acknowledged, and subject to the terms and conditions contained herein, the parties agree as follows:

1. Reciprocal Access and Parking Easement:
   a. American Legion acknowledges and agrees that approximately forty-six (46) vehicular parking spaces presently exist on the American Legion Property and when repaved pursuant to Paragraph 2.a.i. hereof, there will exist at least sixty-four (64) spaces on the American Legion Property as shown on the site plan attached hereto as Exhibit C. American Legion hereby grants to Berkley Twelve, its tenants,
agents, employees, invitees, business guests, licensees, successors and assigns, a perpetual, non-exclusive easement over the roads, driveways, entranceway, sidewalks and parking areas located and to be located on the American Legion Property for parking, passage, circulation, access, delivery and ingress and egress of vehicular and pedestrian traffic to and from the Berkley Twelve Property to Twelve Mile Road; provided, however, American Legion reserves twenty-five (25) vehicular parking spaces east of the existing building on the American Legion Property for American Legion’s exclusive use. Berkley Twelve will, at its expense, provide signage which identifies the parking spaces reserved for American Legion’s exclusive use.

Notwithstanding anything to the contrary contained in this Agreement, American Legion covenants and agrees that it shall not reduce the number of parking spaces located on the American Legion Property to less than sixty-four (64) vehicular parking spaces.

b. Berkley Twelve acknowledges that there presently exists at least one hundred forty (140) vehicular parking spaces on that portion of the Berkley Twelve Property, which is adjacent to the American Legion Property and is depicted on the site plan attached hereto as Exhibit C (“Berkley Easement Area”). Berkley Twelve hereby grants to American Legion, its tenants, agents, employees, invitees, business guests, licensees, successors and assigns, a limited, non-exclusive easement over the roads, driveways, entranceway, sidewalks and parking areas located and to be located on the Berkley Easement Area for parking, passage, circulation, access, delivery and ingress and egress of vehicular and pedestrian traffic to and from the American Legion Property to Twelve Mile Road, which easement may only be utilized after 6:00 p.m. Monday through Sunday. Notwithstanding anything to the contrary contained in this Agreement, Berkley Twelve covenants and agrees that it shall not reduce the number of parking spaces located on the Berkley Easement Area to less than one hundred forty (140) vehicular parking spaces.

2. Repaving and Landscape and Maintenance.

a. Berkley Twelve, at its cost and expense, shall:

i. repave all existing parking areas located on the American Legion Property in accordance with the following specifications:

(1) Existing pavement will be pulverized or removed and any aggregate base will be repaired as necessary;
(2) All parking areas will be: (a) repaved with a three inch (3") asphalt coat applied in two (2) courses; and (b) restriped for approximately sixty (60) parking spaces; and

ii. landscape the parking area on the American Legion Property in a manner consistent with any landscaping installed by Berkley Twelve on the Berkley Twelve Easement Area.

The layout of the repaving required by this Paragraph 2.a. will substantially conform to the site plan attached hereto as Exhibit C (with respect to location of paving, traffic aisles, curb cuts, and other related matters).

b. Berkley Twelve shall perform the work set forth in Paragraphs 2.a.i. and 2.a.ii. above prior to or simultaneously with its proposed development of the Berkley Twelve Property, subject to inclement weather, war, civil insurrection, or the acts or omissions of others beyond the reasonable control of Berkley Twelve. Subject to the force majeure provision set forth in the proceeding sentence, in the event such development does not commence on the Berkley Twelve Property within two (2) years from the date this Agreement has been signed by both parties hereto, American Legion shall have the option, for a period of thirty (30) days following expiration of such two (2) year period, to terminate this Agreement by giving written notice of termination to Berkley Twelve.

c. During the time period Berkley Twelve performs the work identified in Paragraphs 2.a.i. and 2.a.ii. hereinafore, Berkley Twelve also shall pave an area adjoining the west perimeter line of the existing building on the American Legion Property, which area contains approximately nine hundred square feet (900± sq. ft.). Paving of such area (the "West Paving") will be done in manner consistent with Berkley Twelve's other paving on the American Legion Property and at Berkley Twelve's expense.

3. **Maintenance.** Berkley Twelve, at its cost and expense, shall keep and maintain the entire parking area located on the American Legion Property in reasonable order and repair.

4. **Term.** Subject to the provisions of Paragraph 3.b. hereinafore, the term of this Agreement shall be perpetual.

5. **Rights of Berkley Twelve and American Legion.** Each party reserves the following rights with respect to the easements granted to the other party under this Agreement (collectively, the "Easements"):
a. the right to locate and grant other non-exclusive easements and rights-of-way across, over, under and through the portion of such party’s property that is subject to one or more of the Easements, provided that such action does not adversely affect the rights granted to the other party under this Agreement;

b. the right to install across, over, under and through the portion of such party’s property that is subject to one or more of the Easements, public and private utilities and all equipment and facilities related to such utilities, provided that such action does not adversely affect the rights granted to the other party under this Agreement; and,

c. the right to construct or install landscaping, shrubbery, trees, irrigation improvements, signs, permanent fencing, berms, curbs, paving, driveways and sidewalks on, over and across the portion of such party’s property that is subject to one or more of the Easements, provided that such action does not adversely affect the rights granted to the other party under this Agreement.

6. Insurance and Indemnifications.

a. From and after the date hereof, each party shall, at its own cost and expense, keep in full force and effect with respect to the portion of the Easements located within such party’s property, occurrence form comprehensive public liability and property damage insurance with a minimum single limit of One Million and 00/100 Dollars ($1,000,000.00) per occurrence. All policies of insurance that are required to be maintained by a party shall name the other party, its successors, and assigns, as loss payee and additional insureds, as appropriate, as their respective interests may appear, and shall contain a provision that the insurer will not cancel, change or fail to renew the insurance without first giving the other party thirty (30) days prior written notice. Each party shall furnish the other party with such evidence as the other party may reasonably require that the insurance referred to above is in full force and effect and that the applicable premiums have been paid.

b. Each party agrees that they will request their insurance carriers to include in their policies a clause or endorsement whereby the insurer waives its right of subrogation as to any claims against Berkley Twelve or American Legion, as applicable, and, if so available, such clause shall be included only so long as it is includable without additional cost, or if additional cost is chargeable therefor, only so long as the other party pays such additional cost. Each party will notify the other of any such additional cost, and such other party at its election may pay the same, but shall not be obligated to do so.
c. To the extent not covered by insurance required in Paragraph 6.a. hereof, Berkley Twelve hereby indemnifies and holds American Legion harmless from and against any cost, liability, damage, action, cause of action, or expense American Legion may suffer or incur as consequence of harm to person or damage to a person's property using the parking easement granted to American Legion on the Berkley Twelve Property, which harm to person or damage to property is caused by the negligent act or omission of Berkley Twelve or its agents, employees, independent contractors, invitees, or licensees.

d. To the extent not covered by insurance required in Paragraph 6.a. hereof, American Legion hereby indemnifies and holds Berkley Twelve harmless from and against any cost, liability, damage, action, cause of action, or expense Berkley Twelve may suffer or incur as consequence of harm to person or damage to a person's property using the parking easement granted to Berkley Twelve on the American Legion Property, which harm to person or damage to property is caused by the negligent act or omission of American Legion or its agents, employees, independent contractors, invitees, members, or licensees.

7. **Enforcement.** If any party fails to observe, fulfill or perform any covenant, term or condition of this Agreement, upon its part to be performed, then the aggrieved party may, upon fifteen (15) days advance written notice (or sooner in the event of exigent circumstances) undertake such obligation, but in no event shall it have the duty to undertake such obligations. The cost of curing such default shall be due from the defaulting party on demand, plus interest at the rate of two percent (2%) over the announced prime rate of the largest national bank in Metropolitan Detroit. As a consequence of such default, the aggrieved party may seek injunctive relief against the defaulting party or to recover a money judgment against such defaulting party. The prevailing party in any action between the parties hereto shall be entitled to be reimbursed for its actual attorney fees and all out-of-pocket costs and expenses and such amount shall be included in any judgment rendered by the Court. Such judgment may be a lien on the defaulting party's parcel and the aggrieved party may satisfy such judgment out of the proceeds of sale received upon execution of such judgment and levy thereon against the right, title and interest of such defaulting party in its respective parcel, and out of the rents, issues or profits and other payments received from its respective parcel and/or out of the consideration received from sale or other disposition of all or any party of such defaulting party's rights, title and interest in its respective parcel, and other assets of such defaulting party. The rights granted under this paragraph shall be in addition to all rights and remedies at law or equity.
8. **Successors and Assigns.** Every obligation, agreement and covenant in this Agreement shall run with the land and shall be binding upon the party making or assuming such obligation and such party’s successors and assigns and shall inure to the benefit of all other parties hereto and their successors and assigns.

9. **Amendments.** This Agreement shall not be modified or amended other than by written agreement of the parties hereto.

10. **Arbitration.** Any controversy or claim arising out of or related to this Agreement will be settled by binding arbitration before one arbitrator in accordance with the Commercial Arbitration rules of the American Arbitration Association. The arbitration award may be entered as a final judgment in any court of competent jurisdiction. Notwithstanding the applicability of other law to any other provision of this Agreement, the Federal Arbitration Act, 9 USC 1 et seq., will apply to the construction and interpretation of this arbitration provisions.

The arbitrator’s decision shall be made in no event later than ten (10) calendar days after the commencement of the arbitration hearing. The award shall be final and judgment may be entered in any court having jurisdiction thereover.

The arbitrator may award specific performance of this Agreement. The arbitrator may also require remedial measures as part of any award. The arbitrator in his/her discretion may award reasonable attorneys’ fees and costs to the more prevailing party. Notwithstanding anything to the contrary contained in this Agreement, the arbitrator shall not have the right or power to terminate this Agreement.

11. **Notices.** Every notice or demand desired or required to be given or served upon any of the parties hereto shall be in writing and shall be sent by certified mail, postage prepaid, return receipt requested or by any recognized overnight delivery service, or by personal delivery, addressed to the party at the address stated above or at the last changed address given by the party to be notified.

12. **Governing Law.** This Agreement shall be governed by and construed in accordance with the laws of the State of Michigan. If any provision of this Agreement is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions shall nonetheless continue in full force and effect without being impaired or invalidated in any way.

13. **Counterparts.** This Agreement may be executed in multiple counterparts, each of which shall be deemed an original and all of which, together, shall constitute one Agreement. The signature of any party to any counterpart shall be deemed to be a signature to, and may be appended to, any other counterpart.
14. **Entire Agreement.** This document together with all of the instruments herein described constitutes the entire understanding and agreement of the parties with respect to the subject matter of this Agreement, and any and all prior agreements, understandings or representations, written or oral, are hereby terminated and canceled in their entirety and are of no further force or effect.

(Signatures Contained On Next Page)
THIS RECIPROCAL EASEMENT AGREEMENT has been executed as of the date and year set forth above.

WITNESSES:

"Berkley Twelve"

BERKLEY TWELVE ASSOCIATES II, L.L.C.,
a Michigan limited liability company

By: Real Ventures Berkley, L.L.C., a Michigan limited liability company, its Member

By:

William Eisenberg, Trustee of the William Eisenberg Revocable Trust u/a/d 4/24/98
Its Member

By:

Jeffrey L. Howard, Trustee of the Jeffrey L. Howard Revocable Trust u/a/d 9/25/89
Its Member

"American Legion"

BERKLEY POST 374, AMERICAN LEGION, INC.
a Michigan nonprofit corporation

By:

Keith LaPointe
Its: Post Commander

(Acknowledgments Contained on Next Page)
The foregoing instrument was acknowledged before me this 26th day of June 2000, by William Eisenberg, Trustee of the William Eisenberg Revocable Trust u/a/d 4/24/98, Member of Real Ventures Berkley, L.L.C., Member of Berkley Twelve Associates II, L.L.C., a Michigan limited liability company, on behalf of said company.

JUDITH CLAIRE O'CONNOR
Notary Public, Wayne County, MI
My Commission Expires Nov 14, 2004

The foregoing instrument was acknowledged before me this 26th day of June 2000, by Jeffrey L. Howard, Trustee of the Jeffrey L. Howard Revocable Trust u/a/d 9/25/89, Member of Real Ventures Berkley, L.L.C., Member of Berkley Twelve Associates II, L.L.C., a Michigan limited liability company, on behalf of said company.

KAREN R. KOSMATIN
Notary Public, State of Michigan

The foregoing instrument was acknowledged before me this 26th day of June 2000, by Keith LaPointe, as Post Commander of Berkley Post 374, American Legion, Inc., a Michigan nonprofit corporation, on behalf of said corporation.

JUDITH CLAIRE O'CONNOR
Notary Public, Wayne County, MI
My Commission Expires Nov 14, 2004

DRAFTED BY AND
WHEN RECORDED RETURN TO:
Joseph W. Lash, Esq.,
Seyburn, Kahn, Ginn, Bess and Serlin, P.C.
2000 Town Center, Suite 1500
Southfield, Michigan 48075
(248) 353-7620
Exhibit A

Legal Description of Berkley Twelve Property

Land situated in the City of Berkley, Oakland County, State of Michigan, described as:

Lots 32 to 43, inclusive, Lots 44 to 55 inclusive, Stephenson-Barbers Roseland Subdivision, as recorded in Liber 31, Page 6 of Plats, Oakland County Records

Tax Item No. 25-17-126-002 (Lots 44-55) 25-17-150-003 (Lots 32-43)

Commonly Known as: 1949 West Twelve Mile Road
Exhibit B
Legal Description of American Legion Property

Land situated in the City of Berkley, Oakland County, State of Michigan, described as:

Lots 55 to 67, inclusive, and the East 20 feet of the street adjacent to Lot 67,
Stephenson-Barbers Roseland Subdivision.

Tax item No. 25-17-126-001

Commonly Known as: 2079 West Twelve Mile Road
Exhibit C

Site Plan - Berkley Easement Area

Drawing prepared by: Vantine/Guthrie Studio of Architecture
114 S. Main Street,
Northville, Michigan 48167

Project Title: Berkley Nutrition Center
Project Number: 1002-00

<table>
<thead>
<tr>
<th>Sheet Title</th>
<th>Sheet Number</th>
<th>Last Revised</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Plan</td>
<td>SP-1</td>
<td>04/17/00</td>
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</tbody>
</table>
AMENDED AND RESTATED
RECIPROCAL EASEMENT AGREEMENT

THIS AMENDED AND RESTATED RECIPROCAL EASEMENT AGREEMENT ("Agreement") is entered into this 18th day of January, 2001, by BERKLEY TWELVE ASSOCIATES, L.L.C., a Michigan limited liability company, whose address is 28400 Northwestern Highway, Fourth Floor, Southfield, Michigan 48034 ("Berkley Twelve LLC"), and BERKLEY TWELVE ASSOCIATES II, L.L.C., a Michigan limited liability company, whose address is 28400 Northwestern Highway, Fourth Floor, Southfield, Michigan 48034 ("Berkley Twelve II").

RECORDALS:

A. Berkley Twelve LLC owns certain real property and improvements thereon located in the City of Berkley, County of Oakland, State of Michigan, commonly known as 1695 West Twelve Mile Road, which is more particularly described on Exhibit A attached hereto ("Berkley Twelve LLC Property").

B. Berkley Twelve II owns certain real property and improvements thereon located in the City of Berkley, County of Oakland, State of Michigan, commonly known as 1949 West Twelve Mile Road, which is more particularly described on Exhibit B attached hereto ("Berkley Twelve II Property").

C. On June 14, 1989, Griswold Holding Company, Berkley Twelve Associates, a Michigan co-partnership ("Berkley Twelve Associates"), and Carpenters Union Local 998 ("Carpenters Union") entered into a Reciprocal Easement Agreement ("REA"), concerning certain real property located at 1695 West Twelve Mile Road, Berkley, Oakland County, Michigan, more particularly described on attached Exhibit "A" ("Parcel I"), and certain real property located at 1949 West Twelve Mile Road in Berkley, Oakland County, Michigan, more particularly described on attached Exhibit "B" ("Parcel II"). The REA was recorded in Liber 10944, Page 508, Oakland County Records on June 16, 1989.

D. Berkley Twelve LLC is Successor-in-Interest (pursuant to a Warranty Deed dated June 14, 1989, and also pursuant to a Quit Claim Deed dated June 19, 1990, and recorded in Liber 11429, Page 749 on June 20, 1990, and Articles of Organization and Certificate of Conversion dated December 2, 1998 and filed with the Michigan Department of Consumer and Industry Services - Corporation, Securities and Land Development Bureau on December 3, 1998) to Griswold Holding Company and Berkley Twelve Associates, to all rights under the REA.

U.K. - KB
E. Berkeley Twelve II is Successor-in-Interest to Michigan Regional Council of Carpenters, as Successor-in-interest to the Carpenters Union (pursuant to an Assignment And Assumption of Purchase Agreement dated May 17, 1999, whereby Berkeley Twelve Associates assigned all rights, title, and interest in the Purchase Agreement to Berkeley Twelve II, and a Warranty Deed dated May 18, 1999 (and recorded in Liber 20267, Page 570 on July 15, 1999), from Michigan Regional Council of Carpenters, Grantor, to Berkeley Twelve II, Grantee), to all rights under the REA.

F. At this time, the parties desire to amend and restate the REA in order to grant each other the perpetual, non-exclusive reciprocal easements described herein, for the purpose of: (i) providing common vehicular and pedestrian ingress and egress to and from the Berkley Twelve LLC Property and the Berkley Twelve II Property, and (ii) providing Berkley Twelve, Berkley Twelve II and their respective invitees, licensees and guests, with a common parking facility on the Berkley Twelve LLC Property and the Berkley Twelve II Property.

NOW, THEREFORE, in consideration of the mutual covenants, promises and agreements, and for other good and valuable consideration, the adequacy and receipt of which is acknowledged, and subject to the terms and conditions contained herein, the parties agree as follows:

1. Reciprocal Access and Parking Easement.

A. Berkley Twelve II acknowledges that there presently exists at least one hundred and one (101) vehicular parking spaces located on the Berkley Twelve II Property. Berkley Twelve II hereby conveys and grants to Berkley Twelve LLC, its agents, employees, tenants, invitees, and licensees, a non-exclusive, perpetual easement for access, ingress, egress, and parking over and across all areas which constitute the east parking area and the south parking area of the Berkley Twelve II Property, and all access ways serving both such parking areas, which are depicted on the site plan attached hereto as Exhibit “C” and made a part hereof. Berkley Twelve LLC shall not have the right to use the nine (9) parking spaces adjacent to the east face of the existing building located on the Berkley Twelve II Property, as depicted on Exhibit “C” attached hereto, nor shall Berkley Twelve LLC have the right to use any parking area west of the west face of the aforesaid building.

Notwithstanding anything to the contrary contained in this Agreement, Berkley Twelve II covenants and agrees that it shall not reduce the number of parking spaces located on the east parking area and the south parking area of the Berkley Twelve II Property specified hereinabove to less than one hundred one (101) vehicular parking spaces.
B. Berkley Twelve LLC acknowledges that there presently exists approximately one hundred five (105) vehicular parking spaces on the portion of the Berkley Twelve LLC Property which is located adjacent to the Berkley Twelve II Property. Berkley Twelve LLC hereby conveys and grants to Berkley Twelve II, and its agents, employees, tenants, invitees, and licensees, a non-exclusive, perpetual easement for access, ingress, egress, and parking over and across all vehicular parking areas, and vehicular exits and driveways which are located on the portion of the Berkley Twelve LLC Property which is adjacent to the Berkley Twelve II Property, as depicted on Exhibit “C” attached hereto.

2. **Maintenance.** Berkley Twelve LLC and Berkley Twelve II, shall, at their own cost and expense, each keep and maintain the entire parking area located on their respective properties as herein described.

3. **Term.** The term of this Agreement shall be perpetual. Notwithstanding anything to the contrary contained in this Agreement, the Easements referenced in Paragraphs 1.A and 1.B shall survive the termination of this Agreement.

4. **Rights of Berkley Twelve LLC and Berkley Twelve II.** Each party reserves the following rights with respect to the easements granted to the other party under this Agreement (collectively, the “Easements”):

   a. the right to locate and grant other non-exclusive easements and rights-of-way across, over, under and through the portion of such party’s property that is subject to one or more of the Easements, provided that such action does not adversely affect the rights granted to the other party under this Agreement;

   b. the right to install across, over, under and through the portion of such party’s property that is subject to one or more of the Easements, public and private utilities and all equipment and facilities related to such utilities, provided that such action does not adversely affect the rights granted to the other party under this Agreement; and,

   c. the right to construct or install landscaping, shrubbery, trees, irrigation improvements, signs, permanent fencing, berms, curbs, paving, driveways and sidewalks on, over and across the portion of such party’s property that is subject to one or more of the Easements, provided that such action does not adversely affect the rights granted to the other party under this Agreement.
5. **Insurance and Indemnifications.**

   a. From and after the date hereof, each party shall, at its own cost and expense, keep in full force and effect with respect to the portion of the Easements located within such party's property, comprehensive, combined single limit public liability and property damage insurance, in the amount of Two Million and 00/100 Dollars ($2,000,000.00). All policies of insurance that are required to be maintained by a party shall name the other party, its successors, and assigns, as loss payee and additional insureds, as appropriate, as their respective interests may appear, and shall contain a provision that the insurer will not cancel, change or fail to renew the insurance without first giving the other party thirty (30) days prior written notice. Each year, each party shall furnish the other party with such evidence as the other party may reasonably require that the insurance referred to above is in full force and effect and that the applicable premiums have been paid.

   b. To the extent not covered by Berkley Twelve LLC's insurance, Berkley Twelve II hereby indemnifies and holds harmless the Berkley Twelve LLC from and against any and all claims, costs, expenses (including reasonable attorneys fees), damages, liabilities or obligations arising out of any damage to property or harm to any person incurred as a consequence of any negligent or wrongful act or omission of Berkley Twelve II, any of its, managers, agents or employees, in connection with its use of the easement areas on the Berkley Twelve LLC Property granted to Berkley Twelve II.

   c. To the extent not covered by Berkley Twelve II's insurance, Berkley Twelve LLC hereby indemnifies and holds harmless Berkley Twelve II from and against any and all claims, costs, expenses (including reasonable attorneys' fees), damages, liabilities or obligations arising out of any damage to property or harm to any person incurred as a consequence of any negligent or wrongful act or omission of Berkley Twelve LLC, any of its, managers, agents or employees, in connection with its use of the easement areas on the Berkley Twelve II Property granted to Berkley Twelve LLC.

6. **Enforcement.** If any party fails to observe, fulfill or perform any covenant, term or condition of this Agreement, upon its part to be performed, then the aggrieved party may, upon fifteen (15) days advance written notice (or sooner in the event of exigent circumstances) undertake such obligation, but in no event shall it have the duty to undertake such obligations. The cost of curing such default shall be due from the defaulting party on demand, plus interest at the rate of two percent (2%) over the announced prime rate of the largest national bank in Metropolitan Detroit. As a consequence of such default, the aggrieved party may seek injunctive relief against the
defaulting party or to recover a money judgment against such defaulting party. The prevailing party in any action between the parties hereto shall be entitled to be reimbursed for its actual attorney fees and all out-of-pocket costs and expenses and such amount shall be included in any judgment rendered by the Court. The rights granted under this paragraph shall be in addition to all rights and remedies at law or equity.

7. **Successors and Assigns.** Every obligation, agreement and covenant in this Agreement shall run with the land and shall be binding upon the party making or assuming such obligation and such party’s successors and assigns and shall inure to the benefit of all other parties hereto and their successors and assigns.

8. **Partial Invalidity.** If any provision of this Agreement is held by a court of competent jurisdiction to be invalid, void or unenforceable in any manner, the remaining provisions of this Agreement shall nonetheless continue in full force and effect without being impaired or invalidated in any way. In addition, if any provision of this Agreement may be modified by a court of competent jurisdiction such that it may be enforced, then said provision shall be so modified and as modified shall be fully enforce.

9. **Amendments.** This Agreement shall not be modified or amended other than by written agreement of the parties hereto.

10. **Arbitration.** Any controversy or claim arising out of or related to this Agreement will be settled by binding arbitration before one arbitrator in accordance with the Commercial Arbitration rules of the American Arbitration Association. The arbitrator shall be reasonably qualified to hear matters which are the subject of this Agreement. The arbitration award may be entered as a final judgment in any court of competent jurisdiction. Notwithstanding the applicability of other law, any other provision of this Agreement, the Federal Arbitration Act, 9 USC 1 et seq., will apply to the construction and interpretation of this arbitration provisions.

In the event the arbitrator's decision shall be made in no event later than ten (10) calendar days after the commencement of the arbitration hearing. The award shall be final and judgment may be entered in any court having jurisdiction thereover.

The arbitrator may award specific performance of this Agreement. The arbitrator may also require remedial measures as part of any award. The arbitrator in his/her discretion may award reasonable attorneys' fees and costs to the more prevailing party. Notwithstanding anything to the contrary contained in this Agreement, the arbitrator shall not have the right or power to terminate this Agreement.

11. **Notices.** Unless specifically stated to the contrary in this Agreement, all notices, demands, requests, consents, approvals, or other communications which are required or desired to be given or made or sent, by either party hereto to the other, shall be in writing and may be hand delivered or may be delivered by depositing the same in an United States mail receptacle, via first class, certified, registered or equivalent, return
receipt requested, postage prepaid, or by recognized overnight courier (provided that such service is able to provide evidence of receipt or refusal of delivery) addressed to the appropriate party at its address set forth below, or at such other address as such party shall have last designated by notice to the other. Notices, demands, requests, consents, approvals, or other communications shall be deemed given when delivered (or refusal to receive) or three (3) days after mailing; provided, however, that if any such notice, demand, request, consent, approval, or other communication is sent by telecopy or fax machine, then such notice, demand, request, consent, approval, or other communication shall be deemed given at the time and on the date of the machine transmittal if the sending party receives a written send verification on its machine and forwards a copy thereof with its mailed, overnight, or courier delivered communication.

To Berkley Twelve LLC Manager:  
Real Ventures-Berkley Associates  
28400 Northwestern Highway  
Fourth Floor  
Southfield, Michigan 48034  
Attention: Burton D. Farbman, Partner  
Fax No.: (248) 353-0502

To Berkley Twelve II Member:  
Real Ventures Berkley, L.L.C.  
28400 Northwestern Highway  
Fourth Floor  
Southfield, Michigan 48034  
Attention: Burton D. Farbman  
Fax No.: (248) 353-0502

With a copy to:  
Jeffrey L. Howard, Esq.  
Seyburn, Kahn, Ginn, Bess and Serin, P.C.  
2000 Town Center, Suite 1500  
Southfield, Michigan 48075-1195  
Fax No.: (248) 353-3727

And

William Eisenberg  
Grand Sakwa Properties, L.L.C.  
32000 Northwestern Hwy., Suite 125  
Farmington Hills, Michigan 48334  
Fax No. (248) 855-0915

12. **Governing Law.** This Agreement shall be governed by and construed in accordance with the laws of the State of Michigan. If any provision of this Agreement is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions shall nonetheless continue in full force and effect without being impaired or invalidated in any way.
13. **Counterparts.** This Agreement may be executed in multiple counterparts, each of which shall be deemed an original and all of which, together, shall constitute one Agreement. The signature of any party to any counterpart shall be deemed to be a signature to, and may be appended to, any other counterpart.

14. **Entire Agreement.** This document together with all of the instruments herein described constitutes the entire understanding and agreement of the parties with respect to the subject matter of this Agreement, and any and all prior agreements, understandings or representations, written or oral, are hereby amended and restated in their entirety and are of no further force or effect.

**THIS AGREEMENT** has been executed as of the date and year set forth above.

**WITNESSES:**

"Berkley Twelve LLC"

BERKLEY TWELVE ASSOCIATES, L.L.C.,
a Michigan limited liability company

By: REAL VENTURES-BERKLEY ASSOCIATES,
a Michigan co-partnership
Manager

By: ____________________________________________
Burton D. Farbman, Managing Partner

AND

METRO BERKLEY, LLC,
a Michigan limited liability company
Manager

By: JEFFREY L. HOWARD REVOCABLE
TRUST u/a/d September 25, 1999

Its: ____________________________________________
Jeffrey L. Howard, Trustee

(Jurats on following page)
STATE OF MICHIGAN  
) SS
COUNTY OF OAKLAND 

The foregoing instrument was acknowledged before me this 6th day of January, 2001, by Burton D. Farbman, Managing Partner of Real Ventures-Berkeley Associates, a Michigan co-partnership, a Manager of Berkley Twelve Associates, L.L.C., a Michigan limited liability company, on behalf of said company.

Notary Public

My Commission Expires: 6-23-05

STATE OF MICHIGAN  
) SS
COUNTY OF OAKLAND 

The foregoing instrument was acknowledged before me this 18th day of January, 2001, by Jeffrey L. Howard, Trustee of the Jeffrey L. Howard Revocable Trust dated September 25, 1999, Sole Member of Metro Berkley, LLC, a Michigan limited liability company, a Manager of Berkley Twelve Associates, L.L.C., a Michigan limited liability company, on behalf of said company.

Notary Public

My Commission Expires: 6-10-01

WITNESSES:

"Berkley Twelve II"

BERKLEY TWELVE ASSOCIATES II, L.L.C., a Michigan limited liability company

By: Real Ventures Berkley, L.L.C., a Michigan limited liability company
Member and Manager

By: Burton D. Farbman, Manager

AND
METRO BERKLEY, LLC,
a Michigan limited liability company
Manager

By:  JEFFREY L. HOWARD REVOCABLE
     TRUST u/a/d September 25, 1999

Its:  Sole Member

By:  ____________________________

Jeffrey L. Howard, Trustee

Michele C. Walker

Michele C. Walker

Colleen H. Fitzgerald

Colleen H. Fitzgerald

STATE OF MICHIGAN    
COUNTY OF OAKLAND

The foregoing instrument was acknowledged before me this 16th day of January, 2001, by Burton D. Farbman, Manager of Real Ventures Berkley, L.L.C., a Manager of Berkley Twelve Associates II, L.L.C., a Michigan limited liability company, on behalf of said company.

Notary Public
My Commission Expires:  6-23-02

STATE OF MICHIGAN    
COUNTY OF OAKLAND

The foregoing instrument was acknowledged before me this 18th day of January, 2001, by Jeffrey L. Howard, Trustee of the Jeffrey L. Howard Revocable Trust u/a/d September 25, 1999, Sole Member of Metro Berkley, LLC, a Michigan limited liability company, a Manager of Berkley Twelve Associates, L.L.C., a Michigan limited liability company, on behalf of said company.

Notary Public
My Commission Expires:

Drafted by and
When Recorded Return To:
Jeffrey L. Howard, Esq.
Seyburn, Kahn, Ginn, Bess & Serfin, P.C.
2000 Town Center, Suite 1500
Southfield, Michigan 48075

2001JLHmow(3219)=R:\B001936AMENDED.REA
Exhibit A

Legal Description of Berkley Twelve LLC Property

Land situated in the City of Berkley, Oakland County, State of Michigan, described as:

Lots 6 through 31, as platted, and Easterly 15 feet of vacated Mortenson Boulevard adjacent to and West of Lot 19, as platted and public alley abutting Lots 6 through 19 on the South thereof; Westerly 20 feet of vacated Mortenson Boulevard adjacent to and East of Lot 20 and Westerly 20 feet of Brookline Street adjacent to and East of Lot 6, as platted, Stephenson-Barber's Roseland Subdivision as recorded in Liber 31, Page 5 of Plats, Oakland County Records.

Tax Item No. 25-17-127-001 (Lots 6-19) 25-17-126-004 (Lots 20-31)

Commonly Known as: 1695 West Twelve Mile Road

31005
Exhibit B

Legal Description of Berkley Twelve II Property

Land situated in the City of Berkley, Oakland County, State of Michigan, described as:

Lots 32 to 43, inclusive, Lots 44 to 55 inclusive, Stephenson-Barbers Roseland Subdivision, as recorded in Liber 31, Page 5 of Plats, Oakland County Records

Tax Item No. 25-17-126-002 (Lots 44-55)
            25-17-126-003 (Lots 32-43)

Commonly Known as: 1949 West Twelve Mile Road
Parcel "A"

Part of the Southwest 1/4 of Section 33, T.4 N., R.11 E., Oakland Township, Oakland County, Michigan is described as: Beginning at the South 1/4 Corner of Section 33; thence along the South line of Section 33 and centerline Dutton Road due West, 610.49 feet; thence N.05°25'39"E., 291.70 feet; thence N.02°43'55"W., 318.18 feet; thence Due East, 560.80 feet to a point on the West line of "Skyline" subdivision as recorded in Liber 71, Page 26 of the Oakland County Records; thence along said line S.04°54'52"E., measured, (S.04°54'52"E., record), 99.91 feet; thence continuing S.01°11'48"E., 509.48 feet measured, (S.01°11'48"E., record), 509.77 feet recorded to the Point of Beginning and containing 8.943 acres.

Subject to the rights of the public for highway purposes along Dutton Road and to all easements both recorded and unrecorded.

Parcel "B"

Part of the Southwest 1/4 of Section 33, T.4 N., R.11 E., Oakland Township, Oakland County, Michigan is described as: Commencing at the South 1/4 Corner of Section 33; thence along the South line of Section 33 and centerline Dutton Road due West, 610.49 feet to the Point of Beginning; thence continuing along said line Dutton Road, 387.10 feet to a point on the centerline of Lost Lane; thence along said line the following five courses N.04°47'29"E., 463.19 feet measured, (N.04°47'29"E., record), thence along a curve concave to the East of radius 481.12 feet, a central angle of 23°28'54", whose chord bears N.1°27'54"E. measured, (N.1°27'54"E., record), 145.81 feet, an arc distance of 197.19 feet; thence N.24°16'29"E. measured, (N.24°16'29"E., record), 226.75 feet; thence along a curve concave to the West of radius 229.72 feet, a central angle of 24°11'29", whose chord bears N.11°59'45"E. measured, (N.11°59'45"E., record), 97.71 feet, an arc distance of 98.96 feet; thence N.00°18'16"W. measured, (N.00°18'16"W., record), 115.40 feet to a point on an intermediate traverse line said point being traverse point "A"; thence continuing N.00°18'16"W. measured, (N.00°18'16"W., record), 8.00 feet to a point on the centerline of Cobb Creek; thence Northeasterly along the centerline of Cobb Creek to a point on the West line of "Skyline" subdivision as recorded in Liber 71, Page 26 of the Oakland County Records, all witnessed by and described along a traverse line running from traverse point "A" the following five courses; thence S.76°36'30"E., 65.09 feet; thence N.82°24'00"E., 297.72 feet; thence N.88°09'51"E., 193.09 feet; thence N.88°59'01"E., 178.15 feet; thence N.38°12'44"E., 47.98 feet to traverse point "R" said point being S.05°26'58"E., 30.4 feet measured, (S.05°26'58"E., record), 12.0 feet record along the West line of said "Skyline" subdivision from the centerline of Cobb Creek; thence along said line S.04°54'52"E. measured, (S.04°54'52"E., record), 592.72 feet; thence Due West, 560.80 feet; thence S.02°41'54"E., 318.18 feet; S.05°25'39"W., 291.70 feet to the Point of Beginning and containing 14.563 acres.

Subject to the rights of the public for highway purposes along Dutton Road and Lost Lane and to all easements both recorded and unrecorded.
Witnesses:

S.W. Corner Section 33 f - 3/4" bar w/mon. cap
NE-33.69' to PK nail in brass disc #22445 in 6" Locust.
SE-61.41' to PK nail in brass disc #22445 in 16" Locust.
S-59.47' to PK nail in brass disc #22445 in U. Pole.
NW-35.50' to PK nail in brass disc #22445 in U. Pole.

S.1/4 Corner Section 33 f - 5/8" bar w/mon. cap #22445
N05°W-15.16' to PK nail in brass disc #22445 in S. face of 10" Maple.
N20°W-29.02' to PK nail in brass disc #22445 in S.W. face of 20" Cherry.
S10°E-21.22' to PK nail in brass disc #22445 in W. face of 14" Maple.
S45°W-33.88' to PK nail in brass disc #22445 in S. face of 20" Maple.

Center Post Section 33 f- concrete monument
SW-30.11' to PK nail in washer tag #21563 in NW face 30" Oak.
WNW-17.00' to Mag nail in S. face 18" Cherry.
N-45.93' to Mag nail in W. face 14" Cherry.
E-32.11' to Mag nail in S. face 12" Oak.
ADDENDUM TO GEOTECHNICAL REPORT
LUME DEVELOPMENT – 1949 12 MILE ROAD
BERKLEY, MICHIGAN

Prepared For:
LUME CANNABIS CO.
Troy, Michigan

Prepared By:
MATERIALS TESTING CONSULTANTS, INC.

April 2022
MTC Project No. 211705
April 22, 2022
Project No. 211705

Lume Cannabis Co.
769 Chicago Road
Troy, Michigan 48083

Attention: Mathew Burbary
Construction Manager

Reference: Addendum to Report of Geotechnical Investigation
Lume Development – 1949 12 Mile Road
Berkley, Michigan

Dear Mr. Burbary:

We have completed a supplemental geotechnical investigation for the above-referenced project. The purpose of this investigation has been to identify the general subsurface soil conditions in the vicinity of additional stormwater management features onsite, analyze the conditions relative to the planned construction and to provide recommendations related to pavement and stormwater management. This work has been performed as described in our proposal No. 16261.1 and dated April 19, 2022.

MTC completed a geotechnical investigation for the proposed Lume Cannabis development at 1949 12 Mile Road in Berkley, Michigan on March 16th and 17th, 2022 and submitted a geotechnical report (MTC Project Number 211705) dated March 22, 2022. MTC was subsequently contacted by Lume Cannabis Co. on April 15, 2022 who requested additional soil borings east of the previous investigation area for additional stormwater features.

Presented herein are descriptions of the supplemental geotechnical investigation, encountered conditions and engineering recommendations. The Appendix contains the addendum limitations and data collected during this investigation. This addendum letter should be reviewed in conjunction with our geotechnical report (MTC Project Number 211705) dated March 22, 2022.
DESIGN CONSIDERATIONS

Available Information

We have been provided the following documents and information for use in this investigation:

- A marked-up Topographic Survey plan, Sheet C-1.0, prepared by PEA Group, dated March 26, 2022 and received from Lume Cannabis Co. through email on April 15, 2022 which specified the requested supplemental boring locations.
- Email correspondence with Mr. Mathew Burbary of Lume Cannabis Co. and Mr. Scott Peruski, P.E. of PEA Group regarding the geotechnical scope of work, desired boring locations and depths, project authorization, and coordinating the field investigation.

Location and Proposed Design

The proposed construction will be located in plan as shown on Figure No. 1. The site is located at 1949 12 Mile Road in the City of Berkley, immediately south of the Roseland Park Cemetery.

The area of investigation was an HMA surface parking lot located east of the existing Beaumont Health medical facility. Site grades were relatively flat within the investigation area with grades generally ranging from el 672 to 673.

We understand additional underground stormwater management features are proposed east of the existing building, in the general area where the supplemental soil borings were requested (Borings B-101 to B-104). The specific type of stormwater management feature proposed in this area was not specified; however, we anticipate the design will utilize a rain garden, underground Stormtech detention system, or porous pavement in this area utilizing retention features and ultimately directing stormwater offsite, similar to the stormwater management features proposed near the building. We have considered any underground structures will bear within 5 ft of the existing ground surface on clay subgrade.

Porous and non-porous asphalt pavement areas may be constructed onsite. Traffic is expected to consist of relatively light passenger vehicles with only occasional heavier axle wheel loadings from trucks for deliveries, refuse pickup, etc.

We should be informed of any changes between the actual design conditions and those described herein as this information may affect our recommendations.
INVESTIGATION METHODOLOGY

Conventional soil test borings and sampling along with field engineering reconnaissance were used to investigate the subsurface conditions. Boring locations are shown on Figure No. 1. Investigation procedures, soil classification information and boring logs are provided in the Appendix. Ground penetrating radar (GPR) and electro-magnetic (EM) locating equipment was utilized as an added safety precaution to scan the boring locations for potential unmarked underground utilities or anomalies.

<table>
<thead>
<tr>
<th>Number of Borings</th>
<th>4</th>
</tr>
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<tbody>
<tr>
<td>Boring Depth, ft.</td>
<td>10</td>
</tr>
</tbody>
</table>

Borings were drilled and other sampling was conducted solely to obtain indications of subsurface conditions as part of a geotechnical exploration program. No services were performed to evaluate subsurface environmental conditions.

INVESTIGATION RESULTS

Site Conditions

At the time of our field work, the area of investigation was covered with asphalt (HMA) pavement and located east of the existing Beaumont Medical facility. The area, in general, was relatively flat with elevations ranging from approximately 672 to 673. Stormwater appears to currently be managed onsite through inverse crown drainage to interior catch basins located in HMA drive areas, with a catch basin observed southeast of the building.

The asphalt pavement east of the existing building was observed to be in very poor to poor condition with severe block cracking progressing to alligator cracking throughout the pavement as well as edge cracking at the pavement edges and around the perimeter of the catch basin southeast of the building. Cracking appeared to be more severe in drive areas, and several potholes were observed in the drive paths. Overhead electrical lines were located east of the investigation area, and interior parking lot lighting with underground electrical lines was located within the investigation area.
Subsurface Conditions

The soil borings generally encountered 3 inches of HMA over approximately 1 to 4 inches of gravel base. The investigation, in general, encountered loose to medium dense granular fill, visually classified as clayey sand (SC) and clayey sand with gravel (SC) with occasional clay lenses, to a depth of approximately 2.5 ft, over stiff to very stiff lean clay (CL) which grades to a hard consistency below a depth of approximately 5.5 ft.

The relative density of granular soil is based on recorded SPT N-values while the consistency of cohesive soil is based on both recorded SPT N-values and on estimates of the unconfined compressive strength obtained with a calibrated penetrometer.
Calibrated penetrometer readings in the cohesive soil ranged from 1.75 tsf to 4.5 tsf at the 3.5-ft sample interval and exceeded 4.5 tsf at the 6-ft and 8.5-ft sample intervals in each boring.

Poor sample recovery was noted at the 0.5-ft sample interval in Boring B-101 within the clayey sand (SC) fill, possibly indicating the presence of coarse gravel, cobble or deleterious fill obstructions.

Groundwater was not encountered in the soil borings during the drilling activities. Groundwater levels may fluctuate due to seasonal variations such as precipitation, snowmelt, nearby river or lake levels and other factors that may not be evident at the time of measurement. Groundwater levels may be different at the time of construction.

This section has provided a generalized description of the encountered subsurface soil conditions. The boring logs located in the Appendix should be reviewed for detailed soil descriptions. Some variation between boring locations may be expected.

CONCLUSIONS AND RECOMMENDATIONS

Borings B-101 through B-104 encountered granular fill in the upper 2 to 3 ft over stiff/very stiff grading to hard cohesive soil which was consistent with the borings performed as part of our previous investigation in March 2022 (Borings B-1 to B-9). No groundwater was encountered in Borings B-101 to B-104 to the explored depths of 10 ft, which is also consistent with our previous investigation to the west. Due to the consistency in soil and groundwater conditions throughout this area relative to our previous investigation, the conclusions and recommendations presented in our geotechnical report (MTC Project Number 211705) dated March 22, 2022 are also applicable for this supplemental investigation area.

CLOSURE

In this addendum letter, the encountered subsurface conditions and geotechnical recommendations for this supplemental investigation area have been presented. The limitations of this study are described in the Appendix.

The recommendations presented in this addendum are based upon a limited number of subsurface samples obtained from various sampling locations. The samples may not fully indicate the nature and extent of the variations that actually exist between sampling locations. For that reason, among others, we strongly recommend that a qualified geotechnical firm be retained to observe earthwork construction. If variations or other latent conditions become evident during construction, it will be necessary for us to review these conditions and our recommendations as appropriate.
We appreciate the opportunity to provide this service to you on this project. Should you have any questions or require further assistance, please contact our office.

Sincerely,

MATERIALS TESTING CONSULTANTS, INC

Adam L. DePoy, P.E.
Project Manager

Robert J. Warren, P.E.
Project Manager

Attachments: Figure No. 1 - Boring Location Plan
Appendix
- Limitations
- Test Drilling and Sampling Procedures
- Boring Log Terminology and Classification Outline
- Boring Logs
APPENDIX

- Limitations
- Test Drilling and Sampling Procedures
- Boring Log Terminology and Classification Outline
- Boring Logs
LIMITATIONS

Soil Variations

The recommendations in this report are based upon the data obtained from the soil borings. This report does not reflect variations which may occur between these borings, and which would not become evident until construction. If variations then become evident, it would be necessary for a re-evaluation of recommendations of this report, after performing on-site observations.

Warranties

We have prepared this report in accordance with generally accepted soil and foundation engineering practices. We make no other warranties, either expressed or implied, as to the professional advice provided under the terms of our agreement and included in this report. This report is prepared exclusively for our client and may not be relied upon by other parties without written consent from our office.

Boring Logs

In the process of obtaining and testing samples and preparing this report, we follow reasonable and accepted practice in the field of soil engineering. Field logs maintained during drilling describe field occurrences, sampling locations, and other information. The samples obtained in the field are subjected to additional testing in the laboratory and differences may exist between the field logs and the final logs. The engineer reviews the field logs and laboratory test data, and then prepares the final boring logs. Our recommendations are based on the contents of the final logs.

Review of Design Plans and Specifications

In the event that any changes in the design of the building or the location, however slight, are planned, our recommendations shall not be considered valid unless modified or approved in writing by our office. We recommend that we be provided the opportunity to review the final design and specifications in order to determine whether changes in the original concept may have affected the validity of our recommendations, and whether our recommendations have, in fact, been implemented in the design and specifications.
TEST DRILLING AND SAMPLING PROCEDURES

Test Drilling Methods:
- X Hollow stem auger, ASTM D6151
- Mud rotary, ASTM D5783
- Casing advancer, ASTM D5872
- Rock coring, ASTM D2113
- Core/Hand Auger

Note: Cone penetration test data can be used to interpret subsurface stratigraphy and can provide data on engineering properties of soils. The ASTM procedure does not include a procedure for determining soil classification from CPT testing. Soil classifications shown on CPT logs are based on published procedures and are not based on physical ASTM soil classification tests.

Sampling Methods:
- X SPT, ASTM D1586, Auto hammer (140 lb., 30" drop, 2" OD split spoon sampler)
- Thin-walled tube sampler (Shelby), ASTM D1587

Note: The number of hammer blows required to drive the SPT sampler 12 inches, after seating 6 inches, is termed the soil N-value and provides an indication of the soil's relative density and strength parameters at the sample location. SPT blow counts in 6 inch increments are recorded on the boring logs.

Drill Rig:
- X CME 55 LC (ATV)
- Acker Renegade (ATV)
- CME 45 Truck
- Geoprobe 7822 (ATV)
- Geoprobe Rotary Sonic

Boreholes Backfilled With:
- X Excavated soil
- Cement bentonite grout
- Piezometer or Monitoring Well (see notes on logs)
- X Concrete or asphalt patch where appropriate

Sample Handling and Disposition:
- X Samples labeled, placed in jars, returned to MTC Laboratory
- X Discard after 60 days
GROUNDWATER OBSERVATIONS:

TERMS DESCRIBING CONSISTENCY OR CONDITION

**COARSE-GRAINED** SOILS (major portions retained on No. 200 sieve): includes (1) clean gravel and sands and (2) silty or clayey gravels and sands. Condition is rated according to relative density as determined by laboratory tests or standard penetration resistance tests.

<table>
<thead>
<tr>
<th>Descriptive Terms</th>
<th>Relative Density</th>
<th>SPT Blow Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very loose</td>
<td>0 to 15 %</td>
<td>&lt; 5</td>
</tr>
<tr>
<td>Loose</td>
<td>15 to 35 %</td>
<td>5 to 10</td>
</tr>
<tr>
<td>Medium dense</td>
<td>35 to 65 %</td>
<td>10 to 30</td>
</tr>
<tr>
<td>Dense</td>
<td>65 to 85 %</td>
<td>30 to 50</td>
</tr>
<tr>
<td>Very dense</td>
<td>85 to 100 %</td>
<td>&gt; 50</td>
</tr>
</tbody>
</table>

Per ASTM D2487, the following conditions must be met based on laboratory testing to justify the label 'well graded' in a soil description.

Gravel: $C_u = D_{60} / D_{10}$ greater than 4; $C_c = (D_{60} / D_{10})^{3}$ between 1 and 3

Sand: $C_u = D_{60} / D_{10}$ greater than 6; $C_c = (D_{60} / D_{10})^{3}$ between 1 and 3

**FINE-GRAINED** SOILS (major portions passing on No. 200 sieve): includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings, SPT blow count, or unconfined compression tests.

**LIQUID LIMIT (LL)**

- 0 to 15%
- 15 to 30%
- 30 to 50%
- 50 to 100%

**PLASTICITY INDEX (PI)**

- 0 to 4%
- 4 to 8%
- 8 to 15%
- > 15%

**SANDS**

- Clean sands with less than 15% fines
- Clean sands with more than 15% fines

**SILTS AND CLAYS**

- Silts and clays with less than 50% fines
- Silts and clays with more than 50% fines

**HIGHLY ORGANIC SOILS**

- Peat and other highly organic soils

**CLASSIFICATION OUTLINE**

<table>
<thead>
<tr>
<th>COARSE-GRAINED SOILS</th>
<th>MAJOR DIVISIONS</th>
<th>TYPICAL NAMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRAVELS</td>
<td>CLEAN GRAVELS</td>
<td>WELL-GRADED GRAVELS WITH OR WITHOUT SAND</td>
</tr>
<tr>
<td></td>
<td>WITH LESS THAN 15% FINES</td>
<td>GP</td>
</tr>
<tr>
<td></td>
<td>WITH 15% OR MORE FINES</td>
<td>GM</td>
</tr>
<tr>
<td>SANDS</td>
<td>CLEAN SANDS</td>
<td>WELL-GRADED SANDS WITH OR WITHOUT GRAVEL</td>
</tr>
<tr>
<td></td>
<td>WITH 15% OR MORE FINES</td>
<td>SP</td>
</tr>
<tr>
<td></td>
<td>WITH MORE THAN HALF COARSE FRACTION IS FINE THAN NO. 4 SIEVE</td>
<td>SP-SM</td>
</tr>
<tr>
<td></td>
<td>WITH MORE THAN HALF COARSE FRACTION IS 50% OR LESS FINES</td>
<td>SC</td>
</tr>
<tr>
<td></td>
<td>WITH MORE THAN 50% COARSE THAN NO. 200 SIEVE</td>
<td>ML</td>
</tr>
<tr>
<td></td>
<td>WITH 30% OR MORE FINES</td>
<td>OL</td>
</tr>
<tr>
<td></td>
<td>WITH 15% OR MORE FINES</td>
<td>MH</td>
</tr>
<tr>
<td></td>
<td>WITH 5% OR MORE FINES</td>
<td>CH</td>
</tr>
<tr>
<td></td>
<td>WITHOUT GRAVEL</td>
<td>OH</td>
</tr>
<tr>
<td></td>
<td>WITH GRAVEL</td>
<td>PT/OL</td>
</tr>
</tbody>
</table>

**SAMPLE TYPES AND NUMBERING**

- S: SPT, split barrel sample, ASTM D1586
- U: Shelby tube sample, ASTM D1587
- R: Rock core run
- L: SPT with liner, ASTM D1586
- A: Auger cuttings
- G: Geoprobe liner

**MINOR COMPONENT QUANTIFYING TERMS**

<table>
<thead>
<tr>
<th>GRAIN SIZE</th>
<th>Bouldered</th>
<th>&gt;12”</th>
<th>Cobble</th>
<th>12” to 3”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse gravel</td>
<td>3” to 0.75”</td>
<td>0.75” to No. 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine gravel</td>
<td>No. 4 to No. 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coarse sand</td>
<td>No. 10 to No.40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine sand</td>
<td>No. 40 to No. 200</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Boring Logs

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 55  
**Crew Chief:** JC  
**Field Eng.:** JS  
**Rev. By:** AD  
**Coordinates:** N=367869.5 E=13444252.4 (MI South Ift)  
**Elevation:** 673.1 ft  
**Datum:** NAVD 88 (GPS Observation)

**Notes:** Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 5.0 ft.

**Plugging Record:**  
- Backfill with cuttings  
- Patched pavement with cold patch  
- Cave in at 5.0 ft.

**Depth Drilled:** 10.0 ft.

---

### Depth Drilled: 10.0 ft.

<table>
<thead>
<tr>
<th>Elev. FT.</th>
<th>Depth FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
<th>Penetration (Blows Per 6&quot;)</th>
<th>*USCS Group Symbol</th>
<th>*DESCRIPTION</th>
<th>QP taf</th>
<th>MST %</th>
<th>DD pcf</th>
<th>REMARKS</th>
</tr>
</thead>
</table>
| 672.1     | 1         | S-1            | 0.5        | 3-5-3 N=8                   | SC                | 3" HMA, 4" Gravel Base | 0.6    |       |       | Fill: 0.0 to 2.5" +/-  
|           |           |                |            |                             |                   | S-1: Poor recovery; possible coarse gravel / COBBLE |
| 671.1     | 2         | S-1            | 0.5        | 3-4-4 N=8                   | SC                | Brown gray clayey SAND with gravel; mostly coarse to fine sand, little coarse to fine gravel, little clayey fines, moist, Fill with clay lenses | 2.5    |       |       |         |
| 670.1     | 3         | S-1            | 0.5        | 4-8-12 N=20                 | CL                | Gray lean CLAY; mostly clayey fines, few medium to fine sand, moist | 4.5+   |       |       |         |
| 669.1     | 4         | S-1            | 0.5        | 4-8-12 N=20                 | CL                | Grades brown | 4.5+   |       |       |         |
| 668.1     | 5         | S-1            | 0.5        | 10-15-21 N=36               | SC                | End of Boring | 10.0   |       |       |         |

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.
**LOG OF BORING**

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 55  
**Crew Chief:** JC  
**Field Eng.:** JS  
**Rev. By:** AD  
**Coordinates:** N=367871.6 E=13444303.2 (MI South itf)  
**Elevation:** 672.7 ft  
**Datum:** NAVD 88 (GPS Observation)  

**Notes:** Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 4.0 ft.

**Plugging Record:**  
Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 4.0 ft.

**Depth Drilled:** 10.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP = Calibrated Penetrometer (tons/sq. ft.)**

<table>
<thead>
<tr>
<th>Elev. FT.</th>
<th>Depth FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
<th>Penetration (Blows Per 6&quot;) ASTM D 1586</th>
<th><em>USCS Group Symbol</em></th>
<th><em>DESCRIPTION</em></th>
<th>QP taf</th>
<th>MST %</th>
<th>DD pcf</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>671.7</td>
<td>0</td>
<td>S-1</td>
<td>1.5</td>
<td>5-4-3 N=7</td>
<td>SC</td>
<td>3&quot; HMA, 4&quot; Gravel Base</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>Fill: 0.0 to 2.5&quot; +/-</td>
</tr>
<tr>
<td>670.7</td>
<td>0</td>
<td>S-2</td>
<td>1.5</td>
<td>2-3-3 N=6</td>
<td>CL</td>
<td>Brown clayey SAND with gravel; mostly coarse to fine sand, little coarse to fine gravel, little clayey fines, moist, Fill with clay lenses</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>668.7</td>
<td>0</td>
<td>S-3</td>
<td>1.5</td>
<td>4-9-13 N=22</td>
<td></td>
<td>Green gray lean CLAY; mostly clayey fines, few medium to fine sand, moist with occasional sand seams</td>
<td>1.75</td>
<td>1.75</td>
<td>1.75</td>
<td></td>
</tr>
<tr>
<td>665.7</td>
<td>0</td>
<td>S-4</td>
<td>1.5</td>
<td>12-14-17 N=31</td>
<td></td>
<td>Grades brown without sand seams</td>
<td>4.5+</td>
<td>4.5+</td>
<td>4.5+</td>
<td></td>
</tr>
<tr>
<td>664.7</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grades with trace medium to fine gravel</td>
<td>10.0</td>
<td>10.0</td>
<td>10.0</td>
<td></td>
</tr>
<tr>
<td>663.7</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>End of Boring</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>662.7</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.
**LOG OF BORING**

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 55  
**Crew Chief:** JC  
**Field Eng.:** JS  
**Rev. By:** AD  
**Coordinates:** N=367816.6 E=13444253.6 (MI South ft)  
**Datum:** NAVD 88 (GPS Observation)  
**Depth Drilled:** 10.0 ft.

**Notes:**  
Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 3.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%  
**QP** = Calibrated Penetrometer (tons/sq. ft.)

<table>
<thead>
<tr>
<th>Elev. FT.</th>
<th>Depth FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
<th>Penetration (Blows Per 6&quot;)</th>
<th>*USCS Group Symbol</th>
<th>*DESCRIPTION</th>
<th>QP taf</th>
<th>MST %</th>
<th>DD pcf</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>671.0</td>
<td></td>
<td>S-1</td>
<td>1.5</td>
<td>4-5-4</td>
<td>SC</td>
<td>3&quot; HMA, 1&quot; Gravel Base</td>
<td>0.3</td>
<td></td>
<td></td>
<td>Fill: 0.0 to 2.5&quot; +/-</td>
</tr>
<tr>
<td>670.0</td>
<td></td>
<td>S-2</td>
<td>1.5</td>
<td>3-3-5</td>
<td>Ccl</td>
<td>Dark brown clayey SAND; mostly coarse to fine sand, some clayey fines, few coarse to fine gravel, moist, Fill with clay lenses</td>
<td>2.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>669.0</td>
<td></td>
<td>S-3</td>
<td>1.5</td>
<td>5-10-15</td>
<td></td>
<td>Green gray lean CLAY; mostly clayey fines, few medium to fine sand, moist Grades brown at 4.5'</td>
<td>3.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>668.0</td>
<td></td>
<td>S-4</td>
<td>1.5</td>
<td>13-18-21</td>
<td></td>
<td>Grades with trace coarse to fine gravel</td>
<td>4.5+</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

End of Boring

**Date Begin:** 04/21/2022  
**Date End:** 04/21/2022  
**Tools:**  
- **Casing:** HSA 4 1/4" During None  
- **Sampler:** SPT 2" End NA  
- **Core:** Seepage  
- **Tube:** Date Depth, ft.  
- **SPT Hammer:** Auto  

* *Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.*
**LOG OF BORING**

<table>
<thead>
<tr>
<th>Elev. FT.</th>
<th>Depth FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
<th>Penetration (Blows Per 6&quot;)</th>
<th>*USCS Group Symbol</th>
<th>*DESCRIPTION</th>
<th>QP taf</th>
<th>MST %</th>
<th>DD pcf</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>670.6</td>
<td></td>
<td>S-1</td>
<td>1.5</td>
<td>7-8-4 N=12</td>
<td>SC</td>
<td>3&quot; HMA, 4&quot; Gravel Base</td>
<td>0.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>669.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dark brown clayey SAND with gravel; mostly coarse to fine sand, little coarse to fine gravel, little clayey fines, moist, Fill</td>
<td></td>
<td></td>
<td></td>
<td>Fill: 0.0 to 2.5&quot; +/-</td>
</tr>
<tr>
<td></td>
<td>668.6</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
<td>Brown lean CLAY; mostly clayey fines, few medium to fine sand, trace medium to fine gravel, moist</td>
<td>4.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>667.6</td>
<td>4</td>
<td>S-2</td>
<td>1.5</td>
<td>3-5-7 N=12</td>
<td></td>
<td>Grades gray at 9.6'</td>
<td>4.5+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>666.6</td>
<td></td>
<td></td>
<td></td>
<td>CL</td>
<td>End of Boring</td>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>665.6</td>
<td></td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>664.6</td>
<td>7</td>
<td>S-3</td>
<td>1.5</td>
<td>7-12-16 N=28</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>662.6</td>
<td></td>
<td>9</td>
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</tr>
<tr>
<td></td>
<td>661.6</td>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.
**LOG OF BORING**

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 45  
**Crew Chief:** ZM  
**Field Eng.:** JS  
**Rev. By:** AD  
**Coordinates:** N=367853 E=13443979.5 (MI South ft)  
**Elevation:** 674.6 ft  
**Datum:** NAVD 88 (GPS Observation)

**Notes:**
- Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 10.0 ft.

**Depth Drilled:** 25.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

<table>
<thead>
<tr>
<th>Elev. FT.</th>
<th>Depth FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
<th>Penetration (Blows Per 6&quot;)</th>
<th>*USCS Group Symbol</th>
<th>*DESCRIPTION</th>
<th>QP taf</th>
<th>MST %</th>
<th>DD pcf</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>673.6</td>
<td>673.6</td>
<td>S-1</td>
<td>1.5</td>
<td>5-4-4 N=8</td>
<td>CL</td>
<td>4&quot; HMA, 6&quot; Gravel Base</td>
<td>0.8</td>
<td></td>
<td></td>
<td>Fill: 0.0 to 2.5'±</td>
</tr>
<tr>
<td>672.6</td>
<td>672.6</td>
<td>S-2</td>
<td>1.5</td>
<td>2-2-3 N=5</td>
<td>CL</td>
<td>Gray sandy lean CLAY; mostly clayey fines, some coarse to fine sand, few coarse to fine gravel, moist, Fill, with organic silt lenses</td>
<td>2.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>671.6</td>
<td>671.6</td>
<td>S-3</td>
<td>1.5</td>
<td>12-16-18 N=34</td>
<td>CL</td>
<td>Gray brown lean CLAY; mostly clayey fines, few coarse to fine sand, moist</td>
<td>3.25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>669.6</td>
<td>669.6</td>
<td>S-4</td>
<td>1.5</td>
<td>6-11-17 N=28</td>
<td>CL</td>
<td>Grades brown</td>
<td>4.5+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>666.6</td>
<td>666.6</td>
<td>S-5</td>
<td>1.5</td>
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*Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.*
Lume Development - 1949 12 Mile Road

Client: Lume Cannabis Co.
Location: Berkley, Michigan

Project No.: 211705
Boring No.: B-2
Sheet: 1 of 1

Date Begin: 03/16/2022  Date End: 03/16/2022

Plugging Record:
Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 12.0 ft.

Depth Drilled: 25.0 ft.

Plugging Record: Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 12.0 ft.

Component Percentages: Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

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<th>Elev. FT.</th>
<th>Depth FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
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<th>*DESCRIPTION</th>
<th>QP (tfs)</th>
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* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.
**LOG OF BORING**

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 45  
**Crew Chief:** ZM  
**Field Eng.:** JS  
**Rev. By:** AD  
**Coordinates:** N=367890.2 E=13444049.2 (MI South ft)  
**Elevation:** 675.3 ft  
**Datum:** NAVD 88 (GPS Observation)  

**Notes:**  
Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 13.0 ft.  
Depth Drilled: 25.0 ft.  

Date Begin: 03/17/2022  
Date End: 03/17/2022

<table>
<thead>
<tr>
<th>Elev. FT.</th>
<th>Depth FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
<th>Penetration (Blows Per 6&quot;)</th>
<th>*USCS Group Symbol</th>
<th>*DESCRIPTION</th>
<th>QP (t/sq. ft.)</th>
<th>MST %</th>
<th>DD pcf</th>
<th>REMARKS</th>
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<td>1.5</td>
<td>3-1-10 N=11</td>
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<td>8&quot; Clayey Topsoil; mostly clayey fines, some coarse to fine sand, moist, Fill with concrete debris</td>
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<td>Fill: 0.0 to 5.5±</td>
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<td>S-2: Poor recovery; possible coarse gravel / COBBLE</td>
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<td>Brown lean CLAY; mostly clayey fines, few coarse to fine sand, trace coarse to fine gravel, moist</td>
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<td>5-6-7 N=13</td>
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* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.
# LOG OF BORING

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 45  
**Crew Chief:** ZM  
**Field Eng.:** JS  
**Rev. By:** AD  
**Coordinates:** N=367891 E=13444080.9 (MI South ft)  
**Elevation:** 675.5 ft  
**Datum:** NAVD 88 (GPS Observation)

---

**Date Beginning:** 03/17/2022  
**Date Ending:** 03/17/2022

**Plugging Record:** Backfilled borehole with compacted cuttings. Cave in at 14.0 ft.

**Depth Drilled:** 25.0 ft.

---

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%  
**QP** = Calibrated Penetrometer (tons/sq. ft.)

<table>
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<th>Elev. FT.</th>
<th>Depth FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
<th>Penetration (Blows Per 6&quot;)</th>
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<th>QP (tons/sq. ft.)</th>
<th>MST %</th>
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* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.
**LOG OF BORING**

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 45  
**Crew Chief:** ZM  
**Field Eng.:** JS  
**Rev. By:** AD  
**Coordinates:** N=367858.7 E=13444172.1 (MI South ft)  
**Elevation:** 673.8 ft  
**Datum:** NAVD 88 (GPS Observation)  
**Date Begin:** 03/17/2022  
**Date End:** 03/17/2022  
**Notes:**  
**Plugging Record:** Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 13.5 ft.  
**Depth Drilled:** 25.0 ft.

<table>
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<th>Depth FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
<th>Penetration (Blows Per 6&quot;)</th>
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<th>*DESCRIPTION</th>
<th>QP taf</th>
<th>MST %</th>
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<td>1.5</td>
<td>2-2-3</td>
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<td>Gray lean CLAY with sand; mostly clayey fines, little coarse to fine sand, moist</td>
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<td>N=17</td>
<td>Grades with few fine gravel</td>
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<td>Grades gray</td>
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**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%  
**QP = Calibrated Penetrometer (tons/sq. ft.)**

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.
### LOG OF BORING

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 45  
**Crew Chief:** ZM  
**Field Eng.:** JS  
**Rev. By:** AD  
**Coordinates:** N=367828.7 E=13444169.1 (MI South ft)  
**Elevation:** 673.4 ft  
**Datum:** NAVD 88 (GPS Observation)  
**Date Begin:** 03/17/2022  
**Date End:** 03/17/2022

#### Component Percentages:

- Trace < 5%
- Few 5-10%
- Little 15-25%
- Some 30-45%
- Mostly 50-100%

QP = Calibrated Penetrometer (tons/sq. ft.)

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<th>Elev. FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
<th>Penetration (Blows Per 6&quot;)</th>
<th>*USCS Group Symbol</th>
<th>*DESCRIPTION</th>
<th>QP</th>
<th>MST</th>
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<td>Fill: 0.0 to 2.5&quot;</td>
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<td>1.5</td>
<td>10-9-9 N=18</td>
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**Notes:**
- Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 13.0 ft.
- Depth Drilled: 25.0 ft.

*Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.*
## Log of Boring

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 45  
**Crew Chief:** ZM  
**Field Eng.:** JS  
**Rev. By:** AD  
**Coordinates:** N=367817.7 E=13444111.8 (MI South ift)  
**Elevation:** 675.3 ft  
**Datum:** NAVD 88 (GPS Observation)  
**Notes:**

**Plugging Record:** Backfilled borehole with compacted cuttings.

**Date Begin:** 03/16/2022  
**Date End:** 03/16/2022

### Component Percentages:

- Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

### Depth Drilled:

- 25.0 ft.

### Depth Drilled:

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<th>Elev. FT.</th>
<th>Depth FT.</th>
<th>Sample Number</th>
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<th>*DESCRIPTION</th>
<th>QP</th>
<th>MST%</th>
<th>DD pcf</th>
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### Notes:

- * Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.
## Log of Boring

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan

### Plugging Record
- Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 13.5 ft.
- Depth Drilled: 25.0 ft.

### Component Percentages
- Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

### Depth Drilled: 25.0 ft.

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<th>Elev. FT.</th>
<th>Depth FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
<th>Penetration (Blows Per 6&quot;) ASTM D 1586</th>
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<th>*DESCRIPTION</th>
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**Notes:**
- *Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.*
## LOG OF BORING

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 45  
**Crew Chief:** ZM  
**Field Eng.:** JS  
**Rev. By:** AD

### Coordinates:
N=367794.6 E=13444183.4 (MI South ft)

### Elevation:
672.9 ft Datum: NAVD 88 (GPS Observation)

### Notes:
Plugging Record:
Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 12.0 ft.

### Depth Drilled:
25.0 ft.

## Component Percentages:
- Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

## QP = Calibrated Penetrometer (tons/sq. ft.)

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<th>*DESCRIPTION</th>
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March 22, 2022
Project No. 211705

Lume Cannabis Co.
769 Chicago Road
Troy, Michigan 48083

Attention: Mathew Burbary
Construction Manager

Reference: Report of Geotechnical Investigation
Lume Development – 1949 12 Mile Road
Berkley, Michigan

Dear Mr. Burbary:

MATERIALS TESTING CONSULTANTS, INC. has completed a geotechnical investigation for the above-referenced project. The findings of the study along with recommendations for the design of foundations and pavement are presented in the attached report.

We appreciate this opportunity to provide foundation engineering services and express our interest in providing continuing services in the areas of subgrade verification, special inspections and quality testing on various construction materials. Please contact our office should you have any questions or require further assistance.

Sincerely,

MATERIALS TESTING CONSULTANTS, INC.

Adam L. DePoy, P.E.
Project Manager

Todd D. Munger, P.E.
Senior Project Manager

att: Report
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**FIGURE**
BORING LOCATION PLAN

**APPENDIX**
LIMITATIONS
TEST DRILLING AND SAMPLING PROCEDURES
BORING LOG TERMINOLOGY AND CLASSIFICATION OUTLINE
BORING LOGS
INfiltration Test RESULTS
1.0 INTRODUCTION

MATериалs Testing Consultants, Inc. (MTC) has completed a geotechnical investigation for the proposed Lume Development at 1949 12 Mile Road in the City of Berkley, Michigan. This work has been performed as described in our proposal, number 16261 and dated March 7, 2022. Authorization to proceed was received from Mr. Mathew Burbary of Lume Cannabis Co. through email on March 7, 2022.

The scope of this study in general includes the following:

- performance of a field investigation including soil test borings, infiltration testing and field engineering reconnaissance;
- review of recovered samples by one of our engineers and assignment of technical soil classifications;
- engineering evaluation of encountered conditions with respect to the proposed construction; and
- preparation of this report.

Presented herein are descriptions of our understanding of the design considerations, the investigation program, encountered conditions and engineering recommendations. The Appendix contains the report limitations, boring log terminology, soil classification chart, boring logs and infiltration test results.

2.0 DESIGN CONSIDERATIONS

2.1 Available Information

We have been provided the following documents and information for use in this investigation:

- A Report of Engineering Site Plan Review, prepared by Hubbell, Roth and Clark, Inc., dated February 16, 2022 and received through email from Mr. Christopher Enright of Enright
Architects on March 2, 2022 which specified the need for a geotechnical investigation to evaluate the feasibility of the proposed stormwater management system.

- A Topographic Survey plan of the project site, Drawing No. 1, prepared by PEA Group, dated February 24, 2022 and received through email from Mr. Scott Peruski, P.E. of PEA Group on March 10, 2022 which also included existing underground utility information and proposed boring and infiltration test locations.
- A proposed stormwater management plan, Sheet C-8.0, undated and received through email from Mr. Scott Peruski, P.E. of PEA Group on March 10, 2022 which provided information and locations of the proposed detention systems, rain gardens and underground drains.
- Telephone and email correspondence with Mr. Mathew Burbary of Lume Cannabis Co. and Mr. Scott Peruski, P.E. of PEA Group regarding the proposed development, the geotechnical scope of work, Oakland County requirements for design of stormwater management features, project authorization and coordinating the field investigation.
- An onsite meeting with Mr. Stan Stachowicz, Property Manager of the project site, who assisted with private utility clearance and provided access into the existing building structure to review existing conditions.

2.2 Location and Type of Structure

The proposed construction will be located in plan as shown on the attached Boring Location Plan, Figure No. 1. The site is located at 1949 12 Mile Road in the City of Berkley, immediately south of the Roseland Park Cemetery. The project site has an existing multi-story building structure onsite which is currently functioning as a Beaumont Health medical facility. The existing building is approximately 80 ft by 115 ft in plan (9,200 sq-ft), has two above-grade levels and a basement level which extends approximately 10 to 12 ft below existing exterior grades. We understand the existing structure has its main level finish floor at el 676.0 and we have considered the structure’s basement level bears near el 664. Asphalt surface parking lots are located east and west of the building and an asphalt drive is located south of the building. Existing surface grades generally range from el 674 to 675.5 in the west parking lot and generally range from el 672.5 to 675 in the east parking lot within the proposed development areas.
The proposed construction will involve interior renovations to the existing building structure, two new exterior stairwells constructed near the southeast and northwest corners of the building, a new elevator and elevator pit constructed near the northwest corner of the building, as well as the installation of new stormwater management features to be located east, west and north of the building. Through correspondence with the design team, we understand structural loading for the existing building is expected to remain approximately the same as a result of the proposed interior renovations, as no heavy machinery or equipment installations are proposed within the building interior. We have considered the proposed stairwells and elevator pit will bear on mat foundations with a maximum applied static load to the mat slab of 250 kips and an applied mat bearing pressure of approximately 2500 psf.

We understand the design is anticipating predominately cohesive soil conditions onsite and therefore is expected to utilize a stormwater management system which utilizes retention features and ultimately directs collected stormwater offsite. The proposed stormwater management system indicates the following proposed features to be installed:

- **Rain Garden A** – a 0.03-acre rain garden to be located north of the existing building in the existing grass landscaping area with a bottom of pond elevation at 674.
- **Two rain gardens** to be located east of the building’s southeast corner (Rain Gardens B and C) – both rain gardens will be 0.02 acres with a bottom of pond elevation at 672.
- **West Detention System** – a 0.23-acre underground Stormtech system will be installed which will include Isolator Plus SC-740 chambers and occupy an area of approximately 36 ft by 94 ft. The detention system will be located in the existing asphalt drive and parking area west of the existing building. The bottom of the chambers will be at el 669.25 which we understand will be installed on 18 inches of stone bedding.
- **East Detention System** – a 0.21-acre underground Stormtech system will also be installed east of the existing building in an existing pavement area. Design information for the East Detention System was not provided; however, we have considered the system will include SC-740 chambers which will bear approximately 5 ft below the lowest existing pavement elevation on 18 inches of stone bedding. We have considered the SC-740 chambers will bear at approximately el 668.0.
- **Porous pavement** will be constructed in the east and west parking areas near the proposed East and West Detention systems. We understand the porous pavement section will consist of an open-graded HMA surface layer overlying a thin stabilizing choker course
layer and a stone recharge bed layer, underlain by a non-woven geotextile fabric, resting on compacted or proof-rolled subgrade.

Porous asphalt pavement areas are planned, and non-porous asphalt pavement may also be constructed onsite. Traffic is expected to consist of relatively light passenger vehicles with only occasional heavier axle wheel loadings from trucks for deliveries, refuse pickup, etc.

We should be informed of any changes between the actual design conditions and those described herein as this information may affect our recommendations.

3.0 INVESTIGATION METHODOLOGY

3.1 Field Investigation

Subsurface conditions were investigated by nine (9) conventional soil test borings. Borings were performed to a depth of 25 ft below the existing ground surface in areas of proposed stormwater management features. Boring locations are shown on the attached plan, Figure No. 1.

Seven (7) double-ring infiltration tests were performed onsite within the footprint of the proposed detention systems and rain gardens to evaluate the drainage properties of the subgrade soil. The infiltration tests were performed in accordance with the Southeast Michigan Council of Governments (SEMCOG) Low Impact Development (LID) Manual of Michigan. The locations of the infiltration tests are shown on Figure No. 1. The SEMCOG double-ring infiltration tests were performed at depths which correspond to the approximate bottom elevation of the proposed stormwater management features. The results of the infiltration tests are discussed in Section 4.3, and the field test logs with infiltration test results are provided in the Appendix.

One of our engineers staked the approximate boring locations in the field. Boring elevations were approximated using a survey grade GPS unit. The elevations used in this report are given in feet and are based on the NAVD 88 datum. If more precise location and elevation data are desired, a registered professional land surveyor should be retained to locate the borings and
determine their ground elevations. Ground penetrating radar (GPR) and electro-magnetic (EM) locating equipment were utilized as an added safety precaution to scan the boring locations prior to drilling for potential underground anomalies and unmarked private and public utilities.

The drilling was performed using conventional hollow-stem auger methods to advance the boreholes. The boreholes were backfilled to the original ground surface after drilling completion and sealed with cold patch in areas of existing pavement.

Soil samples were recovered on regular intervals by means of the Standard Penetration Test (SPT), ASTM D1586. The SPT test involves the use of a 140-lb hammer with a 30-inch drop to drive a standard 2.0-inch O.D. split spoon sampler. The number of hammer blows required to drive the sampler 12 inches, after seating 6 inches, is termed the soil N-value and provides an indication of the soil's relative density and strength parameters at the sample location. SPT blow counts in 6-inch increments are recorded on the boring logs. The drill rig was equipped with an automatic hammer system which delivers a more consistent driving energy to the sampler compared to the rope and cathead system.

Recovered samples were sealed, labeled and transported to our laboratory. All soil samples will be discarded after sixty days unless a longer hold time is specifically requested.

The recovered soil samples were reviewed by an engineer and technically classified according to the methods of ASTM D2488 "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)". Estimates of the unconfined compressive strength of the cohesive samples were made using a calibrated penetrometer. A copy of the test boring logs along with a description of the terminology used on the logs and a chart of the ASTM D2488 group symbol names are provided in the Appendix.

Borings were drilled and other sampling was conducted solely to obtain indications of subsurface conditions as part of a geotechnical exploration program. No services were performed to evaluate subsurface environmental conditions.
4.0 INVESTIGATION RESULTS

4.1 Regional Geology

The *Map of the Surface Formations of the Southern Peninsula of Michigan*, published by the State of Michigan, indicates the site is in an area of waterlaid moraines, bordered by clay lake beds to the northeast. Soil conditions encountered in moraine formations typically consist of a mixture of sand, silt and clay transported and deposited through glacial processes while soil conditions in clay lake bed areas are predominately cohesive, consistent with the soils encountered during our field investigation.

The *Map of Bedrock Topography of the Southern Peninsula of Michigan* indicates bedrock to be at approximately el 500 to 550, approximately 120 ft or deeper below existing site grades.

4.2 Site Conditions

At the time of our field work, the areas of investigation were asphalt pavement and grass landscaping areas surrounding the existing Beaumont Medical facility. The site, in general, was relatively flat with elevations ranging from approximately 673 to 676. Stormwater appears to be managed onsite through inverse crown drainage to interior catch basins located in HMA drive areas west and southeast of the building. A cluster of trees was located near the northwest corner of the building which required offsetting Boring B-3 to the east.

The asphalt pavement west of the existing building was in poor condition with moderate to severe block cracking observed in the drive lanes, possibly a result of limited surface grading to promote drainage to the stormwater catch basin. The asphalt pavement east of the existing building was in poor condition with edge, transverse and meander cracking observed throughout the pavement, as well as cracking around the perimeter of the southeast catch basin.

The existing two-story brick building onsite appeared to be in fair condition, and there were no obvious signs of structural distress, such as readily-visible settlement or cracking, on the exterior of the existing building.
Miss Dig markings of underground utilities observed while onsite include a watermain below the west concrete sidewalk, a storm sewer located west of the building in the asphalt drive, fiber optic and gas utilities in the north landscaping area near the south edge of the sidewalk, a fire suppression water line running into the building near the building's northeast corner, and gas utilities located east of the building in the asphalt drive.

4.3 Subsurface Conditions

The investigation, in general, encountered stiff to hard cohesive uncontrolled fill and very loose to medium dense granular uncontrolled fill with occasional deleterious material (including buried organics and concrete and asphalt debris) in the upper approximately 1.5 to
5.5 ft over predominately very stiff to hard cohesive soil (CL) to the explored depths of 25 ft with exception to Boring B-7 where uncontrolled fill was encountered to a depth of 12 ft. Borings performed in existing pavement areas encountered 3½ to 4 inches of HMA at the ground surface over 4 to 8 inches of gravel base. Borings performed in existing grass landscaping areas encountered 6 to 8 inches of topsoil.

The relative density of granular soil is based on recorded SPT N-values while the consistency of cohesive soil is based on both recorded SPT N-values and on estimates of the unconfined compressive strength obtained with a calibrated penetrometer.

The encountered cohesive fill generally consisted of stiff to hard lean clay with sand (CL) and sandy lean clay (CL). Calibrated penetrometer readings in the cohesive fill generally ranged from 1.0 tsf to 3.0 tsf with occasional readings on the order of 4.0 tsf or greater. The encountered granular fill generally consisted of loose to medium dense poorly graded sand (SP), poorly graded sand with silt (SP-SM), poorly graded sand with clay (SP-SC), silty sand (SM) and clayey sand (SC). Deleterious material including organics as well as concrete and asphalt debris were occasionally encountered in the fill. Boring B-1 encountered sandy lean clay (CL) fill with organic silt lenses to a depth of 2.5 ft. Boring B-2 encountered a lens of black organic silt (OL) from 1.8 to 2.5 ft. Boring B-3 encountered sandy lean clay (CL) fill with concrete debris to a depth of 2.5 ft. Boring B-7 encountered sandy lean clay (CL) fill with asphalt fragments from 8 to 12 ft and was the area of deepest encountered fill amongst our soil borings. Boring B-9 encountered poorly graded sand with clay (SP-SC) fill with wood fragments to a depth of 1.5 ft. Due to the variability of the fill and presence of organics and debris, the fill is anticipated to be “uncontrolled” in nature.

The native cohesive soil generally had a very stiff to hard consistency based on calibrated penetrometer readings. Calibrated penetrometer readings in the cohesive soil generally ranged from 4.0 tsf to in excess of 4.5 tsf. Occasional silt seams and lenses, as well as few fine to coarse gravel were noted in the cohesive soil.

Poor sample recovery was occasionally noted in the granular fill, cohesive fill and cohesive soil and may indicate the presence of coarse gravel or cobble obstructions. Boulder should be anticipated whenever cobble is noted.
Groundwater was not encountered in the soil borings during the drilling activities. Groundwater levels may fluctuate due to seasonal variations such as precipitation, snowmelt, nearby river or lake levels and other factors that may not be evident at the time of measurement. Groundwater levels may be different at the time of construction.

Infiltration Tests:

Seven (7) in situ infiltration tests were performed onsite in accordance with the SEMCOG Low Impact Development (LID) Manual for Michigan. The locations of the infiltration tests are shown on Figure No. 1.

Infiltration tests were performed at depths of approximately 1 to 7 ft which corresponds with approximately the bottom elevation of the proposed stormwater management features. The subgrade soil at the test depths consisted of cohesive soil classified as lean clay, lean clay with sand and sandy lean clay (CL). The test area was allowed to pre-soak for 60 minutes prior to testing. No infiltration into the cohesive soil was measured during the 3-hour course of the test at each of the test locations. A summary of the infiltration tests is provided in Table 4.3.1:

<table>
<thead>
<tr>
<th>Infiltration Test Location</th>
<th>Proposed Stormwater Management Feature</th>
<th>Bottom of Feature Elevation</th>
<th>Infiltration Test Depth (Elevation)</th>
<th>Soil at Test Depth</th>
<th>Average Measured Rate of Infiltration</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT-1</td>
<td>West Detention System</td>
<td>667.75</td>
<td>667.7</td>
<td>Brown lean CLAY (CL)</td>
<td>Zero</td>
</tr>
<tr>
<td>IT-2</td>
<td>West Detention System</td>
<td>667.75</td>
<td>667.7</td>
<td>Brown lean CLAY (CL)</td>
<td>Zero</td>
</tr>
<tr>
<td>IT-4</td>
<td>Rain Garden A</td>
<td>674.0</td>
<td>674.0</td>
<td>Gray sandy lean CLAY (CL)</td>
<td>Zero</td>
</tr>
<tr>
<td>IT-5</td>
<td>East Detention System</td>
<td>666.5</td>
<td>666.7</td>
<td>Brown lean CLAY (CL)</td>
<td>Zero</td>
</tr>
<tr>
<td>IT-6</td>
<td>East Detention System</td>
<td>666.5</td>
<td>666.7</td>
<td>Brown lean CLAY (CL)</td>
<td>Zero</td>
</tr>
<tr>
<td>IT-8</td>
<td>Rain Garden B</td>
<td>672.0</td>
<td>672.0</td>
<td>Gray lean CLAY with sand (CL)</td>
<td>Zero</td>
</tr>
<tr>
<td>IT-9</td>
<td>Rain Garden C</td>
<td>672.0</td>
<td>671.2</td>
<td>Gray lean CLAY with sand (CL)</td>
<td>Zero</td>
</tr>
</tbody>
</table>
The field test logs with results of the double ring infiltration tests are provided in the Appendix.

This section has provided a generalized description of the encountered subsurface soil conditions. The boring logs located in the Appendix should be reviewed for detailed soil descriptions. Some variation between boring and infiltration test locations may be expected.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Foundations

A mat foundation is recommended for support of the proposed stairwells and elevator pit. It is important that the recommendations of this report, in particular those pertaining to subgrade preparation, construction observation and testing, be implemented during design and construction.

The following parameters are recommended for foundation design:

<table>
<thead>
<tr>
<th>Table 5.1.1 - Foundation Design Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average bearing pressure for mat foundations, maximum gross allowable, psf</td>
</tr>
<tr>
<td>Vertical modulus of subgrade reaction, K_{30}, pci</td>
</tr>
<tr>
<td>Minimum embedment depth for frost protection, inches</td>
</tr>
</tbody>
</table>

Mat foundations are expected to bear near el 664 on the very stiff to hard lean clay (CL) as encountered in the borings or on approved engineered fill. Subgrade preparation recommendations are contained in the following section.

Foundation recommendations presented herein are based on a safety factor to resist bearing capacity failure of at least 3.0 and a maximum anticipated total foundation settlement of 1 inch or less. Differential settlement of the mat foundations will be a function of the mat rigidity to be evaluated and designed by the project Structural Engineer. Considering subgrade preparation is performed as described herein, a modulus of subgrade reaction value, K_{30}, of 100 psi/inch may be considered for structural design to evaluate differential movement.
across the mat based on concentrated loading and structural requirements. New foundations placed adjacent to the existing structure should bear at the same elevation as the existing foundations to prevent undermining. If new foundations will extend below the level of existing foundations, precautions to prevent undermining of the existing foundations should be taken. If new loads will be transferred to the existing foundations, the stability of the foundations (i.e., bearing capacity safety factor and predicted settlement) should be evaluated as part of the design.

5.2 Site and Subgrade Preparation

All topsoil, vegetation, roots, HMA pavement, concrete sidewalk, and any other miscellaneous debris should be removed from within the proposed construction areas. The limits of the proposed construction area, prior to the placement of any structures or engineered fill material, should be proof-rolled and compacted in the upper 12 inches using suitable compaction equipment to at least 95 percent of the soil's maximum ASTM D1557 dry density by the contractor. Proof-rolling is defined as the passing of relatively heavy construction equipment over the soil subgrade under observation by the Geotechnical Engineer. The response of the soil, when subjected to the applied load, is subjectively evaluated by our staff with respect to its ability to support the overlying soil or structure. In areas where excessive deflection is observed, special subgrade preparation measures may be recommended to provide an acceptable subgrade condition. These measures may consist of compaction of the subgrade at moisture contents close to the optimum value, undercutting affected areas and replacing with engineered fill, use of a geotextile separation fabric or some combination of these measures.

Due to the presence of uncontrolled fill with occasional deleterious material (concrete debris, asphalt and wood fragments, buried organics) encountered in the upper approximately 1.5 to 5.5 ft of most borings and to a depth of 12 ft at Boring B-7 during our field investigation and due to variations that may exist between borings, it is expected that some form of subgrade improvement will be required over portions of the development area to provide suitable foundation bearing conditions, particularly near the northwest and southeast corners of the building where new stairwell and elevator construction are proposed. Subgrade improvement may include, but not be necessarily limited to, densification of existing soil in-place or excavation of all unsuitable material to an approved subgrade and replacement with
engineered fill. If overexcavation is selected, it should encompass soil within the stress influence region of the foundation, defined as a region bordered by 2V:1H planes extending down and away from the bottom edge of the foundation to the approved bearing stratum.

The foundation subgrade should be inspected and tested by qualified geotechnical personnel. As part of the inspection and testing, the subgrade at each individual bearing element should be verified to be consistent with the conditions encountered in this investigation and the indicated recommended allowable bearing pressures. This testing should include the verification of acceptable unconfined compressive strengths in cohesive soil and a dynamic cone penetrometer (ASTM STP 399) to verify minimum relative densities and equivalent N-values in granular soil. Care should be taken to maintain the natural moisture content of clayey subgrade soil which may become soft when saturated from rainfall, etc.

Engineered fill is approved on-site or imported soil placed in uniform layers and compacted to a minimum required density. Generally, on-site soil with group symbols of SP or SP-SM are expected to be suitable for engineered fill. Imported engineered fill should meet the requirements for MDOT Class II granular material. MDOT Class II soil or approved on-site soil meeting the requirements of SP or SP-SM should be used as backfill against foundations.

Granular engineered fill and backfill should be compacted to at least 95 percent of the soil's maximum dry density as determined by the Modified Proctor test (ASTM D1557). Vibratory compaction methods are typically found to be most effective in granular soils; however, relatively light equipment should be used adjacent to basement walls to avoid overstressing the walls.

The fill should be placed and compacted in horizontal layers not exceeding 9 inches. Field density tests should be taken on each lift, as the fill is being placed, to verify compliance with compaction specifications. If the earthwork takes place during winter months, fill must not be placed on frozen ground and fill with frozen conglomerations of soil must not be used.

Because the site has been previously developed, there may be buried items not encountered in our borings, such as a septic tank, well, or utility conduit, which may cause settlement problems. The contract documents should reflect that it is necessary to remove or relocate such structures and to fill the excavation with engineered fill.
5.3 **Groundwater**

Groundwater was not encountered in the soil borings. Because groundwater was not encountered within the investigation depth of 25 ft, the control of groundwater for foundation construction and stormwater management installation is not expected to be of concern on this project.

A perimeter footing drain is recommended in all areas where the proposed stairwell and elevator floor slabs are at or below the adjacent exterior elevation.

5.4 **Slopes and Temporary Excavations**

The owner and the contractor should make themselves aware of and become familiar with applicable local, state, and federal safety regulations, including current OSHA excavation and trench safety standards. Construction site safety generally is the sole responsibility of the contractor. The contractor shall also be solely responsible for the means, methods, techniques, sequences and operations of construction operations. We are providing the following information solely as a service on this project and, under no circumstances, should our provision of the following information be construed to mean that we are assuming responsibility for construction site safety or the contractor's activities; such responsibility is not implied and should not be inferred.

The contractor should be aware that slope height, slope inclination, and excavation depths (including utility trench excavations) should in no case exceed those specified in local, state, or federal safety regulations; e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations. For this site, the overburden soil encountered in our exploratory program is a combination of cohesive soil and granular fill. We anticipate that OSHA will classify these materials as Types A and C, respectively. OSHA recommends a maximum slope inclination of 3⁄₄H:1V for Type A and 1½H:1V for Type C soil under ideal conditions. If excavations within the Type A soil are open less than 24 hours and are 12 ft or less in depth then OSHA allows the maximum slope inclination to be ½H:1V under ideal conditions.
Excavations on the order of 7 ft or less will be needed to construct below-grade stormwater management features. Excavations on the order of 12 ft will be needed to construct the proposed stairwells and elevator which are expected to bear at the same elevation as the existing structure’s basement level. As an alternative to temporary slopes, vertical excavations can be temporarily shored. The contractor or the specialty subcontractor should be responsible for the design of the temporary shoring in accordance with applicable regulatory requirements.

5.5 Stormwater Management Considerations

The infiltration tests performed onsite were performed in primarily cohesive soil and measured no infiltration over the 3-hour length of the tests. We understand the design is planning to utilize a stormwater management system which utilizes retention features and directs collected stormwater offsite. The proposed stormwater management features, including the proposed rain gardens, underground Stormtech chambers and porous pavement, appear feasible to manage stormwater onsite considering stormwater is appropriately collected and transported to the proposed stormwater management features. Appropriate pavement surface slopes should be provided to facilitate drainage. New pavement grades should be developed where possible to establish a minimum 2 percent slope.

5.6 Porous Pavement

Industry best practices suggest utilizing flat or gently sloping areas for porous pavement construction and maintaining a flat bottom to the porous pavement section in order to maximize the infiltration surface area. The surface slope of the parking lot should be limited to 5% in order to promote surface infiltration through the pavement. A minimum subgrade infiltration rate of 0.5 inches per hour is current industry practice for porous pavement design. The existing cohesive soil is expected to have an infiltration rate less than 0.5 inches per hour, and therefore, we recommend the installation of an underground retention system. The underground retention chambers should be designed to manage both surface runoff and subsurface infiltration from the porous pavement section. The presence of an underground retention system would minimize the required storage capacity of the porous pavement and would allow for a smaller porous pavement section.
The porous pavement section should be designed and constructed in accordance with all local and county specifications. A porous pavement section consists of an open-graded HMA surface layer, overlying a thin stabilizing choker course layer, over a stone recharge bed layer, underlain by a non-woven geotextile fabric, resting on approved subgrade. The geotextile fabric prevents the migration of subgrade fines into the pavement section. The stone recharge bed provides temporary storage of stormwater while the infiltrated groundwater slowly discharges into the underground retention system. The choker course layer stabilizes the surface of the stone recharge bed in preparation for laying the asphalt pavement. The open-graded HMA surface layer provides both structural support and allows for stormwater to infiltrate into the pavement section.

Industry best practices for porous pavement construction should be followed in order to optimize long-term pavement performance. It is essential to protect porous pavement from construction debris and sediment-rich water both during and after construction.

An approximately 1 to 2 ft stone overflow edge should be placed around the perimeter of the porous pavement to catch any surface runoff that may leave the perimeter. The stone recharge bed layer should extend out to the edge of the stone overflow edge. Ravelling of the HMA surface layer is expected to occur in drive lanes, so if catch basins are planned, they should be located in parking spaces.

*Porous Pavement Construction:*

Prior to porous pavement construction, the project site should be protected from uncontrolled runoff from any nearby construction projects. Particulates in washwater can clog the void spaces of the HMA surface layer and stone recharge bed, reducing their permeability and storage capacity. Temporary storm water control systems should be utilized to prevent surface runoff from breaching the project site.

Site and subgrade preparation in proposed porous pavement areas should be performed as described in Section 5.2.

Porous pavement construction should involve excavating to 24 inches below the finish HMA elevation. Following subgrade excavation, the exposed subgrade should be inspected and
proof-rolled, and any soft or yielding areas should be undercut to an approved depth and backfilled with engineered fill. A Mirafi 160N or approved equivalent nonwoven geotextile should be placed on top of the proof-rolled subgrade (or Class II soil if over-excavation was performed). Adjacent strips of geotextile should overlap a minimum of 16 inches to ensure complete coverage of the exposed subgrade. The geotextile should also extend a minimum 4 ft beyond the limits of the pavement area in all directions to prevent outside sediment from infiltrating the pavement section.

Following placement of the geotextile, the stone recharge bed should be placed on the geotextile to 6 inches below the finish HMA elevation, taking care not to damage the geotextile during placement. The stone recharge bed should be composed of clean uniformly-graded AASHTO #2 size crushed aggregate (1.5- to 2.5-inch diameter). The stone recharge bed aggregate should be placed in lifts of 8 to 12 inches using lightweight track equipment.

Each lift should be compacted with a single pass of a steel-wheeled static roller weighing between 4 and 12 tons. Pneumatic-tired rollers are not permitted for use, as these machines risk over-compact the stone recharge bed and subgrade. Six-inch perforated socked underdrains should be installed directly on the nonwoven geotextile and overlaid with the stone recharge bed. The underdrains will serve to transfer subsurface infiltration from the stone recharge bed to the underground retention system. Following placement of the stone recharge bed, the stabilized choker course layer should be placed. The choker course should be composed of AASHTO #57 size aggregate, placed in a single 2-inch lift, and compacted using a steel-wheeled static roller. Once the choker course has been compacted, the open-graded HMA surface layer should be placed.

The open-graded HMA surface layer should be a minimum of 4 inches thick and constructed following a Contractor-approved mix design conforming to all local and county specifications for porous HMA paving considering the desired life span of the pavement and design pavement loading. The mix design should satisfy gradation requirements established by the Asphalt Pavement Association of Michigan (APAM) with a minimum 18 percent air voids. The HMA surface layer should be placed in two lifts, with the first lift not exceeding 3.0 inches. No bond coat should be used between the asphalt pavement lifts. Each lift should be compacted after placement using one to two passes with a steel-wheeled static roller.
Table 5.6.1 – Recommended Porous Pavement Section

<table>
<thead>
<tr>
<th>Traffic Condition</th>
<th>Standard Duty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonwoven Geotextile</td>
<td>Mirafi 160N or approved equivalent</td>
</tr>
<tr>
<td>Stone Recharge Bed, inches</td>
<td>18</td>
</tr>
<tr>
<td>Stabilizing Choker Course, inches</td>
<td>2</td>
</tr>
<tr>
<td>Open-Graded Asphalt Surface Course, inches (minimum)</td>
<td>4</td>
</tr>
</tbody>
</table>

Post-Construction and Maintenance:

Routine maintenance of the porous pavement surface will be critical to monitor and preserve its stormwater infiltration capabilities. The surface lots should be regularly cleaned of trash and debris. Vacuum sweeping should be performed three to four times per year to remove sediment and fines from the porous pavement. Porous pavement areas should be inspected following storm events to verify the surface is draining properly.

Signs should be posted throughout the parking lots indicating the presence of porous pavement. The inclusion of a stone overflow edge serves as a backup infiltration route to the stone recharge bed should the pavement surface temporarily clog.

Any onsite or uphill landscaping should be stabilized to ensure their drainage areas do not direct onto the porous pavement. Areas of bare soil should be seeded to prevent sediment migration.

5.7 Below-Grade Walls

The lateral earth pressure against below-grade walls is a function of the rigidity of the wall, the nature of the backfill material, the slope of the top surface of the retained soil and surcharge loads.
For design of below-grade walls, the following soil parameters may be used:

<table>
<thead>
<tr>
<th>Table 5.7.1 - Rigid Wall Lateral Earth Pressures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient of at-rest earth pressure</td>
</tr>
<tr>
<td>Coefficient of passive earth pressure</td>
</tr>
<tr>
<td>Friction angle of backfill</td>
</tr>
<tr>
<td>Total unit weight of backfill</td>
</tr>
<tr>
<td>Friction angle between smooth concrete and backfill</td>
</tr>
<tr>
<td>Friction angle between rough concrete and subgrade</td>
</tr>
</tbody>
</table>

The at-rest pressure is recommended for relatively rigid walls, such as basement walls, due to the lack of minor movement that is necessary to reduce the applied pressure from the at-rest to the active condition. Any possible surcharge loads should be included in the design of all earth-retaining structures.

5.8 Flexible Pavement

The following recommendations are provided should conventional HMA pavement be desired onsite. Subgrade preparation in pavement areas should be as described in the "Site and Subgrade Preparation" section of this report. The pavement sections recommended in this section are based on procedures contained in the 1993 AASHTO Guide for Design of Pavement Structures.

The design recommendations provided are based on the following:

<table>
<thead>
<tr>
<th>Table 5.8.1 - Flexible Pavement Basis of Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>AASHTO design method</td>
</tr>
<tr>
<td>Level of reliability</td>
</tr>
<tr>
<td>Analysis period</td>
</tr>
<tr>
<td>Low traffic level, no. 18-kip ESAL</td>
</tr>
<tr>
<td>Number of rehabilitation periods during analysis period</td>
</tr>
</tbody>
</table>
The following flexible pavement sections are recommended:

<table>
<thead>
<tr>
<th>Traffic Condition</th>
<th>Standard Duty</th>
<th>Heavy Duty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand subbase thickness, inches</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Aggregate base thickness, inches</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Bituminous leveling course thickness, inches</td>
<td>2.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Bituminous wearing course thickness, inches</td>
<td>1.5</td>
<td>2.0</td>
</tr>
</tbody>
</table>

The following materials are recommended:

<table>
<thead>
<tr>
<th>Sand subbase</th>
<th>MDOT Class II granular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate base</td>
<td>MDOT 21AA</td>
</tr>
<tr>
<td>Bituminous leveling</td>
<td>MDOT 13A</td>
</tr>
<tr>
<td>Bituminous wearing</td>
<td>MDOT 36A</td>
</tr>
</tbody>
</table>

Sand subbase material should be laboratory tested to confirm MDOT Class II grading requirements. MDOT standard specifications for materials and placement should be observed. The binder grade should be a minimum PG 58-22.

Because of the tendency of a clayey subgrade to soften with an increase in moisture, even though it may be relatively stiff in a dry state, it is recommended that cracks that may develop in the pavement be quickly and properly sealed through a regular maintenance program. Also, the subgrade should be sufficiently sloped to provide drainage within the sand subbase and underdrains should be provided within the subbase, at catch basins and pavement edges, to facilitate drainage. At each catch basin, four underdrains with a watertight connection should extend out radially at least 20 ft. A suitable rubberized asphalt sealant should be placed between all concrete curb/HMA joints immediately after paving.
5.9 MBC Seismic Considerations

The seismic design category can be determined with noted exceptions following Section 1613 of the 2015 Michigan Building Code. The Risk Category under Section 1613.3.5 shall be determined by a licensed structural engineer. Based on the subsurface conditions identified in the soil borings, our experience with the geological conditions in the site vicinity and the procedures outlined in Section 1613 of the 2015 Michigan Building Code and Chapter 20, Table 20.3-1 of ASCE 7, we recommend assigning a Site Class D to this site. A Site Class D designates a stiff soil profile in the upper 100 ft with average SPT uncorrected N-values between 15 and 50 in granular soil and average undrained shear strengths, su, between 1,000 and 2,000 psf in cohesive soil. Recommended seismic ground motion values are provided in Table 5.9.1.

<table>
<thead>
<tr>
<th>Table 5.9.1 - Recommended Seismic Ground Motion Values</th>
</tr>
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<tbody>
<tr>
<td>2015 Michigan Building Code Values</td>
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<tr>
<td>Spectral Response Acceleration, Figure 1613.3.1 (1 and 2), %g</td>
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<tr>
<td>Seismic Site Coefficient, Table 1613.3.3 (1 and 2)</td>
</tr>
<tr>
<td>Maximum Considered Spectral Response Acceleration, Equations 16-37 and 16-38</td>
</tr>
<tr>
<td>5% Damped Spectral Response Acceleration, Equations 16-39 and 16-40</td>
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</tbody>
</table>

6.0 CLOSURE

In this report, descriptions of the geotechnical investigation, encountered conditions and recommendations for the design of foundations and pavement have been provided. The limitations of this study are described in the Appendix.

The recommendations presented in this report are based upon a limited number of subsurface samples obtained from various sampling locations. The samples may not fully indicate the nature and extent of the variations that actually exist between sampling locations. For that reason, among others, we strongly recommend that a qualified geotechnical firm be retained to observe earthwork construction. If variations or other latent conditions become
evident during construction, it will be necessary for us to review these conditions and our recommendations as appropriate.
APPENDIX

- Limitations
- Test Drilling and Sampling Procedures
- Boring Log Terminology and Classification Outline
- Boring Logs
- Infiltration Test Results
Soil Variations

The recommendations in this report are based upon the data obtained from the soil borings. This report does not reflect variations which may occur between these borings, and which would not become evident until construction. If variations then become evident, it would be necessary for a re-evaluation of recommendations of this report, after performing on-site observations.

Warranties

We have prepared this report in accordance with generally accepted soil and foundation engineering practices. We make no other warranties, either expressed or implied, as to the professional advice provided under the terms of our agreement and included in this report. This report is prepared exclusively for our client and may not be relied upon by other parties without written consent from our office.

Boring Logs

In the process of obtaining and testing samples and preparing this report, we follow reasonable and accepted practice in the field of soil engineering. Field logs maintained during drilling describe field occurrences, sampling locations, and other information. The samples obtained in the field are subjected to additional testing in the laboratory and differences may exist between the field logs and the final logs. The engineer reviews the field logs and laboratory test data, and then prepares the final boring logs. Our recommendations are based on the contents of the final logs.

Review of Design Plans and Specifications

In the event that any changes in the design of the building or the location, however slight, are planned, our recommendations shall not be considered valid unless modified or approved in writing by our office. We recommend that we be provided the opportunity to review the final design and specifications in order to determine whether changes in the original concept may have affected the validity of our recommendations, and whether our recommendations have, in fact, been implemented in the design and specifications.
Test Drilling and Sampling Procedures

Test Drilling Methods:
- X Hollow stem auger, ASTM D6151
- ___ Mud rotary, ASTM D5783
- ___ Casing advancer, ASTM D5872
- ___ Rock coring, ASTM D2113
- ___ Core/Hand Auger

Note: Cone penetration test data can be used to interpret subsurface stratigraphy and can provide data on engineering properties of soils. The ASTM procedure does not include a procedure for determining soil classification from CPT testing. Soil classifications shown on CPT logs are based on published procedures and are not based on physical ASTM soil classification tests.

Sampling Methods:
- X SPT, ASTM D1586, Auto hammer (140 lb., 30" drop, 2" OD split spoon sampler)
- ___ Thin-walled tube sampler (Shelby), ASTM D1587

Note: The number of hammer blows required to drive the SPT sampler 12 inches, after seating 6 inches, is termed the soil N-value and provides an indication of the soil's relative density and strength parameters at the sample location. SPT blow counts in 6 inch increments are recorded on the boring logs.

Drill Rig:
- ___ CME 55 LC (ATV)
- ___ Acker Renegade (ATV)
- X CME 45 Truck
- ___ Geoprobe 7822 (ATV)
- ___ Geoprobe Rotary Sonic

Boreholes Backfilled With:
- X Excavated soil
- ___ Cement bentonite grout
- ___ Piezometer or Monitoring Well (see notes on logs)
- X Concrete or asphalt patch where appropriate

Sample Handling and Disposition:
- X Samples labeled, placed in jars, returned to MTC Laboratory
- X Discard after 60 days
**GROUNDWATER OBSERVATIONS:**

- **Date and Depth** - Measurements at indicated date
- **End** - indicates water level immediately after drilling
- **Indicates water level encountered during the boring**
- **Date and Depth** - Measurements at indicated date

**TERMS DESCRIBING CONSISTENCY OR CONDITION**

- **COARSE-GRAINED SOILS** (major portions retained on No. 200 sieve): includes (1) clean gravel and sands and (2) silty or clayey gravels and sands. Condition is rated according to relative density as determined by laboratory tests or standard penetration resistance tests.

<table>
<thead>
<tr>
<th>Descriptive Terms</th>
<th>Relative Density</th>
<th>SPT Blow Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very loose</td>
<td>0 to 15 %</td>
<td>&lt; 5</td>
</tr>
<tr>
<td>Loose</td>
<td>15 to 35 %</td>
<td>5 to 10</td>
</tr>
<tr>
<td>Medium dense</td>
<td>35 to 65 %</td>
<td>10 to 30</td>
</tr>
<tr>
<td>Dense</td>
<td>65 to 85 %</td>
<td>30 to 50</td>
</tr>
<tr>
<td>Very dense</td>
<td>85 to 100 %</td>
<td>&gt; 50</td>
</tr>
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</table>

Per ASTM D2487, the following conditions must be met based on laboratory testing to justify the label ‘well graded’ in a soil description.

- **Gravel:** \[ C_{u} = \frac{D_{60}}{D_{10}} \] greater than 4; \[ C_{c} = \frac{(D_{60})^2}{D_{10} D_{20}} \] between 1 and 3
- **Sand:** \[ C_{u} = \frac{D_{60}}{D_{10}} \] greater than 6; \[ C_{c} = \frac{(D_{60})^2}{D_{10} D_{20}} \] between 1 and 3

**FINE-GRAINED SOILS** (major portions passing on No. 200 sieve): includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings, SPT blow count, or unconfined compression tests.

<table>
<thead>
<tr>
<th>Plasticity Chart</th>
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<tbody>
<tr>
<td>LIQUID LIMIT (LL)</td>
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<tr>
<td>0.0</td>
</tr>
<tr>
<td>SPT Blow Count</td>
</tr>
</tbody>
</table>

**SANDS**

- **More than Half Coarse Fraction Is Finer Than No. 4 Sieve**
- **Clean Sands With Less Than 15% Finer**
- **Clayey Sands With or Without Gravel**

**SILTS AND CLAYS**

- **More Than Half Finer**
- **Liquid Limit Greater Than 50%**
- **Organic Silts or Clays of High Plasticity With or Without Sand or Gravel**
- **Organic Silts or Clays of Low Plasticity With or Without Sand or Gravel**

**SILTS AND CLAYS**

- **Liquid Limit Greater Than 50%**
- **Organic Silts or Clays of Medium Plasticity With or Without Sand or Gravel**
- **Organic Silts or Clays of High Plasticity With or Without Sand or Gravel**

**COARSE-GRAINED SOILS**

- **More Than Half Finer**
- **Well Graded Gravels With or Without Sand**
- **Poorly-Graded Gravels With or Without Sand**
- **Silty Gravels With or Without Sand**
- **Clayey Gravels With or Without Sand**
- **Well Graded Sands With or Without Gravel**
- **Poorly-Graded Sands With or Without Gravel**
- **Silty Sands With or Without Gravel**
- **Clayey Sands With or Without Gravel**
- **Inorganic Silts or Clays of High Plasticity With or Without Sand or Gravel**
- **Inorganic Silts or Clays of Low Plasticity With or Without Sand or Gravel**

**HIGHLY ORGANIC SOILS**

- **Peat and Other Highly Organic Soils**

**GENERAL NOTES**

1. Classifications are based on the United Soil Classification System and include consistency, moisture, and color. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate.
2. “Grades with” or “Grades without” may be used to describe soil when characteristics vary within a stratum.
3. Preserved soil samples will be discarded after 60 days unless alternate arrangements have been made.

**SAMPLE TYPES AND NUMBERING**

- **S** - SPT, split barrel sample, ASTM D1586
- **U** - Shelby tube sample, ASTM D1587
- **R** - Rock core run
- **G** - Geoprobe liner
- **L** - SPT with liner, ASTM D1586
- **A** - Auger cuttings

**MINOR COMPONENT QUANTIFYING TERMS**

- **Trace** Less than 1%
- **Few** 1 to 10%
- **Little** 10 to 25%
- **Some** 25 to 40%
- **Mostly** 40 to 100%

**GRAIN SIZE**

- **Boulder** >12" 3" to 7" 1.5" to 3.75" 0.75" to 1.5" 0.375" to 0.75"
- **Sand** No. 4 to No. 70 0.075" to 0.375" 0.0625" to 0.075" 0.03125" to 0.0625" 0.015625" to 0.03125"

**COARSE GRAVEL**

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<thead>
<tr>
<th>Grain Size</th>
<th>Description</th>
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<tr>
<td>Cobble</td>
<td>3&quot; to 7&quot;</td>
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<tr>
<td>Coarse Gravel</td>
<td>1.5&quot; to 3.75&quot;</td>
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<tr>
<td>Fine Gravel</td>
<td>0.75&quot; to 1.5&quot;</td>
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<tr>
<td>Coarse Sand</td>
<td>No. 4 to No. 70</td>
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<tr>
<td>Medium Sand</td>
<td>No. 10 to No. 40</td>
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<tr>
<td>Fine Sand</td>
<td>No. 40 to No. 200</td>
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</table>
**LOG OF BORING**

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 45  
**Crew Chief:** ZM  
**Field Eng.:** JS  
**Rev. By:** AD  
**Coordinates:** N=367853.0 E=13443979.5 (MI South ft)  
**Elevation:** 674.6 ft  
**Datum:** NAVD 88 (GPS Observation)  

**Notes:**

Plugging Record: Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 10.0 ft.  
Depth Drilled: 25.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

<table>
<thead>
<tr>
<th>Elev. FT.</th>
<th>Depth FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
<th>Penetration (Blows Per 6&quot;)</th>
<th>USCS Group Symbol</th>
<th>*DESCRIPTION</th>
<th>QP taf</th>
<th>MST %</th>
<th>DD pcf</th>
<th>REMARKS</th>
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<tbody>
<tr>
<td>673.6</td>
<td>1</td>
<td>S-1</td>
<td>1.5</td>
<td>CL 4-4</td>
<td></td>
<td>Gray sandy lean CLAY; mostly clayey fines, some coarse to fine sand, few coarse to fine gravel, moist. Fill, with organic silt lenses</td>
<td>4.25</td>
<td></td>
<td></td>
<td>Fill: 0.0 to 2.5'±</td>
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<tr>
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<td>1.5</td>
<td>CL 2-3</td>
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<tr>
<td>671.6</td>
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<td>Grades brown</td>
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<td>Grades gray</td>
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<td>CL 5-9-12</td>
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<td>CL 5-8-12</td>
<td></td>
<td></td>
<td>4.25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.*
**LOG OF BORING**

Project: Lume Development - 1949 12 Mile Road  
Client: Lume Cannabis Co.  
Location: Berkley, Michigan  
Drill Type: CME 45  
Crew Chief: ZM  
Field Eng.: JS  
Rev. By: AD  
Coordinates: N=367803.3 E=13443989.3 (MI South ft)  
Elevation: 674.5 ft  
Datum: NAVD 88 (GPS Observation)  

**Notes:**  
Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 12.0 ft.  
Depth Drilled: 25.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%  
QP = Calibrated Penetrometer (tons/sq. ft.)

<table>
<thead>
<tr>
<th>Elev. FT.</th>
<th>Depth FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
<th>Penetration (Blows Per 6&quot;)</th>
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<th>*DESCRIPTION</th>
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<th>MST %</th>
<th>DD pcf</th>
<th>REMARKS</th>
</tr>
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<td>4-3-3</td>
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<td>0.8</td>
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<td></td>
<td>Fill: 0.0 to 5.5'±</td>
</tr>
<tr>
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<td>S-1</td>
<td>1.5</td>
<td>4-3-3</td>
<td>CL</td>
<td>Brown lean CLAY with sand; mostly clayey fines, little coarse to fine sand, moist, Fill</td>
<td>1.8</td>
<td></td>
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<td>Grades gray with trace fine gravel</td>
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* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.
<table>
<thead>
<tr>
<th>Elev. FT.</th>
<th>Depth FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
<th>Penetration (Blows Per 6&quot;)</th>
<th>Group Symbol</th>
<th>*DESCRIPTION</th>
<th>QP</th>
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<th>DD</th>
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*Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.*
### LOG OF BORING

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 45  
**Crew Chief:** ZM  
**Field Eng.:** JS  
**Rev. By:** AD  
**Coordinates:** N=367891.0 E=13444080.9 (MI South ft)  
**Elevation:** 675.5 ft  
**Datum:** NAVD 88 (GPS Observation)  

---

**Notes:**  
Plugging Record: Backfilled borehole with compacted cuttings. Cave in at 14.0 ft.  

---

**Depth Drilled:** 25.0 ft.  
**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%  
**QP = Calibrated Penetrometer (tons/sq. ft.)**

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<th>*DESCRIPTION</th>
<th>QP taf</th>
<th>MST %</th>
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* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.
**LOG OF BORING**

**Project:** Lume Development - 1949 12 Mile Road

**Client:** Lume Cannabis Co.

**Location:** Berkley, Michigan

**Drill Type:** CME 45

**Crew Chief:** ZM  
**Field Eng.:** JS  
**Rev. By:** AD

**Coordinates:** N=367858.7 E=13444172.1 (MI South ft)

**Elevation:** 673.8 ft  
**Datum:** NAVD 88 (GPS Observation)

**Notes:**
- Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 13.5 ft.

---

**Date Begin:** 03/17/2022  
**Date End:** 03/17/2022

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**Plugging Record:** Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 13.5 ft.

**Depth Drilled:** 25.0 ft.

---

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP** = Calibrated Penetrometer (tons/sq. ft.)

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* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.
### LOG OF BORING

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 45

**Crew Chief:** ZM  
**Field Eng.:** JS  
**Rev. By:** AD

**Date Begin:** 03/17/2022  
**Date End:** 03/17/2022

**Coordinates:** N=367828.7 E=13444169.1 (MI South ift)  
**Elevation:** 673.4 ft  
**Datum:** NAVD 88 (GPS Observation)

### Notes:

Plugging Record: Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 13.0 ft.  

Depth Drilled: 25.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP** = Calibrated Penetrometer (tons/sq. ft.)

*Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.*

<table>
<thead>
<tr>
<th>Elev. FT.</th>
<th>Depth FT.</th>
<th>Sample Number</th>
<th>Recov. FT.</th>
<th>Penetration (Blows Per 6&quot;)</th>
<th><em>USCS Group Symbol</em></th>
<th><em>DESCRIPTION</em></th>
<th>QP taf</th>
<th>MST %</th>
<th>DD pcf</th>
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**End of Boring**
**LOG OF BORING**

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 45  
**Crew Chief:** ZM  
**Field Eng.:** JS  
**Rev. By:** AD

**Coordinates:** N=367817.7 E=13444111.8 (MI South ft)  
**Elevation:** 675.3 ft  
**Datum:** NAVD 88 (GPS Observation)

**Notes:**  
Plugging Record: Backfilled borehole with compacted cuttings.

**Depth Drilled:** 25.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%

**QP = Calibrated Penetrometer (tons/sq. ft.)**

<table>
<thead>
<tr>
<th>Depth FT.</th>
<th>Sample Number</th>
<th>Penetration (Blows Per 6&quot;)</th>
<th>*USCS Group Symbol</th>
<th>*DESCRIPTION</th>
<th>QP taf</th>
<th>MST %</th>
<th>DD pcf</th>
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<td>Brown sandy lean CLAY; mostly clayey fines, some coarse to fine sand, moist, Fill with asphalt fragments</td>
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<td>Gray lean CLAY; mostly clayey fines, few coarse to fine sand, moist</td>
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<td>Gray lean CLAY; mostly clayey fines, few coarse to fine sand, moist</td>
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**Date Begin:** 03/16/2022  
**Date End:** 03/16/2022

**Tooling:**
- Casing: HSA 3 1/4" During None
- Sampler: SPT 2" End NA
- Core: Seepage
- Tube: Date Depth, ft.
- SPT Hammer: Auto

**Plugging Record:**
- Backfilled borehole with compacted cuttings.

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.
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<tr>
<th>Elev. FT.</th>
<th>Depth FT.</th>
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<td>3-4-5</td>
<td>CL</td>
<td>4&quot; HMA, 4&quot; Gravel Base</td>
<td>0.7</td>
<td>4.5</td>
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<tr>
<td>671.4</td>
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<td>Fill: 0.0 to 2.5'±</td>
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<tr>
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<tr>
<td>669.4</td>
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<td>S-2</td>
<td>1.0</td>
<td>4-2-3</td>
<td>CL</td>
<td>Gray lean CLAY with sand; mostly clayey fines, little coarse to fine sand, moist</td>
<td>2.75</td>
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<td></td>
<td>S-2, S-7: Poor recovery; possible coarse gravel / COBBLE</td>
</tr>
<tr>
<td>668.4</td>
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<td>7</td>
<td>S-3</td>
<td>1.5</td>
<td>4-6-10</td>
<td>N=16</td>
<td>Brown lean CLAY; mostly clayey fines, few coarse to fine sand, moist</td>
<td>4.5+</td>
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<td>665.4</td>
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<tr>
<td>659.4</td>
<td>14</td>
<td>S-5</td>
<td>1.5</td>
<td>4-6-11</td>
<td>N=17</td>
<td>Grades gray</td>
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<td>1.5</td>
<td>5-8-9</td>
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<td>S-7</td>
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<td>5-7-10</td>
<td>N=17</td>
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<td>4.0</td>
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<td>25.0</td>
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</tbody>
</table>

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.
**LOG OF BORING**

**Project:** Lume Development - 1949 12 Mile Road  
**Client:** Lume Cannabis Co.  
**Location:** Berkley, Michigan  
**Drill Type:** CME 45  
**Crew Chief:** ZM  
**Field Eng.:** JS  
**Rev. By:** AD

**Coordinates:** N=367794.6 E=13444183.4 (MI South ft)  
**Elevation:** 672.9 ft  
**Datum:** NAVD 88 (GPS Observation)

**Notes:**  
Plugging Record: Backfilled borehole with compacted cuttings, patched pavement with cold patch. Cave in at 12.0 ft.

**Date Begin:** 03/16/2022  
**Date End:** 03/16/2022

**Tooling Type** | **Dia.** | **Groundwater, ft.**  
--- | --- | ---  
Casing | HSA | 3 1/4" | During | None  
Sampler | SPT | 2" | End | NA  
Core | | | Core | Seepage  
Tube | | | Tube | Date | Depth, ft.  
SPT Hammer | Auto | &gt;4.5 |  

**Depth Drilled:** 25.0 ft.

**Component Percentages:** Trace < 5%, Few 5-10%, Little 15-25%, Some 30-45%, Mostly 50-100%  
**QP** = Calibrated Penetrometer (tons/sq. ft.)

| Elev. FT. | Depth FT. | Sample Number | Recov. FT. | Penetration (Blows Per 6") ASTM D 1586 | *USCS Group Symbol* | *DESCRIPTION* | QP taf | MST % | DD pcf | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 671.9 | 1 | S-1 | 0.4 | 3-2-4 | SP-SC | Brown poorly graded SAND with clay; mostly coarse to fine sand, few clayey fines, moist, fill, with wood fragments | 1.0 | 3.5 | 8.0 | Fill: 0.0 to 1.5'±  
S-1, S-3, S-7: Poor recovery; possible coarse gravel / COBBLE |
| 670.9 | 2 | S-1 | 0.4 | 3-2-4 | N=6 | | 1.5 | | |  |
| 669.9 | 3 | S-2 | 1.5 | 6-4-4 | CL | Gray lean CLAY with sand; mostly clayey fines, little coarse to fine sand, moist | 3.5 | | 8.0 | |  
| 666.9 | 6 | S-3 | 0.5 | 16-20-24 | N=44 | | | | | |
| 664.9 | 8 | S-4 | 1.5 | 8-8-14 | N=22 | | | | |  
| 662.9 | 10 | S-4 | | | | | | | |  
| 661.9 | 11 | | | | | | | | |  
| 660.9 | 12 | | | | | | | | |  
| 659.9 | 13 | | | | | | | | |  
| 658.9 | 14 | S-5 | 1.5 | 7-7-9 | CL | Grades gray with trace coarse to fine gravel | 4.5+ | | |  
| 657.9 | 15 | S-5 | | | | | | | |  
| 656.9 | 16 | | | | | | | | |  
| 655.9 | 17 | | | | | | | | |  
| 654.9 | 18 | | | | | | | | |  
| 653.9 | 19 | | | | | | | | |  
| 652.9 | 20 | S-6 | 1.5 | 6-7-10 | N=17 | | | | |  
| 651.9 | 21 | | | | | | | | |  
| 650.9 | 22 | | | | | | | | |  
| 649.9 | 23 | | | | | | | | |  
| 648.9 | 24 | | | | | | | | |  
| 647.9 | 25 | S-7 | 0.4 | 9-10-11 | N=21 | | | | |  
| 644.6 | 26 | | | | | | | | |  

**End of Boring**

---

* Visual estimate following ASTM D 2488 unless laboratory testing has been performed. Stratification changes are approximated between samples.
Double Ring Infiltration Test

Activity Information

Weather: Partly Cloudy
Low / High Temp, °F: 41 / 63
Activity Date: 03/16/2022
Test No.: IT-1

Tested By: Schaap, Jonathan

DOUBLE RING INFILTRATION TEST - SEMCOG METHOD

Pre-Test Soaking Duration (min): 60
Water Level Drop in Last 30 Minutes of Presoak (in): 0
Inner Diameter (in): 4
Outer Diameter (in): 6

Soil Description: Brown lean CLAY (CL)

Test Data

<table>
<thead>
<tr>
<th>Time (min:sec)</th>
<th>Water Drop (in)</th>
<th>Time Interval (min)</th>
<th>Infiltration Rate (inches per hour)</th>
</tr>
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</tr>
<tr>
<td>120:00</td>
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</tr>
</tbody>
</table>

Note: This test method provides a measure of infiltration rate, not hydraulic conductivity. Although the units of infiltration rate, and hydraulic conductivity are similar, there is a distinct difference between these two quantities. They cannot be directly related unless the hydraulic boundary conditions, such as hydraulic gradient and the extent of lateral flow of water are known or can be reliably estimated. Test results apply only to the specific test location, depth/elevation, and in-situ moisture content and density at time of test. An appropriate factor of safety should be applied to these results.

Remarks: NA
### DOUBLE RING INFILTRATION TEST - SEMCOG METHOD

**Pre-Test Soaking Duration (min):** 60

**Water Level Drop in Last 30 Minutes of Presoak (in):** 0

**Inner Diameter (in):** 4

**Outer Diameter (in):** 6

**Soil Description:** Brown lean CLAY (CL)

<table>
<thead>
<tr>
<th>Time (min:sec)</th>
<th>Water Drop (in)</th>
<th>Time Interval (min)</th>
<th>Infiltration Rate (inches per hour)</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>120:00</td>
<td>0</td>
<td>30</td>
<td>0</td>
</tr>
</tbody>
</table>

**Ground Surface Elev. (ft):** 674.4  
**Test Elev. (ft):** 667.7  
**Groundwater Elev. (ft):** NA

---

**Note:** This test method provides a measure of infiltration rate, not hydraulic conductivity. Although the units of infiltration rate and hydraulic conductivity are similar, there is a distinct difference between these two quantities. They cannot be directly related unless the hydraulic boundary conditions, such as hydraulic gradient and the extent of lateral flow of water are known or can be reliably estimated. Test results apply only to the specific test location, depth/elevation, and in-situ moisture content and density at time of test. An appropriate factor of safety should be applied to these results.

**Remarks:** NA
Double Ring Infiltration Test

Client: Lume Cannabis Co.
Project: 211705

Activity Information
Weather: Partly Cloudy
Low / High Temp, °F: 40 / 71
Tested By: Schaap, Jonathan
Activity Date: 03/17/2022
Test No.: IT-4

DOUBLE RING INfiltrATION TEST - SEMCOG METHOD

Pre-Test Soaking Duration (min): 60
Water Level Drop in Last 30 Minutes of Presoak (in): 0
Inner Diameter (in): 4
Outer Diameter (in): 6

Soil Description: Gray sandy lean CLAY (CL)

Test Data

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<th>Time (min:sec)</th>
<th>Water Drop (in)</th>
<th>Time Interval (min)</th>
<th>Infiltration Rate (inches per hour)</th>
</tr>
</thead>
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Note: This test method provides a measure of infiltration rate, not hydraulic conductivity. Although the units of infiltration rate and hydraulic conductivity are similar, there is a distinct difference between these two quantities. They cannot be directly related unless the hydraulic boundary conditions, such as hydraulic gradient and the extent of lateral flow of water are known or can be reliably estimated. Test results apply only to the specific test location, depth/elevation, and in-situ moisture content and density at time of test. An appropriate factor of safety should be applied to these results.

Remarks: NA
Double Ring Infiltration Test

Activity Information
Weather: Partly Cloudy  Low / High Temp, °F: 40 / 71  
Activity Date: 03/17/2022  
Test No.: IT-5

Tested By: Schaap, Jonathan

DOUBLE RING INFILTRATION TEST - SEMCOG METHOD

Pre-Test Soaking Duration (min): 60  
Water Level Drop in Last 30 Minutes of Presoak (in): 0  
Inner Diameter (in): 4  
Outer Diameter (in): 6  

Ground Surface Elev. (ft): 673.7  
Test Elev. (ft): 666.7  
Groundwater Elev. (ft): NA  

Soil Description: Brown lean CLAY (CL)

<table>
<thead>
<tr>
<th>Time (min:sec)</th>
<th>Water Drop (in)</th>
<th>Time Interval (min)</th>
<th>Infiltration Rate (inches per hour)</th>
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</table>

Note: This test method provides a measure of infiltration rate, not hydraulic conductivity. Although the units of infiltration rate, and hydraulic conductivity are similar, there is a distinct difference between these two quantities. They cannot be directly related unless the hydraulic boundary conditions, such as hydraulic gradient and the extent of lateral flow of water are known or can be reliably estimated. Test results apply only to the specific test location, depth/elevation, and in-situ moisture content and density at time of test. An appropriate factor of safety should be applied to these results.

Remarks: NA
Double Ring Infiltration Test

Activity Information

Weather: Partly Cloudy

Low / High Temp, °F: 40 / 71

Activity Date: 03/17/2022

Tested By: Schaap, Jonathan

Test No.: IT-6

DOUBBLE RING INfiltrATION TEST - SEMCOG METHOD

Pre-Test Soaking Duration (min): 60

Water Level Drop in Last 30 Minutes of Presoak (in): 0

Inner Diameter (in): 4

Outer Diameter (in): 6

Ground Surface Elev. (ft): 673.5

Test Elev. (ft): 666.7

Groundwater Elev. (ft): NA

Soil Description: Brown lean CLAY (CL)

Test Data

<table>
<thead>
<tr>
<th>Time (min:sec)</th>
<th>Water Drop (in)</th>
<th>Time Interval (min)</th>
<th>Infiltration Rate (inches per hour)</th>
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Note: This test method provides a measure of infiltration rate, not hydraulic conductivity. Although the units of infiltration rate, and hydraulic conductivity are similar, there is a distinct difference between these two quantities. They cannot be directly related unless the hydraulic boundary conditions, such as hydraulic gradient and the extent of lateral flow of water are known or can be reliably estimated. Test results apply only to the specific test location, depth/elevation, and in-situ moisture content and density at time of test. An appropriate factor of safety should be applied to these results.

Remarks: NA
Activity Information
Weather: Partly Cloudy
Low / High Temp, °F: 41 / 63
Activity Date: 03/16/2022
Test No.: IT-8
Tested By: Schaap, Jonathan

DOUBLE RING INFILTRATION TEST - SEMCOG METHOD

Pre-Test Soaking Duration (min): 60
Water Level Drop in Last 30 Minutes of Presoak (in): 0
Inner Diameter (in): 4
Outer Diameter (in): 6

Soil Description: Gray lean CLAY with sand (CL)

<table>
<thead>
<tr>
<th>Time (min:sec)</th>
<th>Water Drop (in)</th>
<th>Time Interval (min)</th>
<th>Infiltration Rate (inches per hour)</th>
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</table>

Note: This test method provides a measure of infiltration rate, not hydraulic conductivity. Although the units of infiltration rate, and hydraulic conductivity are similar, there is a distinct difference between these two quantities. They cannot be directly related unless the hydraulic boundary conditions, such as hydraulic gradient and the extent of lateral flow of water are known or can be reliably estimated. Test results apply only to the specific test location, depth/elevation, and in-situ moisture content and density at time of test. An appropriate factor of safety should be applied to these results.

Remarks: NA
Activity Information

Weather: Partly Cloudy
Low / High Temp, °F: 41 / 63
Activity Date: 03/16/2022
Test No.: IT-9
Tested By: Schaap, Jonathan

DOUBLE RING INFILTRATION TEST - SEMCOG METHOD

Pre-Test Soaking Duration (min): 60
Ground Surface Elev. (ft): 673.0
Water Level Drop in Last 30 Minutes of Presoak (in): 0
Test Elev. (ft): 671.2
Inner Diameter (in): 4
Groundwater Elev. (ft): NA
Outer Diameter (in): 6
Soil Description: Gray lean CLAY with sand (CL)

<table>
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<th>Water Drop (in)</th>
<th>Time Interval (min)</th>
<th>Infiltration Rate (inches per hour)</th>
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<tr>
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</table>

Note: This test method provides a measure of infiltration rate, not hydraulic conductivity. Although the units of infiltration rate, and hydraulic conductivity are similar, there is a distinct difference between these two quantities. They cannot be directly related unless the hydraulic boundary conditions, such as hydraulic gradient and the extent of lateral flow of water are known or can be reliably estimated. Test results apply only to the specific test location, depth/elevation, and in-situ moisture content and density at time of test. An appropriate factor of safety should be applied to these results.

Remarks: NA
DECLARATION OF EASEMENTS

THIS DECLARATION OF EASEMENTS ("Declaration") is made this ___ day of ____________, 2022 (the “Effective Date”), by MONARCH ACQUISITIONS, LLC, a Michigan limited liability company, whose mailing address is ___________________________, Michigan ______ (“Declarant”).

Background

Declarant is the owner of (i) the parcel of land described on Exhibit “A” ("Burdened Parcel") and the parcel of land described on Exhibit “B” (the “Benefitted Parcel”). The Burdened Parcel and the Benefitted Parcel are collectively referred to as the “Parcels”.

Declarant is in the process of developing the Parcels (the “Project”) in accordance with and subject to the terms of certain approvals and permits that have been granted by the City of Berkley (the “City”). In connection with development of the Project, and as contemplated by the approvals, Declarant wishes to establish parking and a storm water drainage system, for use and benefit of the Burdened Parcel and the Benefitted Parcel.

Declarant hereby declares, grants and establishes the parking and storm water drainage easements in accordance with, and subject to, the terms and conditions set forth herein.

Easements

NOW, THEREFORE, for and in consideration of the sum of $10.00, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Declarant hereby declares as follows:

1. DEFINITIONS. In addition to other terms defined herein, when used in this Declaration, the capitalized term:

   a. “Owner” means the record owner from time to time (whether one or more persons) of title to a Parcel, or portion thereof, but excluding those holding title solely as security for the performance of an obligation.

   b. “Permitted Users” means, as to a Parcel, the Owner and the tenants and occupants of that Parcel, and the respective employees, agents, contractors, customers, guests, invitees and licensees of (a) the Owner of a Parcel, and (b) the tenants and occupants of that Parcel.

2. STORM WATER DRAINAGE EASEMENT AND AGREEMENT FOR STORM WATER SYSTEM MAINTENANCE. Declarant hereby declares, establishes and grants to all current and future Owners of the Benefitted Parcel and its respective Permitted Users, a permanent and nonexclusive easement for establishment of, and use of, a storm water drainage system that shall be located on, over, across and upon the Burdened Parcel (collectively the “Storm Water Drainage Easement”). For clarity, the Burdened Parcel shall also be connected to and shall utilize the storm water drainage system. The storm water drainage system shall be established, installed and constructed on the Parcels by the Declarant, at its sole cost and
expense, in accordance with and subject to the terms and conditions of the approvals, including
the site plan approval, granted by the City. The Owner of the Benefitted Parcel shall be solely
and exclusively responsible for repairs, maintenance and replacement of the storm water
drainage system, which shall include without limitation, maintaining the storm water system in
strict compliance with the Agreement for Storm Water System Maintenance which is attached
hereeto as Exhibit “C”. The Owner of the Burdened Parcel shall not change or modify the storm
water drainage system without the approval of the City and the Owner of the Benefitted Parcel.

3. PARKING EASEMENT. Declarant hereby declares, establishes and grants to
all current and future Owners of the Benefitted Parcel and its respective Permitted Users, a
permanent and nonexclusive easement for parking, pedestrian and vehicular passage over, across
and upon the Burdened Parcel (collectively the “Parking Easement”). The parking areas,
drives, walks and connections shall be established, installed and constructed on the Burdened
Parcel by the Declarant in accordance with and subject to the terms and conditions of the
approvals, including the site plan approval, granted by the City. The Owner of the Benefitted
Parcel shall be responsible for snow and ice removal, and for repairs, maintenance and
replacement of improvements established on the Burdened Parcel. The Owner of the Burdened
Parcel shall not materially change or modify the improvements established on the Burdened
Parcel without the approval of the City and the Owner of the Benefitted Parcel and shall not
obstruct or unreasonably prevent use of the easement by the Permitted Users.

4. INDEMNITY. Each Owner (“Indemnitor Owner”) shall protect, defend,
indemnify and hold the other Owners (each an “Indemnitee Owner” and collectively the
“Indemnitee Owners”) harmless from and against all claims, demands, injuries, liabilities,
losses, damages, costs and expenses (including reasonable attorneys’ fees and costs) arising from
or relating to (A) injuries to persons or property arising out of or in connection with this
Declaration to the extent caused by the negligence or willful misconduct of the Indemnitor
Owner or its employees, agents, contractors or Permitted Users, and/or (B) such Indemnitor
Owner’s failure to perform its obligations under this Declaration.

5. INSURANCE. Each Owner shall procure and at all times maintain general
and/or comprehensive public liability and property damage insurance against claims for personal
injury, death or property damage occurring upon such Owner’s Parcel as may be required by
Declarant, with single limit coverage of not less than an aggregate of Two Million Dollars
($2,000,000) subject to any increases required by Declarant from time to time. The Owners shall
deliver a certificate evidencing the coverage required hereunder to Declarant upon the request of
Declarant from time to time.

6. RUN WITH THE LAND. The rights, easements and covenants established
herein for the benefit of each Parcel shall be appurtenant to title to each Parcel, shall be burdened
upon and shall run with the title to each Parcel and shall be perpetual and shall continue in full
force and effect forever, and shall be binding upon and inure to the benefit of Declarant, its
grantees, successors and assigns.

7. SUCCESSORS AND ASSIGNS. The agreements contained herein and the
rights granted hereby shall bind and inure to the benefit of the parties hereto and their respective
successors, assigns, heirs, and personal representatives.
8. **COMPLIANCE WITH LAW.** Each Owner, in exercising their privileges granted by this Declaration, shall comply with all applicable federal, state, county and municipal laws, ordinances and regulations.

9. **NOTICE.** All notices given or made pursuant to this Declaration shall be made in writing and shall be deemed given upon: (i) upon receipt if given by personal delivery; (ii) upon receipt, if given by United States certified mail, return receipt requested, with postage prepaid; or (iii) one (1) day after the sender’s deposit of the notice with a recognized overnight carrier (such as Federal Express or United Parcel Service), charges prepaid. Notices shall be addressed to an Owner at its last known mailing address.

10. **GOVERNING LAW.** This Declaration shall be governed by, interpreted in accordance with, and enforceable under, the laws of the State of Michigan.

11. **ENTIRE AGREEMENT.** This document constitutes the entire agreement between any Owner, regarding the subject matter hereof and it shall not be amended, altered or changed except by a written agreement signed by all persons who are Owners at the time of such.

12. **NON-MERGER.** So long as Declarant, or any other Owner, is the Owner of the Parcel or any part thereof, now or in the future, this Declaration shall not be subject to the doctrine of merger.

13. **MISCELLANEOUS.** The headings of the paragraphs contained herein are inserted only as a matter of convenience and for reference and in no way define, limit or describe the scope or intent of this document nor in any way affect the terms and provisions hereof, and shall not be used to interpret the agreements contained herein or the rights granted hereby. Time is of the essence in this Declaration. All pronouns and any variation thereof shall be deemed to include and refer to the masculine, feminine, neuter, singular or plural form of the word used, as the identity of the party or parties, or their personal representatives, successors, or assigns may require. If any provision of this Declaration, or the application thereof to any person or circumstances, shall for any reason and to any extent be invalid or unenforceable, the remainder of this Declaration and the application of such provision to other persons or circumstances shall not be affected thereby but rather shall be enforced to the greatest extent permitted by law.

*<Signature Page Follows>*
IN WITNESS WHEREOF, the parties have executed this Declaration the day and year first above written.

DECLARANT:

Monarch Acquisitions, LLC,
a Michigan limited liability company

By:__________________________
Name:__________________________
Title:__________________________

STATE OF MICHIGAN )
COUNTY OF OAKLAND )

Acknowledged before me this _____ day of __________, 2022, by ________________, as _________ of Monarch Acquisitions LLC, a Michigan limited liability company, on behalf of the limited liability company.

My commission expires: __________________________

_____________________________________
Notary Public, State of Michigan
Notary ID #: ___________________________
Print Notary Name: ______________________

THIS INSTRUMENT PREPARED BY
AND WHEN RECORDED RETURN TO:

J. Patrick Lennon
Honigman LLP
650 Trade Centre Way
Suite 200
Kalamazoo, Michigan 49002
EXHIBIT “A”

BURDENED PARCEL

Land located in the City of Berkley, County of Oakland and State of Michigan being more particularly described as follows:

Lot numbers 44 through 55, inclusive, Stephenson-Barbers Roseland Subdivision as recorded in Liber 31 of Plats, Page 5 Oakland County records. Also, all of the east-west 20 foot wide public alley abutting the south side of said lots.

Parcel No. 25-17-126-002
EXHIBIT “B”

BENEFITTED PARCEL

Land located in the City of Berkley, County of Oakland and State of Michigan being more particularly described as follows:

Lot numbers 32 through 43, inclusive, Stephenson-Barbers Roseland Subdivision as recorded in Liber 31 of Plats, Page 5 Oakland County records. Also, all of the east-west 20 foot wide public alley abutting the south side of said lots.

Parcel No. 25-17-126-003
EXHIBIT “C”

AGREEMENT OF STORM WATER SYSTEM MAINTENANCE
AGREEMENT FOR
STORM WATER SYSTEM MAINTENANCE

This Agreement is made on ___________________________ , by ___________________________ (“Developer”), a (corporation, limited liability company, partnership) whose address is ___________________________ ; and the CITY OF BERKLEY (the “City”), whose address is 3888 Coolidge Hwy, Berkley, MI 48879.

WHEREAS, Developer owns and proposes to develop the Property described in attached Exhibit A; and

WHEREAS, the proposed development of the Property will alter the natural flow of surface and storm water drainage; and

WHEREAS, Developer has proposed, and the City has approved, a storm water management system (the “System”) as described and depicted in the plan attached as Exhibit B; and

WHEREAS, the parties will benefit from the proper operation, use, and maintenance of the System and enter into this agreement to provide for the same.

THEREFORE, the parties agree:

1. Use of the System:

Components of the System, including any and all water conveyance, detention and water quality treatment facilities and devices, pumping system, storm sewer pipe, catch basins, manholes, end-sections, ditches, swales, open water courses and rip-rap, shall be used solely for the purpose of conveying, detaining and treating storm and surface drainage on the property until such time as: (i) The City determines and notifies Developer or Developer’s successors, grantees or assigns, in writing, that it is no longer necessary to convey, detain or treat the storm and surface drainage; and (ii) An adequate alternative for conveying, detaining and treating storm and surface drainage has been provided which is acceptable to the City and which includes the granting of any easements to the City or third parties as may be required or necessary for the alternative drainage system.

2. Maintenance:

A. Developer shall be responsible for the proper maintenance, repair and replacement of the System and all parts thereof as detailed in the Maintenance Plan attached as Exhibit C.
B. Proper maintenance of the System shall include, but is not limited to: (i) Removing accumulated sediment, trash and debris from the detention basin and at inlet pipes; (ii) Managing deleterious vegetative growth; (iii) Maintaining storm sewer, structures, end-sections and safety features; (iv) Controlling the effects of erosion; (v) Inspection and cleaning of the water quality treatment device; (vi) Inspection of inlet and outlet pipes for structural integrity; (vii) Inspection and replacement of riprap at inlet pipes; (viii) Inspection and cleaning of the storm sewer and catch basins upstream from the detention basin; (ix) Inspection and replacement of stone around the outlet pipe; and (vi) Any other maintenance that is reasonable and necessary to facilitate and continue the proper operation and use of the System.

3. **Action by City:**

If, at any time, Developer or Developer’s successors, grantees or assigns neglect or fail to properly maintain the System or any part thereof, the City may notify Developer or Developer’s successors, grantees or assigns. The notice shall be in writing and shall list and describe maintenance deficiencies and demand that they be corrected within thirty (30) days.

The notice shall further specify a date and place for a hearing to be held at least fourteen (14) days after the date of the notice before the City Council, or such other board or official as the City Council may designate. At the hearing, the City Council (or other designated board or official) may affirm or modify the list and description of maintenance deficiencies and, for good cause shown, may extend the time for the deficiencies to be corrected.

Thereafter, if the maintenance deficiencies are not corrected within the time allowed, the City may undertake the necessary corrective actions, and the City may maintain the System for up to one (1) year. Such maintenance of the System by the City shall not be construed to be a trespass or a taking of the Property, nor shall the City’s actions vest in the public any right to enter or use the Property. Thereafter, if Developer or Developer’s successors, grantees or assigns do not properly maintain the System, the City may, after providing similar written notice, schedule and hold another hearing to determine whether the City should maintain the System for another year, and subject to a similar notice, hearing and determination, in subsequent years.

In the event the City determines an emergency or public nuisance condition caused by or relating to the System threatens the public health, safety or general welfare, the City shall have the right to immediately and without notice enter the Property and undertake appropriate corrective action.

4. **Charges:**

The City shall charge to the current owner of the Property the cost of maintenance or other corrective action undertaken by the City under this agreement, plus a ten percent (10%) administrative fee. If not timely paid, the City may place the charges on the City’s tax roll, which charges shall be a lien on the Property and shall be collectable and enforceable in the same manner general property taxes are collected and enforced.

5. **Notice:**

Any notices required under this agreement shall be sent by certified mail to the address for each party set forth below, or to such other addresses as such party may notify the other parties in writing:

To ___________________________:

__________________________________

2
To the City:

City Manager
City of Berkley
3888 Coolidge Hwy
Berkley, MI 48879

6. **Successors and Assigns:**

This agreement shall bind and inure to the benefit of the parties and their respective successors, grantees and assigns. The benefits, burdens, rights, obligations and responsibilities hereunder shall run with the land and shall bind all current and future owners of the Property and any divisions thereof.

7. **Recording of Agreement:**

This agreement shall be recorded at the Oakland County Register of Deeds.

By: ____________________________

Its: ____________________________

CITY OF BERKLEY

By: ____________________________

Matthew Baumgarten, City Manager

STATE OF MICHIGAN

:SS

COUNTY OF ________

This agreement was acknowledged before me on ________, by ____________________________ of ____________________________ on behalf of the ____________________________.

______________________________
Notary public

County, Michigan

My commission expires: __________

STATE OF MICHIGAN

:SS

COUNTY OF OAKLAND

This agreement was acknowledged before me on ________, by Matthew Baumgarten, City Manager, of the City of Berkley, on behalf of the City.

______________________________
Notary public

County, Michigan

My commission expires: __________

Drafted by:
John D. Staran, Esq.
2055 Orchard Lake Road
Sylvan Lake, MI 48320

When Recorded Return to:
City Clerk
City of Berkley
3888 Coolidge Hwy.
Berkley, MI 48879

3
NOTICE OF PUBLIC MEETING
BERKLEY PLANNING COMMISSION

NOTICE IS HEREBY GIVEN, in accordance with Section 138-528 and Section 30-806 of the Berkley City Code, that there will be a meeting of the Berkley Planning Commission to be held at the City of Berkley in the Council Chambers, 3338 Coolidge Hwy, Berkley Michigan, on Tuesday, May 24, 2022 at 7:10 pm, or as near thereto as the matter may be reached.

APPLICATION PSP-03-22

Christopher Enright, on behalf of David Farbman, 1949 Twelve Mile Rd., Parcels #25-17-126-002 and #25-17-126-003, is requesting site plan approval for the conversion of 6,764 square feet of the existing building to a retail marihuana dispensary and office use for the remaining 17,677 square feet.

Complete application information is available for review at www.berkleymich.org/urbanplanning.

Comments regarding the request may be made in person on the night of the meeting or may be made in writing. All written comments must be submitted to the Building Department or email to comdirector@berkleymich.net before 5:00p.m on the date of the Planning Commission meeting.

You can watch the meeting: https://www.berkleymich.org/livestream/index.php

MEGAN MASSON-MINOCK
INTERIM COMMUNITY DEVELOPMENT DIRECTOR
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You can watch the meeting: https://www.berkleymich.org/livestream/index.php

MEGAN MASSON-MINOCK
INTERIM COMMUNITY DEVELOPMENT DIRECTOR

Publish Once:
Royal Oak Tribune
Friday, May 6, 2022
DOROTHY ROY
ROBERT ROY
1950 ROSEMONT RD
BERKLEY MI 48072 3305

JASON NABER
2008 ROSEMONT RD
BERKLEY MI 48072 3306

ANDREW LOCKMAN
2023 ROSEMONT RD
BERKLEY MI 48072 3308

BRENDA DUNLOP
2057 ROSEMONT RD
BERKLEY MI 48072 3308

PAUL LAURENCHELLE
1963 ROSEMONT RD
BERKLEY MI 48072 3307

JO ANNE RODDY
2071 ROSEMONT RD
BERKLEY MI 48072 3308

Occupant
29001 WOODWARD AVE
BERKLEY MI 48072 0917

MIDWEST MEMORIAL GROUP LLC
31300 SOUTHFIELD RD STE 1
BEVERLY HILLS MI 48025 5456

Occupant
1949 12 MILE RD
BERKLEY MI 48072 1853

MONARCH ACQUISITION LLC
28400 NORTHWESTERN HWY FL 4
SOUTHFIELD MI 48034 8349

LARRY FONS
TERESA FONS
1908 ROSEMONT RD
BERKLEY MI 48072 3305

MARK ROEDER
REBECCA KENNEDY
1992 ROSEMONT RD
BERKLEY MI 48072 3305

WILLIAM BOTENS
ROCHELLE BOTENS
2088 ROSEMONT RD
BERKLEY MI 48072 3306

GILBERT TECKER
1877 ROSEMONT RD
BERKLEY MI 48072 1845

JOHN S SPARLING JOINT TRUST
MICHAE L A COLLING
MARY LYNN SPARLING JOINT TRUST
1889 ROSEMONT RD
BERKLEY MI 48072 1845

JORDAN D PATERRA
2007 ROSEMONT RD
BERKLEY MI 48072 3308

TIMOTHY SWEENEY-DUCHENE
CHELSEA SWEENEY-DUCHENE
1936 ROSEMONT RD
BERKLEY MI 48072 3305

Occupant
2087 ROSEMONT RD
BERKLEY MI 48072 3308

GAMAL ELBIALY
1949 ROSEMONT RD
BERKLEY MI 48072 3307

JASON J FULKS
AKEMI FULKS
1921 ROSEMONT RD
BERKLEY MI 48072 3307

LAWRENCE SERMO
1890 ROSEMONT RD
BERKLEY MI 48072 1846

MATTHEW D DEFEVER
SHERRI A DEFEVER
1991 ROSEMONT RD
BERKLEY MI 48072 3307

RICHARD IORIO
TAMARA ROBEY
2024 ROSEMONT RD
BERKLEY MI 48072 3306
APPLICATION FOR SITE PLAN REVIEW

NOTICE TO APPLICANT: Applications for Site Plan review by the Planning Commission must be submitted to the City of Berkley Building Department in substantially complete form at least 30 days prior to the Planning Commission’s meeting at which the application will be considered. The application must be accompanied by the data specified in the Zoning Ordinance, including fully dimensioned site plans, plus the required review fees.

The Planning Commission meets the fourth Tuesday of the month at 7:00pm in the Council Chambers at the City of Berkley City Hall, 3338 Coolidge Hwy, Berkley, MI 48072.

TO BE COMPLETED BY APPLICANT:

I (We), the undersigned, do hereby respectfully request Site Plan Review and provide the following information to assist in the review:

Project Name: Quality Roots
Applicant: Michael Klar
Mailing Address:
Telephone:
Email:

Property Owner(s), if different from Applicant: L & L Developments
Mailing Address:
Telephone:
Email:

Applicant’s Legal Interest in Property: Future Tenant

LOCATION OF PROPERTY:

Street Address: 3916 Eleven Mile Road, Berkley, MI 48237
Nearest Cross Streets: Cummings
Sidewell Number(s): 25-18-353-030 and 25-18-353-027
**PLEASE COMPLETE THE FOLLOWING CHART:**

<table>
<thead>
<tr>
<th>Type of Development</th>
<th>Number of Units</th>
<th>Gross Floor Area</th>
<th>Number of Parking Spaces On Site</th>
<th>Number of Employees on Largest Shift</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attached Residential</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office</td>
<td></td>
<td>686 G, 481 U</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Commercial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Retail</td>
<td></td>
<td>5724 G, 2837 U</td>
<td>19</td>
<td>11</td>
</tr>
</tbody>
</table>

**PROFESSIONALS WHO PREPARED PLANS:**

A. Name: Stucky Vitale Architects
   Mailing Address: 
   Telephone: 
   Email: 
   Design Responsibility (engineer, surveyor, architect, etc.): Architect

B. Name: Nowak and Fraus
   Mailing Address: 
   Telephone: 
   Email: 
   Design Responsibility: Civil Engineer

**SUBMIT THE FOLLOWING:**

1. Fifteen (15) individually folded copies of the site plans, measuring 24" x 36", sealed by a registered architect, engineer, or surveyor.
2. A pdf file of the site plans, submitted to the Community Development Director.
3. Proof of property ownership (title insurance policy or registered deed with County stamp).
4. Review comments or approval received from County, State or Federal agencies that have jurisdiction over the project, including, but not limited to:
   - Road Commission for Oakland County
   - Ml Dept. of Transportation
   - Oakland County Health Division
   - Ml Dept. of Environment, Great Lakes & Energy

Updated 07.01.2021
PLEASE NOTE: The applicant, or a designated representative, MUST BE PRESENT at all scheduled meetings, or the Site Plan may be tabled due to lack of representation.

Failure to provide true and accurate information on this application shall provide sufficient grounds to deny approval of a Site Plan Application or to revoke any permits granted subsequent to the site plan approval.

We encourage applicants to make a presentation of the proposed project to the Planning Commission and City Council, as appropriate. To assist in this effort, we have available for your use at meetings a projector, laptop computer and screen. This will allow the Planning Commission and audience to be fully engaged so they can give your project the attention it deserves. Planning Commission meetings are recorded and televised.

PROPERTY OWNER'S APPROVAL: (Initial each line)

I hereby authorize the employees and representatives of the City of Berkley to enter upon and conduct an inspection and investigation of the above-referenced property.

APPLICANT'S ENDORSEMENT: (Initial each line)

All information contained therein is true and accurate to the best of my knowledge.

I acknowledge that the Planning Commission will not review my application unless all information in this application and the Zoning Ordinance has been submitted. I further acknowledge that the City and its employees shall not be held liable for any claims that may arise as a result of acceptance, processing or approval of this site plan application.

I hereby acknowledge that if engineering or other reviews are required, additional fees must be submitted. Should the review fees be greater than the required minimum, sufficient additional charges will be imposed to satisfy the additional review fees. All fee obligations must be satisfied prior to permit approval.

If an application is withdrawn more than three (3) weeks prior to the meeting date, 90% of the fee will be refunded. If the application is withdrawn less than three (3) weeks prior to the meeting, no refund will be given.
Michael Klar
Signature of Applicant
Applicant Name (Print)

Michael Klar
Applicant Name (Print)

Signature of Applicant
Date

Applicant Name (Print)

Linus Drogs
Property Owner Name (Print)

3/25/2022 | 07:48:49 PDT
Signature of Property Owner Authorizing this Application
Date

OFFICE USE ONLY

Received 3/28/22 Receipt # 0006970 Meeting Date Case # PSP-09-22
Fees:
Site Plan Review $600 Façade Change: $200 Revision: $300
Extension $200 Engineering: Multi-family $1,500 + $30/unit
Escrow (New construction) $1,000 Commercial $1,000

Updated 07.01.2021
MEMORANDUM

To: Planning Commission

From: Megan A. Masson-Minock, Interim Community Development Director

Subject: PSP-09-22: 3916 Eleven Mile Road – Quality Roots Provisioning Center
        Site Plan Approval
        Plan Date: April 19, 2022

Date: May 19, 2022

Attached are the following reviews for the site plan submitted:

Planning Review from Carlisle Wortman Associates (CWA) dated May 3, 2022

In their review, CWA flagged inconsistencies between the site rendering and the landscape plan as to plantings proposed in the right-of-way of Eleven Mile Road. They also asked for clarification on trash storage and removal. After clarification of what is proposed, CWA noted that the Planning Commission should review the landscaping and make a finding as to whether the plans presented meet the standard in Section 130-37.

CWA also noted that a flexible lighting tube is proposed on the Eleven Mile façade, but the color had not been included nor had it been shown on the renderings. They requested that color rendering with the lighting tube color at night be shared with the Planning Commission to understand the effect of the proposed colored tubes. The Planning Commission and applicant should note that unshielded lighting tubes have not been allowed in Berkley, since they are illuminated signs with blank faces and shine light directly onto traffic or adjacent property, prohibited signs under Section 94-6 of the Sign Ordinance. Tube lighting covered by an awning, eave or soffit has been allowed.

CWA recommended preliminary site plan approval with the following conditions:

1. Clarification of the planting proposed along Eleven Mile.
2. Indication of the method of trash storage and removal.
3. Inclusion on revised plans of any additional landscaping based on Planning Commission review.
4. Confirmation that the roof top wind system has been designed to comply with all provisions of Section 138-99 at time of building permit review.
Review from City of Berkley Department of Public Works (DPW) dated May 6, 2022

DPW had the following comments:

1. HRC will review the geotechnical report, storm water detention calculations and grading.
2. The proposed stormwater management system will be a private system under the maintenance of the property owner. A stormwater management agreement with exhibits, which includes vacuum requirements for the permeable pavers, must be approved by the City Attorney.
3. More details on the new permanent and temporary easements are required with the adjacent parcel (25-18-353-029) shown on Sheet C1 are needed. The permanent easement shall be included in storm water detention calculations.
4. The applicant shall verify the new development will not negatively impact the adjacent properties and existing drainage conditions.
5. More information is needed regarding the adjacent properties broken sanitary sewer during excavation on Sheet C-4.
6. The Community Development Department will review the striping plan for verification of number of stalls required, sizing, handicap considerations and general site circulation.
7. A Storm Water Service Fixed Charge will be assessed upon completion of construction. This charge will be reflected on the regular utility bill and is based on an Equivalent Residential Units (impervious area).

Review from Hubbell, Roth & Clark (HRC) dated May 9, 2022

HRC recommended approval of the proposed site plan, subject to the applicant revising the permeable paver cross section on the plans as stated in their letter and submitting the maintenance agreement as well as any required permits to the City of Berkley. The Planning Commission should note the following requested plan revisions and permits:

1. The geotechnical report submitted by the applicant states that the proposed stormwater system is feasible provided a geotextile separator followed by a minimum of 12” of 6A stone under a 3” layer of 17A stone is used under the permeable pavers. The proposed permeable paver cross section on the plan set must reflect the recommended cross section.
2. The developer will be required to prepare and enter into a perpetuity maintenance agreement with the City for the proposed private stormwater systems. The applicant must contact the City DPW regarding this item prior to commencing construction.
Review from City of Berkley Fire Inspector

Fire Inspector Pete Kelly stamped the plan set dated as revised on March 24, 2022 as approved on April 1, 2022.

Summary and Recommendation

The applicant should provide clarification on the following:

1. The planting proposed along Eleven Mile.
2. Trash storage and removal.
3. The color and mounting location of the proposed light tubing on the Eleven Mile façade.

The Planning Commission needs to make the following determination:

1. **Standards for Site Plan Approval – Landscaping and Trash Enclosure:** CWA stated in their review that the applicant was providing landscaping on the side elevation, Eleven Mile frontage and in the bioswale stormwater management system. The Planning Commission must determine whether the landscaping, as presented, meets the standards for Site Plan approval, per Section 138-678.

If the Planning Commission chooses to grant site plan approval, we recommend that the following items be conditions of approval:

1. Revisions of the site plan to reflect any changes to the site plan required by the Planning Commission to meet the standards of Section 138-678. The required changes should be specifically stated in the motion.
2. At time of building permit review, confirmation that the roof top wind system has been designed to comply with all provisions of Section 138-99.
3. A pre-construction meeting is required. Before scheduling of that meeting, all items and information listed the City’s DPW review letter, dated May 6, 2022, must be received by the City.
4. Approval from the City’s Engineer that the permeable paver cross section on the plans meets the requirements of their review letter dated May 9, 2022, the maintenance agreement, and any required permits to the City of Berkley, as noted in their review letter dated May 9, 2022, have been submitted and/or met.
5. All signs and mural must be approved under a separate permit and meet the requirements of Chapter 94 – Signs of the City of Berkley’s Code of Ordinances.
Site Plan Review
For
City of Berkley, Michigan

Applicant: Aric Klar, Quality Roots
Project Name: Quality Roots
Plan Date: April 19, 2022
Location: 3916 Eleven Mile Road
Zoning: Eleven Mile District
Action Requested: Site Plan Approval

SITE DESCRIPTION

The subject site is two parcels. One parcel is located on the north side of Eleven Mile, between Cummings Avenue and Thomas Avenue. The second parcel is directly north, across a public alley, and fronts on Cummings Avenue. Currently the +/-6,400 sq.ft building is located on the Eleven Mile parcel, and small garage and parking area is located on the Cummings Avenue parcel.

The applicant proposes to remodel the existing +/-6,400 sq. ft. building for a marihuana provisioning center on the first floor and a small accounting office on the second floor. An accounting firm currently utilizes the second story and the applicant is renovating that space for their continued use in the future. In addition, the applicant proposes to remove the existing
garage on the Cummings Avenue parcel and convert that parcel into parking and stormwater management.

Other than façade improvements there are no proposed changes or enlargement to the existing building. Site improvements include:

- Wall art mural
- Sun shade
- Benches along Eleven Mile
- Permeable parking pavers
- Increased landscaping
- Quality architecture improvements
- Green stormwater management in the form of a bioswale
- Roof amenities:
  - Solar panels
  - Wind turbines
  - Stormwater runoff water collection
  - Green roof
  - PVC Roof

The site is zoned Eleven Mile District. Marihuana use is a permitted use but must meet the zoning requirements in Section 138-528 Marihuana Business Regulations.

Site Location:
Proposed Use of Subject Parcel:

6,400 sq. ft. building for marihuana provisioning use and small accounting office.

Surrounding Property Details:

<table>
<thead>
<tr>
<th>Direction</th>
<th>Zoning</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>Single Family Residential R-1D</td>
<td>Single Family Residential</td>
</tr>
<tr>
<td>South</td>
<td>Oak Park / NA</td>
<td>Vacant/Light Industrial</td>
</tr>
<tr>
<td>East</td>
<td>Eleven Mile District</td>
<td>Commercial</td>
</tr>
<tr>
<td>West</td>
<td>Eleven Mile District</td>
<td>Office</td>
</tr>
</tbody>
</table>

Items to be addressed: None.

NATURAL FEATURES

The site has been graded for a building and parking lot. There are no existing natural resources.

BUILDING ARRANGEMENT AND SITE DESIGN

The site and building layout will remain in its current configuration. The square foot arrangement of the building is as follows:

<table>
<thead>
<tr>
<th>Floor</th>
<th>Tenant/Use</th>
<th>Total Square Footage</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>Quality Roots</td>
<td>5,724</td>
</tr>
<tr>
<td>Second</td>
<td>Accounting Office</td>
<td>686</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>6,410</td>
</tr>
</tbody>
</table>

Items to be addressed: None

AREA, WIDTH, HEIGHT, SETBACKS

Sec. 138-526. - Schedule of regulations of the Zoning Ordinance establishes the dimensional requirements for the Local Commercial District.

<table>
<thead>
<tr>
<th>Front (Eleven Mile)</th>
<th>Required / Allowed</th>
<th>Provided</th>
<th>Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front yard setbacks shall be ten feet or equal to the setback</td>
<td>0-feet setback based upon adjacent building to east</td>
<td>0-feet</td>
<td>Complies</td>
</tr>
</tbody>
</table>
Items to be addressed: None

PARKING

The applicant has provided a parking table on Sheet TS1.1. This is a multiple tenant building. The parking required is a total of all uses combined in the building:

<table>
<thead>
<tr>
<th></th>
<th>Required / Allowed</th>
<th>Provided</th>
<th>Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Roots (Retail) 1 space per 225 usable square feet</td>
<td>2,837 usable sq. ft. / 225 = 13 spaces</td>
<td>19 spaces</td>
<td></td>
</tr>
<tr>
<td>Accounting Office 1 per 300 usable square feet</td>
<td>481 usable sq. ft. / 300 = 2 spaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrier Free</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bicycle Parking Credit</td>
<td>Reduces parking requirement by two</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13 spaces</strong></td>
<td><strong>19 spaces</strong></td>
<td></td>
</tr>
</tbody>
</table>

The applicant has provided sufficient parking.

Items to be Addressed: None

SITE ACCESS AND CIRCULATION

Site access and circulation remain as currently situated. There is one point of access off Eleven Mile and access via the alley. There is an existing sidewalk on Eleven Mile that will remain as is.

Items to be Addressed: None
LANDSCAPING

A landscaping plan has been provided on sheet L-1. The site is limited with regards to plantable area; however, the applicant is adding landscaping where they can, including along the side elevation to the east and in the bioswale stormwater management system. One of the site rendering shows planting along and in the right-of-way of Eleven Mile. However, this planting is not indicated on the landscape plan. Applicant should clarify planting along Eleven Mile.

As set forth in section 130-37, when the development of any property requiring site plan approval occurs, the City Planning Commission shall review landscaping plans and may require additional landscaping to be planted on or near the site consistent with the elements of the adopted city master plan.

Trash Enclosure:

There is not an outside trash enclosure shown on the site plan. There is an internal waste room, and it is assumed that a truck will come to the back of the site to pick up trash. The applicant shall clarify trash storage and removal.

**Items to be Addressed:** 1). Clarify Planting along Eleven Mile; 2). Planning Commission to review landscaping; and 3). Indicate trash storage and removal.

SITE AMENITIES

The applicant is proposing a number of site amenities including:

- Wall art mural
- Sun shade
- Benches along Eleven Mile
- Permeable parking pavers
- Green stormwater management in the form of a bioswale
- Roof amenities:
  - Solar panels
  - Wind turbines
  - Stormwater runoff water collection
  - Green roof
  - PVC Roof

We support the sustainable and creative use of the green roof. Wind turbines are regulated by Section 138-99. Requirements include:
No details of the rooftop system were provided; however, the applicant has added a note that the roof top wind system will be designed to comply with all provisions of Section 138-99.

**Items to be Addressed:** Confirm that the roof top wind system has been designed to comply with all provisions of Section 138-99 with building permit review.

**PHOTOMETRICS**

The applicant is proposing three (3) pole mounted lights in between the bioswale and the rear parking. As requested, due to the proximity of the adjacent single-family home, the pole height has been reduced to 12-feet. In addition, the applicant is proposing various forms of building lighting.

Along 11-Mile the applicant is proposing a flexible lighting “tube” that can be various colors. The applicant should confirm color. The renderings don’t show the lighting. In order to better understand the effect of the tubes the applicant should show a color rendering at night.

**Items to be Addressed:** 1). Indicate color tubes; and 2). Show a color rendering at night.

**EXTERIOR APPLIANCES**

Applicant has shown exterior appliances (air conditioners, generators, etc.) on site plan to ensure that they are in compliance with Sec. 138-73.

**Items to be Addressed:** None.

**FLOOR PLAN AND ELEVATIONS**

Floor plans and elevations have been provided. The applicant is making significant elevation improvements to the existing building including wood siding veneer parapet, metal paneling, storefront glass, aluminum canopy, new sign lettering (reviewed under separate sign permit), green roof, and public art mural.
**Items to be Addressed:** None

**MARIHUANA BUSINESS REGULATIONS**

Section 138-528 Marihuana Business Regulations, the site plan shall be reviewed and approved by the Planning Commission upon finding that:

a) A marihuana business must front on a major thoroughfare with the primary ingress/egress onto a major thoroughfare.

   CWA Response: The marihuana business fronts on Eleven Mile Road, with ingress/egress onto a major thoroughfare.

b) The marihuana business must have all applicable state and local licenses and approvals to operate.

   CWA Response: The marihuana business will be required to obtain all applicable state license prior to any final approvals.

c) The property where the marihuana business will be located must be entirely within the boundaries of the city and must not be within 1,000 feet of a pre-existing public or private school providing education in kindergarten or any of grades 1 through 12.

   CWA Response: The marihuana business will not be located with 1,000 feet of any pre-existing public or private school.

d) Notwithstanding any other provision in the zoning ordinance, a marihuana business must operate within a fully enclosed building.

   CWA Response: The marihuana business will operate within a fully enclosed building.

e) Pursuant to article XV of chapter 30 of the Berkley City Code, all marihuana business license approvals are subject to the following:

   i. Public notice requirements as outlined in section 30-806; and

   ii. Site plan approval from the planning commission must be obtained prior to receiving license approval from the city council. Failure to do so will result in license denial as outlined in section 30-813.

   CWA Response: 1). Public notice requirements are expected to be met; and 2). The applicant is seeking site plan approval from the Planning Commission. If granted...
site plan approval, the applicant would then seek license approval from the City Council.

**Items to be Addressed:** None

**RECOMMENDATION**

Overall, the applicant is making a significant investment into the site as noted in our report. As part of their discussion, the Planning Commission should consider the use of the flexible light tubes on the 11-Mile elevation. The applicant should indicate color and show rendering to assist in this evaluation.

Based on that discussion, we recommend preliminary site plan approval with the following conditions:

1. **Clarify Planting along Eleven Mile.**
2. **Indicate trash storage and removal.**
3. **Any additional landscaping based on Planning Commission review.**
4. **Confirmation that the roof top wind system has been designed to comply with all provisions of Section 138-99 at time of building permit review.**

Sincerely,

[Signature]

CARLISE/WORTMAN ASSOC., INC.
Benjamin R. Carlisle, LEED AP, AICP
Transmittal Memo

To: Megan Masson-Minock, Interim Community Development Director (via email)
Cc: Kim Anderson, Community Development Department (via email)
     Ric Chalmers, Assistant DPW Director (via email)
     Eddie Zmich, HRC (via email)

From: Shawn Young, DPW Director

Date: May 6th, 2022

Subject: Quality Roots Provisioning Center
         3916 11 Mile Rd Site Plan Review #2

We have reviewed the site plans provided by the Community Development Department on March 28 and prepared by Stucky Vitale Architects and Nowak & Fraus Engineers. Please find below our initial comments:

1. The site plans will be reviewed by the City’s engineering consultant, Hubbell, Roth & Clark (HRC). Among other things, HRC will review the geotechnical report, storm water detention calculations and grading.

2. Please note the proposed stormwater management system will be a private system under the maintenance of the property owner. A template approved by the City Attorney is attached for use and should also include vacuum requirements for the permeable pavers. Exhibits will also need to be prepared by the applicant and included with the document.

3. Sheet C1 notes new permanent and temporary easements are required with the adjacent parcel (25-18-353-029). Please provide more details on these proposed easements. The permanent easement shall be included in storm water detention calculations.

4. The applicant shall verify the new development will not negatively impact the adjacent properties and existing drainage conditions.

5. Sheet C-4 mentions addressing the adjacent properties broken sanitary sewer during excavation. Please provide more information regarding this issue.
6. Note the Community Development Department will review the striping plan for verification of number of stalls required, sizing, handicap considerations and general site circulation.

7. A Storm Water Service Fixed Charge will be assessed upon completion of construction. This charge will be reflected on the regular utility bill and is based on an Equivalent Residential Units (impervious area). Note the two parcels will be combined from an ERU perspective.

A response letter from the applicant to the comments noted above would be helpful in subsequent reviews.

Feel free to call with any questions or concerns. Thank you.
May 9, 2022

City of Berkley
3338 Coolidge Highway
Berkley, Michigan 48072

Attention: Ms. Megan Masson-Minock, Community Development Director
Mr. Matthew Baumgarten, City Manager

Re: Quality Roots
3916 Eleven Mile Road
Engineering Site Plan – Review No. 2
City of Berkley, MI

Dear Ms. Masson-Minock and Mr. Baumgarten:

As Consulting Engineers for the City of Berkley, and in accordance with your request, we have completed the Engineering Site Plan review of the proposed subject development located at 3916 Eleven Mile Road for compliance with the City of Berkley’s engineering and site plan requirements. The plans were prepared by Stucky-Vitale Architects of Royal Oak, Michigan with the engineering site plan created by Nowak & Fraus Engineers of Pontiac, Michigan. The plans have a revision date of April 19, 2022. The proposed project scope includes the renovation of the existing building and replacement of the existing parking lot and other site features. We hereby offer the following comments:

Water and Fire Protection Services:

1. A note indicates the existing water service lead will remain in place and be re-utilized. The applicant must have the lead inspected by a licensed contractor/plumber and the video footage submitted to the City verifying the lead is suitable for re-use prior to construction. The plans have been revised to include removal and replacement of the water service lead. This item is no longer applicable.

2. The plans must include REU value calculations demonstrating that the existing water lead is sufficiently sized to be reused for the proposed new establishment. REU calculations have been shown on the plans. This item has been satisfactorily addressed.

Storm Drainage and Detention/Sanitary Sewer:

1. Stormwater runoff calculations have been provided using a 100-year, 24-hour storm event and appear to show that the proposed pavement section and detention system will provide adequate storage for the site. The provided storage calculations have been updated to reflect the recommended porosity values for the proposed section in the geotechnical report. This item has been satisfactorily addressed.

2. A geotechnical investigation must be performed to evaluate the feasibility of the proposed stormwater management system. The report and soil logs must be submitted along with the plans, including the elevation of the groundwater table, soil types encountered, and the design recommendations or comments on the proposed stormwater collection system. The geotechnical report has been submitted along with the revised plans. The report recommends that the proposed stormwater system is feasible provided

May 9, 2022

City of Berkley
3338 Coolidge Highway
Berkley, Michigan 48072

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Mr. Matthew Baumgarten, City Manager

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that the recommended cross section be used under the permeable pavers. The geotechnical report recommends a geotextile separator followed by a minimum of 12" of 6A stone under a 3" layer of 17A stone. The 3" layer of 17A stone must be reflected in the proposed permeable paver cross section on the plan set.

3. The developer will be required to prepare and enter into a perpetuity maintenance agreement with the City for the proposed private stormwater systems. The Applicant must contact the City DPW regarding this item prior to commencing construction. **This item is still applicable.**

4. A new sanitary connection must be made rather than reusing the existing connection. The connection must be a TwisTee sewer saddle, as per the City DPW, or approved equal. The Applicant is responsible for any roadwork and restoration associated with the new utility connections which must be shown on the submitted plans. The DPW must be contacted prior to the commencement of work within the right-of-way (ROW). **This connection and note have been shown on the plans. This item has been satisfactorily addressed.**

5. The existing sanitary sewer lead must be properly abandoned via a spot liner or another DPW approved method. The DPW must be contacted prior to the commencement of work within the right-of-way (ROW). **The sewer lead abandonment has been shown on the plans. This item has been satisfactorily addressed.**

**Recommendation:**

Based on our aforementioned comments, we recommend approval of the proposed Site Plan subject to the applicant revising the permeable paver cross section on the plans as stated above and submitting the maintenance agreement as well as any required permits to the City of Berkley.

If you have any questions or require any additional information, please contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

Edward D. Zmich     Mitch Stark
Project Manager    Review Engineer

EDZ/MAS/mas
pc: City of Berkley; Mr. Derrick Schueller, Mr. Shawn Young
    HRC; R. Alix, File
    Nowak & Fraus; P. Tulikangas
    Stucky-Vitale; A. Danaher
QUALITY ROOTS | BERKLEY
PROVISIONING CENTER
3916 ELEVEN MILE ROAD
BERKLEY, MI  48237

APPLICABLE CODES (COMMERCIAL):
BUILDING CODE:
2015 MICHIGAN REHABILITATION FOR EXISTING BUILDING
MECHANICAL CODE:
2015 MICHIGAN MECHANICAL CODE AS AMENDED
PLUMBING CODE:
2015 MICHIGAN PLUMBING CODE AS AMENDED
ELECTRICAL CODE:
2017 NATIONAL ELECTRIC CODE AS AMENDED & MICHIGAN AMENDMENTS PART 8.
FIRE CODE:
2015 INTERNATIONAL FIRE CODE REFERENCED IN 2015 MICHIGAN BUILDING CODE
BARRIER FREE REQUIREMENTS:
2010 ADA STANDARDS FOR ACCESSIBLE DESIGN (DOJ)
MBC-2012 (CHAPTER 11)
ICC / ANSI 117.1 - 2009, EXCEPT SECTION 611 & 707
LIFE SAFETY CODES:
2015 NFPA 101 LIFE SAFETY CODE
2013 NFPA 13  STANDARD FOR INSTALLATION OF SPRINKLER SYSTEMS
2013 NFPA 72 NATIONAL FIRE ALARM CODE

PROJECT AREA:
EXISTING
FIRST FLOOR = 5,724 SF
QUALITY ROOTS - RETAIL
SECOND FLOOR = 686 SF
EXISTING (TENANT B) - BUSINESS
OFF STREET PARKING REQUIREMENTS
(USEABLE FLOOR AREA) :
FIRST FLOOR = 2,837 SF
· OFFICE: 102 SF
· RECEIVING ROOM: 236 SF
· TRANSACTION AREA: 394 SF
· SHOWROOM: 1,672 SF
· WAITING ROOM: 375 SF
· CHECK IN: 58 SF
2,837/ 225 = 12.61 = 13 PARKING STALLS
SECOND FLOOR = 481 SF
· OFFICE: 300 USF
481/225 = 2.14 = 3 PARKING STALLS
13 + 3 = 16 PARKING STALLS
SEC. 138-217 BERKLEY ORDINANCE
Bicycle parking may be used to reduce the number of required off-street parking spaces. Existing developments may elect to reduce the required off-street parking by two car parking spaces by providing four bicycle parking spaces (i.e., by installing two inverted U, loop style, or other approved style of bicycle rack).
REQUIRED PARKING = 16 - 2 = 14 SPACES
PROVIDED PARKING = 19 SPACES
City of Berkley,
Oakland County, Michigan
SITE PLAN DOCUMENTS
Prepared For
Quality Roots
PART OF THE SW 1/4 OF SECTION 18,
CITY OF BERKLEY,
OAKLAND COUNTY, MICHIGAN

Project Name
Quality Roots
Berkley
SOIL EROSION CONTROL

C5

Location Map

LEGEND

CONSTRUCTION SEQUENCE / TIMING SCHEDULE

CONSTRUCTION SEQUENCE / TIMING SCHEDULE

- Site Clearing
- Planting
- Sidewalk Construction
- Roadway Construction
- Drainage
- Signage

NOTES

- Soil Erosion Control Plan
- Part of the SW 1/4 of Section 18, T.1N., R.11E., City of Berkley, Oakland County, Michigan

SOIL DATA

- Soil Types:
  - Loam
  - Clay

- Slope:
  - Gentle

- Rainfall:
  - Moderate

ESTIMATED QUANTITIES

- Silt Fence Detail
- Section A-A
- Front View
- Plan View
- Section B-B
- Construction Access Road
- Temporary Crushed Concrete

DEVELOPMENT:

- Site Preparation
- Electrical Systems
- Plumbing Systems
- Heating, Ventilation, and Air Conditioning

CIVIL ENGINEERS
- NOWAK & FRAUS ENGINEERS
- 46777 Woodward Ave.
- Pontiac, MI 48342-5032
- Tel. (248) 332-7931
- Fax. (248) 332-8257
- WWW.NOWAKFRAUS.COM

PROJECT:
- Quality Roots Berkley
- 3910 11 Mile Road
- Berkley, MI 48072-1005

CLIENT:
- Quality Roots

DATE: February 25, 2020

M. Carter

P. Tulikangas
UNLESS EXEMPT, PROJECT MUST COMPLY WITH LIGHTING CONTROLS REQUIREMENTS DEFINED IN ASHRAE 90.1 2013. FOR AND/OR FLOOR UP.

ACTUAL PERFORMANCE OF ANY MANUFACTURER’S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING / FUTURE FIELD CONDITIONS. THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE FOR REVIEWING AND APPROVING THE LIGHTING CALCULATIONS.

1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Symbol</th>
<th>Avg</th>
<th>Max</th>
<th>Min</th>
<th>Max/Min</th>
<th>Avg/Min</th>
<th>Avg/Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td></td>
<td>11.6 ft</td>
<td>0.2 ft</td>
<td>58.01</td>
<td>19.5</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>Parking/Alleyway</td>
<td></td>
<td>3.4 ft</td>
<td>11.6 ft</td>
<td>0.8 ft</td>
<td>14.5</td>
<td>4.3</td>
<td>0.31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grade</th>
<th>Symbol</th>
<th>Avg</th>
<th>Max</th>
<th>Min</th>
<th>Max/Min</th>
<th>Avg/Min</th>
<th>Avg/Max</th>
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<tr>
<td>Grade</td>
<td></td>
<td>4.1 ft</td>
<td>0.3 ft</td>
<td>13.7</td>
<td>4.3</td>
<td>0.31</td>
<td></td>
</tr>
</tbody>
</table>

MOUNTING HEIGHT IS MEASURED FROM GRADE TO FACE OF FIXTURE. POLE HEIGHT SHOULD BE CALCULATED AS THE MOUNTING HEIGHT PLUS BASE HEIGHT.
QUALITY ROOTS | BERKLEY | PROVISIONING CENTER + RETAIL DISPENSARY
3916 ELEVEN MILE RD.
BERKLEY, MI

A3.2

CONCEPTUAL RENDERING VIEW FROM 11 MILE (DAY TIME)

EXISTING VIEW FROM 11 MILE

EXISTING VIEW FROM REAR PARKING LOT

CONCEPTUAL RENDERING VIEW FROM THE PARKING LOT (DAY TIME)

N.T.S.

SCALE:

APRIL 18, 2022
INTERIOR RENDERING FROM THE SHOWROOM

INTERIOR RENDERING FROM THE WAITING AREA

INTERIOR RENDERING FROM THE TRANSACTION AREA

APRIL 18, 2022
During the sketch plan review meeting held on March 22, several Planning Commission members inquired about the use of stadium-style parking spaces. Furthermore, the original submission that was worked on with our team and Erin Schlotow utilized the stadium-style spaces to get extra parking as a great way to maximize the site. We are proposing the use of 6 stadium-style spaces for a total of 25. We would mark those 6 spaces as employees only, which would give us 17 customer spots, which is more than any of the locations we have. While we are okay with our proposal of 19 parking spots, we would appreciate the ability to install the 6 stadium parking spots. We feel it is best to take this approach now, if the Planning Commission is in support of it. If not, we are okay and our business will be more than sufficient with 19 parking spots as currently shown.

The reason we want to discuss it now is because once we do all of our underground work, it will be tough and costly to add those three additional spots.

We have put together a brief overview of our current stores and also, some other stores around Oakland County that we wanted to share with you. We understand this is new to the City and we want to assure you that our operations inside and the circulation of the proposed site is more than sufficient.

Quality Roots Hamtramck
- Parking Spots = 13 customer spots , 6 employee spots
- Transactions per Day = 300-500
- Transactions per hour = 30-40
- Avg Transaction Time = 7 minutes

Past 60 Day AVG
Quality Roots Battle Creek
- Parking Spots = 10 Customer Spots, 5 Employee Spots
- Transactions per Day = 150-250
- Transactions per hour = 15-30
- Avg Transaction Time = 5 minutes

Past 60 Day AVG

Quality Roots Berkley (Projected)
- Parking Spots = 10 Customer Spots, 6 Employee Spots (3 more additional on site either for staff or customers)
- Transactions per Day = 200-300
- Transactions per hour = 15-30
- Avg Transaction Time = 5 minutes

We also wanted to point out some of the other Marijuana Facilities in Oakland County in regards to parking:

New Standard Hazel Park (Shared Parking with a total of 4 businesses)
- 30 Parking spots for all 4 businesses
Hyatt Hazel Park
- Total of 19 parking spots

Lume Walled Lake
- 12 total parking Spots
April 18, 2022

Benjamin R. Carlisle, LEED AP, AICP, Principle
Carlisle/ Wortman Associates, Inc.
117 N. First St., Suite 70
Ann Arbor, MI 48104

Re: Site Plan Review for 3616 Eleven Mile Road
Architects’ Project No.: 2020.153

Mr. Carlisle:

Included in this response letter are the responses of the Site Plan Review letter. This response is intended to provide the requested documents and revisions from response letters dated March 31, 2022. Please let us know if you need any other information.

Below are our team's revisions made in response to the review letters provided.

**Attached Documents**
- Same sheets submitted as before (please refer to the sheet index)

**Permit Submittal Letter dated March 31, 2022 (Design Team's response in italics)**

1. Clarify Planting along Eleven Mile.
   - Please refer to landscape plan provided by Nowak and Fraus. We have removed all renderings that may have indicated otherwise for clarification.

2. Planning Commission to review landscaping.
   - Please refer to landscape plan provided by Nowak and Fraus. We have removed all renderings that may have indicated otherwise for clarification.

3. Confirm that the roof top wind system has been designed to comply with all provisions of Section 138-99.
   - Roof top wind system has been revised. Please refer to sheet A3.1.

4. Confirm and reduce pole height to 12-feet.
   - Refer to the revised photometric plan.

5. Applicant shall either remove up lighting or seek deviation from Planning Commission up lighting.
   - All up lighting has been removed from the project. Please refer to the photometric plan.
6. Indicate trash storage and removal.
   - There shall be no dumpster enclosure on site due to safety concerns. All trash will be located indoors and will be curbside service on a weekly schedule.

Please let us know if there are any questions, comments or concerns with the documents as submitted. We look forward to working with you and your team on this project and appreciate your help.

Sincerely,

John A. Vitale, AIA, NCARB
President/CEO
April 19, 2022

City of Berkley
3338 Coolidge Highway
Berkley, MI 48072

Attention: Ms. Megan Masson-Minock, Interim Community Development Director
            Mr. Matthew Baumgarten, City Manager

Re: Quality Roots Berkley – 3916 Eleven Mile Road
   City of Berkley – Site Plan Review No. 1
   NFE Job #C360-02

Ms. Masson-Minock and Mr. Baumgarten,

This letter provides responses specific to the Department of Public Works (DPW) and Hubbell, Roth & Clark, Inc. (HRC) engineering site plan review comments that were included as part of the City of Berkley’s first site plan review that was performed for the above-noted project. We have addressed all comments received in these reviews and are re-submitting civil and landscape drawings as part of the revised site plan package for final site plan approval. Below are responses specific to each letter:

Department of Public Works (DPW) Memo (Dated 04/04/22)
1. We have received the site plan review comments from HRC, and have provided separate response comments herein.
2. The topographic survey background has been revised to reflect a 12” water main and 8” combined sewer main in the 11 Mile R.O.W. as noted.
3. The drawings have been revised to reflect requirements noted for connecting the proposed sanitary sewer lead to the existing sanitary main located in the public alley north of the existing building. The demolition plan (sheet C2) notes the existing lead shall be removed and capped within 2 feet of the main. Note that the proposed lead is in the same alignment as the existing lead, and therefore the existing pipe will be removed instead of abandoned. The new connection is shown on the utility plan and noted to be performed using a “TwistTee” sewer saddle per City requirements.
4. Replacement of the existing domestic water service of 11 Mile Road has been included on the revised drawings. The building is proposed to have a replacement 1.5” type “K” copper water service connection from the existing 12” water main, and the existing water service (size & material unknown) will be disconnected from the main and removed within the same trench in accordance with City requirements. Work proposed for the water service also includes removal and replacement of the existing concrete sidewalk and pavement in the 11 Mile R.O.W. as required, which is also reflected in the revised drawings.
5. The complete “Geotechnical Evaluation Report” dated 01/11/20, furnished by S.M.E., is included as an enclosure with the revised site plan submittal package. Approximate soil boring locations (4 each) have been added to plan sheet C1 for reference.
6. Notes pertaining to the maintenance agreement that will be provided for the proposed stormwater management system have been added to the “City of Berkley Stormwater Management System Notes” provided on sheet C4. The owner will complete the maintenance agreement during the final approval process for this project.
7. The ownership team for the proposed Quality Roots development is in the process of securing the noted permanent and temporary easements with the adjacent property owner for parcel 25-18-353-029. A permanent ingress/egress
easement is required in the shared pavement area between the two buildings to allow for two-way traffic to and from 11 Mile Road. A temporary construction easement is required for the proposed grading and pavement replacement on the neighboring parcel.

8. The proposed grading and storm drainage design shown on sheets C3 and C4 will not negatively impact drainage conditions on any adjacent properties. The grading design matches existing elevations at all repair limits, and surface drainage conditions throughout the project impact limits, including within the public alley, will be improved compared to existing conditions.

9. It is acknowledged that the Berkley Community Development Department will review the proposed striping and site circulation plan.

10. Notes pertaining to the stormwater service charge that will be implemented by the City of Berkley have been added to the “City of Berkley Stormwater Management System Notes” provided on sheet C4.

Hubbell, Roth & Clark, Inc. (HRC) Letter (Dated 04/11/22)

Water Service

1. The proposed scope of work for the water service has been changed since the initial site plan submittal, and replacement of the existing domestic water service of 11 Mile Road has been included on the revised drawings. See response comment #4 under the DPW memo heading for additional details.

2. REU calculations have been added to sheet C4. We have confirmed with the M.E.P. engineer on the project that the proposed 1.5” domestic water service is sufficient for the building size and use.

Storm Drainage & Detention / Sanitary Sewer

1. A minor change has been made to the proposed detention system calculations. We have reduced estimated porosity for the permeable paver subbase to 20% from the previous 30%. This change was made to match recommendations from the “Geotechnical Evaluation Report” dated 01/11/20, furnished by S.M.E.

2. The complete “Geotechnical Evaluation Report” dated 01/11/20, furnished by S.M.E., is included as an enclosure with the revised site plan submittal package. Approximate soil boring locations (4 each) have been added to plan sheet C1 for reference. The report includes soils information, logs, and design recommendations associated with the proposed storm water management system.

3. Notes pertaining to the maintenance agreement that will be provided for the proposed stormwater management system have been added to the “City of Berkley Stormwater Management System Notes” provided on sheet C4. The owner will complete the maintenance agreement during the final approval process for this project.

4. Requirements for the proposed sanitary sewer lead replacement have been revised on the drawings to meet applicable requirements. See response comment #3 under the DPW memo heading for additional details. Also, notes have been added to the plans to specify all work within the 11 Mile Road and Public Alley right-of-ways require applicable permitting and coordination with the City DPW department.

5. The existing sanitary sewer lead is noted on the demolition plan (sheet C2) to be cut and capped within 2 feet of the main. The existing service pipe is proposed to be removed, rather than abandoned in place, since the proposed replacement service pipe will be in the same alignment. As shown on sheet C4, the new connection location will be downstream of the existing connection, and the connection is noted to be made per City DPW requirements.

Please review the enclosed revised drawings dated 04/19/22, and feel free to contact myself or Brett Buchholz at our office if you have any questions or comments.

Sincerely,

Paul Tulikangas, P.E., Associate/Engineering Manager

Brett Buchholz, P.E., Principal
Cc: Ms. Kim Anderson, Community Development Department
    Mr. Shawn Young, City of Berkley, DPW Department
    Mr. Edward Zmich, HRC
    Mr. Andrew Danaher, Stuckey-Vitale Architects
    Mr. Erik Fix, Schostak Brothers & Company, Inc.
    Mr. Michael Klar, Quality Roots, Inc.
January 11, 2020

Mr. Steve E. Duczynski II
Schostak Brothers & Company
17800 Laurel Park Drive North
Suite 200C
Livonia, Michigan 48152

Transmitted via e-mail: duczynskis@schostak.com (PDF File)

RE: Geotechnical Evaluation Report
Quality Roots Site Improvements
3916 Eleven Mile Road
Berkley, Michigan
SME Project 085599.00

Dear Mr. Duczynski:

We have completed the geotechnical evaluation for the Quality Roots Site Improvements project in Berkley, Michigan. This report presents the results of our observations and analyses, and our geotechnical engineering recommendations based on the information disclosed by the borings.

We appreciate the opportunity to be of service. If you have questions or require additional information, please contact me.

Sincerely,

SME

Joel W. Rinkel, PE
Group Leader – Geotechnical Services
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APPENDIX A  
BORING LOCATION DIAGRAM (FIGURE NO. 1)  
BORING LOG TERMINOLOGY  
BORING LOGS (B1 THROUGH B4)  

APPENDIX B  
IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL ENGINEERING REPORT  
GENERAL COMMENTS  
LABORATORY TESTING PROCEDURES
1. INTRODUCTION

This report presents the results of the geotechnical evaluation performed by SME for the Quality Roots Site Improvements project. We performed this evaluation in general accordance with the scope of services outlined in SME Proposal No. P03621.20, dated November 18, 2020. Our services for this evaluation were authorized by Schostak Brothers & Company (Schostak).

To assist with our evaluation and preparation of this report, Schostak provided SME a drawing titled, “ALTA/NSPS Land Title / Topographic Survey,” (Sheet No. 1) with latest revision date of April 14, 2020, prepared by NF Engineers, Inc (NFE).

1.1 SITE CONDITIONS

The project site consists of an existing commercial property located at 3916 W. 11 Mile Road in Berkley, Michigan. The approximate location of the site is depicted on the Location Map inset on the Boring Location Diagram (Figure No.1) included in Appendix A.

The site consists of several adjoining land parcels (Lot Nos. 274 – 277 and 279) bisected by a 16-foot wide public alleyway. Included in the site is a commercial building, pavements (drive lane, parking, and dumpster pad), and grass-covered areas. The commercial building is a single-story structure with a footprint area of 5,674 square-feet and finished floor elevation of 688.35 feet. A relatively small shed (under 500 square-feet) is located on the northern portion of the site. An aerial image depicting recent site conditions is provided below, for reference.
1.2 PROJECT DESCRIPTION

The project consists of repurposing the site for continued commercial usage, including new pavements and dumpster enclosure. We understand a permeable pavement system is desirable. The new enclosure will be a relatively small (under 750 square-feet) single-story slab-on-grade structure. Based on the existing ground surface levels, we anticipate cuts and fills of less than 1 foot will be required to achieve final subgrade levels. Please contact SME if these design assumptions are incorrect.

2. EVALUATION PROCEDURES

2.1 FIELD EXPLORATION

SME completed four hand auger borings (B1 through B4) at the site on November 25, 2020. The borings were advanced to depths of 6 to 10 feet below existing grades. The approximate as-drilled boring locations are shown on Figure No. 1.

NFE determined the planned number and locations of the borings. SME located the planned borings in the field referencing existing site features. SME retained a private underground locating service (GPRS) to review a 10-foot radius around the proposed boring locations using a ground penetrating radar unit as well as an electromagnetic line locator. The final boring locations were adjusted as needed from the planned locations to maintain an appropriate distance from existing utilities. SME estimated the existing surface elevations at the as-drilled boring locations to the nearest 1-foot using available topographic data shown on the referenced drawing.

The hand augers were then advanced using a 2-inch diameter bucket auger in conjunction with Dynamic Cone Penetrometer (DCP) testing. The pavement at the borings B3 and B4 was cored by FMG Concrete Cutting, Inc. prior to advancing the boreholes. The DCP test consisted of dropping a 10-pound slide hammer that falls 24 inches and drives a rod with a 1-1/8 inch conical tip into the subgrade. Portions of the recovered auger cuttings were sealed in glass jars.

Groundwater level observations in the boreholes were recorded during drilling and immediately after completion of drilling. The boreholes were backfilled with auger cuttings after completion and collection of groundwater readings. Therefore, long-term groundwater observations are not available from the borings. Borings located in pavement areas were capped with asphalt cold patch after backfilling.

Soil samples recovered from the field exploration were returned to the SME laboratory for further observation and testing.

2.2 LABORATORY TESTING

The laboratory testing program consisted of visual soil classification on recovered samples in general accordance with ASTM D-2488. Moisture content and hand penetrometer tests were performed on portions of cohesive samples obtained. Loss-On-Ignition (LOI) tests were performed on samples of the existing fill suspected of containing organic material. The Laboratory Testing Procedures in Appendix B provides descriptions of the laboratory tests performed. Based on the laboratory testing, we assigned a group symbol to the various soil strata encountered based on the Unified Soil Classification System (USCS).

Upon completion of the laboratory testing, we prepared boring logs including the soil descriptions, penetration resistances, pertinent field observations, the results of the laboratory testing, and the existing ground surface elevations. The boring logs are included in Appendix A. Explanations of symbols and terms used on the boring logs are provided on the Boring Log Terminology sheet included in Appendix A.

Soil samples are normally retained in our laboratory for 60 days and are then disposed, unless instructed otherwise.
3. SUBSURFACE CONDITIONS

3.1 SOIL CONDITIONS

The soil conditions encountered at the boring locations generally consisted of surficial materials (pavement or topsoil) overlying existing fill underlain by natural clays extending to the explored depths. A generalized summary of the materials encountered at the boring locations, beginning at the existing ground surface and proceeding downward, is provided below.

STRATUM 1 – SURFICIAL MATERIALS

Topsoil ranging from about 2 to 3 inches in thickness was present at borings B1 and B2 performed at the north end of the site. Asphalt ranging from about 2 to 3-1/2 inches in thickness was present at borings B3 and B4 performed in pavement areas closer to the commercial building.

STRATUM 2 – EXISTING FILL

The existing fill consisted of clay soils containing interbedded sand layers and extended to depths of 2 to 5 feet below existing grades at the boring locations. The existing clay fill exhibited stiff to very stiff consistencies with undrained shear strengths ranging from 1.5 to 3.5 kips-per-square-foot (ksf) and had moisture contents ranging from 13 to 23 percent. Some of the existing fill appeared to contain organics. The existing sand fill was generally encountered in a medium dense to dense condition with DCP values ranging from 18 to greater than 50 blows-per-half-foot. Layers of buried topsoil were encountered within the existing fill. LOI tests performed on obtained samples of the existing fill indicated organic contents of 3.6 and 6.0 percent.

STRATUM 3 – NATURAL CLAYS

Natural clays were encountered underlying the existing fill and extended to the explored depths. Interbedded sand layers were encountered within the overall cohesive soil profile. The natural clays exhibited medium to very stiff consistencies with undrained shear strengths ranging from 1.0 to 3.5 kips-per-square-foot (ksf) and had moisture contents ranging from 14 to 21 percent.

GENERAL NOTES

Consider thickness measurements of surficial materials reported on the boring logs approximate since mixing of the surficial materials with the underlying subgrade can occur while advancing the augers, and it is difficult to measure the thickness of surface materials in small-diameter boreholes. Therefore, if more accurate surficial material thickness measurements are required, we recommend performing additional evaluations such as additional pavement cores and hand auger borings or test pit excavations.

It is sometimes difficult to distinguish between fill and natural soils based on samples and cuttings from small-diameter boreholes, especially when portions of the fill do not contain man-made materials, debris, topsoil or organic layers, and when the fill appears similar in composition to the local natural soils. Therefore, consider the delineation of fill described above and on the appended boring logs approximate only. A more comprehensive evaluation of the extent and composition of the existing fill could be made by reviewing former site topography plans and by observing test pit excavations.

The soil profile described above and included on the boring logs are generalized descriptions of the conditions encountered. The stratification depths described above and shown on the logs are intended to indicate a zone of transition from one soil type to another. They are not intended to show exact depths of change from one soil type to another. The soil descriptions are based on visual classification of the soils encountered. Soil conditions may vary between or away from the boring locations. Please refer to the boring logs for the soil conditions at the specific locations.
3.2 GROUNDWATER CONDITIONS

Groundwater was encountered in borings B1 and B4 performed for this evaluation. Groundwater was encountered in boring B1 at about 8 feet below existing grades during drilling and measured at about 9 feet below existing grades upon completion (corresponding to approximate elevation 681 and 680 feet, respectively). Groundwater was encountered in boring B4 at about 1 feet below existing grades during drilling and measured at about 3.5 feet below existing grades upon completion (corresponding to approximate elevation 687 and 684.5 feet, respectively).

The encountered groundwater at boring B1 was present within sand seams interbedded within the natural clay soils. At boring B4 the encountered groundwater is considered perched within the existing fill overlaying the less permeable natural clay soils. In cohesive soils (i.e., clays and clayey silts), a long time may be required for the groundwater level in the borehole to reach an equilibrium position. Therefore, the use of groundwater observation wells (piezometers) can be necessary to more accurately determine the hydrostatic groundwater level within soil profiles containing clays.

Expect hydrostatic groundwater levels/elevations to fluctuate throughout the year, based on variations in precipitation, evaporation, run-off, and other factors. The groundwater conditions indicated by the borings represent conditions at the time the readings were taken. The groundwater levels at the time of construction may vary from those conditions noted on the boring logs. If more information regarding groundwater levels at this site is required, then we recommend performing additional subsurface assessment(s).

4. ANALYSIS AND RECOMMENDATIONS

Based on the soil borings, subsurface conditions are favorable for the proposed improvements provided that proper engineering controls, and proper construction methods, are properly incorporated, implemented and completed. The site is predominantly clayey, so stormwater infiltration into the subgrade is not practical. Rather, an engineered system would be required to control water from precipitation, surface runoff, perched groundwater, etc. Soil strength appears generally adequate for support of the proposed improvements, provided the subgrade is properly prepared during construction.

Refer to the following comments and recommendations for the proposed improvements for this project.

4.1 SITE PREPARATION AND EARTHWORK

Site preparation is expected to consist of removal of the existing surficial materials (e.g., pavements, topsoil, etc.), building elements, buried slabs/obstructions, and other site features, compaction of the subgrade using large vibratory rollers, placement of engineered fill, and then the commencement of below-grade construction. Detailed recommendations are provided below.

4.1.1 EXISTING FILL CONSIDERATIONS

We consider the existing fill to be undocumented since we do not have information on the origin of the fill, including data on placement and compaction. For foundation construction, due to the variabilities associated with undocumented existing fill and the depth of the existing fill, we recommend the existing fill be removed (i.e., undercut) to bear directly on suitable natural clay, or be widened and backfilled with engineered fill as needed to re-establish the design foundation bearing elevation. Refer to Section 4.2 of this report for information.
Regarding (non-critical) floor slabs and pavements, the existing fill can be considered for support of grade slabs and pavements provided the Owner accepts an elevated risk for poor performance (e.g. settlement, cracking) of slabs/pavements constructed over the existing fill. This risk can be reduced via proper subgrade preparation and evaluation during construction (as described below) and provided site grades are raised no more than one foot above the existing ground surface. We recommend retaining SME to provide construction materials services to verify proper subgrade preparation methods, and to further test the existing subgrade, to mitigate this risk.

Typical construction practice is to construct pavements and non-critical (and lightly-loaded) floor slabs over existing (compacted, relatively inorganic, minimal debris, non-expansive, non-reactive) fill, provided the fill is properly prepared during construction. However, it is the Owner’s responsibility to make decisions on how to address existing fill and other soil/groundwater related conditions. For example, if the Owner is not willing to accept the risk for poor performance from the existing fill, then the existing fill must be undercut beneath the entire zone of influence of the proposed improvements and replaced with engineered fill. While this option would be costly, we would be pleased to provide additional recommendations for mass removal and replacement of the existing fill soils if requested. The existing fill had organic contents of 3.6 and 6.0 percent for the tested samples. Organic contents greater than about 4.0 percent are generally considered elevated and at risk for post-construction settlement, particularly if the organic containing soils are near (e.g. within two feet of) design final grades. If the existing fill will remain in-place for support of floor slabs, further evaluation of the existing fill during construction must be conducted by SME. Further evaluation includes observing the condition of the existing fill in hand-auger borings or shallow test pits, testing the existing fill several feet below the subgrade surface using a cone penetrometer, observing the condition of the existing fill in the sides of the foundation excavations, and observing the response of the surface of the existing fill when subjected to a proofroll. Suspect existing fill materials observed during the evaluation and testing need be further evaluated by performing additional hand-auger borings and/or test pits and the contractor need to be prepared to assist SME, as needed. Existing fill to remain in-place must be of sufficient strength and free of deleterious materials such as excessive debris and organics. The risk for additional settlement after construction increases when the poorly compacted fill soils are left in-place and are not sufficiently improved, or when debris-laden fills are left in-place and the debris collapses in on itself (or the surrounding soil migrates into the gaps between the debris) over time. Unsuitable existing fill unable to be improved in-place shall be removed (i.e., undercut) and replaced with engineered fill placed and compacted per the requirements outlined in Section 4.1.4 of this report.

The recommendations provided in the following report sections are based on the assumption existing fill will be undercut beneath foundations, SME will be retained to provide construction materials services, the Owner accepts the risks of poor performance of the floor slab, and suitable existing fill will remain in-place and be used to support floor slabs. Please contact SME if our assumptions are incorrect so we can update our report as necessary.

4.1.2 SITE SUBGRADE PREPARATION

Following demolition of the existing site features, including removal of existing pavements, topsoil, and unsuitable materials, the underlying subgrade is expected to consist of mixed clay and sand fill soils. Completely remove existing buried structural elements associated with previous construction at the site from within the proposed development areas and backfill with engineered fill. Reroute existing utilities outside of the proposed development areas and backfill with engineered fill.

After stripping and removal of unsuitable materials, and making cuts to design subgrade levels, the exposed subgrade needs to be uniformly compacted using large construction equipment, as the fill and natural soil conditions near the surface varied in condition/consistency. Take care during compaction not to damage nearby existing structures and underground utilities. As predominantly silty and clayey soil conditions are expected, we recommend using large, sheepsfoot vibratory rollers for the compaction operations. We recommend at least several passes be made with the compaction equipment. In some areas, moisture conditioning and/or undercutting may be necessary to enhance the effectiveness of the compaction operation.
After compaction, we recommend the exposed subgrade be proofrolled in the presence of SME. Proofroll using a fully-loaded, tandem-axle dump truck or other similar pneumatic-tire construction equipment. Improve areas of unsuitable (e.g., loose) subgrade revealed during proofrolling by compacting in-place, if feasible. Soils unable to be suitably improved in-place must be removed (undercut) and replaced with engineered fill.

We recommend performing proofroll test(s) on a regular basis throughout the site earthwork operations. The purpose for the proofroll tests are to verify compaction and subgrade stability prior to placement of additional fill/pavements/slabs, etc. As subgrade conditions can change due to changes in weather, traffic, or other factors, we recommend placing the new fill/pavements/slabs soon after a successful proofroll test. We also recommend evaluating the intensity and type of proofrolling on a case-by-case basis. For example, when proofrolling engineered fill subgrade that has been uniformly placed and properly compacted (and remains in an undisturbed condition), wheel spacing of about 10 to 20 feet is typically acceptable. For proofrolling subgrade where compaction is relatively unknown, wheel spacing of less than one foot (e.g. continuous coverage; and possibly multiple passes) may be necessary to assist with the compaction process while performing the proofroll test.

The subgrade soils are sensitive to disturbance when exposed to water. If the subgrade is exposed to water, it may be necessary to improve the disturbed subgrade or remove and replace the soils with engineered fill, crushed aggregate or crushed concrete. Placement of crushed aggregate or crushed concrete, possibly with a geotextile for separation, is a traditional treatment to protect subgrades.

In the case of more severe subgrade disturbance, particularly if the construction will occur during the winter and early spring months, chemical stabilization of the subgrade could be considered. SME can provide additional information about chemical stabilization using lime or cement, if desired.

After the exposed subgrade is evaluated (as described above) and improved as necessary, engineered fill may be placed on the exposed subgrade to establish final design subgrade levels. See Section 4.1.4 of this report for materials and compaction requirements for engineered fill.

4.1.3 ENGINEERED FILL REQUIREMENTS

Fill placed within structural areas, including utility trench backfill, must be an approved material, free of frozen soil, organics, construction debris, over-sized materials, reactive/expansive materials, or other unsuitable materials. Compact fill placed in structural areas to a minimum of 95 percent of the maximum dry density determined in accordance with the Modified Proctor test. Spread fill in level layers with a loose thickness appropriate for the type of equipment used to obtain compaction. Thinner lifts will be required in confined spaces, when clay/clayey fill is used, and where compaction is achieved with hand-operated equipment. Sand fill can be compacted with a smooth-drum vibratory roller or vibratory plate compactors, including either walk-behind types or plate compactors mounted on a backhoe or excavator (i.e., hoe-pac). Clay fill can be compacted with sheepsfoot rollers, or large pneumatic tire construction equipment (e.g. fully loaded front-end loader) at a moisture content between the optimum and two percent below the optimum.

Based on the information from the borings, portions of the existing fill encountered at the boring locations are considered suitable for reuse as site engineered fill provided the material meets the requirements in the previous paragraph and is at a suitable moisture content for compaction. The on-site clays, and wet sands, will likely require moisture conditioning (i.e., aeration and drying) to achieve suitable moisture levels for proper compaction. We do not recommend reusing asphalt millings as engineered fill directly below new pavements; however, some asphalt millings (e.g. 50/50 mix with inorganic soil) could be reused below the proposed aggregate base level in the proposed pavement areas. Also, we recommend limiting the organic content of any general engineered fill soils to less than 4 percent. Aggregate bases and/or leveling courses must be inorganic.
The site clays (with a USCS designation of “CL”) and sands with silt contents in excess of 10 percent (with USCS designations of “SM” and “SP-SM”) will be difficult to compact in confined areas, such as in utility trenches and foundation excavations, where smaller, walk-behind type compaction equipment is used. Do not use clayey and silty soils as engineered fill where drainage is required. Clayey and silty soils can be used as engineered fill in open areas where compaction is achieved with large equipment and where moisture conditioning is feasible. During wetter/colder periods of the year when moisture conditioning of the clayey and silty soils will likely not be feasible, we expect it will be necessary to import granular fill to the site and waste the clayey and silty soils on non-structural areas of the site.

In utility trenches or foundation excavations, and in other areas where compaction is accomplished primarily by smaller plate compaction equipment, we recommend an approved granular material containing relatively low amounts of silt or clay, such as MDOT Class II granular material, be used as backfill. Thinner lift sizes may be required to achieve the required dry density in areas where smaller compaction equipment is used. We also recommend MDOT Class II granular material be used in areas requiring drainage or where the fill will serve as a capillary separation. The soils encountered in the borings, at locations and within depths where cuts are anticipated, are not expected to meet the gradational requirements of MDOT Class II granular material. Therefore, we anticipate soils conforming to MDOT Class II granular material will need to be imported to the site.

Coarse crushed aggregate used to backfill undercuts or to stabilize subgrades must consist of a well-graded crushed natural aggregate or crushed concrete ranging from 1 to 3 inches in nominal size with no more than 7 percent by weight passing the No. 200 sieve. In cases where granular engineered fill will be placed over the crushed aggregate, top the surface of the coarse crushed material with a layer of at least 6 inches of dense-graded aggregate, such as MDOT 21AA, or covered with a suitable non-woven geotextile, to prevent migration of the granular materials into the coarser crushed aggregate.

For trenches and other excavations, we recommend the upper 18 inches of backfill consist of soils that are similar with the surrounding subgrade. The purpose for this is to limit mixing of different soil types near final subgrade levels.

4.2 SHALLOW FOUNDATIONS

Support the proposed dumpster enclosure on shallow spread foundations bearing on suitable natural clays, or on engineered fill placed over suitable natural clays. Use a maximum net allowable soil bearing pressure of 2,000 pounds per square-foot (psf) for design of shallow foundations bearing on suitable soils as described above. According to boring B1, suitable natural soils are anticipated to be encountered at/near design foundation bearing levels. The design net allowable soil bearing pressure will achieve a global safety factor of three or more (for general shear failure).

Once each foundation area is exposed, SME must observe and test the foundation subgrades to verify suitable bearing conditions are present. Existing fill was encountered to a depth of about 3 feet below existing grades at boring B1 performed in the enclosure footprint. Assuming foundations will bear at frost depth (i.e., at 3.5-feet below final grades), we anticipate the existing fill will be removed during foundation excavation and undercutting will not be required. If present, undercut unsuitable soils encountered in foundation areas that are not able to be improved in-placed to expose underlying suitable soils. Foundations can then be constructed to bear directly at this lower level where suitable subgrade is encountered, or the design foundation bearing level can be reestablished using engineered fill or crushed aggregate placed as backfill in the undercut excavation. Where backfilling to the design foundation bearing level is performed, extend the undercut excavation to remove unsuitable soils laterally on a two vertical to one horizontal slope from the edge of the foundation. Please refer to the following Typical Foundation Undercutting Diagram.
Situate foundations a minimum of 42 inches below final site grade in unheated areas for protection against frost action during normal winters. Protect the foundations and proposed bearing soils from freezing during construction if work occurs in the winter months.

Slope back foundation excavations and form the foundations to maintain vertical foundation sides. Remove caved soils from the foundation bearing surfaces before placing concrete. Place foundation concrete as soon as practical after foundation excavations have been completed and the design bearing pressure verified to reduce the potential for disturbance of the foundation subgrade.

For bearing capacity and settlement considerations, design continuous (wall) foundations with a minimum width of 16 inches and isolated (column) foundations with a minimum dimension of 30 inches. Given the higher anticipated loads for the parking structure, we expect the design bearing pressure may govern the size of the foundation.

We estimate total settlement for shallow spread or continuous foundations using the recommended maximum net allowable bearing pressure and bearing on suitable soils, as described above, to be 1 inch or less and differential settlements to not exceed about one-half the total settlement for similarly loaded foundations. We base the settlement estimates on the available boring information, the estimated structural loads, our experience with similar structures and soil conditions, and field verification of suitable bearing soils by SME.

### 4.3 INFILTRATION CONSIDERATIONS

The existing fill soils and the underlying natural clays at this site are essentially impermeable with respect to a precipitation event. While there are some granular soils interbedded within the existing clayey fill, the granular soils contained an appreciable amount of soil fines (silt, clay), indicating relatively low infiltration characteristics. In addition, the granular fill soils are likely limited in lateral extent and, accordingly, infiltration rates into the existing fill are anticipated to decrease with time and storm intensity as the void spaces within the granular soils would quickly become saturated. Accordingly, the existing soil profile at this site is judged to have extremely limited infiltration capacity and is considered unreliable for design of a permeable pavement system and/or a stormwater infiltration system.

The use of a permeable pavement at this site will require an engineered system (e.g. open graded aggregate with a storm water outlet). For stormwater runoff, it may be possible to temporarily store some of the stormwater in an engineered system before being discharged into the stormwater collection system. Or, an underground stormwater basin is also an option for stormwater detention.
4.4 PERMEABLE PAVER RECOMMENDATIONS

Permeable pavers are being considered for a portion of this project. Based on the relatively impervious existing subgrade, a layer of coarse crushed stone will be required as the aggregate base and leveling course for this site. For separation purposes, a layer of heavy-duty geotextile fabric (e.g. Mirafi 180N, or approved equal) will be required between the crushed stone and the surrounding subgrade.

We recommend aggregate base/leveling course below the permeable pavers consist of at least 12 inches of MDOT 6A crushed (and washed) stone below three inches of MDOT 17A crushed (and washed) stone. Peastone is another option in lieu of the 17A crushed stone, provided the difficulties with properly placing/compacting rounded peastone can be addressed during construction. Prior to placing the 6A crushed stone, it will be critical to properly compact, proofroll, and then fine-grade the existing subgrade so that the existing subgrade surface drains toward the designated low-point(s) at the stormwater collection location(s). This will also help maintain a uniform thickness of crushed stone for added subgrade stability.

It will be important to thoroughly, and uniformly, compact the crushed stone so it is stable under construction traffic. Any disturbed crushed stone will need to be thoroughly recompacted prior to paver placement. We recommend an SME representative be onsite during the compaction operations so that subgrade compaction can be documented and recommendations regarding compaction can be made in the field at the time of the compaction process.

When considering storage capacity of stormwater in the crushed stone layer, we recommend using a porosity value of 0.2. The hydraulic gradient within the crushed stone layer (between stormwater point(s) of entry, and point(s) of discharge) will also need to be considered when designing for stormwater storage capacity. For extreme stormwater events, it may also be practical to temporarily store some stormwater above the paver surface for a short period of time.

It is important to note that, as with any permeable pavement system, any water that freezes below the pavers has the potential to result in undesirable frost-heave on the paver system. In some cases, weather conditions may cause significant frost-heave to occur before the stormwater can travel through the crushed stone and offsite via the stormwater discharge outlet(s). For pavers that experience frost heave, the pavers can be releveled (and the subgrade recompacted) once the frost subsides. In general, the thicker the crushed stone layer, the less likely that frost-heave would be a concern. However, a permanent heat-melt system below the exterior pavements would be required to prevent the subgrade (and overlying pavers/pavements) from freezing.

We recommend using only rigid piping (e.g. schedule 40 PVC, or better) below the proposed pavements at this site. The crushed stone backfill increases the potential for installation damage to piping. Also, we recommend including a filter sock around any perforated rigid piping.

We recommend using pavers that are specifically manufactured for use as an exterior permeable paver system in a northern climate. Permeable pavers will need to be at least three inches thick, and have a design compressive strength of at least 8,000 psi. Permeable pavers will also need to have a functioning permeable joint material. Also, edge restraints will be required to prevent lateral shifting of the pavers. In addition, we recommend pavers be designed for relatively ‘flat’ surfaces (e.g. less than 2 percent slopes) to limit the potential for additional lateral shifting. Expect some lateral shifting of the pavers to occur if the edge(s) of the pavers are also the low spot(s) in the paver surface and are not restrained by a rigid pavement/structure.

Regular maintenance is required for a permeable paver system. It is important to keep drainage pathways open, and abundant, so that stormwater can quickly travel below the pavers and to the stormwater discharge outlet(s).
4.5 CONSTRUCTION CONSIDERATIONS

The contractor must take precautions to protect nearby existing buildings, pavements, and utilities during construction. Exercise care during the excavating and compacting operations so excessive vibrations do not cause settlement of nearby existing buildings, pavements, and utilities, and to avoid undermining existing utilities, floor slabs, or foundations when performing excavations for the proposed construction.

Significant groundwater seepage is not expected to be encountered in site excavations. However, seepage from precipitation, surface runoff, perched groundwater sources, or other events could be encountered above this elevation. Control water accumulations in excavations above the groundwater level using standard sump pit and pumping procedures. Utilize a working surface of either crushed aggregate or crushed concrete to protect the exposed subgrade where seepage is encountered.

Remove ponded surface water and prevent run-off from reaching foundation excavations and areas of prepared subgrade. Establish positive surface drainage at the onset of construction to mitigate the potential for subgrade disturbance.

The existing fill at this site will be sensitive to disturbance when trafficked, especially when these soils become wet. If the subgrade is disturbed, it will be necessary to disc, aerate, and recompact the disturbed existing fill, or to remove and replace the disturbed soils with engineered fill, crushed aggregate, or crushed concrete. To protect areas of prepared subgrade from disturbance and to create dependable haul routes and material laydown areas, placement of crushed aggregate or crushed concrete, possibly with a geotextile for separation, could be required.

The contractor must provide safely sloped excavations or adequately constructed and braced shoring systems in accordance with federal, state and local safety regulations for individuals working in an excavation exposing them to the danger of moving ground. If material is stored or heavy equipment is operated near an excavation, use appropriate shoring to resist the extra pressure due to the superimposed loads.

Handling, transportation and disposal of excavated materials and groundwater need to be performed in accordance with applicable environmental regulatory requirements.

5. SIGNATURES

Report Prepared By: Jeremy S. Wahlstrom
Report Reviewed By: Joel W. Rinkel, PE
Project Engineer
Group Leader – Geotechnical Services
APPENDIX A
BORING LOCATION DIAGRAM (FIGURE NO. 1)
BORING LOG TERMINOLOGY
BORING LOGS (B1 THROUGH B4)
LEGEND

APPROXIMATE BORING LOCATION

NOTE:
DRAWING INFORMATION TAKEN FROM A PDF OF A DRAWING TITLED "ALTA/NSPS LAND TITLE / TOPOGRAPHIC SURVEY." LATEST ISSUE DATE OF 04/14/2020, PREPARED BY NF ENGINEERS, INC.
**BORING LOG TERMINOLOGY**

**UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART**

**COARSE-GRAINED SOIL**
(more than 50% of material is larger than No. 200 sieve size.)

- Clean Gravel (Less than 5% fines)
- Gravel
- Silty gravel; gravel
- Gravel with fines (More than 12% fines)
- GM
- GC
- Limestone
- Organic silt and organic

**GRAVEL**

- More than 50% of coarse fraction larger than No. 4 sieve size
- GW
- Well-graded gravel; gravel-sand mixtures, little or no fines
- GP
- Poorly-graded gravel; gravel-sand mixtures, little or no fines
- SW
- Well-graded sand; sand-gravel mixtures, little or no fines
- Sp
- Poorly graded sand; sand-gravel mixtures, little or no fines
- Sand with fines (More than 12% fines)
- SM
- Silty sand; sand-silt-gravel mixtures
- SC
- Clayey sand; sand-clay-gravel mixtures
- Clean Sand (Less than 5% fines)
- Clean Gravel (Less than 5% fines)
- Gravel
- Silty gravel; gravel-sand mixtures, little or no fines
- Gravel with fines (More than 12% fines)
- GM
- GC
- Limestone
- Organic silt and organic

**SAND**

- 50% or more of coarse fraction smaller than No. 4 sieve size
- SW
- Well-graded sand; sand-gravel mixtures, little or no fines
- Sp
- Poorly graded sand; sand-gravel mixtures, little or no fines
- Sand with fines (More than 12% fines)
- SM
- Silty sand; sand-silt-gravel mixtures
- SC
- Clayey sand; sand-clay-gravel mixtures
- Clean Sand (Less than 5% fines)
- Clean Gravel (Less than 5% fines)
- Gravel
- Silty gravel; gravel-sand mixtures, little or no fines
- Gravel with fines (More than 12% fines)
- GM
- GC
- Limestone
- Organic silt and organic

**SILT AND CLAY**

- Liquid limit less than 50%
- ML
- Inorganic silt; sandy silt or gravelly silt with slight plasticity
- CL
- Inorganic clay of low plasticity; lean clay, sandy clay, gravelly clay
- OL
- Organic silt and organic clay of low plasticity
- MH
- Inorganic silt of high plasticity, elastic silt
- CH
- Inorganic clay of high plasticity, elastic clay
- CH
- Organic silt and organic clay of high plasticity
- OH
- Peat and other highly organic soil
- PT

**FINE-GRAINED SOIL**

- (50% or more of material is smaller than No. 200 sieve size)
- GM
- GM/GC (Silty to Clayey Gravel)
- GM/ML (Silty Gravel to Gravelly Silty)
- GP/GW (Gravel or Gravel with Sand)
- SW/SP (Sand or Sand with Gravel)
- SC/GC (Clayey Sand with Gravel to Clayey Gravel with Sand)
- SM/ML (Silty Sand to Sandy Silty)
- SM/SC (Sandy Silty to Silty Sandy)
- SC/CL (Clayey Sandy to Sandy Clay)
- SC/CH (Clayey Sandy to Clayey Lean Clay)
- CH/ML (Fatty Clay to Elatic Silt)
- CH/CL (Clayey Sandy to Sandy Clay)
- CL/ML (Silty Clay to Elatic Silt)
- CL/CL (Silty Clay to Silty Clay)
- GM/SM (Silty Clayey Sand to Silty Clayey Sand with Gravel)
- SM/SM (Silty Clayey Sand to Silty Clayey Sand with Gravel)
- GM/SM (Silty Clayey Sand to Silty Clayey Sand with Gravel)
- GM/ML (Silty Gravel to Gravelly Silty)
- GP/GW (Gravel or Gravel with Sand)
- SW/SP (Sand or Sand with Gravel)
- SC/GC (Clayey Sand with Gravel to Clayey Gravel with Sand)
- SM/ML (Silty Sand to Sandy Silty)
- SM/SC (Sandy Silty to Silty Sandy)
- SC/CL (Clayey Sandy to Sandy Clay)
- SC/CH (Clayey Sandy to Clayey Lean Clay)
- CH/ML (Fatty Clay to Elatic Silt)
- CH/CL (Clayey Sandy to Sandy Clay)
- CL/ML (Silty Clay to Elatic Silt)
- CL/CL (Silty Clay to Silty Clay)

**LABORATORY CLASSIFICATION CRITERIA**

**Visual Manual Procedure**

*When laboratory tests are not performed to confirm the classification of soils exhibiting borderline classifications, the two possible classifications would be separated with a slash, as follows:*

- For soils where it is difficult to distinguish if it is a coarse or fine-grained soil:
  - SC/CL (CLAYEY SAND to Sandy Lean CLAY)
  - SM/ML (Silty SAND to Sandy CLAY)
  - GC/CL (CLAYEY GRAVEL to GRAYEY LEAN CLAY)
  - GM/ML (Silty GRAVEL to Gravelly Silty)

- For soils where it is difficult to distinguish if it is sand or gravel, poorly or well graded sand or gravel; silt or clay; or plastic or non-plastic silt or clay:
  - SP/GP or SW/GW (SAND with GRAVEL to GRAVEL with Sand)
  - SC/GC (CLAYEY SAND with Gravel to CLAYEY GRAVEL with Sand)
  - SM/ML (Silty SAND with Gravel to Silty GRAVEL with Sand)
  - SW/SP (SAND with Sand with Gravel)

- For soils where it is difficult to distinguish if it is gravel, sandy or silty gravel, clayey sand, silty sand, or sandy silt:
  - SP/GP or SW/GW (SAND with GRAVEL to GRAVEL with Sand)
  - SC/GC (CLAYEY SAND with Gravel to CLAYEY GRAVEL with Sand)
  - SM/ML (Silty SAND with Gravel to Silty GRAVEL with Sand)
  - SW/SP (SAND with Sand with Gravel)

**Drilling and Sampling Abbreviations**

- 2ST – Shelby Tube – 2” O.D.
- 3ST – Shelby Tube – 3” O.D.
- AS – Auger Sample
- GS – Grab Sample
- LS – Liner Sample
- NR – No Recovery
- PM – Pressuremeter
- RC – Rock Core diamond bit, N.I. size, except where noted
- SB – Split Sample 1-3/8” I.D., 2” O.D., except where noted
- VS – Vane Shear
- WS – Wash Sample

**Depositional Features**

- Parting – as much as 1/16 inch thick
- Seam – 1/16 inch to 1/2 inch thick
- Layer – 1/2 inch to 12 inches thick
- Stratum – greater than 1/2 inches thick
- Pocket – deposit of limited lateral extent
- Lens – lens with limited deposit
- Hardpan/Till – an unstratified, consolidated or cemented mixture of clay, silt, sand and/or gravel, the size, shape, texture and composition of the constituents vary widely
- Lacustrine – soil deposited by lake water
- Motill – soil irregularly marked with spots of different color that vary in number and size
- Varved – alternation of parts or seams of silt and/or clay
- Mottled – alternation of parts or seams of silt and/or clay
- Industrial – occasional or less than one per foot of thickness
- Interbedded – stratification of strata or beds of rock lying between or alternating with other strata of a different nature

**Description of Relative Quantities**

- Trace – particles are present but estimated to be less than 5%
- Few – 5 to 10%
- Little – 15 to 25%
- Some – 30 to 45%
- Mostly – 50 to 100%

**Cohesionless Soils**

<table>
<thead>
<tr>
<th>Relative Density</th>
<th>N(D)-N Value (Blows per foot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Loose</td>
<td>0 to 4</td>
</tr>
<tr>
<td>Loose</td>
<td>5 to 10</td>
</tr>
<tr>
<td>Medium Dense</td>
<td>11 to 30</td>
</tr>
<tr>
<td>Dense</td>
<td>31 to 50</td>
</tr>
<tr>
<td>Very Dense</td>
<td>51 to 80</td>
</tr>
<tr>
<td>Extremely Dense</td>
<td>Over 81</td>
</tr>
</tbody>
</table>

**Cohesive Soils**

<table>
<thead>
<tr>
<th>Consistency</th>
<th>N(D)-N Value (Blows per foot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Silt</td>
<td>2 or less</td>
</tr>
<tr>
<td>Silt</td>
<td>2 to 4</td>
</tr>
<tr>
<td>Medium</td>
<td>5 to 8</td>
</tr>
<tr>
<td>Silt</td>
<td>9 to 15</td>
</tr>
<tr>
<td>Very Silt</td>
<td>16 to 30</td>
</tr>
<tr>
<td>Hard</td>
<td>30 or greater</td>
</tr>
</tbody>
</table>

*Standard Penetration ‘N’ Value – Blows per foot of a 140-pound hammer falling 30 inches on a 2 inch O.D. split barrel sampler, except where noted. N=0 values as reported on boring logs represent raw N-values corrected for hammer efficiency only.*
Sample AS5 was too disturbed to perform shear strength testing.

NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.
2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.
GROUNDWATER & BACKFILL INFORMATION

GROUNDWATER WAS NOT ENCOUNTERED

BACKFILL METHOD: Auger Cuttings

NOTES: 1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.
2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.
**Boring B3**

**Date Started:** 11/25/20  
**Completed:** 11/25/20  
**Boring Method:** Hand Auger  
**Logged By:** BRB  
**Checked By:** JSW  

**Groundwater & Backfill Information**

- **Groundwater Was Not Encountered**
- **Backfill Method:** Auger Cuttings & Cold Patch

**Notes:**
1. The indicated stratification lines are approximate. The in-situ transitions between materials may be gradual.  
2. The colors depicted on the symbolic profile are solely for visualization purposes and do not necessarily represent the in-situ colors encountered.
Loss-On-Ignition (LOI) test performed on Sample SB2 indicates an organics content of about 3.6 percent.
APPENDIX B
IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL ENGINEERING REPORT
GENERAL COMMENTS
LABORATORY TESTING PROCEDURES
The Geoprosfessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for This Report
Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times
Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared solely for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:
- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. If you are the least bit uncertain about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full
Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. Read and refer to the report in full.

You Need to Inform Your Geotechnical Engineer About Change
Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:
- the site’s size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, always inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. The geotechnical engineer who prepared this report cannot accept...
Most of the “Findings” Related to This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site’s subsurface using various sampling and testing procedures. Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report’s Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations only after observing actual subsurface conditions exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.

This Report Could Be Misinterpreted

Other design professionals’ misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals’ plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, but be certain to note conspicuously that you’ve included the material for information purposes only. To avoid misunderstanding, you may also want to note that “informational purposes” means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, only from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and be sure to allow enough time to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled “limitations,” many of these provisions indicate where geotechnical engineers’ responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a “phase-one” or “phase-two” environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Unanticipated subsurface environmental problems have led to project failures. If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer’s services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, proper implementation of the geotechnical engineer’s recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. Geotechnical engineers are not building-envelope or mold specialists.
GENERAL COMMENTS

BASIS OF GEOTECHNICAL REPORT
This report has been prepared in accordance with generally accepted geotechnical engineering practices to assist in the design and/or evaluation of this project. If the project plans, design criteria, and other project information referenced in this report and utilized by SME to prepare our recommendations are changed, the conclusions and recommendations contained in this report are not considered valid unless the changes are reviewed, and the conclusions and recommendations of this report are modified or approved in writing by our office.

The discussions and recommendations submitted in this report are based on the available project information, described in this report, and the geotechnical data obtained from the field exploration at the locations indicated in the report. Variations in the soil and groundwater conditions commonly occur between or away from sampling locations. The nature and extent of the variations may not become evident until the time of construction. If significant variations are observed during construction, SME should be contacted to reevaluate the recommendations of this report. SME should be retained to continue our services through construction to observe and evaluate the actual subsurface conditions relative to the recommendations made in this report.

In the process of obtaining and testing samples and preparing this report, procedures are followed that represent reasonable and accepted practice in the field of soil and foundation engineering. Specifically, field logs are prepared during the field exploration that describe field occurrences, sampling locations, and other information. Samples obtained in the field are frequently subjected to additional testing and reclassification in the laboratory and differences may exist between the field logs and the report logs. The engineer preparing the report reviews the field logs, laboratory classifications, and test data and then prepares the report logs. Our recommendations are based on the contents of the report logs and the information contained therein.

REVIEW OF DESIGN DETAILS, PLANS, AND SPECIFICATIONS
SME should be retained to review the design details, project plans, and specifications to verify those documents are consistent with the recommendations contained in this report.

REVIEW OF REPORT INFORMATION WITH PROJECT TEAM
Implementation of our recommendations may affect the design, construction, and performance of the proposed improvements, along with the potential inherent risks involved with the proposed construction. The client and key members of the design team, including SME, should discuss the issues covered in this report so that the issues are understood and applied in a manner consistent with the owner’s budget, tolerance of risk, and expectations for performance and maintenance.

FIELD VERIFICATION OF GEOTECHNICAL CONDITIONS
SME should be retained to verify the recommendations of this report are properly implemented during construction. This may avoid misinterpretation of our recommendations by other parties and will allow us to review and modify our recommendations if variations in the site subsurface conditions are encountered.

PROJECT INFORMATION FOR CONTRACTOR
This report and any future addenda or other reports regarding this site should be made available to prospective contractors prior to submitting their proposals for their information only and to supply them with facts relative to the subsurface evaluation and laboratory test results. If the selected contractor encounters subsurface conditions during construction, which differ from those presented in this report, the contractor should promptly describe the nature and extent of the differing conditions in writing and SME should be notified so that we can verify those conditions. The construction contract should include provisions for dealing with differing conditions and contingency funds should be reserved for potential problems during earthwork and foundation construction. We would be pleased to assist you in developing the contract provisions based on our experience.

The contractor should be prepared to handle environmental conditions encountered at this site, which may affect the excavation, removal, or disposal of soil; dewatering of excavations; and health and safety of workers. Any Environmental Assessment reports prepared for this site should be made available for review by bidders and the successful contractor.

THIRD PARTY RELIANCE/REUSE OF THIS REPORT
This report has been prepared solely for the use of our Client for the project specifically described in this report. This report cannot be relied upon by other parties not involved in the project, unless specifically allowed by SME in writing. SME also is not responsible for the interpretation by other parties of the geotechnical data and the recommendations provided herein.
LABORATORY TESTING PROCEDURES

VISUAL ENGINEERING CLASSIFICATION

Visual classification was performed on recovered samples. The appended General Notes and Unified Soil Classification System (USCS) sheets include a brief summary of the general method used visually classify the soil and assign an appropriate USCS group symbol. The estimated group symbol, according to the USCS, is shown in parentheses following the textural description of the various strata on the boring logs appended to this report. The soil descriptions developed from visual classifications are sometimes modified to reflect the results of laboratory testing.

MOISTURE CONTENT

Moisture content tests were performed by weighing samples from the field at their in-situ moisture condition. These samples were then dried at a constant temperature (approximately 110º C) overnight in an oven. After drying, the samples were weighed to determine the dry weight of the sample and the weight of the water that was expelled during drying. The moisture content of the specimen is expressed as a percent and is the weight of the water compared to the dry weight of the specimen.

HAND PENETROMETER TESTS

In the hand penetrometer test, the unconfined compressive strength of a cohesive soil sample is estimated by measuring the resistance of the sample to the penetration of a small calibrated, spring-loaded cylinder. The maximum capacity of the penetrometer is 4.5 tons per square-foot (tsf). Theoretically, the undrained shear strength of the cohesive sample is one-half the unconfined compressive strength. The undrained shear strength (based on the hand penetrometer test) presented on the boring logs is reported in units of kips per square-foot (ksf).

TORVANE SHEAR TESTS

In the Torvane test, the shear strength of a low strength, cohesive soil sample is estimated by measuring the resistance of the sample to a torque applied through vanes inserted into the sample. The undrained shear strength of the samples is measured from the maximum torque required to shear the sample and is reported in units of kips per square-foot (ksf).

LOSS-ON-IGNITION (ORGANIC CONTENT) TESTS

Loss-on-ignition (LOI) tests are conducted by first weighing the sample and then heating the sample to dry the moisture from the sample (in the same manner as determining the moisture content of the soil). The sample is then re-weighed to determine the dry weight and then heated for 4 hours in a muffle furnace at a high temperature (approximately 440º C). After cooling, the sample is re-weighed to calculate the amount of ash remaining, which in turn is used to determine the amount of organic matter burned from the original dry sample. The organic matter content of the specimen is expressed as a percent compared to the dry weight of the sample.

ATTERBERG LIMITS TESTS

Atterberg limits tests consist of two components. The plastic limit of a cohesive sample is determined by rolling the sample into a thread and the plastic limit is the moisture content where a 1/8-inch thread begins to crumble. The liquid limit is determined by placing a ½-inch thick soil pat into the liquid limits cup and using a grooving tool to divide the soil pat in half. The cup is then tapped on the base of the liquid limits device using a crank handle. The number of drops of the cup to close the gap formed by the grooving tool ½ inch is recorded along with the corresponding moisture content of the sample. This procedure is repeated several times at different moisture contents and a graph of moisture content and the corresponding number of blows is plotted. The liquid limit is defined as the moisture content at a nominal 25 drops of the cup. From this test, the plasticity index can be determined by subtracting the plastic limit from the liquid limit.
Passionate People Building and Revitalizing our World
NOTICE OF PUBLIC MEETING
BERKLEY PLANNING COMMISSION

NOTICE IS HEREBY GIVEN, in accordance with Section 138-528 and Section 30-806 of the Berkley City Code, that there will be a meeting of the Berkley Planning Commission to be held at the City of Berkley in the Council Chambers, 3338 Coolidge Hwy, Berkley Michigan, on **Tuesday, May 24, 2022** at 7:10 pm, or as near thereto as the matter may be reached.

**APPLICATION PSP-09-22**

John Vitale, on behalf of L & L Development LLC, 3916 W. Eleven Mile Rd., Parcels #25-18-353-030 and #25-18-353-027, is requesting site plan approval for the renovation of the existing building to a retail marihuana dispensary and office tenant space.

Complete application information is available for review at [www.berkleymich.org/urbanplanning](http://www.berkleymich.org/urbanplanning).

Comments regarding the request may be made in person on the night of the meeting or may be made in writing. All written comments must be submitted to the Building Department or email to comdirector@berkleymich.net before 5:00p.m on the date of the Planning Commission meeting.

You can watch the meeting: [https://www.berkleymich.org/livestream/index.php](https://www.berkleymich.org/livestream/index.php)

MEGAN MASSON-MINOCK
INTERIM COMMUNITY DEVELOPMENT DIRECTOR

**Publish Once:**
Royal Oak Tribune
Friday, May 6, 2022
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MEGAN MASSON-MINOCK
INTERIM COMMUNITY DEVELOPMENT DIRECTOR
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