



301 East Main Street
Lowell, Michigan 49331
Phone (616) 897-8457
Fax (616) 897-4085

PLANNING COMMISSION-CITIZEN ADVISORY COMMITTEE
CITY OF LOWELL, MICHIGAN
AGENDA

FOR THE REGULAR MEETING OF
MONDAY, OCTOBER 12, 2020 AT 7:00 P.M.

AT THE
LOWELL CITY HALL
CITY COUNCIL CHAMBERS
SECOND FLOOR
301 EAST MAIN STREET

1. CALL TO ORDER: PLEDGE OF ALLEGIANCE, ROLL CALL
2. APPROVAL OF AGENDA
3. APPROVAL OF THE MINUTES OF PREVIOUS MEETINGS
 - a. September 14, 2020 – Regular Meeting
4. PUBLIC COMMENTS AND COMMUNICATIONS CONCERNING ITEMS NOT ON THE AGENDA
5. OLD BUSINESS
 - a. Site Plan Review – 126 S. West Street – Tabled from last meeting
6. NEW BUSINESS
 - a. Site Plan Review – Special Land Use – Grand Rapids Gravel
7. STAFF REPORT
8. COMMISSIONERS REMARKS
9. ADJOURNMENT

**OFFICIAL PROCEEDINGS
OF THE
PLANNING COMMISSION-CITIZEN ADVISORY COMMITTEE
CITY OF LOWELL, MICHIGAN
FOR THE REGULAR MEETING OF
MONDAY, SEPTEMBER 14, 2020 AT 7:00 P.M.**

1. **CALL TO ORDER, PLEDGE OF ALLEGIANCE, ROLL CALL.**

The Meeting was called to order at 7:00 p.m. by Chair Barker.

Present: Commissioners Marty Chambers, Michael Gadula, Tony Ellis, Collin Plank, Amanda Schrauben and Chair Bruce Barker.

Absent: Commissioner Cadwallader.

Also Present: Andy Moore with William & Works and Lowell Deputy City Clerk Amy Brown.

2. **EXCUSE OF ABSENCES.**

Commissioner Cadwallader was excused of his absence.

3. **APPROVAL OF AGENDA.**

IT WAS MOVED BY ELLIS and seconded by CHAMBERS to approve the agenda as written.
YES: 6. NO: None. ABSENT: 1. MOTION CARRIED.

4. **APPROVAL OF MINUTES OF PREVIOUS MEETING.**

IT WAS MOVED BY GADULA and seconded by ELLIS to approve the minutes from the July 13 Regular Planning Commission meeting as written.
YES: 6. NO: None. ABSENT: 1. MOTION CARRIED.

5.. **PUBLIC COMMENTS AND COMMUNICATIONS CONCERNING ITEMS NOT ON THE AGENDA.**

There were no comments.

6. **OLD BUSINESS.**

7. **NEW BUSINESS.**

a. **Site Plan Review – 126 S. West Street.**

Andy Moore with William & Works reviewed the site plan and application. The subject property is approximately 0.3 acres in the C3 General Business district. The site plan indicates that the building's end use will be a marihuana growing establishment and dispensary (microbusiness); however, the applicant has applied first for site plan approval, and intends to erect the building and apply for the adult use marihuana special land use permit at a future date. Therefor, the marihuana use will not be evaluated in this review; rather, a separate special land use application must be submitted and reviewed to evaluate a marihuana microbusiness use in the proposed building. This site plan review is not intended to authorize any land use; rather, it is intended only to evaluate the merits of the building in relation to the site and surrounding area. Unless a special land use permit is subsequently submitted and approved, the building cannot be occupied for any use other than those permitted by right in the C3 General Business district.

Moore noted this has been a long vacant parcel in this district.

It is worth noting that the site plan shows that the building would be used for “retail” and a majority of the floor area would be used for “warehousing”. While retail is permitted in the C-3 district, warehousing is not. The applicant should be mindful of the land uses that are permitted in C-3 and be prepared to demonstrate compliance with the zoning ordinance if the plans for a microbusiness are not fulfilled.

The applicant has submitted site plan documents for review. Section 18.04 B provides a list of information required for a detailed site plan review unless deemed unnecessary by the zoning enforcement officer. Moore finds that the site plan is generally complete for review; however, there were nine items that yet need to be submitted.

While some of the above items can be considered not pertinent to the application, at a minimum, updated plans should be provided as indicated in Moore’s memo.

Contractor Shawn Bowne of 806 N. Washington explained the applicant wants to get a structure up. The original intent was a microbusiness, however, with all the other businesses of this nature in town, other options are being considered.

Bowne explained the stamped plans would be submitted once he knows exactly what the Planning Commission would like to see.

The Commission reviewed the Site Plan Review Standards.

Chair Barker suggested tabling the site plan until the October Planning Commission meeting until further information can be provided. By general consensus, the Commissioners agreed.

IT WAS MOVED BY CHAMBER and seconded by ELLIS that site plan be tabled until additional information can be provided as follows; parking space dimensions and lot layout, unloading areas, zoning of adjacent properties, landscaping plan, utility information approved by DPW, storm water information and information on the size of water lines, size of the warehouse.

ROLL CALL: COMMISSIONER, COMMISSIONER ELLIS, COMMISSIONER GADULA, COMMISSIONER SCHRAUBEN, AND CHAIR BARKER.

YES: 6. NO: NONE. ABSENT: 1. MOTION CARRIED.

8. **STAFF REPORT.**

No reports at this time.

9. **COMMISSIONERS REMARKS.**

Commissioner Gadula asked if the joint Planning Commission was going to take place the end of October with Lowell and Vergennes Townships. Sue Ullery will check into this.

Commissioner Chambers commented on the Pink Arrow Drive In event at the Fairgrounds that will take place on September 25, 2020. Volunteers are welcomed.

10. ADJOURNMENT.

IT WAS MOVED BY CHAMBERS and seconded by ELLIS to adjourn at 8:01 p.m.

DATE:

APPROVED:

Bruce Barker, Chair

Susan Ullery, Lowell City Clerk

Sue Ullery

From: Moore, Andrew <Moore@williams-works.com>
Sent: Friday, October 09, 2020 2:58 PM
To: Sue Ullery
Subject: FW: 126 S. West St
Attachments: City Utility drawing.pdf

This is my email conversation with Shawn this week.

AM

From: sbowne@bowneconstruction.com [mailto:sbowne@bowneconstruction.com]
Sent: Wednesday, October 07, 2020 9:02 AM
To: Moore, Andrew <Moore@williams-works.com>
Cc: Ryan Klosner <rwklosner@gmail.com>
Subject: RE: 126 S. West St

It will be handled on site.

Very Truly Yours,

Shawn Bowne
Bowne Construction Corporation
Member CMAA in Good Standing
www.bowneconstruction.com

P 616-965-2345
C 702-807-6899

----- Original Message -----

Subject: RE: 126 S. West St
From: "Moore, Andrew" <Moore@williams-works.com>
Date: 10/7/20 8:56 am
To: "sbowne@bowneconstruction.com" <sbowne@bowneconstruction.com>
Cc: "Ryan Klosner" <rwklosner@gmail.com>

Shawn,

Thank you for the update and I look forward to receiving the updated site plan. It sounds like it will address the Planning Commission's requirements. Do you have any information on stormwater for that site? Is there a city storm sewer available for connection or will it be handled on-site?

thank you,

AM

From: sbowne@bowneconstruction.com [mailto:sbowne@bowneconstruction.com]
Sent: Tuesday, October 06, 2020 4:25 PM
To: Moore, Andrew <Moore@williams-works.com>
Cc: Ryan Klosner <rwklosner@gmail.com>
Subject: RE: 126 S. West St

Yes, I call Dan at DPW 3 weeks ago and have not heard back from him to this date, although I have left multiple messages. I have 3/4" water and 4" sewer at the site (property line). I have added 6 Box Elder bushes along West Street P/L. I have sized the parking spaces (although I would like to find an approved space in Lowell that is not 9x18). I have attached a typical curb detail for the approach. The drawing is in route to Iron Mountain for my Engineer to stamp. As I had stated in our Pre Planning Committee meeting and again after the September Planning meeting, I will NOT stamp the drawings until the Planning Committee gives me the changes that they want and are entitled to as stated in the City Ordinances and Charter. I will be supplying each member and yourself of a snapshot of the property and the utilities that are already located there (see attached copy). Since the meter fee was paid for the site by the prior owner, and never refunded, there will not be any fees for a new meter on the site.

I had expected to hear from you a little earlier than today, I know you are busy, as we discussed you emailing me a time that we could meet and go over everything during our last discussion after the September meeting. So, as we understand, all of the items that were requested by the Planning Committee during the September meeting are referenced above and have been added to the site plan. Additionally I will reiterate that the building plans will not be stamped until the Committee supplies my client with all compliant changes that they require.

Please feel free to contact me with any questions or comments that you may have.

Very Truly Yours,

Shawn Bowne

Bowne Construction Corporation

Member CMAA in Good Standing

www.bowneconstruction.com

P 616-965-2345

C 702-807-6899

----- Original Message -----

Subject: 126 S. West St

From: "Moore, Andrew" <Moore@williams-works.com>

Date: 10/6/20 3:27 pm

To: "sbowne@bowneconstruction.com" <sbowne@bowneconstruction.com>

Shawn,

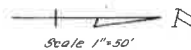
Any progress on this site plan? I haven't heard anything and want to make sure this is on your radar. Lowell's next PC meeting is next week Monday (10/12). Let me know if I can help.

Thanks!

AM

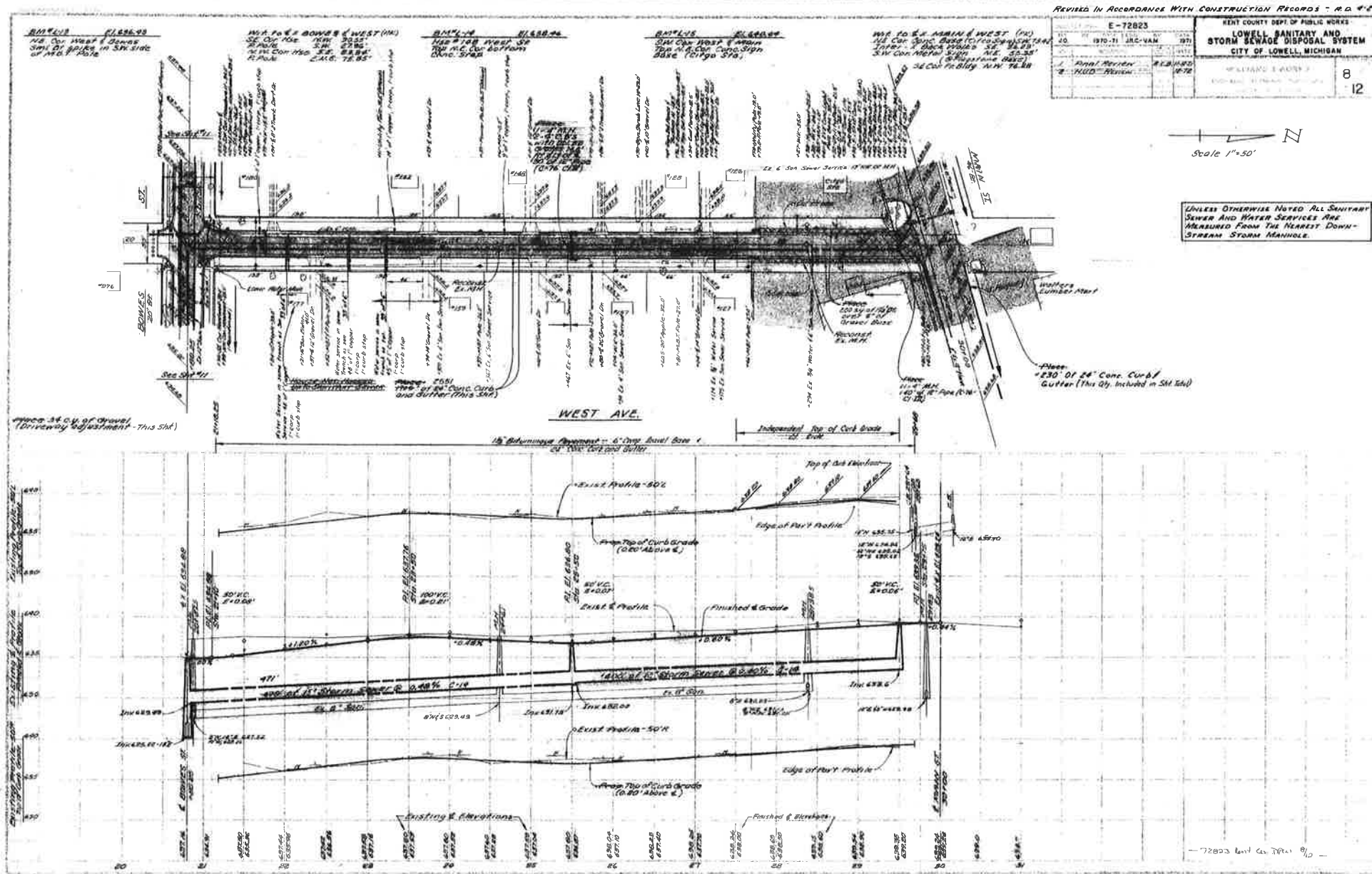
E-72823			
NO.	DATE	BY	CHK.
10	1970-11	JAC-VAN	1971
LOWELL SANITARY AND STORM SEWAGE DISPOSAL SYSTEM			
CITY OF LOWELL, MICHIGAN			
REVISIONS			
1	REVISION	REVISION	REVISION
2	REVISION	REVISION	REVISION
3	REVISION	REVISION	REVISION

8
12



Scale 1"=50'

UNLESS OTHERWISE NOTED ALL SANITARY SEWER AND WATER SERVICES ARE MEASURED FROM THE NEAREST DOWN-STREAM STORM MANHOLE.



CONTRACT I-A

WEST AVE

williams&works

engineers | surveyors | planners

MEMORANDUM

To: City of Lowell Planning Commission
Date: September 11, 2020
From: Andy Moore, AICP
Whitney Newberry
RE: 126 S. West Avenue SE

Klosner Properties LLC, represented by Ryan Klosner, has applied for site plan approval to construct a building at 126 S. West Avenue SE (PPN 41-20-02-353-002). The purpose of this memorandum is to review the request pursuant to Chapter 18 Site Plan Review of the City of Lowell Zoning Ordinance.

Background

The subject property has an area of approximately 0.3 acres and has long been a vacant parcel within the C3 General Business district. The site plan indicates that the building's end use will be a marihuana growing establishment and dispensary (microbusiness); however, the applicant has applied first for site plan approval, and intends to erect the building and apply for the adult use marihuana special land use permit at a future date. Therefore, the marihuana use will not be evaluated in this review; rather, a separate special land use application must be submitted and reviewed to evaluate a marihuana microbusiness use in the proposed building. This site plan review is not intended to authorize any land use; rather, it is intended only to evaluate the merits of the building in relation to the site and surrounding area. Unless a special land use permit is subsequently submitted and approved, the building cannot be occupied for any use other than those permitted by right in the C3 General Business district.

It is also worth noting that the site plan shows that the building would be used for "retail" and a majority of the floor area would be used for "warehousing." While retail is permitted in the C-3 district, warehousing is not. The applicant should be mindful of the land uses that are permitted in C-3 and be prepared to demonstrate compliance with the zoning ordinance if the plans for a microbusiness are not fulfilled.



Completeness of Submission

The applicant has submitted site plan documents for review. Section 18.04 B provides a list of information required for a detailed site plan review unless deemed unnecessary by the zoning enforcement officer. We find that the site plan is generally complete for review; however, the following items were not included:

1. Name of the professional individual responsible for the preparation of the site plan. The seal of a professional surveyor is present on the site plan. However, proposed site improvements appear to be hand-drawn over the survey.
2. The size (in acres) of the subject property.
3. The front yard setback.
4. The location of all existing and proposed signs, exterior lighting, curbing, dimensions of a typical parking space, and unloading areas.
5. The existing zoning and use of all properties abutting the subject property.
6. The location, type, and size of all proposed landscaping, and the location, height, and type of existing and proposed fences and walls.
7. Size and location of existing and proposed utilities, including any proposed connections to public sewer or water supply systems.
8. The location and size of all surface water drainage facilities.
9. Existing and proposed topographic contours at a minimum of five (5) foot intervals.

While some of the above items can be considered not pertinent to the application, at a minimum, updated plans should be provided that include items 1, 4, 6, 7, 8, and 9 from the above list.

SITE PLAN REVIEW

Setbacks and Dimensional Requirements. The site plan appears to meet the front, side, and rear setback requirements. The subject property is legally nonconforming in terms of its lot area and width. Section 12.04 requires a minimum lot size of 20,000 square feet and a lot width of 100 feet in the C3 district. The subject property is about 13,000 square feet and has a width of 66 feet. However, the City permits nonconforming lots to be developed in accordance with the underlying zoning district, provided that all applicable setbacks are met.

Landscaping. Landscaping is not included on the site plan. The applicant has submitted a narrative that low impact, drought-tolerant species are proposed with either recycled wood or reflective white marble chips as ground cover. This narrative states the applicant's intent to be environmentally friendly and desire to reduce the building's impact on water needs.

Section 4.26 E(2) requires front yard landscaping in the C-3 district, with a minimum of one canopy tree and three deciduous shrubs for every 30 feet of lot width. Based on the subject

property's width of 66 feet, this equates to two canopy trees and six deciduous shrubs. Additionally, Section 4.26 E(3)(b) requires frontage parking lot landscaping where a parking area faces a public street. This should include either a strip of land at least five feet wide with a solid screen of a hedge, fence, or decorative wall at least three feet tall, or a strip of land 10 feet wide containing at least one canopy tree for each 30 feet in lot width. This strip of land does not appear to be proposed on the site plan between the parking area and West Street. The applicant may satisfy front yard landscaping and frontage parking lot landscaping with the same trees and shrubs, if desired. These should be indicated on the site plan or on a separate landscaping plan.

The Planning Commission may modify the landscape requirements when it finds circumstances that warrant a change in the requirements or in finding that existing landscaping, screening, or existing conditions on the site would be preserved and meet the intent of Section 4.26.

Lighting. The building floor plan includes notes regarding the means of egress illumination. This includes illumination of egress spaces at all times and emergency power in the event of a power supply failure. The locations of exterior building or site lights are not depicted on the site plan. All lighting must comply with Section 4.24, which may be included as a condition of approval.

Parking/Circulation. The applicant is proposing seven parking spaces, including one ADA space. The purpose of this site plan review is to evaluate the building on the site and its potential impacts on the surrounding area. Therefore, a specific land use is not being considered in this application and thus parking requirements are not defined for review. However, because the applicant intends to use the building for retail and warehouse purposes, parking requirements for these uses are considered to ensure the building would be appropriately situated to accommodate parking for future occupancy.

Retail stores require one parking space for each 200 square feet of gross floor area. The site plan indicates that the mercantile portion of the building is 855 square feet, equating to five required spaces. Warehouse uses require one parking space for each 2,000 square feet of gross floor area, with a minimum of four spaces. The site plan notes that the building's storage use is approximately 1,545 square feet, requiring a minimum of four spaces. In total, nine spaces would be required for this building if it is later approved for warehouse and retail uses. Therefore, it is worth noting that additional parking may be required in the future to satisfy future parking requirements.

Signage. Because this review will not authorize a specific land use, signage is not currently proposed and will be addressed in a future application for land use approval.

Site Plan Review Standards. In order to approve a special land use, the Planning Commission must find that each of the standards listed in Section 18.06 would be met. Following are the standards and our remarks on each:

- A. The uses proposed will not adversely affect the public health, safety, or welfare. Uses and structures located on the site shall be planned to take into account topography, size

of the property, the uses on adjoining property and the relationship and size of buildings to the site. The site shall be developed so as not to impede the normal and orderly development or improvement of surrounding property for uses permitted in this ordinance.

Remarks: All surrounding properties are in the C-3 General Business district. The applicant is not proposing a specific land use; rather, he has requested approval of the building before land use approval. If the applicant intends to operate a marihuana microbusiness in the building, a separate special land use application is required and this standard will be evaluated again with consideration of this use. In order to ensure any potential uses in the building remain compatible with the surrounding area, the Planning Commission should include a condition of approval that this building cannot be occupied by any use except for those permitted by right in the C-3 General Business district unless special land use approval is received at a future date. Additionally, a condition of approval can require that a certificate of occupancy not be granted until a zoning compliance permit is obtained from the city.

Additionally, utilities to the building are not indicated on the site plan. Considering that the applicant intends to create a marihuana microbusiness, the building may require additional utilities beyond a typical retail or warehouse use. The Planning Commission may discuss the location and size of utilities being connected to the building to ensure the site can adequately provide any proposed services. The Planning Commission may defer to the Township Engineer and Lowell Light & Power in this regard.

- B. Safe, convenient, uncongested, and well-defined vehicular and pedestrian circulation shall be provided for ingress/egress points and within the site. Drives, streets, and other circulation routes shall be designed to promote safe and efficient traffic operations within the site and at ingress/egress points.

Remarks: A curb cut exists on the property from West Street, although the rest of the property is vacant. The site plan indicates that this curb cut would be used to provide access to the site, although it is unknown if there would be any improvements or resurfacing of this existing concrete. This location appears to provide safe access to the proposed parking area from West Street.

Parking spaces are designated near the front of the building to provide convenient access. Interior vehicular circulation is unknown, as paved areas are not defined on the site plan. Although the parking areas are present, the surface and edge of the lot are not included in the site. The Planning Commission may address this to determine the circulation routes of vehicles.

A sidewalk exists along the property front and connects to adjacent properties. An eight-foot-wide covered porch is also proposed along the building front, which would provide access from the parking area to building ingress/egress locations. Pedestrian circulation is expected to be safe and convenient.

- C. The arrangement of public or private vehicular and pedestrian connections to existing or planned streets in the area shall be planned to provide a safe and efficient circulation system for traffic within the City of Lowell.

Remarks: The applicant is proposing to use the existing curb cut on West Street to provide site access. A curb cut at this location is expected to contribute to safe and efficient traffic along West Street. Although is near a curb cut on the adjacent property, but no vegetation would obscure views between the properties. Provided the applicant receives a driveway permit from the City, the Planning Commission may find this standard met.

- D. Removal or alteration of significant natural features shall be restricted to those areas, which are reasonably necessary to develop the site in accordance with the requirements of this ordinance. The planning commission requires that approved landscaping, buffers and/or greenbelts be continuously maintained to ensure that proposed uses will be adequately buffered from one another and from surrounding public and private property.

Remarks: The site plan materials do not indicate the presence of any natural features on the site. A review of aerial imagery indicates that the site is mostly open space, although a few trees may exist near the rear lot line. It is expected that the building would not result in the removal of significant natural features; however, the Planning Commission may inquire whether any trees will be removed from the site.

- E. Satisfactory assurance shall be provided that the requirements of all other applicable ordinances, codes, and requirements of the City of Lowell will be met.

Remarks: A condition of approval can stipulate continual compliance with applicable codes and ordinances.

- F. The general purposes and spirit of this ordinance and the Comprehensive Plan of the City of Lowell shall be maintained.

Remarks: The purpose of the C3 General Business district is to permit a mixture of residential, office, and commercial uses that do not necessarily adhere to the style of downtown buildings. This district offers more automobile-related uses that would not always be compatible with residential uses. The building form and site layout appear to align with the intent of the C3 General Business district.

The City of Lowell's Master Plan was adopted in 2007 and outlines a desired vision for land uses in the City. The subject property is located in the Mixed Use future land use category. The Mixed Use designation is "intended to permit a mixture of residential, office, and commercial land uses but not necessarily in a downtown style building." Although not in a downtown style building, the Plan notes that these areas should still be pedestrian-oriented. The proposed building and subject property appear to maintain the general purposes and spirit of the Ordinance and Master Plan. The Planning Commission may find that this standard is met.

Recommendation

At the September 14th meeting, the Planning Commission should discuss the site plan, application, and carefully consider any comments from the public and the applicant. Subject to those comments, the Planning Commission may approve the application. If the Planning Commission approves the site plan, we suggest the following conditions be included, along with any others deemed necessary:

1. Prior to issuance of any City permits, the applicant shall have paid all application, permit, reimbursable escrow, and other fees related to the request.
2. The applicant shall comply with any requirements from the City's Department of Public Works, City Engineer, Light and Power, or other City officials.
3. The proposed special land use shall comply with all applicable federal, state, and local requirements, and copies of all applicable permits shall be submitted to the City.
4. The applicant shall continually comply with applicable ordinances, codes, and requirements of the City of Lowell.
5. The applicant shall submit an updated site plan containing all site plan items required in Section 18.04 B and identified as missing above unless specifically waived by the zoning enforcement officer.
6. Site landscaping shall comply with the applicable standards of Section 4.26 of the Zoning Ordinance unless specifically modified by the Planning Commission.
7. Any exterior lighting shall comply with the lighting standards of Section 4.24 and 19.03 C of the Zoning Ordinance.
8. The proposed building shall not be occupied by any use except for those permitted by right in the C-3 General Business district unless special land use approval is received at a future date. A certificate of occupancy for the building shall not be granted until a zoning compliance or special use permit is obtained from the city.

Request Number: _____

Filing Fee: _____



301 East Main Street
Lowell, Michigan 49331
Phone (616) 897-8457
Fax (616) 897-4085

APPLICATION FOR SITE PLAN REVIEW

- All drawings must be sealed by an architect, engineer or surveyor unless waived by the Zoning Administrator.
- 15 copies of the site plan must be submitted to the City Manager's office no later than three weeks before the Planning Commission meeting to allow adequate staff review.
- The Planning Commission meets the second Monday of the month at 7:00 p.m. where plans are approved, rejected or modified.
- Preliminary plans may be presented for Planning Commission comment, but no final approval is given until all required conditions are met.
- After approval, public works and building permits must be secured before construction may commence.

1. Street Address and/or Location of Request: 126 S West Ave SE
2. Parcel Identification Number (Tax I.D. No.): #41-20-02-353-002
3. Applicant's Name: Klosner Properties LLC Phone Number (248) 763-2037
Address: 8780 Currie rd Northville MI 48168
Street City State Zip
Fax Number — Email Address RWKLOSNER@gmail.com
BKLOS8780@gmail.com
4. Are You: ☒ Property Owner ☐ Owner's Agent ☐ Contract Purchaser ☐ Option Holder
5. Applicant is being represented by: Ryan Klosner Phone Number (248) 756-0180
Address: 13992 Grand River Dr SE Lowell, MI 49331
6. Present Zoning of Parcel C-3 Present Use of Parcel Vacant
7. Description of proposed development (attach additional materials if needed):
2400 sqft office/warehouse building
40 x 60 x 10ft eave height

The facts presented above are true and correct to the best of my knowledge.

Signature: [Signature] Date: 8-18-2020

Type or Print Your Name Here: Ryan W. Klosner

Property Owner Approval: As owner I hereby authorize the submittal of this application and agree to abide by any decision made in response to it. [Signature] 8-18-2020
Owner Date

The following 16 points make up the **CHECKLIST** of required information needed on the drawing for final plan approval (unless specifically waived by the Planning Commission). Please go over this **CHECKLIST** with the City Manager and Zoning Administrator before presenting to the Planning Commission.

1. Date, north arrow and scale (not more than 1" = 100', supplementary site plans at a 1" = 50' or larger scale are encouraged)
2. A city locational sketch
3. Legal description and City address of the subject property
4. The size in acres or square feet of the subject property
5. All lot and/or property lines with dimensions, including building setback lines
6. The location of all existing structures within one hundred (100) feet of the subject property's boundary
7. The location and dimensions of all existing and proposed structures on the subject property
8. The location and dimensions of all existing and proposed:
 - Drives
 - curb openings (NOTE: all new openings onto M-21 (Main Street) must receive State Transportation Department approval)
 - sidewalks
 - exterior lighting
 - curbing
 - parking areas (include and delineate the total number of parking spaces showing dimensions of a typical space)
 - unloading areas
 - recreation areas
 - common use areas
 - areas to be conveyed for public use and purpose
9. The location, pavement width and right-of-way width of abutting roads, alleys or easements
10. The existing zoning of all properties abutting the subject project
11. The location of all existing and proposed:
 - landscaping and vegetation
 - location, height and type of existing and proposed fences and walls
12. Proposed cost estimates of all site improvements
13. Size and location of existing and proposed hydrants and utilities including proposed connections to public sewer or water supply systems
14. The location and size of septic and drain fields
15. Contour intervals shown at five (5) foot intervals
16. **FOR RESIDENTIAL DEVELOPMENT**, the following information is required (affixed to the drawing):
 - Net developable area, in acres or in square feet, defined as all areas that could be developed subtracted by lands used or dedicated for existing easements and rights of way
 - The number of dwelling units proposed (by type), including typical floor plans for each type of dwelling
 - The number and location of efficiency and one or more bedroom units
 - Typical elevation views of the front, side and rear of each type of building
 - Dwelling unit density of the site (total number of dwellings / net developable area)

INITIAL

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

MR

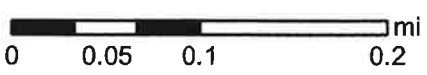


Kent County Web Map

August 20, 2020



Kent County, MI makes no warranty, expressed or implied, regarding the accuracy, completeness or usefulness of information presented. Users of this information assume all liability for its fitness for a particular use.



SITE IMPROVEMENT COST ESTIMATE

The estimated value of all site improvements is \$25,650.00, exclusive of landscaping. This includes saw cutting of curb and gutter, paving, concrete approach, water and sewer hook ups, striping of parking lot.

Landscaping

We are proposing to utilize low impact, drought tolerant plants with either recycled wood as ground cover or reflective white marble chips in the front areas of the property. Since we are trying to be as environmentally conscious as possible, we will need to verify that the city will allow us some latitude in order to reduce our water imprint for this building.

KLOSNER, LLC

40' x 60' POLE BLDG.

CODES:

2015 MICHIGAN BUILDING CODE- COMMERICAL
2015 MICHIGAN PART 8 ELECTRICAL CODE
2017 NATIONAL ELECTRICAL CODE
2015 MICHIGAN MECHANICAL CODE
2015 MICHIGAN PLUMBING CODE
2015 MICHIGAN UNIFORM ENERGY CODE

DESIGN CRITERIA

BUILDING END USE: MARIJUANA GROWING AND DISPENSARY
USE GROUP CLASSIFICATION: BUSINESS
TYPE OF CONSTRUCTION: VB
FLOOR AREA: 40'-0" x 60'-0"; 2,400 SFT.
LEAN-TO AREA: 8'-0" x 40'-0"; 320 SFT.
TOTAL AREA: 2,720 SFT
ALLOWABLE BUILDING AREA, N.S.: 9,000 SFT.
ROOF SLOPE: 4/12
LEAN-TO ROOF SLOPE: 1/12
GROUND SNOW LOAD: 35 PSF.
ROOF SNOW LOAD (FLAT) Pf: 24.5 PSF.
ROOF SNOW LOAD (SLOPED) Ps: 20.0 PSF, MIN. SNOW LOAD
SNOW DRIFT LOADS WERE INCLUDED IN LEAN-TO DESIGN
TOP CHORD DL: 3 PSF.
BOTTOM CHORD DL: 10 PSF.
RISK CATEGORY: II
SNOW EXPOSURE FACTOR, Ce: 1.0
SNOW IMPORTANCE FACTOR, Is: 1.0
ROOF SLOPE FACTOR, Cs: 0.94
TERRIAN CATEGORY: "B"
THERMAL FACTOR, Ct: 1.0
ULTIMATE WIND SPEED, Vult: 115 MPH
NOMINAL DESIGN WIND SPEED, Vasd: 89 MPH
WIND IMPORTANCE FACTOR, Iw: 1.0
DESIGN WIND LOAD: 19.4 PSF.
SEISMIC CATEGORY: "A"
SEISMIC IMPORTANCE FACTOR: 1.0
ALLOWABLE SOIL BEARING CAPACITY: 3000 PSF.
DEFLECTION LIMITS:
SECONDARY ROOF STRUCTURAL MEMBERS SUPPORTING
FORMED METAL ROOFING, DESIGN LL DEFL. < /= 1/150
SECONDARY WALL MEMBERS SUPPORTING FORMED METAL
SIDING, DESIGN WIND LOAD DEFL. < /= 1/90
BEAMS AND HEADERS: 1/240

ENERGY EFFICIENCY

CLIMATE ZONE: 5A
ATTIC INSULATION: R-38
WOOD FRAMED WALLS: R 20
SLABS: R 10 FOR 24 "

PROJECT NOTES

1. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE REMOVED FROM THE LOCATION WHERE THE SLAB AND/OR THE FOOTINGS WILL BE CONSTRUCTED.
2. FOOTINGS ARE DESIGNED TO BEAR ON NATURAL MATERIALS OR GRANULAR FILL. A 12" SAND BASE, MINIMUM, CONSISTING OF WELL GRADED SAND OR GRAVELLY SAND WITH LITTLE OR NO FINES SHALL BE PLACED ON A PREPARED SURFACE AND COMPACTED TO ASSURE UNIFORM SUPPORT OF THE SLAB.
3. 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 3,500 PSI. CONCRETE FORM WORK SHALL BE SQUARE AND ACCURATE TO THE DIMENSIONS SHOWN ON THE PLAN. THE SLAB SURFACE IS TO BE STEEL TROWELED AND FREE OF VOIDS AND TROWEL MARKS.
4. ALL CONCRETE REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, ANCHOR BOLTS ASTM A 307, GRADE A. REINFORCING STEEL SHALL BE FREE OF RUST, BENT AROUND CORNERS AND CONTINUOUS WITH 12" LAPS. REINFORCEMENT LAPS MAY BE NONCONTACT WITH A MINIMUM CLEARANCE OF 3".
5. LUMBER IN CONTACT WITH CONCRETE PRODUCTS SHALL BE PRESSURE TREATED WITH CHEMICAL PERSERVATIVE.
6. INSULATION INSTALLED AROUND THE PERIMETER OF THE FOUNDATION SHALL BE RIGID CLOSED-CELL EXTRUDED POLYSTYRENE THERMAL BOARD INSULATION COMPLYING WITH ASTM C 578-92. VERTICAL INSULATION AND NONBEARING HORIZONTAL INSULATION CAN BE TYPE IV, DENSITY 1.6 LBS./CU. FT. COMPRESSIVE STRYOFAM BRAND SQUARE EDGE, STRENGTH 25 PSI.
7. VERTICAL INSULATION PLACED ALONG THE EXTERIOR EDGE OF THE SLAB-ON-GRADE SHALL HAVE A OPAQUE AND WATER RESISTANT PROTECTIVE COVERING. THE PROTECTIVE COVERING, FLASHING, SHALL BE COMPARIBLE WITH THE INSULATION MATERIAL AND EXTEND A MINIMUM OF 6" BELOW FINISHED GRADE. EXTERIOE HORIZONTAL INSULATION SHALL HAVE A MINIMUM OF 10" OF SOIL COVER.
8. THE ELEVATION OF THE TOP OF SLAB SHALL BE ESTABLISHED ON SITE WITH THE OWNER TO ENSURE SURFACE WATER DRAINS AWAY FROM THE BUILDING FOUNDATION.
9. CONTROL JOINTS: SAW CUT 20' O.C. MAXIMUM.
CONSTRUCTION JOINTS: PROVIDE AND INSTALL #4 REBAR 2' O.C., 12" MINIMUM EMBEDMENT EACH POUR.

GENERAL NOTES

1. OWNER/CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS BEFORE PROCEEDING WITH WORK.
2. WHEN CONTRADICTION OCCURS BETWEEN PLANS AND SPECIFICATIONS AND/OR ERRORS ARE FOUND IN EITHER, THE CONTRACTOR/OWNER SHALL OBTAIN CLARIFICATION FROM THE ENGINEER OF RECORD BEFORE CONTINUING WITH CONSTRUCTION.
3. CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE PLANS AS APPROVED BY THE KENT COUNTY CODE COMMISSION AND CITY OD LOWELL, MI IF REQUIRED.
4. THE OWNER/CONTRACTOR IS RESPONSIBLE FOR CONTACTING "MISS DIG". CALL 811.
5. THESE PLANS ARE FOR FOUNDATION AND BUILDING CONSTRUCTION. THE OWNER/CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING THE BUILDING PERMIT.
6. ALL OTHER CONTRACTORS INVOLVED IN THE CONSTRUCTION OF THIS PROJECT, WILL BE REQUIRED TO PROVIDE THE NECESSARY INFORMATION TO THE CODE COMMISSION, AS IT RELATES TO THEIR TRADE, IN ORDER TO SECURE A WORK PERMIT FOR THIS PROJECT.
7. THE ENGINEER OF RECORD AND THE CODE COMMISSION SHALL BE ADVISED OF STRUCTURAL CHANGES WHICH MAY COMPROMISE THE STRUCTURAL INTEGRITY OF THE BUILDING.
8. DO NOT SCALE DIMENSIONS FROM PLAN. DIMENSIONS SHALL BE AS INDICATED ON DRAWINGS. CONTRACTOR AND/OR OWNER SHALL CONTACT THE ENGINEER OF RECORD FOR CLARIFICATION OF DISCREPANCES OR QUESTIONS. ALL DIMENSIONS ARE FROM FACE OF STUDS OR FACE OF FOUNDATION UNLESS OTHERWISE NOTED.

INDEX TO PLANS

COVER SHEET	C1.0
FOUNDATION PLAN	S1.0
BUILDING SECTION DETAIL A-A	S2.0
LONGITUDINAL SECTION B-B	S3.0

OWNER:

KLOSNER, L.L.C.
LOWELL, MI. 49331

JACOBETTI ENGINEERING

1321 EVERGREEN DR.
IRON MOUNTAIN MI. 49801
(906) 779-1332

COVER SHEET

PROJECT: KLOSNER, LLC
40' x 60' POLE BARN
8' x 40' LEAN-TO

DATE:

2/13/2020

SHEET NO.

C1.0

- SPEEDWAY SUPER AMERICA LLC
1004 W MAIN ST
41-20-02-353-012



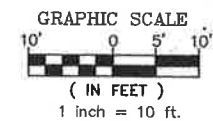
Kevin Roosen, PS#31604

Date: August 23, 2018

LEGAL DESCRIPTION FROM FIRST AMERICAN TITLE POLICY NO. 821045:
Lot(s) 26 of SWEET & SMITH'S ADDITION, City of Lowell, Kent County,
Michigan, according to the plat thereof recorded in Liber 7 of Plats, Page 13
of Kent County Records.

NOTE:

1. According to FEMA FIRM map dated May 16, 1983, community panel no. 260108 0001 B, subject parcel lies in Zone B, which is described as areas lying between the 100 year flood plain and 500 year flood plain zones.



ALTA/NSPS LAND TITLE SURVEY
126 S WEST STREET SE
SWEET AND SMITH'S ADD.
CITY OF LOWELL, KENT CO., MI.

CLIENT:
SHAWN BOWNE
BOWNE CONSTRUCTION
806 N WASHINGTON ST.
LOWELL, MI 49331

PROJECT NO. 181056
SHEET 1 of 1

DRAWN BY: NCR 8045062

DRAWN BY: KJR
APPROVED BY: KJR
DATE: AUGUST 23, 2018

SERVING THE NEEDS OF OUR
OF FRAMES CUSTOM 400M

Rossini & Associates
INTERIORS AND LANDSCAPING

1055 PLAINFIELD AVE. NE TEL. (616) 381-7230

Building Code Summary

Site Address:	126 S. West Avenue SE Lowell, Michigan
Project Description:	This project involves the construction of a 2,400 sq. ft., one-story pole barn structure.
Local Jurisdiction:	City of Lowell, Michigan
Applicable Building Code:	Michigan Building Code 2015 (MBC) Accessibility Code ANSI/ICC 117.1-2009
Use Group Occupancy:	M (Mercantile per MBC 309.1) S-1 (Storage per MBC 311.1) Building governed as Non-separated (M) per MBC 509.3
Construction Type:	Type V-B (Combustible)
Automatic Sprinkler System:	Non-Sprinkled
Gross Building Floor Area:	555 sq ft - Mercantile (M) Area 1,545 sq ft - Storage (S-1) Area Total building sq ft = 2,400 sq ft
Allowable Floor Area:	Allowable Area (MBC 503 - Table 506.2): 9,000 sq ft (M - base allowable) Frontage Increase (MBC 506.3): 0 sq ft Total Allowable Area: 9,000 sq ft
Proposed Building Height:	Building Height (MBC 503): 17'-6 1/2" / 1 Story Allowable Height (MBC 504 - Table 504.3 & 504.4): 40'-0" / 1 Story
Fire Rated Separation:	None Required
Fire Rated Exterior Walls:	None Required - Table 602 - Separation Distance 10' < X < 30'
Fire Alarm System:	None Required
Fire Extinguishers:	Must be located within 75' of every location within the building. Rated 3A:40BC per NFPA 10 and IFG 506.
Raised Character and Braille Exit Signs:	Provided at each door to an area of refuge, an exterior area for assisted rescue, an exit stairway, an exit ramp, an exit passageway and the exit discharge per MBC 1013.1.
Draftstopping:	Draftstopping not required; no attic compartments greater than 3,000 sq ft per MBC 719.4.3.
Smoke and Heat Vents:	Not required
Interior Wall/Ceiling Finishes:	All interior wall and ceiling finishes shall maintain the following per MCB 803.1.1 and Table 803.1.1: At rooms and enclosed spaces: (Class C) Flame spread Index 0-200 Smoke Developed Index 0-450
Maximum Common Path of Egress:	M: 75'-0" w/o sprinkler system per MBC Table 1006.2.1
Maximum Exit Access Travel Distance:	M: 200'-0" w/o sprinkler system per MBC Table 1017.2
Building Occupant Load:	Mercantile (M) Area (1/60 gross) - 625 sq ft = 10.4 occupants Storage (S-1) Area (1/200 gross) - 1,874 sq ft = 5.69 occupants TOTAL: 16 occupants
Plumbing Fixture Count- Required/Provided:	1 Unisex Restroom w/ 1 WC, 1 Lav (ADA Accessible fixtures) 1 Hi-Lo Drinking Fountain (DF) 1 Mop Sink (MS)

Codes Implemented

Building:
2015 MICHIGAN BUILDING CODE
Energy Code:
2015 COMMERCIAL MICHIGAN UNIFORM ENERGY CODE
Mechanical:
2015 MICHIGAN MECHANICAL CODE
Electrical:
2017 MICHIGAN ELECTRICAL CODE
Fire/Life Safety Code:
2015 INTERNATIONAL FIRE CODE
Accessibility:
ICC/ANSI 117.1-2009
Plumbing:
2015 MICHIGAN PLUMBING CODE

Means of Egress Illumination (Commercial Tenant Spaces)

1008.2 - Illumination required. The means of egress, including the exit discharge, shall be illuminated at all times the building space served by the means of egress is occupied.

1008.2.1 - Illumination level. The means of egress illumination level shall not be less than 1 footcandle (11 lux) at the walking surface.

1008.3 - Emergency power for illumination. The power supply for means of egress illumination shall normally be provided by the premises' electrical supply. In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:

1008.3.1 General. In the event of power supply failure in rooms and spaces that require two or more means of egress, an emergency electrical system shall automatically illuminate all of the following areas:

1. Aisle.
2. Corridor.
3. Exit access stairways and ramps.

1008.3.2 Buildings. In the event of power supply failure in buildings that require two or more means of egress, an emergency electrical system shall automatically illuminate all of the following areas:

1. Interior exit access stairways and ramps.
2. Interior and exterior exit stairways and ramps.
3. Exit passageways.
4. Vestibules and areas on the level of discharge used for exit discharge in accordance with Section 1028.1.
5. Exterior landings as required by Section 1010.1.5 for exit doorways that lead directly to the exit discharge.

1008.3.3 Rooms and spaces. In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:

1. Electrical equipment rooms.
2. Fire command centers.
3. Fire pump rooms.
4. Generator rooms.
5. Public restrooms with an area greater than 300 square feet (27.97 m2).

The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 2202.

Project Team

OWNER
Klosner Properties, LLC
8780 Currie Road
Northville, MI 48168

CONSTRUCTION MANAGER
Bowne Construction Corp.
2531 W. Main Street
Lowell, MI 49331
Phone: (616) 985-2345
Contact: Shawn Bowne
sbowne@bowneconstruction.com

ARCHITECTURE
Dixon Architecture
523 Ada Drive SE #200
PO Box 404
Ada, MI 49301
Phone: (616) 682-4570
Contact: Ken Dixon
ken@dixonarch.com

STRUCTURAL ENGINEERING
Jacobetti Engineering
1321 Evergreen Drive
Iron Mountain, MI 49801
Phone: (906) 779-1332
Contact: Colin Jacobetti

CIVIL ENGINEERING
TBD

Vicinity Map



Klosner Pole Barn

126 S. West Avenue SE | Lowell, MI

Review Set: 4/6/2020



523 Ada Drive SE, Suite 200
PO Box 404
Ada, MI 49301
p. (616) 682-4570

www.dixonarch.com

Klosner Pole Barn 126 S. West Avenue SE Lowell, Michigan Code Summary & Building Floor Plan



Revisions:
Review Set: 4/6/20

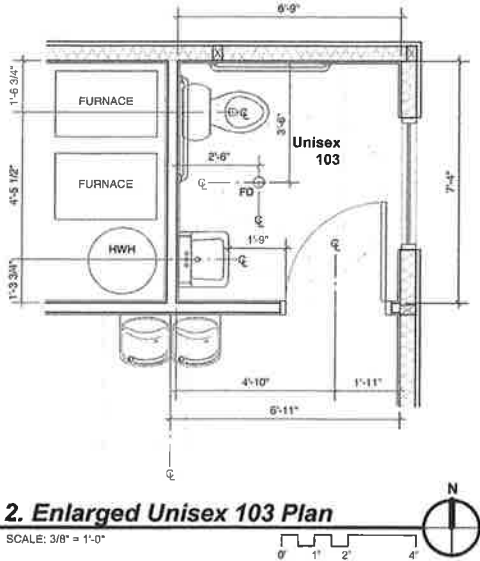
Project No.: 220010

Issue Date: 4/6/20

Reviewer: KCD

Drawn By: KCD/PJH

A2.1



Fire Life-Safety Legend

- EMERGENCY EXIT SIGNAGE
- FIRE EXTINGUISHER ON WALL MOUNT HANGER
- RAISED CHARACTER AND BRAILLE EXIT SIGNAGE

1. Building Floor Plan

SCALE: 3/16" = 1'-0"
BUILDING AREA: 2,400 SQ FT

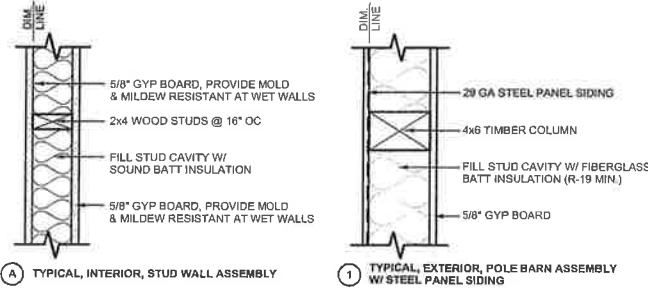
Floor Plan Legend

- MP MOP SINK
- FD FLOOR DRAIN
- EP ELECTRICAL PANEL
- OF DRINKING FOUNTAIN

Building Floor Plan Key Notes

1. 40' X 8' CONCRETE PORCH AT EAST SIDE OF BUILDING; SLOPE 2% AWAY FROM BUILDING FOR PROPER DRAINAGE.
2. 5' X 5' CONCRETE STOOP AT WEST SIDE OF BUILDING; SLOPE 2% AWAY FROM BUILDING FOR PROPER DRAINAGE.
3. ROOF CANOPY OVERHEAD; SEE EXTERIOR ELEVATIONS ON SHEET A4.1. SEE STRUCTURAL DRAWINGS FOR WALL SECTIONS.
4. PROVIDE ELECTRIC STRIKE FOR DOOR OPERATION BETWEEN RETAIL 101 AND PURCHASING 102.
5. INSTALL 4" REINFORCED CONCRETE SLAB THROUGHOUT; PROVIDE CONTROL JOINTS PER STRUCTURAL ENGINEER'S RECOMMENDATION.
6. 30"W X 4"H TRANSACTION WINDOW WITH DRAWER; SET SILL AT 34" ABOVE FLOOR FINISH (AFF).
7. GENERAL NOTE: INSTALL ON DEMAND HEATER FOR SINK IN RESTROOM AND MOP SINK.

Wall Compositions



General Notes

1. UNLESS NOTED OTHERWISE, ALL INTERIOR PARTITION WALLS SHALL BE CONSTRUCTED OF 2x4 WOOD STUDS @ 16" O.C. W/ SOUND ATTENUATION BATTS AND 5/8" GYP BOARD EACH SIDE.
2. REFER TO EXTERIOR ELEVATIONS FOR EXTERIOR WALL MATERIALS.
3. PROVIDE GYP. BD CONTROL JOINTS @ 30' O.C. MAXIMUM AT WALL PARTITIONS AND CEILINGS.
4. ALL WOOD FRAMING THAT COMES IN CONTACT WITH DISSIMILAR MATERIAL SHALL BE TREATED TO RESIST DECAY AND/OR HAVE A BARRIER TO PREVENT MOISTURE TRANSMISSION.
5. ALL METAL TO METAL CONNECTIONS SHALL BE SUCH AS TO AVOID DISSIMILAR METAL GALVANIC CORROSION.
6. FLOOR DRAINS, UNLESS REQUIRED OTHERWISE, SET ALL FLOOR DRAINS 1" BELOW FLOOR LINE AND PITCH FROM 24" RADIUS.
7. UNLESS INDICATED OTHERWISE, FLOOR MATERIAL CHANGES SHALL OCCUR BENEATH DOORS OR THRESHOLDS.
8. WHERE OPENINGS IN INTERIOR PARTITIONS OCCUR (INCLUDING DOORS AND WINDOWS), CONSTRUCTION ABOVE OPENINGS SHALL MATCH ADJACENT CONSTRUCTION IN FINISH AND FIRE RATING.

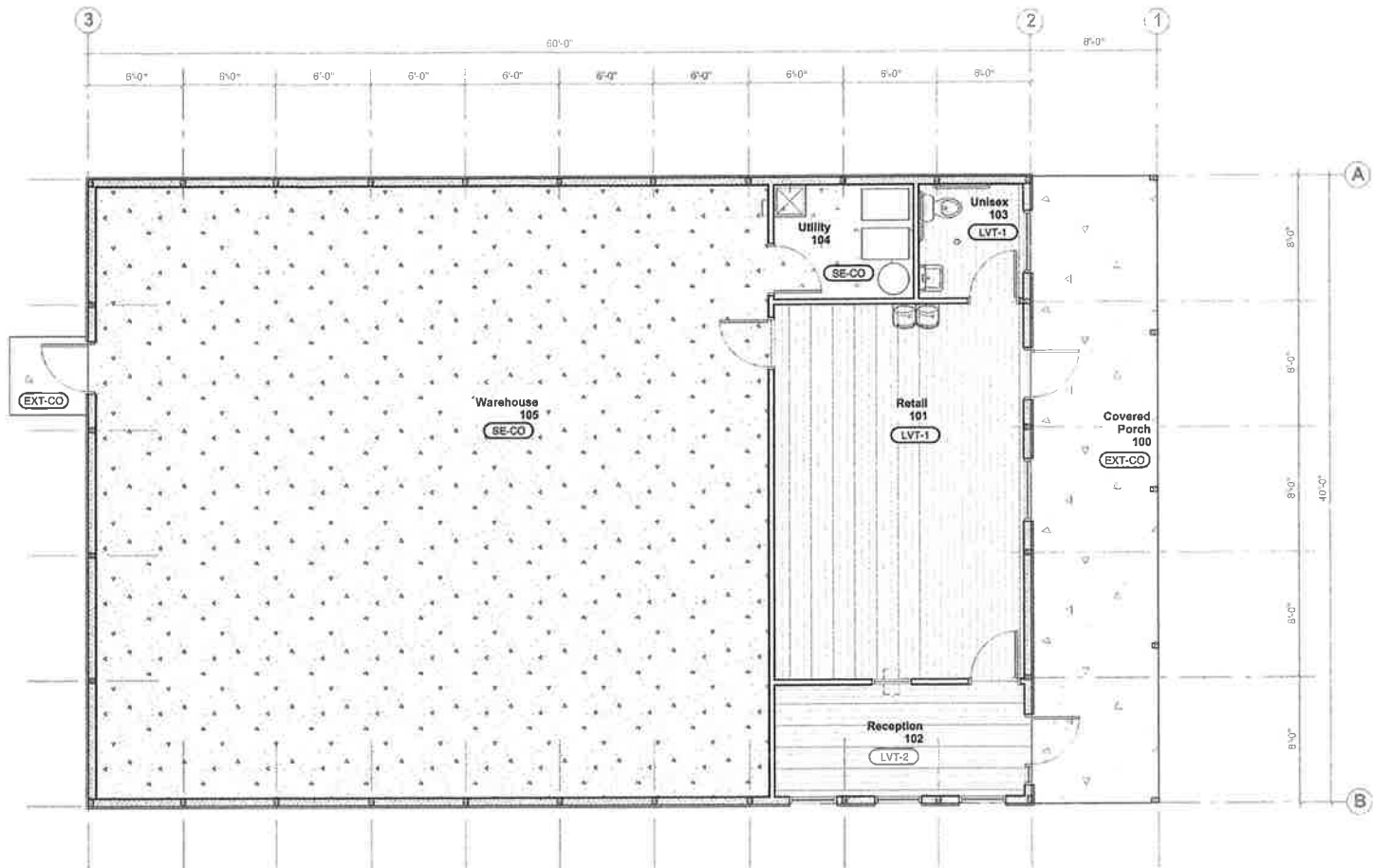
Klosner Pole Barn
126 S. West Avenue SE
Lowell, Michigan
Floor Finish Plan



Revisions:
Review Sat: 4/6/20

Project No: 220010
Issue Date: 4/6/20
Reviewer: KCD
Drawn By: KCD/PJH

A3.1



Floor Finish Legend			
	SE-CO INTERIOR CONCRETE SLAB - CLEAN & SEAL		EXT-CO EXTERIOR CONCRETE SLAB SLOPED FOR DRAINAGE
	LVT-1 LUXURY VINYL TILE AT EMPLOYEE AREAS MANUFACTURER: TBD COLOR & STYLE: TBD		LVT-2 LUXURY VINYL TILE AT CUSTOMER AREAS MANUFACTURER: TBD COLOR & STYLE: TBD

General Notes

- REFER TO FLOOR PLANS FOR ALL BUILDING DIMENSIONS.
- REFER TO A6.1 FOR FINISH SCHEDULES.
- FOR ALL SITE WORK, INCLUDING SIDEWALKS AND LANDSCAPING, REFER TO CIVIL DRAWINGS.
- GYPSON BOARD TO BE MOLD, MILDEW & MOISTURE RESISTANT AT ALL WET WALL LOCATIONS.
- UNLESS NOTED OTHERWISE, FLOOR FINISH TRANSITIONS WILL OCCUR AT DOOR THRESHOLDS.
- ALL WALLS TO BE PAINTED, UNLESS NOTED OTHERWISE.
- ALL WINDOW SILLS TO BE PAINTED BIRCH WOOD.

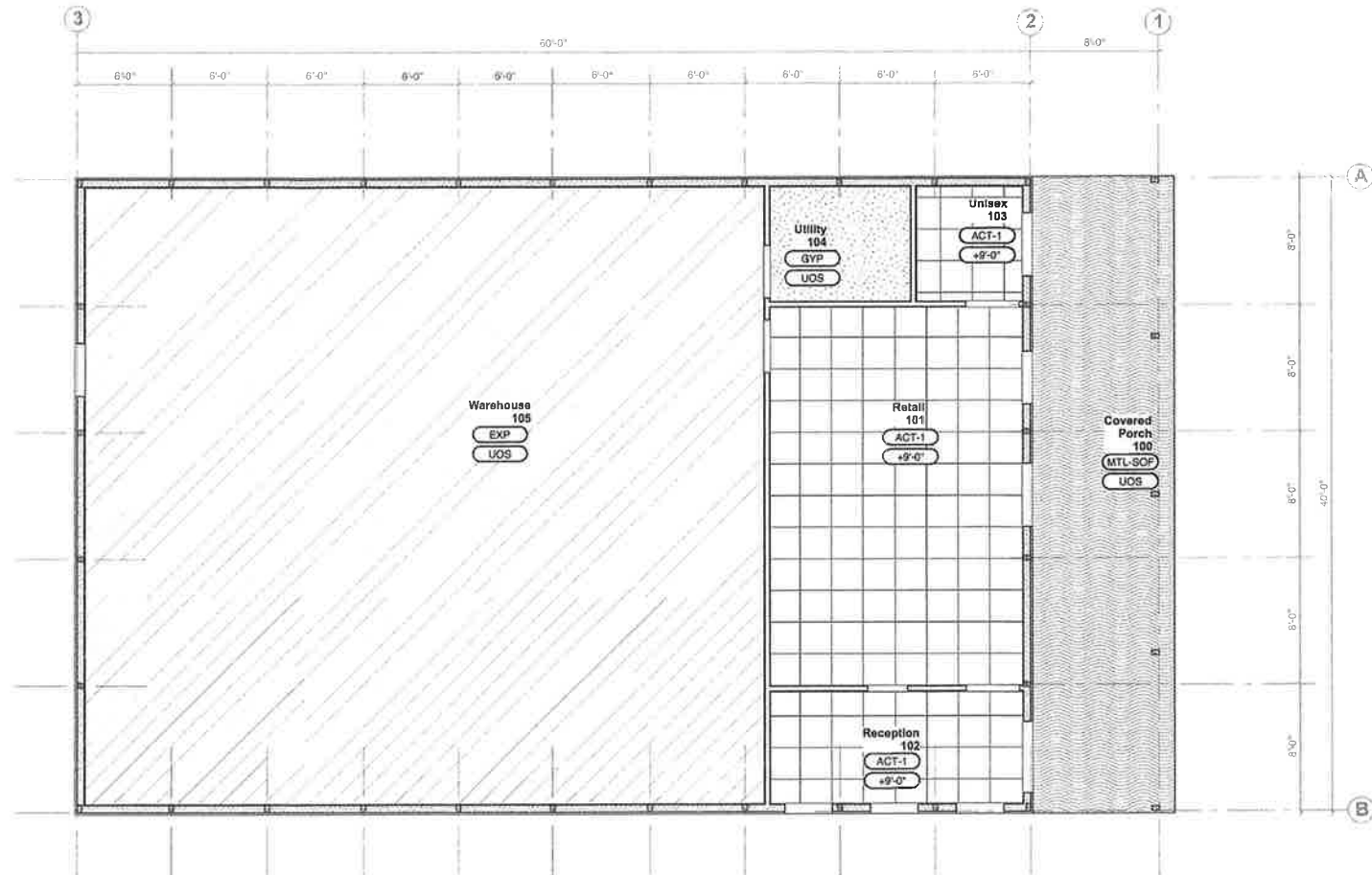
Klosner Pole Barn
126 S. West Avenue SE
Lowell, Michigan
Reflected Ceiling Plan



Revisions:
Review Set: 4/6/20

Project No: 220010
Issue Date: 4/6/20
Reviewer: KCD
Drawn By: KCD/PJH

A3.2



Ceiling Finish Legend			
	ACT-1		GYP
	ACOUSTICAL CEILING TILE		GYP. BOARD, PAINTED,
	MANUFACTURER: TBD		PAINT COLOR TBD.
	COLOR & STYLE: TBD		
	MTL-SOF (EXTERIOR)		EXP
	METAL SOFFIT ABOVE. SEE		EXPOSED TO UNDERSIDE OF
	ENLARGED DETAILS.		STRUCTURE
	FINISH COLOR: WOOD GRAIN		PAINT COLOR TBD.

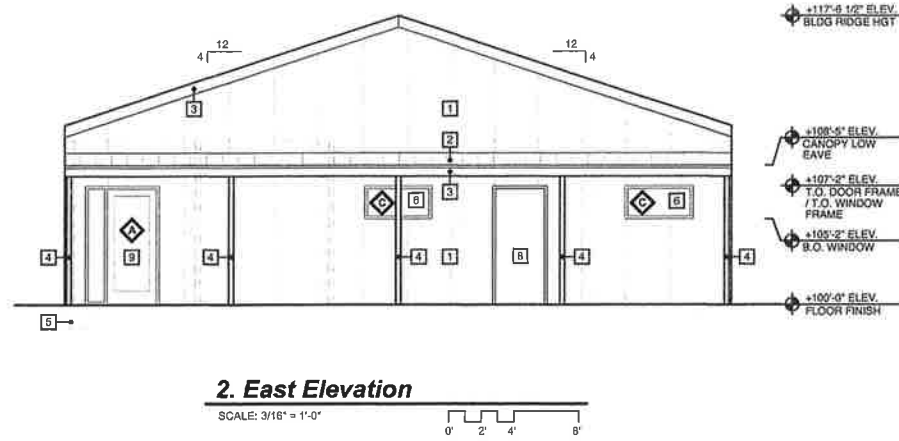
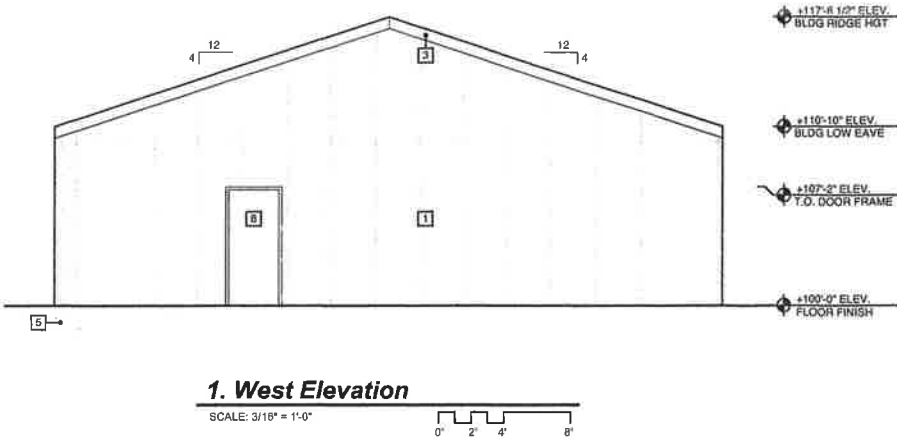
General Notes

1. REFER TO FLOOR PLAN 1/A2.1 FOR BUILDING DIMENSIONS.
2. REFER TO A6.1 FOR FINISH SCHEDULES.
3. FOR ALL SITE WORK, INCLUDING SIDEWALKS AND LANDSCAPING, REFER TO CIVIL DRAWINGS.
4. GYP BOARD TO BE MOLD, MILDEW & MOISTURE RESISTANT AT ALL WET WALL LOCATIONS.
5. ALL GYP BOARD CEILINGS TO BE PAINTED, UNLESS NOTED OTHERWISE.
6. REFER TO MECHANICAL DRAWINGS FOR ALL MECHANICAL EQUIPMENT LOCATIONS AND/OR CEILING PENETRATIONS.
7. REFER TO ELECTRICAL DRAWINGS FOR ALL LIGHT TYPES, LOCATIONS & LEVELS PRIOR TO PROCUREMENT.

1. Reflected Ceiling Plan
SCALE: 3/16" = 1'-0"

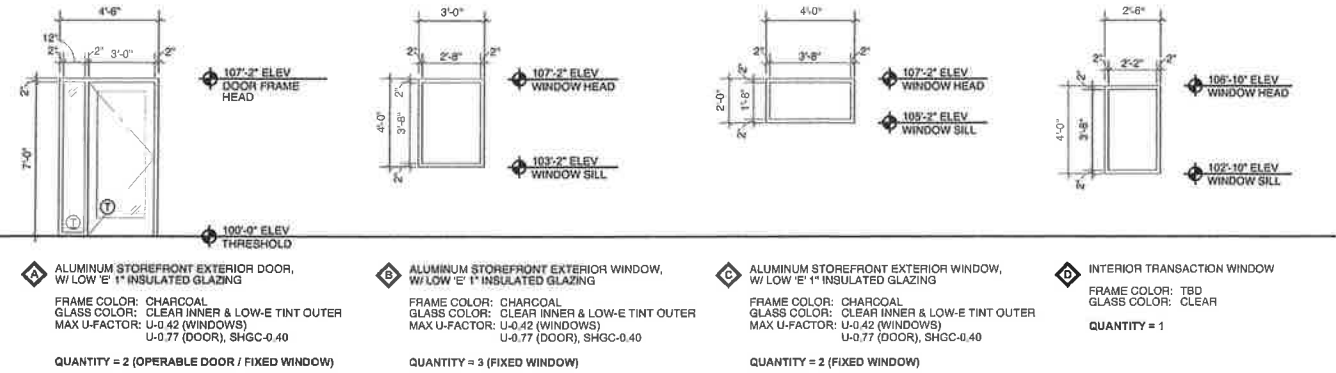
General Hardware Notes

- ALL DOOR HARDWARE MUST COMPLY WITH STATE AND LOCAL CODE REQUIREMENTS.
- CLOSERS AND LOCKSETS SHALL MEET ADA REQUIREMENTS PER ANSI A117.1-2009.
- EXTERIOR DOORS TO HAVE A MAXIMUM PUSH/PULL PRESSURE OF 8.5 LBS. INTERIOR DOORS TO HAVE A MAXIMUM PUSH/PULL PRESSURE OF 5 LBS.
- ALL LOCKSETS TO BE KEYED SEPARATELY.
- EGRESS DOORS TO BE MAINTAINED OPEN DURING BUSINESS HOURS AND SHALL REQUIRE NO SPECIAL KNOWLEDGE, TOOLS OR OPERATION TO OPEN OR UNLOCK.
- THRESHOLD HEIGHT (1/2"-INCH MAXIMUM).
- MANUALLY OPERATED EDGE OR SURFACE-MOUNT FLUSH BOLTS ARE PROHIBITED @ ALL DOUBLE DOORS.
- ALL MAN DOORS FOR FOR THIS BUILDING SHALL MEET THE ACCESSIBILITY REQUIREMENTS, INCLUDING PUBLIC AND PRIVATE CIRCULATION PATHS, OFFICES, RESTROOMS, COMMON AREAS AND STAIRWAYS.
- DOOR LATCHES SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE LATCHES SHALL BE 5 LBS. MAXIMUM.
- A SMOOTH SURFACE, BOTTOM RAIL THAT IS A MINIMUM OF 10-INCHES SHALL BE PLACED ON THE PUSH SIDE OF ALL FULL LITE DOORS.
- PROVIDE TACTILE SIGNAGE (ADA RAISED CHARACTER AND BRAILLE) AT EACH EXTERIOR EXIT DOOR STATING "EXIT". REFER TO FIRE-LIFE SAFETY PLANS FOR SIGNAGE DETAILS AND REQUIREMENTS.



Window Schedule

SCALE: 1/4" = 1'-0" ① = TEMPERED / SAFETY GLAZING



Door Schedule

RM #	ROOM NAME	DOOR				FRAME		FIRE	LOCKSET	NOTES
		SIZE	TYPE	THICK	MAT'L	TYPE	MAT'L	RATING		
101A	RETAIL	3'-0" X 7'-0"	A	1-3/4"	HM	1	HM	-	1	
101B	RETAIL	3'-0" X 7'-0"	A	1-3/4"	HM	1	HM	-	2	
102A	RECEPTION	3'-0" X 7'-0"	B	1-3/4"	AL	1	AL	-	3	SEE 'A' IN THE WINDOW SCHEDULE
102B	RECEPTION	3'-0" X 7'-0"	A	1-3/4"	HM	1	HM	-	4	
103	UNISEX RESTROOM	3'-0" X 7'-0"	A	1-3/4"	HM	1	HM	-	5	
104	UTILITY	3'-0" X 7'-0"	A	1-3/4"	HM	1	HM	-	2	
105	WAREHOUSE	3'-0" X 7'-0"	A	1-3/4"	HM	1	HM	-	1	

ADDITIONAL DOOR NOTES:

1. ALL DOORS SHALL BE ADA LEVER TYPE; CONTRACTOR TO VERIFY HARDWARE STYLE / FINISH WITH OWNER PRIOR TO ORDER AND INSTALLATION

2. CONTRACTOR TO VERIFY ALL DOOR KEYING WITH OWNER PRIOR TO ORDER AND INSTALLATION

3. ALL HOLLOW METAL DOOR FRAMES TO BE WELDED FRAMES

Door Hardware (CONSIDERED BASIS OF DESIGN; CONTRACTOR TO VERIFY WITH OWNER)

SET #1 (Typical Exterior Man Door)

QTY.	ITEM	MODEL NO.	STYLE	MANUFACTURER
3 EA	HINGE, BALL BEARING	PROVIDED BY MANUF.		
1 EA	PUSH/PULL	PROVIDED BY MANUF.		
1 EA	DEAD BOLT W/ THUMB TURN	PROVIDED BY MANUF.		
1 EA	PIVOTS	PROVIDED BY MANUF.		
1 EA	WEATHER STRIP W/ SWEEP	PROVIDED BY MANUF.		
1 EA	THRESHOLD	PROVIDED BY MANUF.		
1 EA	CLOSER	PROVIDED BY MANUF.		

SET #2 (Interior Passage Door with Lock)

QTY.	ITEM	MODEL NO.	STYLE	MANUFACTURER
3 EA	HINGE	58B1 4.5 X 4.5	613	IVES
1 EA	STOREROOM LOCK	AL80PD JUP	613	SCHLAGE
1 EA	SURFACE CLOSER	1450 RW/PA	605	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW B-CS	613	IVES
1 EA	WALL STOP	WS406/407CCV	613	IVES
1 EA	SILENCER	SR64	613	IVES

SET #3 (Exterior Alumn. Storefront Door)

QTY.	ITEM	MODEL NO.	STYLE	MANUFACTURER
1 EA	CONT HINGE	112HD	613	IVES
1 EA	PANIC HARDWARE	9847-EO	613	VON
1 EA	RIM CYLINDER	20-857	613	SCHLAGE
1 EA	90 DEG OFFSET PULL	8190HD 10" O	613	IVES
1 EA	SURFACE CLOSER	4050 SCUSH	595	LCN
1 EA	DOOR SWEEP	CB27A	CL	NGP
1 EA	THRESHOLD	425	AL	NGP
1 EA	WEATHERSTRIP BY DOOR/FRAME MANUFACTURER			

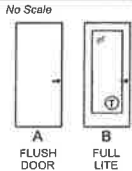
SET #4 (Interior Passage Door with Lock)

QTY.	ITEM	MODEL NO.	STYLE	MANUFACTURER
3 EA	HINGE	58B1 4.5 X 4.5	613	IVES
1 EA	ELECTRIC STRIKE LOCK	AL80PD JUP	613	SCHLAGE
1 EA	SURFACE CLOSER	1450 RW/PA	605	LCN
1 EA	KICK PLATE	8400 10" X 2" LDW B-CS	613	IVES
1 EA	WALL STOP	WS406/407CCV	613	IVES
1 EA	SILENCER	SR64	613	IVES

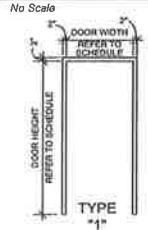
SET #5 (Private Restroom)

QTY.	ITEM	MODEL NO.	STYLE	MANUFACTURER
3 EA	HINGE	58B1 4.5 X 4.5	613	IVES
1 EA	PRIVACY SET	F40 ACC 716	716	SCHLAGE
1 EA	SURFACE CLOSER	4050 RW/PA	605	LCN
1 EA	WALL STOP	WS406/407CCV	613	IVES

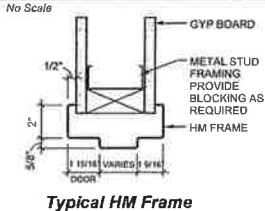
Door Types



Frame Types

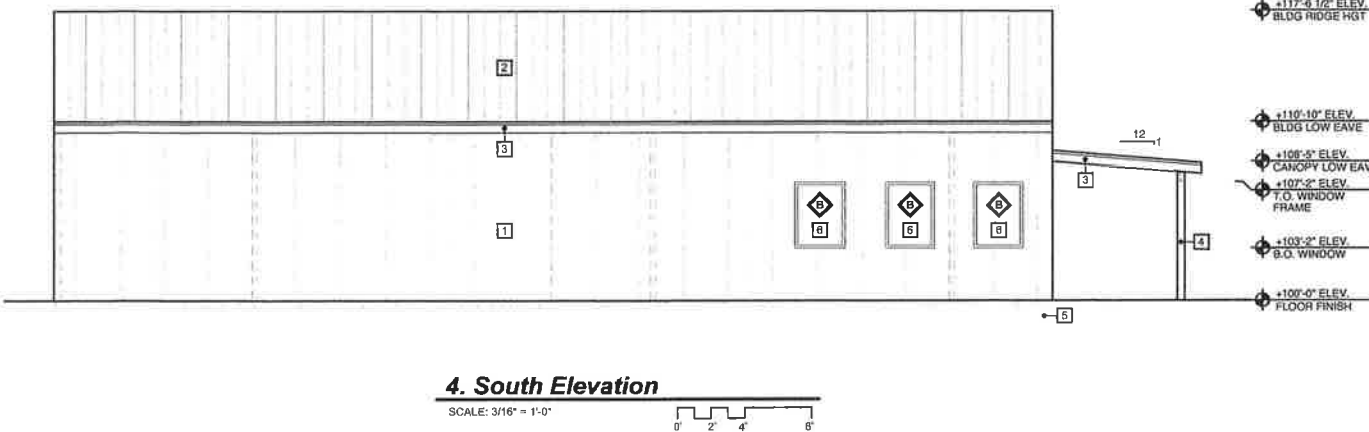
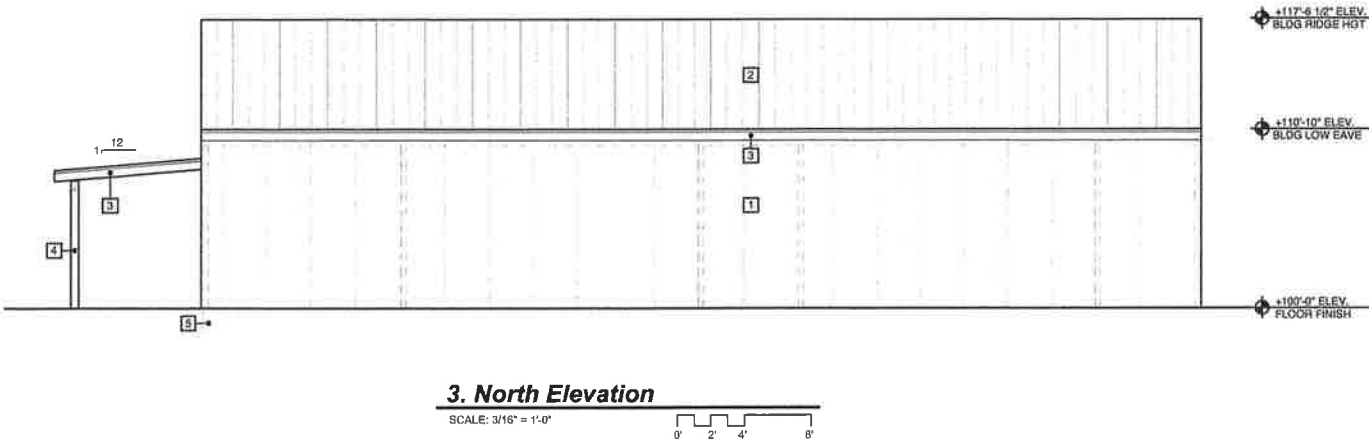


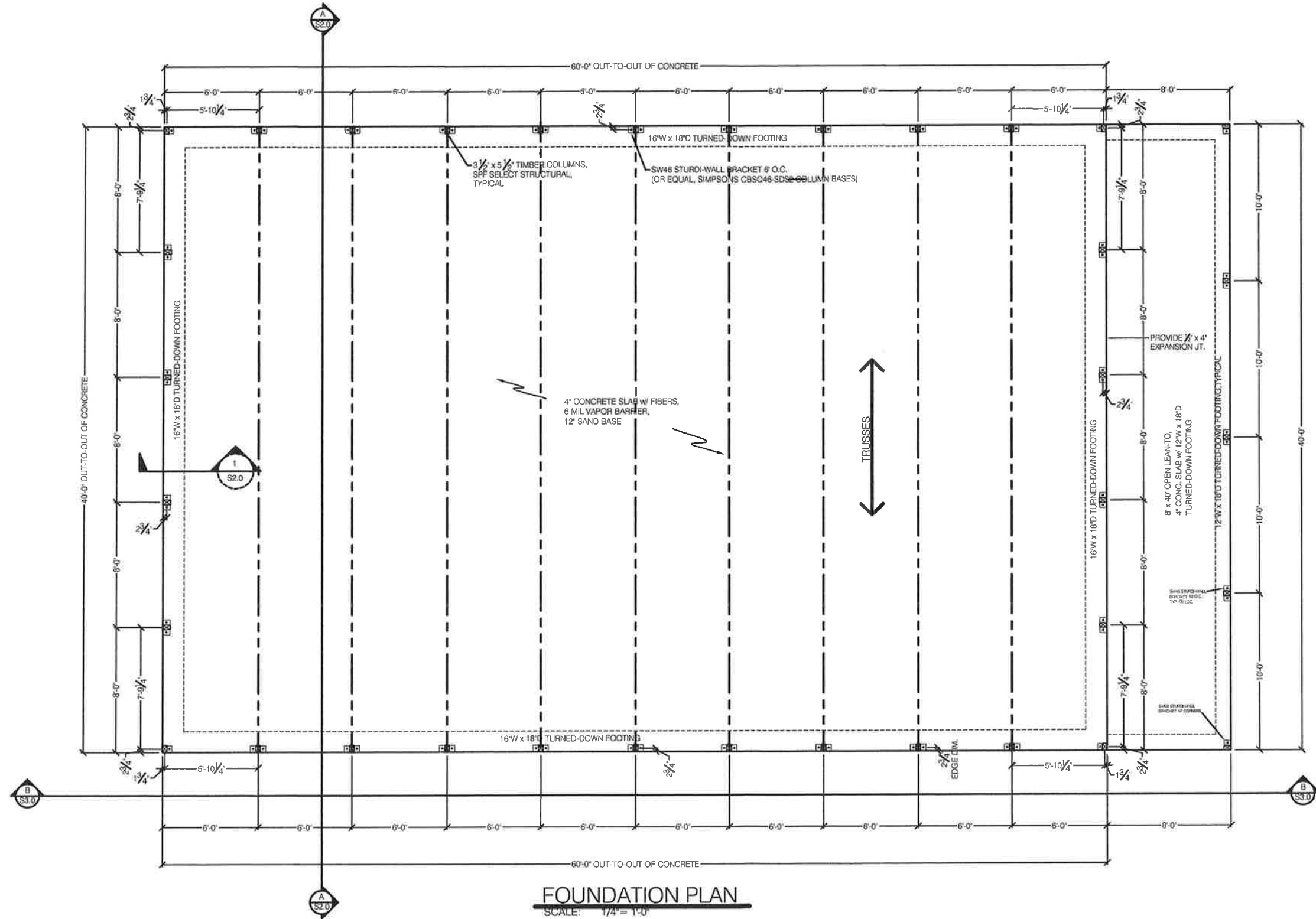
Frame Types - Jambs



Material Legend (ALL SELECTIONS TO BE CONSIDERED 'BASIS OF DESIGN' (ALL COLORS TO BE VERIFIED BY OWNER)

LABEL	MATERIAL	MANUFACTURER	STYLE	COLOR
1	2 1/2" GA RIB-STEEL WALL PANELS	TBD	TBD	TBD
2	29 GA RIB-STEEL ROOF PANELS	TBD	TBD	TBD
3	2X8 FASCIA BOARD W/ STEEL WRAP	TBD	TBD	TBD
4	4X8 TIMBER COLUMN	TBD	TBD	TBD
5	CONCRETE FOOTING, SEE STRUCTURAL	TBD	TBD	TBD
6	WINDOW	TBD	TBD	TBD
7	EXTERIOR LIGHT FIXTURE	TBD	TBD	TBD
8	HOLLOW METAL DOOR	TBD	TBD	TBD
9	EXTERIOR STOREFRONT DOOR	TBD	TBD	TBD





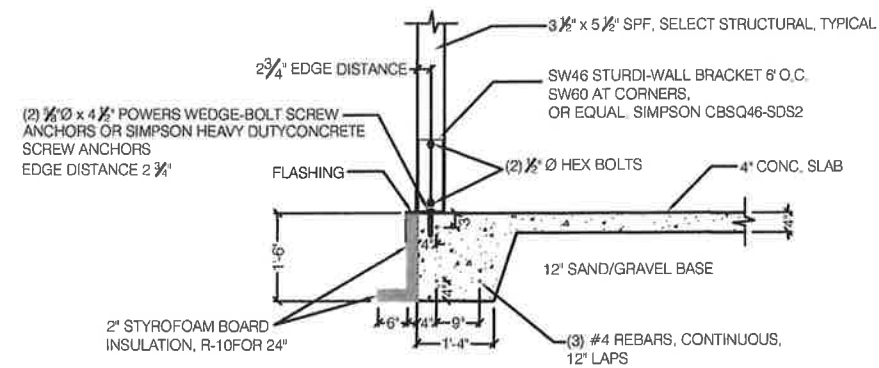
FOUNDATION PLAN
SCALE: 1/4" = 1'-0"

JACOBETTI ENGINEERING
1321 EVERGREEN DR.
IRON MOUNTAIN MI. 49801
(906) 779-1332

FOUNDATION PLAN

PROJECT: KLOSNER, LLC
40' x 60' POLE BARN
8' x 40' LEAN-TO

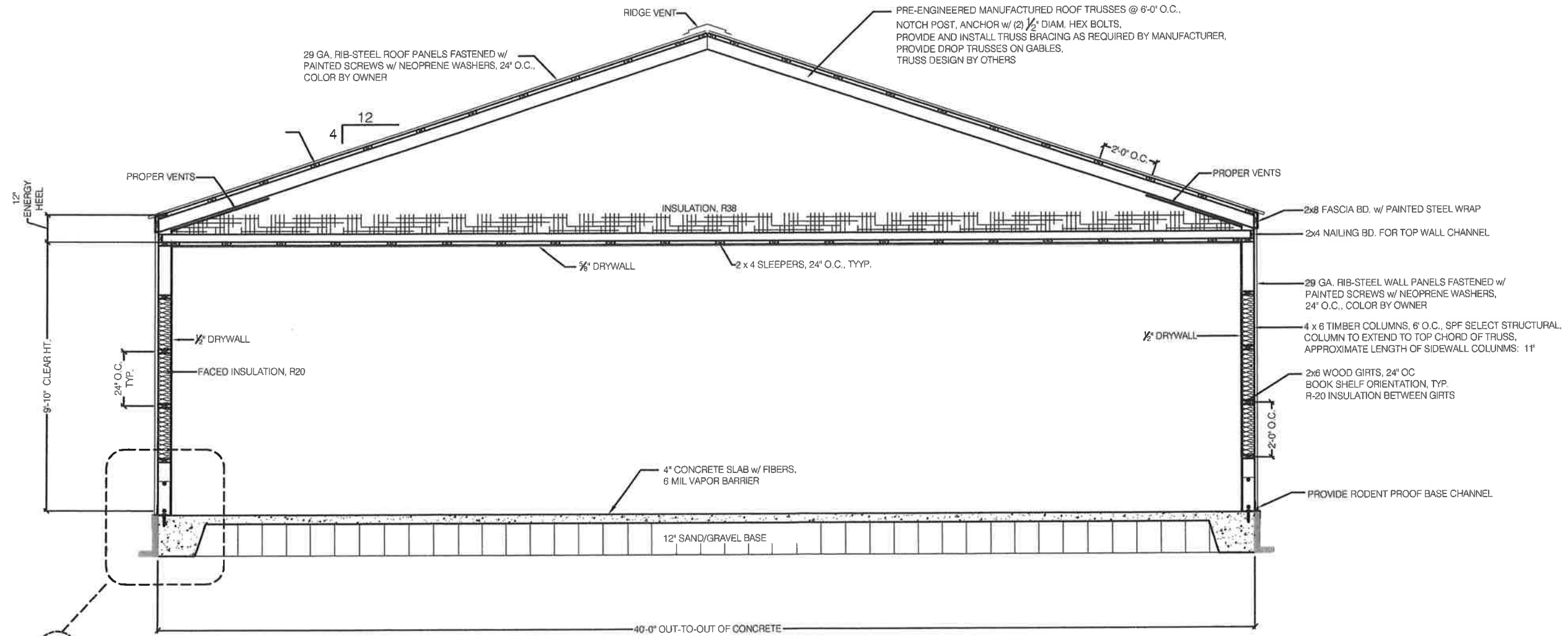
DATE:
2/13/2020
SHEET NO.
S1.0



1
S2.0

TURNED-DOWN FOOTING DETAIL

SCALE: 1/2" = 1'-0"



A
A2.0

BUILDING SECTION

SCALE: 1/4" = 1'-0"

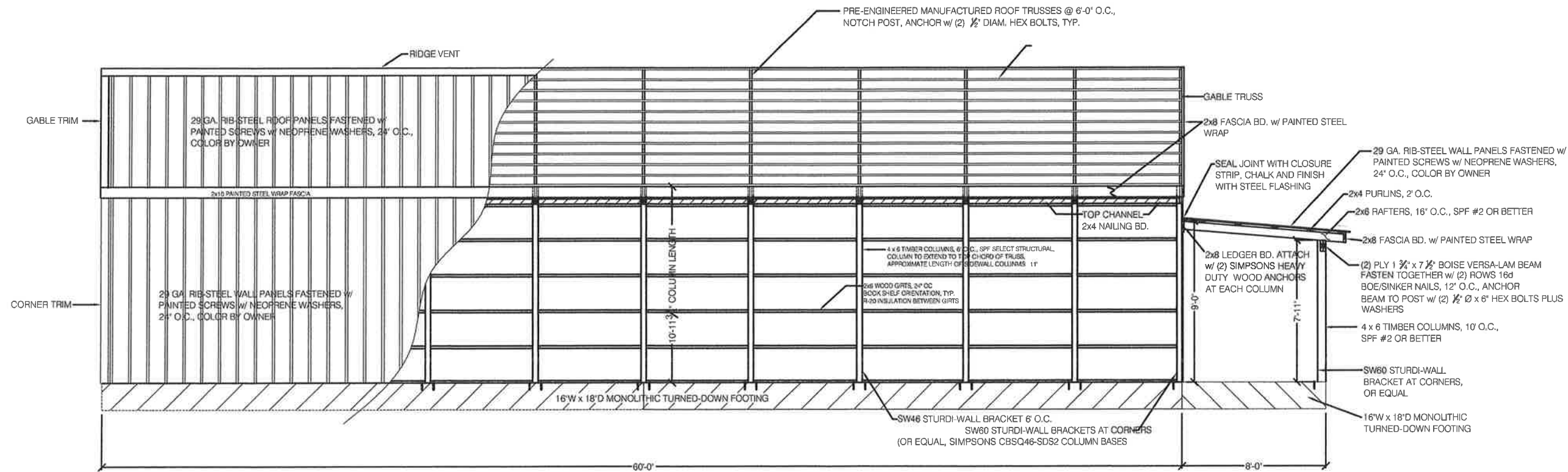


LONGITUDINAL SECTION

PROJECT: KLOSNER, LLC
40' x 60' POLE BARN
8' x 40' LEAN-TO

DATE:
2/13/2020

SHEET NO.
A3.0



B SIDEWALL FRAMING ELEVATION, TYPICAL
SCALE: 1/4" = 1'-0"

williams&works

engineers | surveyors | planners

MEMORANDUM

To: City of Lowell Planning Commission
Date: October 9, 2020
From: Andy Moore, AICP
Whitney Newberry
RE: **Grand Rapids Gravel – Special Land Use Application**

Grand Rapids Gravel, represented by James Dykema and Mike Berg, has submitted an application for site plan review and special land use approval to operate a gravel mine at 2014 Bowes Road SE (PPNs 41-20-10-100-004, 41-20-10-100-005, 41-20-10-100-014, and 41-20-10-100-015). The purpose of this memorandum is to review the request pursuant to Chapter 17 of the City of Lowell Zoning Ordinance.

Background

The subject property is comprised of four parcels, totaling approximately 63.7 acres in the Industrial and the River's Edge districts. A portion of the property is also within the Floodplain Overlay district. The site is primarily open space; however, two houses and accessory structures are present on the smaller parcels. The applicant intends to abandon these houses, although a few structures may remain to function as an office/garage for the mining operation. The applicant expects that the mining operation will occur for 10 years, resulting in a 22.5-acre lake around which the applicant desires to create a residential development. A volume of 322,000 cubic yards is expected to be removed from the site.

The Industrial district is also located to the north across Bowes Road and the PF Public Facilities district is adjacent to the east. The western property boundary is adjacent to the AG-2 Rural Agricultural district in Lowell Township, which contains a Township park. The southern property boundary is adjacent to the Grand River and the Grand River Riverfront Park is also located across the river in Lowell Township.

The "removal and processing of topsoil, stone, rock, sand, gravel, lime, or other soil or mineral resources" is only permitted by special land use in the Industrial and River's Edge districts.



Completeness of Submission

The applicant has submitted site plan documents for review. Section 18.04 B provides a list of information required for a detailed site plan review unless deemed unnecessary by the zoning enforcement officer. The applicant has submitted many of the items required for final site plan review; however, the following items were not included on the site plan:

- Required setbacks shown and dimensioned, B(g).
- Dimensions and radii of proposed drives, signs, lighting, parking areas, and unloading areas, as applicable, B(j).
- Pavement width and right-of-way width of all streets and access easements within 100 feet of the subject property, B(k).
- Location of all existing vegetation on the site, B(m)
- Size and location of existing and proposed utilities, B(n)
- Cost estimates for all public improvements included as part of any performance guarantee, if applicable, B(r).

In our opinion, most above items are either not relevant or easily discoverable, so we consider the site plan to be sufficiently complete for review.

Section 17.04 C of the Zoning Ordinance includes additional application materials required for all mining operations. Many of the required items were received; however, the following items were not included:

- Setback lines as required by this section, C(2)(e).
- A written plan containing the methods of mining, moving, storing, processing, loading, and transporting of the natural resources on and from the site, C(2)(g). (although some of this is indicated on the site plan itself)
- Copies of any permits or applications for permits issued by or filed with the Michigan Department of Environment, Great Lakes & Energy (EGLE), C(2)(m).
- Copies of all other federal, state or County, permits or approvals that relate to and are required for the proposed Earth Change, C(2)(n)

The end use plan is required to contain all information required for a sketch plan in Section 18.04(A)(2) of the Ordinance. The applicant has submitted a sketch plan detailing the proposed end use; however, the following items were not included in the end use plan:

- All lot lines with dimensions;
- Significant natural features, including stands of trees and floodplains.
- Number of acres allocated to each proposed use and gross area in buildings, structures, parking, public and/or private streets and drives, and open space.
- Proposed method of providing sewer and water service, as well as other public and private utilities.
- Proposed method of providing storm drainage.

- Written description of the computation for required parking.
- Exterior lighting.

The proposed end use plan does, however, contain a reasonably detailed plan for the property after the mining activities are completed. It is also important to note that while the end use plan is intended to give the City an idea for how the site will be restored, the applicant will still need to apply for all necessary zoning permits. In this case, the property should be rezoned at the end of the mining process before proceeding with any residential development on the property.

SITE PLAN REVIEW

Setbacks and Dimensional Requirements. Setbacks and dimensional requirements are not indicated on the site plan. The mining operation is proposed primarily in the Industrial district, with a portion also in the River's Edge district. Existing residential buildings are proposed to be abandoned, while a few existing structures may remain. The only new building proposed is an office trailer adjacent to the access drive in the Industrial district. This appears to be outside the required setbacks, but compliance with setbacks may be included as a condition of approval. Other dimensional requirements are met for the Industrial and River's Edge districts.

Additional setbacks are required for machinery as part of a mining operation; this is addressed under specific special land use standards below.

Site Development Requirements. Section 13.04 provides site development requirements for the Industrial district. No building or structure, nor its enlargement, can be erected unless these requirements are met and maintained. Each subsection is listed below, along with our remarks on each:

- A. Permitted and special land uses in this chapter shall be conducted within a completely enclosed building or within an area enclosed on all sides by a solid non-combustible fence or wall at least six (6) feet in height; provided further that no goods, materials, or objects shall be stacked higher than the fence or wall.

Remarks: This standard is not applicable as no buildings or structures are proposed other than the office trailer. The Planning Commission should discuss acceptable heights for berms and stockpiles, and landscaping that may be needed to effectively screen the operation from adjacent properties. This is discussed in greater detail below.

- B. The outdoor storage of goods or materials shall be prohibited in the required front yard or within any yard abutting a residential district or use.

Remarks: There are a few residential uses nearby, separated by the Bowes Road right-of-way. However, since these do not directly abut the subject property, this standard is not applicable.

- C. Landscaping shall be provided as required in Section 4.26.

Remarks: A 4 to 6-foot berm is proposed along the entire property frontage. Although the industrial district is located across , there are a few residential uses still present.

Section 4.26 E(1) requires that a about wall or wooden privacy fence 6-8 feet in the Industrial district, or landscaped buffer or berm, be located along boundaries adjacent to a residential use. The buffer or berm is required to be at least partially comprised of evergreen trees. Although the applicant has proposed a berm along the property frontage for screening purposes, the site plan does not indicate any trees on the berm.

Section 4.26 E(1) does not include a height requirement for a berm. However, given that the wall or fence must be 6-8 feet tall in the Industrial district, it is expected that the berm should provide somewhat of an equivalent measure of screening. The current proposal indicates a shorter berm (4-6 feet) height and no trees. We question the effectiveness of a 4-6 foot berm, and a taller one (8-10 feet) should be considered. The Planning Commission may discuss an appropriate berm height and the requirement of evergreen trees to accomplish screening purposes.

Section 4.26 E(2) requires additional front yard landscaping in all industrial districts, with a minimum of one canopy tree and three deciduous shrubs for each 30 feet of lot width. The lot width is not indicated on the site plan; however, a cursory review of the parcel length indicates it is approximately 2,000 feet. This equates to 66 canopy trees and 200 deciduous shrubs. A review of aerial imagery indicates there are many trees present along the roadway, which may satisfy this requirement if retained. Because trees are not indicated on the site plan, it is uncertain how many of these trees (if any) will be preserved. The Planning Commission may discuss the landscaping along with the applicant.

In accordance with Section 4.26 B, the City may modify landscape requirements when it finds circumstances that warrant a change in the requirements of Section 4.26, or in finding that existing landscaping or screening, or existing conditions on the site, will be preserved and would meet the intent of Section 4.26. The site contains some vegetation along Bowes Road that will aid in visual screening, particularly during the summer months, but the Planning Commission should discuss additional measures if desired.

- D. No parking area shall be located nearer than twenty-five (25) feet to any rear lot line.

Remarks: No parking areas are proposed and wetlands are located along the rear lot line. The Planning Commission may find this standard met.

- E. No use permitted in this chapter shall create or cause to be created fire and explosion hazards, smoke, fumes, odors, gases, dust, fumes, liquid or solid waste, vibration, noise, or glare shall exist to affect adjoining residential properties adversely.

Remarks: Due to the activities naturally inherent as part of a mining operation, there is potential for dust, vibration, and noise. Mitigation of these impacts will be addressed later in this memo.

The subject property is also in the River's Edge district, which includes additional standards for development in Section 14A.05. Below are these standards, followed by our remarks on each:

- A. All necessary development permits shall have been issued by appropriate local, state, and federal authorities, including a floodplain permit, approval, or letter of no authority

from the Michigan Department of Natural Resources under the authority of Act 451, of the Public Acts of 1994, as amended. Where a development permit cannot be issued prior to the issuance of zoning compliance permit, a letter from the issuing agency indicating intent to issue contingent only upon proof of zoning compliance may be acceptable.

Remarks: This may be addressed as a condition of approval.

- B. Utilities, streets, off-street parking, structures, and buildings for public or recreational uses and any other proposed uses and/or structure(s) shall be designed as not to reduce the water impoundment capacity of the floodplain, significantly change the volume or speed of the flow of water or be otherwise detrimental to the public health, safety, and welfare.

Remarks: The proposed mining operation would occur almost entirely in the Industrial district. Land in the River's Edge district generally coincides with the floodway as determined by FEMA and contains regulated wetlands. These areas would remain largely undisturbed. The applicant has submitted a hydrogeological report detailing the expected impacts to the groundwater flow of the entire site, which concludes that any short- or long-term reduction of groundwater elevation due to the lake's construction is considered insignificant based on conservative modeling.

Lastly, the subject property is also within the F-1 Floodplain Overlay District. This overlay district coincides with the boundaries of the 100-year flood (Section 14.02 A). Section 14.03 provides additional standards for development in this overlay district. Most of these standards are related to the construction of buildings or structures in the floodplain overlay district. Because the applicant has not proposed buildings or structures in this overlay district, most of these standards are not applicable. Compliance with applicable permits was addressed above related to the River's Edge district.

Section 14.03 A(4) states "The proposed use and/or structure(s) shall be so designed as not to reduce the water impoundment capacity of the floodplain or significantly change the volume or speed of the flow of water." Our comments related to this standard remain similar to those for subsection B above for the River's Edge district. The proposed operation would result in a lake with the capacity to hold water in the floodplain and regulated wetlands would be preserved. The mining actions are not expected to reduce the water impoundment capacity of the floodplain or significantly alter the volume or speed of water flow.

Site Plan Review Standards. In order to approve a special land use, the Planning Commission must find that each of the standards listed in Section 18.06 would be met. Following are those standards and our remarks on each:

- A. The uses proposed will not adversely affect the public health, safety, or welfare. Uses and structures located on the site shall be planned to take into account topography, size of the property, the uses on adjoining property, and the relationship and size of buildings to the site. The site shall be developed so as not to impede the normal and orderly

development or improvement of surrounding property for uses permitted in this ordinance.

Remarks: The applicant has proposed a mining operation that will result in an approximate 22.5-acre lake in a single phase. The application narrative indicates that this is expected to take approximately 10 years. The site is relatively flat overall, with more topographic variation towards the Grand River and wetlands area. Neighboring uses are primarily public, commercial, and industrial, with a few residential uses remaining in the Industrial district. In order to protect surrounding properties, the Planning Commission may evaluate the proposed preventative measures to protect surrounding areas from impacts such as noise, dust, and vibrations.

The applicant has proposed a 4 to 6-foot berm along the property frontage. Although the berm location appears appropriate to screen the proposed use we question whether 4-6 feet would adequately screen the mining operation. The Planning Commission may discuss the height and slope of this berm for its ability to provide a visual screen, reduce dust, mitigate noise, and ensure the developability of neighboring properties. Public input may also be considered in this regard.

Further, the Planning Commission may also discuss the height of stockpiles with the applicant to better understand potential impacts on surrounding properties. The anticipated height of mined materials is not included in the site plan and may determine the extent to which neighboring properties are impacted. This should be addressed.

Proposed equipment includes front-end loaders, a drag line crane, conveyors, a crushing plant, and dozers. A field conveyor, dewatering screw, and log washers are also identified on the site plan. While the applicant has proposed a single phase, a general idea of how the operation will proceed over the duration of the operation should be provided.

- B. Safe, convenient, uncongested, and well-defined vehicular and pedestrian circulation shall be provided for ingress/egress points and within the site. Drives, streets, and other circulation routes shall be designed to promote safe and efficient traffic operations within the site and at ingress/egress points.

Remarks: The applicant is proposing one point of ingress and egress to the site from Bowes Road. The access point includes a 300-foot paved drive to a location near the stockpiles. Other circulation routes are not identified throughout the site, so it appears there is not a designated driveway beyond this point.

Pedestrian circulation is not provided within the site. Due to the nature of the operation and lack of pedestrian connections along Bowes Road, specific pedestrian routes such as sidewalks are not necessary.

- C. The arrangement of public or private vehicular and pedestrian connections to existing or planned streets in the area shall be planned to provide a safe and efficient circulation system for traffic within the City of Lowell.

Remarks: The proposed driveway access point is not expected to create any conflict with the existing roadway; however, the City DPW will need to approve the location of the driveway. The applicant has proposed a haul route west on Bowes Road to Main Street. This is an appropriate haul route and must be strictly enforced to ensure that trucks do not drive east on Bowes Road through residential neighborhoods.

- D. Removal or alteration of significant natural features shall be restricted to those areas, which are reasonably necessary to develop the site in accordance with the requirements of this ordinance. The planning commission requires that approved landscaping, buffers and/or greenbelts be continuously maintained to ensure that proposed uses will be adequately buffered from one another and from surrounding public and private property.

Remarks: The subject property involves four parcels, which together are mostly open space. Regulated wetlands are located in the southern portion of the property along the Grand River; the applicant has proposed to preserve all regulated wetlands. Other open space areas contain sporadic trees, shrubs, and grass. Trees are not shown on the site plan. A review of aerial imagery indicates these are located throughout the site and also present in areas along Bowes Road. These may enhance screening of the site if retained; however, the extent to which vegetation will be retained is unknown.

The applicant has stated in a narrative that "vegetation and topsoil within our mining area will not be moved or ran over in order to not disturb." This statement likely refers to vegetation in mining areas that are either not excavated or are located outside of the lake area. The Planning Commission may request that this be clarified and the applicant clearly show the areas that will remain completely undisturbed for the duration of the mining activities. If determined necessary for screening, the Planning Commission may require that trees along Bowes Road or along property boundaries be preserved as a condition of approval.

- E. Satisfactory assurance shall be provided that the requirements of all other applicable ordinances, codes, and requirements of the City of Lowell will be met.

Remarks: The site plan states that a soil removal permit will be in effect prior to and during any soil removal operations. It also states the applicant will obtain all applicable permits from the Michigan Department of Environment, Great Lakes, and Energy (EGLE) for lake excavation and work in the floodplain and wetlands and that the applicant will maintain compliance with PA 451, all provisions of Section 17.04(c) of the City of Lowell Zoning Ordinance, and all other applicable State and federal statutes. If approved, a condition of approval is recommended that the applicant maintain continual compliance with other applicable ordinances, codes, and requirements.

- F. The general purposes and spirit of this ordinance and the Comprehensive Plan of the City of Lowell shall be maintained.

Remarks: The purpose of the Ordinance includes the provision of land uses that are situated in appropriate locations; limitation of congestion of population and transportation systems and other public facilities; to provide adequate and efficient transportation systems and other public services and facilities; and to promote the public health, safety,

and welfare. The proposed operation is permitted as a special land use in the Industrial and River's Edge districts. Provided the applicant complies with applicable provisions of the Zoning Ordinance, recommended conditions for approval as outlined in this memo, and other permits and approvals are obtained and maintained from other applicable ordinances, codes, and requirements, the Planning Commission may find that the general purposes and spirit of this Ordinance would be maintained.

The City of Lowell's Master Plan was adopted in 2007 and outlines a desired vision for land uses in the City. The subject property is located in the Industrial and Flood Plain future land use categories. Land in the Industrial category corresponds to parcels zoned Industrial on the zoning map. Since the proposed use is allowed as a special land use in the Industrial district, it appears to align with the Master Plan's vision for future land uses in this area. With regard to the end use plan, the City should consider amending the future land use map in the next ten years so the Master Plan remains compatible with uses on the site. The Planning Commission may find that this standard is met.

Special Land Use Review Standards. In order to approve a special land use, the Planning Commission must find that the proposed special land use meets each of the following standards in accordance with Section 17.03. Following are these standards and our remarks on each:

- A. The proposed special land use shall be designed, constructed, operated, and maintained so as to be harmonious and appropriate in appearance, with the existing or intended character of the general vicinity and that such a use will not change the essential character of the area in which it is proposed;

Remarks: The mining operation is proposed on a large parcel that is primarily open space and wetlands and within the Industrial and River's Edge districts. Surrounding properties are in the Industrial and Public Facilities districts in the City of Lowell and the Rural Agricultural district in Lowell Township. Adjacent land uses include the Grand River Riverfront Park, the City of Lowell water treatment plant, other industrial and commercial uses, and a few residential uses. Therefore, the land use pattern in this area is generally public, industrial, and commercial. Due to the presence of a few houses, consideration should be given to screening, dust, and noise mitigation in relation to residential uses. However, due to the adjacent zoning districts and the character of this area, it is not expected that the mining operation would change the essential character of the area. The Planning Commission should also take into account comments from neighboring property owners and residents in this regard.

Specific impacts of the operation and their mitigation, such as noise, dust, traffic, and hours of operation, will influence the proposed operation's impact on the character of the area. Mining operations are inherently different than most other uses, presenting many factors that must be considered for compatibility with the surrounding lands. The impact of the proposed operation on neighboring properties will likely be influenced by the degree of screening proposed which may mitigate visual impacts, noise, and dust throughout the anticipated 10-year duration of the operation. These are considered in more detail in the standards below.

- B. The proposed special land use shall be generally consistent with the City of Lowell Master Plan;

Remarks: See comments under Site Plan Review, F above.

- C. The proposed special land use shall be served adequately by essential public facilities and services such as highways, streets, police, fire protection, drainage structures, refuse disposal, water, and sewage facilities;

Remarks: The site plan does not indicate any public facilities and services on the site. An office trailer is proposed near the access road, which does not indicate a connection to any public facilities or services; however, this should be clarified by the applicant. Other structures that may be used in the operation are existing on the property and would not require additional utilities.

No dewatering is proposed. Wet ore is proposed to be placed adjacent to the lake to allow the water to drain back into the lake. The hydrogeological report states that all stormwater at the site will be contained within the site. Log washers are proposed for gravel, which will use water to clean the gravel. The source of this water is unknown and the amount of water required to wash the gravel is also unknown. The Planning Commission may discuss the amount of water expected for washing and cleaning the gravel with the applicant.

The applicant has proposed a haul route west on Bowes Road to Main Street and anticipates 50-125 trucks leaving the site per day, based on the season. It is expected that streets in this route would adequately serve the gravel haulers; however, this will require review and approval by the City DPW. Further, emergency vehicle access to the site should involve review and approval by the Lowell Area Fire Department.

- D. The proposed special land use shall not create excessive additional requirements at public cost for public facilities and services;

Remarks: The applicant has indicated the intent to comply with all applicable local, state, and federal regulations. Ongoing compliance with public health, safety, welfare, and environmental regulations would be addressed as a condition of approval if approved.

The applicant submitted a hydrogeological report, detailing potential impacts on neighboring wells. 14 water wells were identified within a quarter-mile of the site, 9 of which were shallow water wells in the same water-bearing formation as the lake. Construction of the lake would involve excavation below the water table using a dragline. The report states that although no groundwater would be lost (except for an insignificant amount of evaporation from stockpiles), the removal would result in a short-term lowering of the water table as the water travels back into the lake. Based on the installation of observation wells and predictions from standard hydrogeological calculations and models, the maximum drawdown at the nearest residence was predicted to be 0.31 feet and 0.13 feet at the nearest Type 1 supply well, using a conservative prediction. These are less than the seasonal fluctuations in the water

table, so the report concludes that any drawdown resulting from the operation would not result in a significant decrease in the availability of groundwater. Therefore, impacts on other wells are expected to be minimal and not result in additional requirements for those owning wells in nearby areas.

It is worth noting that hydrogeological predictions assumed that the lake construction would take approximately 5 years, rather than 10 years as stated in the applicant's narrative. Additionally, the groundwater inflow rate was based on an annual mining schedule of 240 days, roughly from March 15th to November 15th. This seasonal operation allows groundwater to normalize during the winter. It is unknown how a longer duration of the operation would impact these predictions, if at all. It is also unknown if this is the applicant's intended operational time, as an operating year is not defined elsewhere in the application. The Planning Commission may discuss this with the applicant.

- E. The proposed special land use shall not involve uses, activities, processes, materials, and equipment or conditions of operation that will be detrimental to any persons, property, or the general welfare by reason of excessive production of traffic, noise, smoke, fumes, glare, or odors.

Remarks: A variety of potential nuisances can result from a mining operation, so it is important to consider mitigation of these nuisances to ensure the operation will not be detrimental to any existing or permitted uses in the area. Ongoing compliance with applicable standards of the Ordinance and conditions, if approved, would be important in mitigating many of these impacts. The hydrogeologic plan states that ore will be placed adjacent to the lake so that water can drain back into the lake.

No chemicals are proposed on the site and the hydrogeological report states that daily inspections will be conducted to prevent fuels and lubricants from contaminating the lake. The storage of fuel and lubricants was not indicated in the submitted materials or on the site plan. The Planning Commission may address fuel storage with the applicant to ensure the protection of property in the event of a spill.

Other measures to mitigate potential impacts are addressed in specific special land use standards for mining operations, located below. A discussion of very serious consequences is also outlined at the end of this memo.

- F. The proposed special land use shall comply with all applicable federal, state, and local requirements, and copies of all applicable permits shall be submitted to the City.

Remarks: If approved, the Planning Commission may include this standard as a condition of approval.

Removal and Processing of Gravel Operational Standards. In addition to the general standards for special land uses in Section 17.03, the Planning Commission must also find that the proposed special land use would comply with specific operational standards established for the removal and processing of topsoil, stone, rock, sand, gravel, lime or other soil or mineral

resources as listed in Section 17.04 C(4). Following are those standards, along with our remarks on each:

- A. All uses shall be established and maintained in accordance with all applicable State of Michigan, County, or City statutes, ordinances, and regulations. In cases where there is a conflict between state and local statutes, the more restrictive regulations shall control.

Remarks: If approved, the Planning Commission may include this standard as a condition of approval.

- B. All earth removal operations shall be conducted in a manner such that the earth removal will not alter predominate drainage patterns or cause drainage impacts to adjoining properties.

Remarks: The applicant has submitted a hydrogeological report, which describes the operation's expected impact on groundwater flow and drainage. This report states that no flooding or dewatering concerns are predicted resulting from the operation, since the lake would not be created by dewatering, the mined ore would be placed adjacent to the lake in order to allow water to flow back into the lake, the mining would not occur throughout a confining layer or unusual stratigraphy, and the lake would be a "water table" lake. The report notes that several similar lakes have been created locally, which have not resulted in flooding or significant groundwater lowering. Further, the presence of the lake is also expected to function for stormwater management on the site.

An impact on neighboring water wells was described in Special Land Use Review Standard D, above. The report concluded that drawdown of wells during the operation would not result in a significant lowering of the water table that would impact nearby wells, as it is predicted to be less than the seasonal variation of the water table. After the lake is completed, the groundwater elevation is predicted to be lowered by a maximum of two feet at the north property line and return to natural levels within a short distance from the lake. The report does not anticipate this reduction to impact local wells.

Lastly, drainage is considered for regulated wetlands on the property. The hydrogeological report states that since the lake has no outlet and would not be dewatered during construction, a significant lowering of groundwater elevation is not expected that could drain the wetlands.

- C. No machinery shall be erected or maintained within fifty (50) feet of any property or street right-of-way. Further, no cut or excavation shall be made closer than fifty (50) feet to any street right-of-way line or property line in order to ensure sublater support to surrounding property. The planning commission may require greater distances for the location of machinery, storage or parking of equipment, or limits of excavation where the site is located within two hundred (200) feet of any residential district or use.

Remarks: Setbacks are not indicated on the site plan, nor are parking areas designated for equipment. This standard appears to be met along Bowes Road (with the exception of the berm) and along the western boundary, but it appears that some cuts along the eastern boundary are within fifty feet of the property line. It appears that all machinery

structures on the property and stockpiles are proposed outside the 50-foot setback. If approved, the Planning Commission should require 50-foot (or greater) setbacks for all machinery, including mining structures and vehicle parking, and all cuts and excavation. The site plan should be updated to show compliance with this standard along the eastern property line.

- D. Where it is determined by the planning commission to be a public hazard, all uses shall be enclosed by a fence, berm, or other acceptable screening at least six (6) feet or more in height for the entire periphery of the property or portion thereof. Fences shall be adequate to prevent trespassing and shall be placed no closer than fifty (50) feet to the top or bottom of any slope.

Remarks: Fencing is not indicated on the site plan; however, the applicant's narrative states that fences and a locked gate entrance/exit would be present to prevent trespass on the site. These should be added to the site plan and the Planning Commission may discuss their locations with the applicant. Due to the presence of public parcels adjacent to the east and west, one of which is a public park, fencing may be needed adjacent to public property to deter accidental trespassing on the site. The Planning Commission may discuss height, type, and location of fencing with the applicant to prevent trespassing. If approved, fencing may be included as a condition of approval.

- E. No building shall be erected on the premises except as may otherwise be permitted in this ordinance or except as temporary shelter for machinery or for a field office, subject to approval by the planning commission.

Remarks: The applicant is proposing to have one office trailer on the site. Two residential buildings are already present and are proposed to be abandoned. The applicant has indicated a few existing structures may remain to use for an office/garage. The Planning Commission may inquire whether any machinery will be stored in these existing structures, and if so, how they will be accessed.

- F. The planning commission shall establish routes for truck movement to and from the site in order to minimize the wear on public streets and to prevent hazards and damage to properties in the community. Access roads within the area of operation shall be provided with a dustless surface and the entry road within the site shall be hard-surfaced for a distance established by the planning commission to minimize dust, mud, and debris being carried onto the public street.

Remarks: The applicant has proposed a truck route west on Bowes Road to Main Street. This appears to be the most efficient route leading to a state highway. Once Main Street is reached, the route is not defined.

The applicant has proposed a 300-foot paved driveway off Bowes Road and indicated on the site plan that any soil spillage on the public right-of-way would be removed daily. In our experience, a 300-foot paved entrance is adequate.

The site plan does not indicate any internal service roads by which equipment will access the mining site and equipment. The Planning Commission may discuss internal

circulation with the applicant to ensure internal access roads prevent hazards to neighboring properties to the greatest extent feasible.

- G. All permitted installations shall be maintained in a neat, orderly condition so as to prevent injury to property, individuals, or to the community in general.

Remarks: Proposed equipment for processing the mined ore is located in relative proximity to the driveway entrance/exit. The site plan appears to present an organized layout of mining equipment. The hydrogeological report indicates that mining would begin from the existing pond on the west side of the property. The locations of all installations appear logical based on this starting location. However, as mining progresses, it appears unlikely that this equipment could remain in its currently-proposed locations, as stockpiles and equipment would eventually end up in the lake. The Planning Commission may discuss the movement of installations and equipment to ensure the protection of surrounding properties.

Further, the site plan lists a crushing plant in the equipment list. This is not shown on the site plan. This may generate noise resulting from the crushing activity. Water is also commonly used in crushing plants to help minimize dust. The Planning Commission may discuss the crushing plant location and its associated impacts with the applicant.

- H. The conduct and operations of the mining shall not result in:

- 1) wind-blown sand, dust, or soil that would migrate off-site;
- 2) the collection of surface water or the run-off of water onto adjoining lands contrary to normal and natural drainage patterns;
- 3) the removal or disturbance of existing trees and vegetation on the site in areas on which the Natural Resource Extraction for a specific phase or cell is not commenced or continuing or that is not used for drives or Ancillary Activities;
- 4) the failure to promptly reclaim any area of a phase or cell when the mining for that phase or cell is completed.

Remarks: The applicant has proposed a 300-foot paved access drive to reduce dust and soil from migrating off-site. The narrative states that dust control will be regulated through EGLE. The Planning Commission may request a copy of this permit for the City's file. Additionally, the Planning Commission may consider the proposed berm height and stockpile height while evaluating dust control. Berms are currently proposed 4 to 6 feet in height and stockpile heights were not defined. The Planning Commission may consider berm and stockpile heights for potential dust mitigation and may define heights for these features if determined necessary to minimize impacts on adjacent properties. If approved, ongoing dust prevention and mitigation should be included as a condition of approval.

The hydrogeological report states that no flooding or dewatering concerns are predicted, as described in Special Land Use Standard D and Specific Special Land Use Standard

B. Therefore, the collection of surface water and run-off onto adjoining lands is not expected to result from the operation.

Because the operation would result in a lake, the disturbance of trees and vegetation is expected to occur in accordance with the progression of mining activities. The mined areas would become a lake and therefore not require trees and vegetation to be planted in the mining area once finished. However, the Planning Commission may request additional information regarding the protection of wetlands during the mining operation, since the lake's boundary would be almost adjacent to the wetlands.

The property is proposed for mining as one continuous phase and would not involve remediation after different cells or phases are completed. Areas outside of the lake should be restored with topsoil and seeded when mining activities are complete.

- I. When excavation and removal operations or either of them are completed, the excavated area shall be graded so that no gradients are disturbed earth shall be steeper than a slope of 3:1 (horizontal-vertical). A layer of arable topsoil, of a quality approved by the zoning enforcement officer, shall be spread over the excavated area, except exposed rock surfaces or areas lying below natural water level, to a minimum depth of four (4) inches in accordance with the approved contour plan. The area shall be seeded with a perennial rye grass and maintained until the area is stabilized and approved by the planning commission.

Remarks: The site plan provides a cross-section of the lake and includes a slope of 3:1. Since the excavation would result in a water table lake, topsoil will not be necessary over most of the excavated area. The Planning Commission may find this standard met.

- J. Where excavation operation results in a body of water five (5) feet deep or greater, the owner or operator shall place appropriate "Keep Out Danger" signs around said premises, not more than one hundred fifty (150) feet apart.

Remarks: The excavation would result in a lake 12 feet deep, so these signs will be necessary. These are not indicated on the site plan. If approved, the Planning Commission may include this standard as a condition of approval.

- K. The planning commission may require, as a condition of approval, the annual review of a mining project and/or an annual report to be presented to the planning commission by the applicant. Such a report would summarize progress on the site, the amount of material removed, any complaints received and their resolution and other items deemed necessary by the planning commission.

Remarks: The Planning Commission may require this standard as a condition of approval, if desired.

Consideration of Very Serious Consequences. The Michigan Zoning Enabling Act outlines requirements for local governments regarding mining operations. The Act states "An ordinance shall not prevent the extraction, by mining, of valuable natural resources from any property

unless very serious consequences would result from the extraction of those natural resources. Natural resources shall be considered valuable for the purposes of this section if a person, by extracting the natural resources, can receive revenue and reasonably expect to operate at a profit.”

In reviewing an application for mining, the Planning Commission shall also determine whether or not the applicant has satisfied its burden in demonstrating that no very serious consequences would result from the extraction. In making this determination, the Planning Commission may consider several factors in accordance with MCL 125.3205. These are listed below, followed by our remarks on each:

- a. The relationship of extraction and associated activities with existing land uses.

Remarks: The applicant has proposed hours of operation Monday through Friday 7:00am – 5:00pm, Saturdays 7:00am – 2:00pm, and no holidays. These hours of operation generally align with typical business hours and appear reasonable given the location and zoning district of the subject property. The Planning Commission may discuss hours of operation with the applicant and may include it as a condition of approval. The Planning Commission may also discuss the duration of the operation throughout the year. While the hydrogeological study was based on a 240-day operating year, this was not stated in the applicant's narrative.

The surrounding land uses are generally public and commercial. Some industrial and residential uses are also present. Residential properties are legally nonconforming in the industrial district. However, their presence should still be considered in relation to the proposed mining activities. The Planning Commission may consider comments from neighboring property owners regarding this standard.

- b. The impact on existing land uses in the vicinity of the property.

Remarks: Due to the nature and duration of the proposed mining activity, there is potential to impact neighboring properties in the general vicinity. However, considering that the surrounding districts are primarily Public Facilities and Industrial, this location would be distanced from residential neighborhoods and other areas where there is a higher concentration of pedestrians.

Further, the hydrogeological report evaluated water quality resulting from the lake, concluding that water quality would likely be improved from the lake's construction. This is related to softening the water through exposure to the atmosphere and the prohibition of chemicals on the site. Additionally, groundwater elevation was determined to not have a significant impact on nearby wells during or after the creation of the lake.

Noise may also be considered for its ability to impact surrounding properties. The movement of equipment as mining progresses, the extent to which vegetation is preserved on the site, and the height of berms will all impact noise transmission from the site. The applicant has stated that noise control and vibration will be meet EGLE standards. The Planning Commission may request a copy of this permit for the

Township's file. Additionally, the Planning Commission may consider comments from neighboring property owners regarding this standard.

- c. The impact on property values in the vicinity of the property and along the proposed hauling route serving the property, based on credible evidence.

Remarks: The applicant has not provided any studies related to the proposed operation's impact on property values in the general vicinity and along the proposed hauling route. However, the proposed haul route (west on Bowes Road to Main Street) seems appropriate. The Planning Commission may request additional information from the applicant if it is deemed necessary.

- d. The impact on pedestrian and traffic safety in the vicinity of the property and along the proposed hauling route serving the property.

Remarks: The applicant has not provided any traffic or pedestrian impact studies. There is little pedestrian activity in this area.

- e. The impact on other identifiable health, safety, and welfare interests in the local unit of government.

Remarks: To understand water table impacts, six observation wells were installed on the subject property and observed in 2020. The applicant's hydrogeological study indicates that water quality and the water table elevation levels are not expected to be negatively impacted. This report states that "the storage, recharge, and quality of the aquifer is likely to be improved with the construction of the lake." The applicant has also indicated that they will obtain and comply with all requirements of PA 451. Further detail regarding health, safety, and welfare interests may be requested by the Planning Commission if determined necessary.

- f. The overall public interest in the extraction of the specific natural resource on the property.

Remarks: The applicant has not addressed this standard specifically. While demand for sand and gravel likely exists, the Planning Commission may also request additional information from the applicant if determined necessary.

In deciding whether or not the proposed mining activity should be approved, the Planning Commission should consider whether or not the applicant has adequately demonstrated that the operation will not result in very serious consequences using the above criteria.

Summary of Information and Issues. The submittal is generally complete and Grand Rapids Gravel is a well-known and reputable organization in West Michigan. However, this is also a more complex application and the long-term nature of it warrants scrutiny by the Planning Commission. The following list provides an overview of considerations that may require further review and discussion by the Planning Commission. If further information is needed from the applicant, the commission should request it for its (and our) review and consideration.

- *Setbacks.* Setbacks are not included on the site plan. All machinery, cuts, and excavation must occur outside of the required 50-foot setback and in some cases, this setback may not be satisfied.
- *Screening.* Does the applicant intend to maintain existing vegetation along the property lines to help screen the property? How will landscaping standards be satisfied? Should the Planning Commission require a taller berm?
- *Berms.* Berms are proposed, but the heights may be less than the height requirement for fencing. Berms should be sufficient enough to contain noise and visual screening of the operation from neighboring property owners. Section 4.26 E requires evergreens to be planted on berms, which are not depicted on the site plan.
- *Operational Year.* The hydrogeological report was based on a 240-day mining operation, which does not operate in the winter. Is this the same time frame the applicant intends to operate? The report is also based on a 5-year construction of the lake, rather than 10 years as proposed by the applicant.
- *Protection from Fuel Spills.* Does the applicant have a plan in place for storing fuel on-site? If so, what approach to fuel spill containment is being proposed?
- *Crushing plant.* Where will the crushing plant be located on the site? Will the applicant use additional water as part of this process?
- *Hydrogeological Concerns.* Our engineering staff has performed a brief review of the Hydrogeological "certification" provided by Lakeshore Environmental and have the following comments:
 - How were the resultant groundwater contours derived in the "Predicted Groundwater Elevation" figure? These contours seem severe (steep) for a water table system in equilibrium.
 - Under the attachment that shows Theoretical Lake Excavation Drawdown Calculations; using a single well placed in the center of the proposed lake to simulate drawdowns at various distances from the lake is not a realistic model, particularly since drawdowns will begin at the edge of the lake and not at the center. The lake itself will become one large equivalent well. In addition, it may be more appropriate to perform this simulation using a lower storage coefficient and a lower hydraulic conductivity value which would test the sensitivity and show a range of possibilities. The value of $S=0.24$ is considered the upper range of storage values for an unconfined aquifer, and there is no evidence that this storage value is appropriate either at the site or laterally away from the excavation area, particularly in the vicinities of the private wells and the public water supply wells. There are more appropriate analytical models that simulate this behavior rather than the Theis equation to simulate a single pumping well.

- We are concerned with the proximity of this facility to the City water supply wells (roughly 700 feet). The protection of this public water supply and future increased development of this wellfield (as planned) needs to be carefully considered.
- *Any additional concerns by the Planning Commission.* The Planning Commission should consider this an active list and may add or subtract from it as desired.

Recommendation. At the October 12 public hearing, the Planning Commission should discuss the site plan, application, and carefully consider any comments from the public and the applicant. Subject to those comments, we recommend the Planning Commission table the application to resolve issues identified above and gain more information on the application.

If the Commission is inclined to make a decision, we recommend a *tentative* decision, and instruct staff to prepare an appropriate motion and findings for the commission's consideration.

As always, please contact us if there are any questions.

c: Sue Ullery, City Clerk

Request Number: _____

Filing Fee: _____



301 East Main Street
Lowell, Michigan 49331
Phone (616) 897-8457
Fax (616) 897-4085

APPLICATION FOR SITE PLAN REVIEW / SPECIAL LAND USE

- All drawings must be sealed by an architect, engineer or surveyor unless waived by the Zoning Administrator.
- 15 copies of the site plan must be submitted to the City Manager's office no later than four weeks before the Planning Commission meeting to allow adequate staff review.
- The Planning Commission meets the fourth Monday of the month at 7:00 p.m. where plans are approved, rejected or modified.
- Preliminary plans may be presented for Planning Commission comment, but no final approval is given until all required conditions are met.
- After approval, public works and building permits must be secured before construction may commence.

1. Street Address and/or Location of Request: 2014 Bowes St SE
2. Parcel Identification Number (Tax I.D. No.): #41-20-10-100-'004', '005', '014', '015'
3. Applicant's Name: Grand Rapids Gravel Phone Number (616) 538-000 Ext. 114
Address: 2700 28th St SW Wyoming MI 49519
Street City State Zip
Fax Number _____ Email Address JDykema@Grgravel.com
4. Are You: ☒ Property Owner ☐ Owner's Agent ☐ Contract Purchaser ☐ Option Holder
5. Applicant is being represented by: James Dykema/Mike Berg Phone Number (616) 363-6895 Ext. 331
Address: _____
6. Present Zoning of Parcel Industrial Present Use of Parcel Nothing / Residential housing
7. Description of proposed development (attach additional materials if needed):
A Narrative is attached with description of proposed activity.

The facts presented above are true and correct to the best of my knowledge.

Signature: James Dykema Date: 9-04-2020

Type or Print Your Name Here: JAMES DYKEMA

Property Owner Approval: As owner I hereby authorize the submittal of this application and agree to abide by any decision made in response to it.

Owner

Date

The following 16 points make up the **CHECKLIST** of required information needed on the drawing for final plan approval (unless specifically waived by the Planning Commission). Please go over this **CHECKLIST** with the City Manager and Zoning Administrator before presenting to the Planning Commission.

- | | |
|---|----------------|
| 1. Date, north arrow and scale (not more than 1" = 100', supplementary site plans at a 1" = 50' or larger scale are encouraged) | INITIAL |
| 2. A city locational sketch | |
| 3. Legal description and City address of the subject property | |
| 4. The size in acres or square feet of the subject property | |
| 5. All lot and/or property lines with dimensions, including building setback lines | |
| 6. The location of all existing structures within one hundred (100) feet of the subject property's boundary | |
| 7. The location and dimensions of all existing and proposed structures on the subject property | |
| 8. The location and dimensions of all existing and proposed: | |
| ▪ Drives | |
| ▪ curb openings (NOTE: all new openings onto M-21 (Main Street) must receive State Transportation Department approval) | |
| ▪ sidewalks | |
| ▪ exterior lighting | |
| ▪ curbing | |
| ▪ parking areas (include and delineate the total number of parking spaces showing dimensions of a typical space) | |
| ▪ unloading areas | |
| ▪ recreation areas | |
| ▪ common use areas | |
| ▪ areas to be conveyed for public use and purpose | |
| 9. The location, pavement width and right-of-way width of abutting roads, alleys or easements | |
| 10. The existing zoning of all properties abutting the subject project | |
| 11. The location of all existing and proposed: | |
| ▪ landscaping and vegetation | |
| ▪ location, height and type of existing and proposed fences and walls | |
| 12. Proposed cost estimates of all site improvements | |
| 13. Size and location of existing and proposed hydrants and utilities including proposed connections to public sewer or water supply systems | |
| 14. The location and size of septic and drain fields | |
| 15. Contour intervals shown at five (5) foot intervals | |
| 16. FOR RESIDENTIAL DEVELOPMENT , the following information is required (affixed to the drawing): | |
| ▪ Net developable area, in acres or in square feet, defined as all areas that could be developed subtracted by lands used or dedicated for existing easements and rights of way | |
| ▪ the number of dwelling units proposed (by type), including typical floor plans for each type of dwelling | |
| ▪ the number and location of efficiency and one or more bedroom units | |
| ▪ typical elevation views of the front, side and rear of each type of building | |
| ▪ Dwelling unit density of the site (total number of dwellings / net developable area) | |

Section 17.03 of the City of Lowell Zoning Ordinance specifies that to approve a special land use, the Planning Commission must find that the request meets the following standards. Please describe how the proposed project would meet each standard.

- A. Each application shall be reviewed for the purpose of determining that the proposed special land use meets the following standards and, in addition, that each use of the proposed site will:
1. Be designed, constructed, operated and maintained so as to be harmonious and appropriate in appearance, with the existing or intended character of the general vicinity and that such a use will not change the essential character of the area in which it is proposed;
We will have a berm for dust / noise control and to block view of public. Future land use will be a wonderful development with a lake and residential for the area.

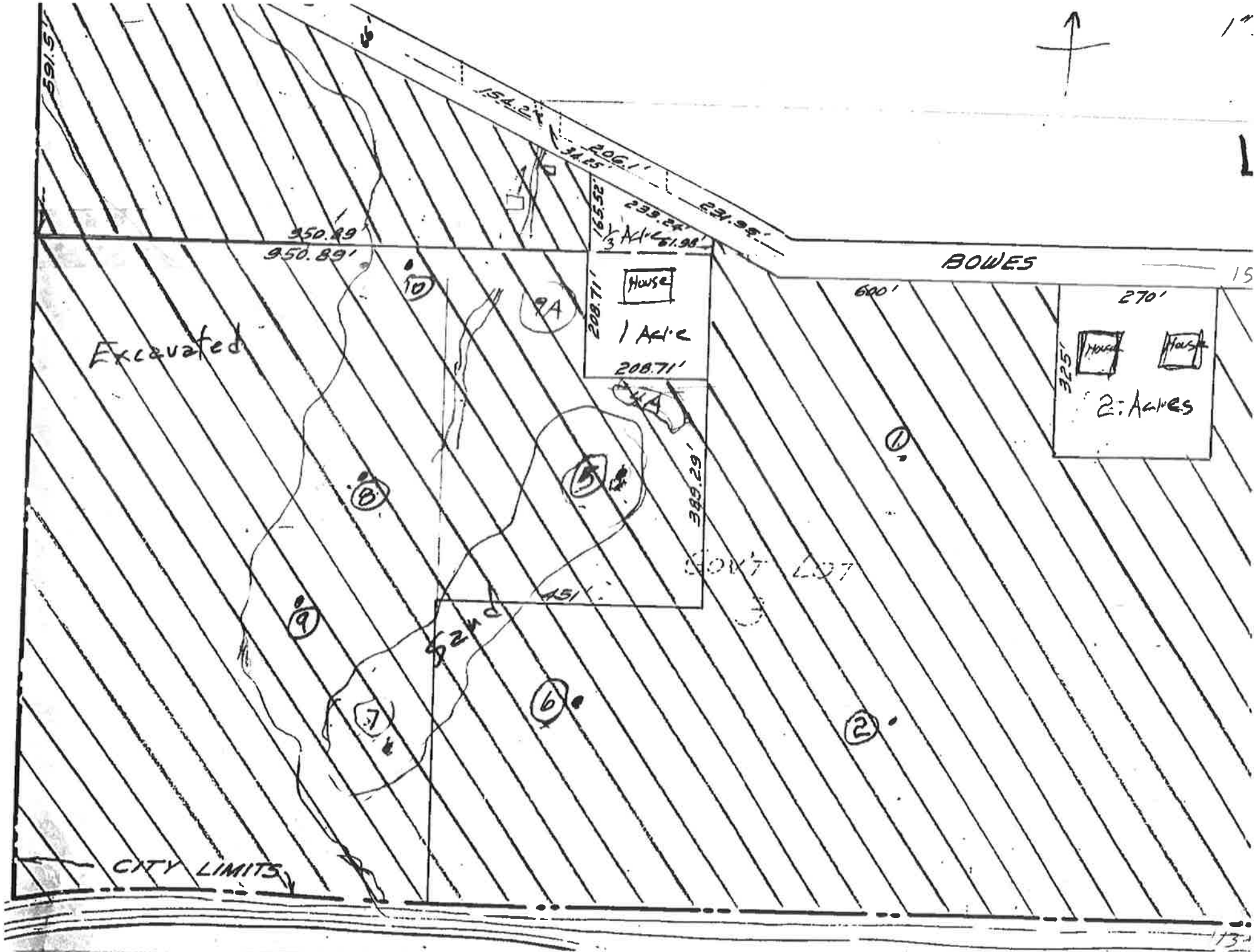
 2. Be served adequately by essential public facilities and services such as highways, streets, police, fire protection, drainage structures, refuse disposal, water and sewage facilities;
We will work with all necessary public facilities to have access to the site.

 3. Not create excessive additional requirements at public cost for public facilities and services; and
There is no extra cost for the public for this project.

 4. Not involve uses, activities, processes, materials, and equipment or conditions of operation that will be detrimental to any persons, property, or the general welfare by reason of excessive production of traffic, noise, smoke, fumes, glare, or odors.
We have completed many different mining operations and have turned them into wonderful developments.
We abide by the EGLE standards for noise / dust / etc. and have had no issues.

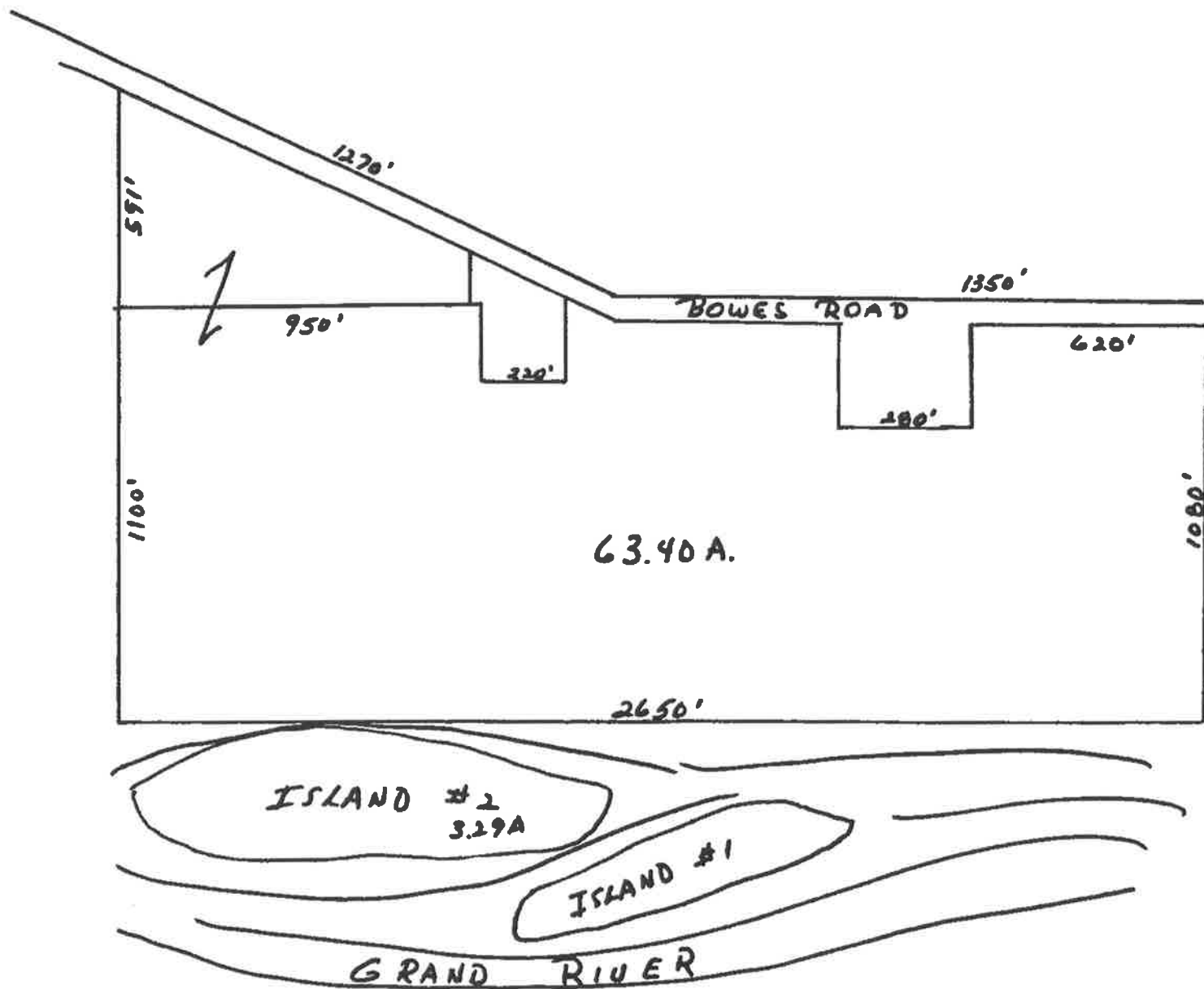
Section 17.04 of the City of Lowell Zoning Ordinance lists specific standards pertaining to special land uses that must be met. Please respond to those standards below as it pertains to the proposed project, describing how the standards would be met by this proposal:

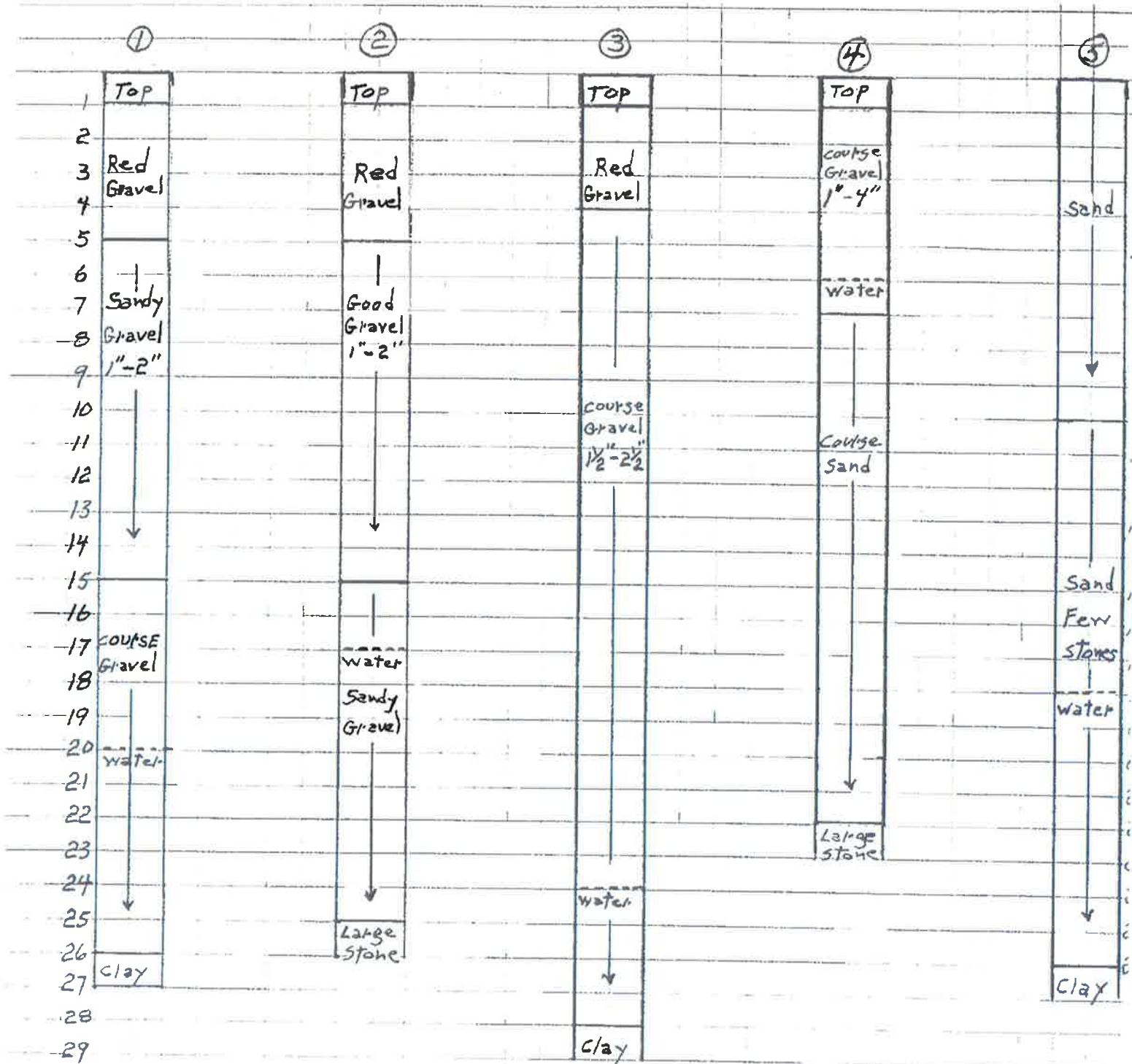
Please see attached document.



12/27/86

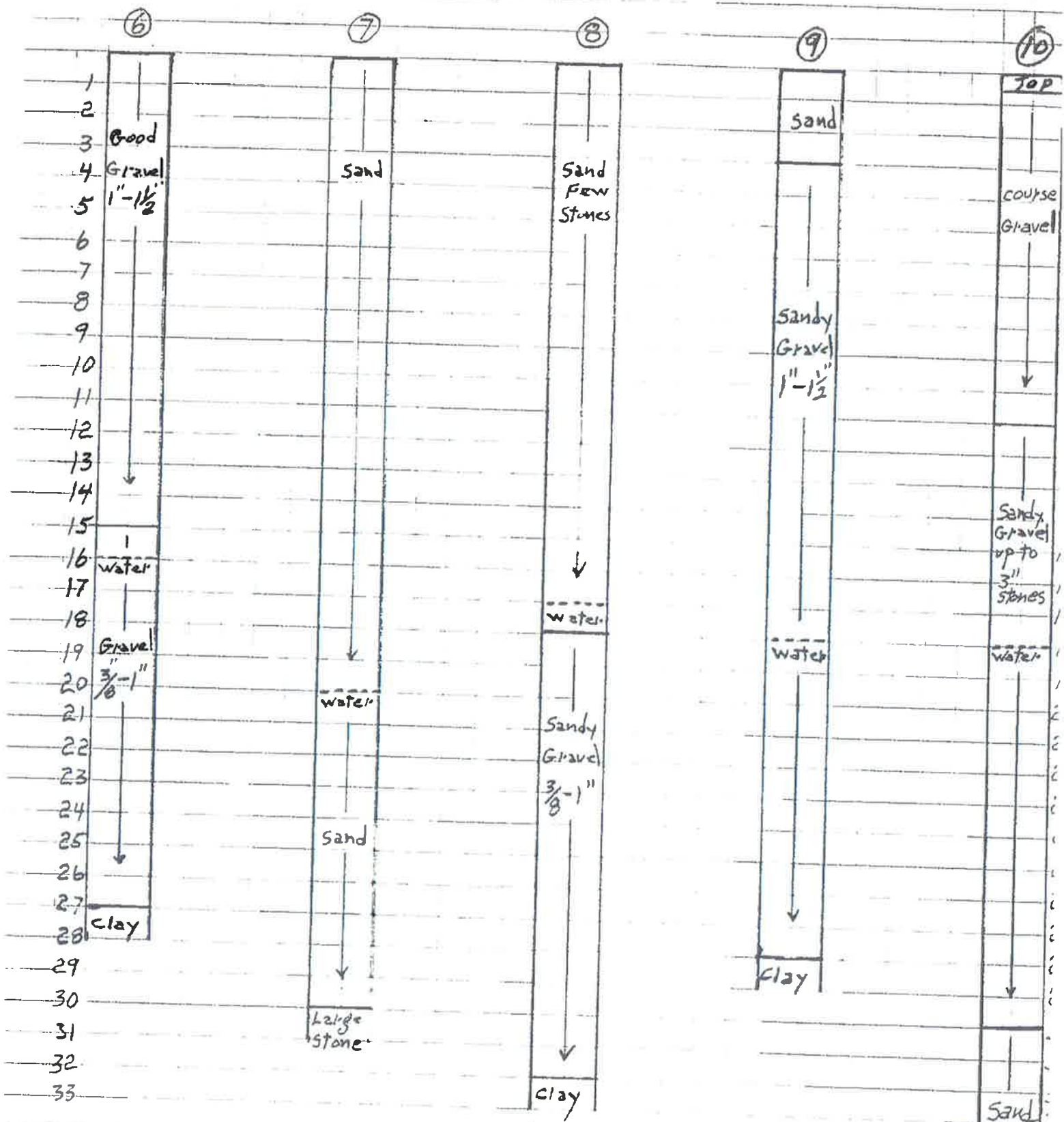
L OWELL





Lowell Property Borings

Oct. 10, 1986



Lowell Property Borings
Oct. 10, 1996

clay at

- No 1 1' black 4' red = sandy gravel 1' 2"
water 20' bigger stone at 15' = clay 2'
- No 2 1' black 4' red good gravel 10' then
more sandy water 17' = 25' big stones
- No 3 1' black 3' red 3" stone good = water 24'
clay 28'
- No 4 1' black = water 6' = coarse gravel 4" = 13' sand
big stone at 22' couldn't get them.
- No 5 sand 10' = sandy very little gravel = water
18' = 26' clay
- No 6 no top = gravel good (1 1/2") finer at 15' water 16'
27' clay
- No 7 sand = water 20' = big stone 30' could
not drill them = no gravel
- No 8 sand 18' = sandy gravel 32' clay
- No 9 3' sand = sandy gravel 1 1/2" water 18'
28' to clay
- No 10 6" black 0 good gravel 11' then more sandy
3" stones = finer 30' - sand 42' clay

1600 - cu. yds. per Acre per ft.
x 32 Acres

51,200 - cu. yds per per ft.

x 20 - Deep

1,024,000 - cu. yds -

July 1, 2020

Sent via e-mail only: mberg@dykemaexcavators.com

Mr. Mike Berg
Grand Rapids Gravel, Inc.
2700 28th Street SW
Grand Rapids, MI 49509

Re: *Hydrogeological Certification
Grand Rapids Gravel Inc.
City of Lowell, Kent County, MI*

Dear Mr. Berg,

Per your request, Lakeshore Environmental, Inc. (LEI), has prepared this document to provide an analysis and corresponding certification of the predicted hydrogeological conditions during and after the proposed lake construction for Grand Rapids Gravel, Inc. (GR Gravel). The primary hydrogeological concerns are short-term changes in groundwater elevations during lake construction, and long-term changes in the overall quality or quantity of groundwater. A summary of our analysis with regard to these concerns is provided below.

PERTINENT HYDROGEOLOGICAL CONDITIONS

GR Gravel proposes to construct a 22.5-acre lake at the property located at 2104 Bowes Street SE, Lowell, Michigan (Site). The vicinity of the proposed lake is characterized by outwash sediments deposited during and after the last glacial event in Michigan approximately 4,000 to 20,000 years ago. More specifically, the Site is located on sediments deposited during the formation of the Charlotte Morainic System approximately 14,000 years ago. Being in the glacial outwash between end moraines, the deposits are generally a mixture of sand and gravel. At this specific location sands and gravels were deposited on the western flank of the Inner Charlotte Moraine by braided streams carrying meltwater from the glacier. At the same time, occasional debris flows (mud slides) spilled from the melting glacier and deposited small pockets of clay.

Shortly after the retreat of glacial ice from the region, the Site was covered with post glacial alluvium. As the Grand River first formed it cut through the Inner Charlotte Moraine and drained Glacial Lake Whittlesey in the present Lake Huron basin westward to Lake Chicago in the present Lake Michigan basin (12,500 years ago). As a result of the high flow velocity and volume of water in the very large early Grand River, sand and gravel was deposited (again) in the Grand River Valley. Later, as flow in the Grand River slowed to present day velocities, sand was deposited on top of the gravel.

Based on survey information (USGS), ground elevations at the Site range between approximately 640 feet at the north side along Bowes Street and approximately 615 feet at the south side. The Grand River is located along the south border of the Site, which has a surface water elevation of approximately 615 feet.

Based on soil boring data, stratigraphy consists of fine sand to coarse gravel (ore) to a minimum depth of 16 feet at the south portion of the Site and 24 feet at the north portion of the Site.

Corporate Office

803 VerHoeks Street
Grand Haven, Michigan 49417
Phone: 800.844.5050
www.LakeshoreEnvironmental.com

Grand Haven, MI

Grand Rapids, MI

Vestaburg, MI

Muskegon, MI



Groundwater occurs at a depth of 3 to 14 feet below grade, depending on topography. Based on observation well data, groundwater flow is consistent with topography and is to the south at a relatively high gradient of 0.0068 (ft/ft). The predicted water elevation for the completed lake is 618 feet, however, the lake elevation will be dependent on the elevation of the Grand River. The locations of the observation wells (soil borings) are illustrated in Figure 1 and Figure 2. The Site soil boring and well construction logs are included as Attachment A. A summary of observation well data is included as Table 1.

The stratigraphy recorded in the soil boring logs was utilized to construct a North to South cross section (Figure 3). As illustrated, the Site contains more gravel to the north as the topography is higher up on the floodplain, and more sand to the south as the topography drops towards the Grand River.

Based on available information from EGLE's *GeoWebFace*, 14 water wells are located within a quarter mile of the Site. Following a review of the 14 water wells identified in *GeoWebFace*, LEI was able to conclude only nine of the 14 water wells are considered shallow wells that are installed in the same water bearing formation as the proposed lake. While a few area water wells are present in deeper confined aquifers, these wells are not hydraulically connected to the shallow aquifer where the lake construction will occur and thus are not considered relevant for this report. The closest water well with an available well log that is installed in the shallow aquifer is located at 2175 Bowes Road (700 feet to the north). There are four Type 1 public wells installed in the shallow aquifer directly east of the Site, which supply water to the City of Lowell. The closest Type 1 well according to *GeoWebFace* is located at least 700 feet east of the proposed lake boundary. The wellhead protection zone for these Type 1 wells is located outside of the boundary of the proposed lake (Figure 1). A FOIA was submitted to EGLE's Drinking Water Division for any information regarding pump capacity and annual water usage, which did not grant any information. All shallow aquifer water well logs within a quarter mile of the proposed lake are included as Attachment B. The nine well logs included as Attachment B are summarized in Table 2 and their locations are illustrated in Figures 1 and 2. The wells were designated as 1 through 9 (for simplicity) as listed in Table 2.

In addition, LEI identified two additional residences adjacent to the Site that were not identified in *GeoWebFace* (1600 Bowes and 12138 Bowes). A Freedom of Information Act (FOIA) request was submitted to Kent County, which did not yield any well information regarding these residences. Based on discussions with the homeowners and the site contact, LEI determined that these two residences are currently connected to municipal supply and are also scheduled for demolition to facilitate construction of the mine. In fact, the well log designated as #1 in Table 2 (Welllogic ID 41000001523) corresponds to 1600 Bowes and its published location on *GeoWebFace* is not correct. The correct location is illustrated in Figures 1 and 2. Please note, GR Gravel owns both of these residences and they will be properly abandoned upon construction of the mine.

With regard to surface water, the Grand River lies approximately 250 feet south of the proposed lake. A small pond is present on the west side of the Site, which will be excavated and incorporated into the final, proposed lake. A second pond exists on the east side of the Site, which is supplied by a storm water drain that flows from the north under Bowes Road. An outlet is also present in this pond that flows by gravity in an open drain directly south to the Grand River. A regulated wetland exists across the southern border of the property as illustrated in Figure 1. The nearest point of this wetland to the proposed lake boundary is 30 feet.

No flooding or dewatering concerns are predicted as a result of the proposed lake construction for the following reasons:

1. All storm water at the mine site will be contained within the Site.

2. The lake is not being created by dewatering.
3. Wet ore will be placed adjacent to the lake to allow water to drain back into the lake.
4. The lake is not being excavated through a confining layer or unusual stratigraphy.
5. The lake will be a water table lake. The lake elevation is not being held up by a dam, pump, or a clay liner.
6. Several local water table lakes have been created from mining that have not resulted in flooding or a lowering of the groundwater. This is best exemplified by Stoney Lake at Stoney Lakeside Park.

SHORT TERM CHANGES IN THE GROUNDWATER ELEVATION DURING LAKE CONSTRUCTION

GR Gravel is proposing to construct a lake with a total area of 22.5 acres. The projected lake elevation, based on regional geology, seasonal water table fluctuations and hydrology is 618 feet. However, the actual lake elevation will fluctuate seasonally in response to the Grand River. A water level datalogger was installed in OW-1 and OW-2 to monitor the relationship of these wells and the Grand River. The latest results from the dataloggers are illustrated as Figure 4. Both OW-1 and OW-2 increased by over 5 feet within a week of receiving significant precipitation. These wells trend with the Grand River and thus so will the proposed lake. This is further supported by surface water elevations measured on Stoney Lake located to the east. Stoney Lake was constructed in the same glacial outwash deposits and in the same vicinity to the Grand River as the proposed lake. The water elevations measured indicate that Stoney Lake also increases and decreases in elevation based on the Grand River.

To construct the lake, which is anticipated to take approximately 5 years, approximately 322,000 cubic yards of sand will be excavated from below the water table (wet) utilizing a dragline. The wet ore will be stockpiled near the lake and water will be allowed to drain back into the lake (recycled). Even though there is no actual loss of groundwater (with the exception of an insignificant amount of evaporation from the stockpiles), the ore removal results in a short term lowering of the water table as groundwater flows into the excavation to fill the void where the ore was located. This lowering only occurs during excavation activities, and does not occur in the winter, when no mining takes place and groundwater levels equilibrate.

Groundwater elevation changes and potential effects on adjoining properties can be predicted utilizing standard hydrogeological calculations and models. Aquifer thickness values used in the calculations were obtained from local water well logs and on-site soil boring data. Hydraulic conductivity values were derived from aquifer material collected during the observation well installation. In summary, the maximum groundwater inflow rate to account for ore removal is calculated to be 29 gallons per minute (GPM) based on an annual mining schedule of 240 days. This results in a maximum predicted drawdown of 0.31 feet at the nearest residence with a shallow water well (2175 Bowes Road), and 0.13 feet (1.6 inches) at the nearest Type 1 supply well. This level of drawdown is less than the seasonal fluctuation in the water table and will not result in a significant decrease in the availability or quality of groundwater.

This prediction is conservative for the following reasons:

1. Groundwater drawdown calculations assume that the lake is started at the center of the proposed lake boundary. Initial lake excavation is proposed to begin at the existing west pond, and therefore the actual effect of the drawdown will be reduced.
2. The calculations assume there is no recharge to the aquifer for a period of 240 days. Based on historical precipitation records, this has not occurred to date.
3. The amount of infiltration will be increased during and after lake construction as a greater percentage of precipitation is maintained on-site and not allowed to run off (it will fall into a lake). Groundwater calculations do not account for increased infiltration.

A summary of the sieve analyses and hydraulic conductivity calculations utilized in the predictions is provided in Table 3. The sieve analyses completed on the aquifer material are provided as Attachment C. The actual hydrogeological calculations and modeling data (predictions) are provided in Attachment D.

LONG TERM EFFECTS OF LAKE CONSTRUCTION

In general, the potential long-term effects of lake construction relate to the following:

1. A change in groundwater quality as a result of lake construction.
2. Draining of area wetlands as a result of lake construction.
3. A reduction of area groundwater elevations by increased evaporation.
4. Long term changes in groundwater elevations as a result of the presence of the new lake.

An analysis of these potential effects is provided below:

1. Groundwater quality of the aquifer is likely to be improved due to the construction of the lake. Since the lake is a water table lake, where groundwater flows in one side of the lake and out the other (for simplicity), iron and hardness are readily removed as the water in the lake is exposed to the atmosphere where it can readily exchange dissolved oxygen and carbon dioxide. This improved lake water is then returned to the aquifer. In addition, no chemicals are utilized at the Site, nor are they proposed for the future, and daily inspections will be conducted to prevent fuels and lubricants from having the potential to enter the lake.
2. The proposed lake has no outlet and will not be dewatered during construction. As a result, there will not be a significant lowering of the groundwater elevation that could result in the draining of wetlands. Furthermore, the nearest delineated wetland is located downgradient from the proposed lake and adjacent to the Grand River. There is no predicted change in the downgradient groundwater elevations due to the presence of the lake. The wetlands located along the drain flowing out of the east pond will also not be affected as they are sourced by surface water, not groundwater.
3. The construction of the lake will result in an increase in evaporation during the summer. The net loss in the water budget from lake evaporation can be predicted utilizing the EGLE recommended EVAP model. The model compares the existing evapotranspiration to the future lake evaporation and calculates the net deficit. A net deficit of 11 GPM will occur following lake construction. The effect of the loss on area groundwater was calculated using the Theis Drawdown Equation, which resulted in a predicted drawdown at the closest residential well of only 0.11 feet (1.3 inches). The predicted drawdown at the nearest Type 1 supply well is only 0.04 feet. Considering that there is over 60 feet of water column present above its well screen, this predicted drawdown is of no concern. The regulated wetland to the south is predicted to have a long-term loss of 0.19 feet. This predicted deficit is not significant as it is less than seasonal fluctuations in the water table. EVAP model calculations and Theis Drawdown Equation are provided in Attachment E.
4. The existing groundwater elevations at the location of the proposed lake vary from approximately 617 feet at OW-1 to 624 feet at OW-5. The proposed lake has a predicted surface elevation of 618 feet, which results in a localized decrease of the groundwater elevation in the immediate vicinity of the upgradient (north) edge of the constructed lake. However, within a short distance of the lake the groundwater will return to natural levels. The area where this will occur was predicted utilizing computerized groundwater contouring. The results of this groundwater contouring are illustrated in Figure 2. Based on the computerized contouring of the groundwater after lake construction, the groundwater will be reduced in elevation by a maximum of 2.0 feet at the north property line. A reduction of this magnitude is not anticipated to affect local water wells.

CONCLUSION

LEI collected hydrogeological information relating to the proposed lake construction. This included a review of area water wells and geology, local elevation surveys, Site soil borings, the installation of observation wells, data analysis, and groundwater modeling to predict the effects of lake construction on area groundwater resources. Any short term or long term reduction of the groundwater elevation due to lake construction is insignificant based on conservative modeling. In fact, the storage, recharge, and quality of the aquifer is likely to be improved with the construction of the lake.

As a result of the above analysis and assumptions, LEI certifies that the proposed lake construction will not have an adverse effect on area groundwater resources. Thank you for your consideration. Please contact me with any questions, comments, or concerns regarding this information.

Sincerely,
Lakeshore Environmental, Inc.



Nathan C. Koella, EIT
Environmental Engineer

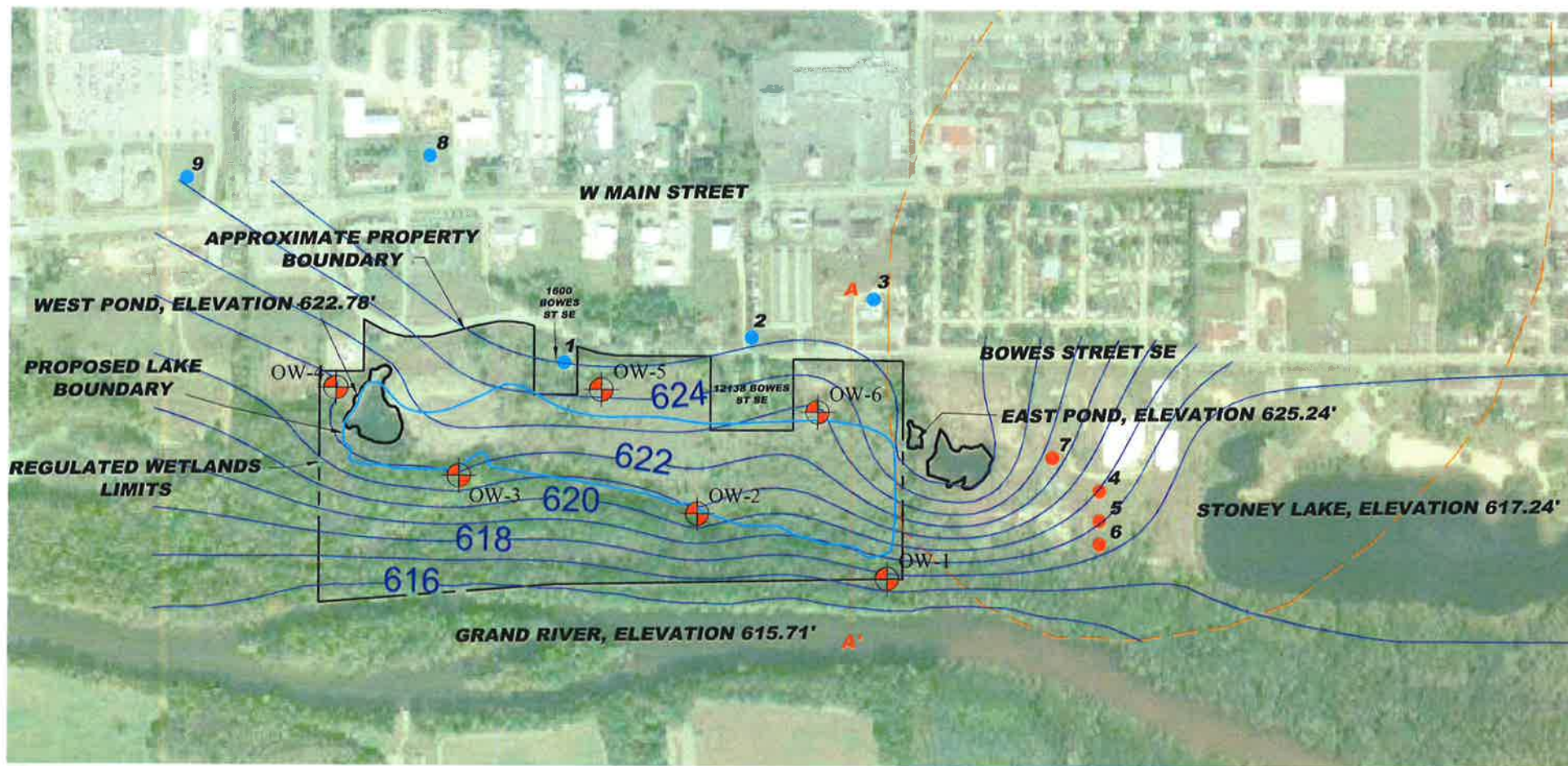
Email: NateK@My-LEI.com

Attachments: Figures and Tables
 A: Site Soil Boring and Observation Well Construction Logs
 B: Relevant Local Water Well Logs
 C: Sieve Analyses and Hydraulic Conductivity Calculations
 D: Short Term Drawdown Calculations
 E: Long Term Evapotranspiration Calculations







Cc: None
 File – LEI (20-800 /ck: KCK/nck/jrc)

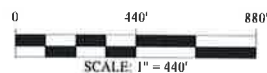
Figures and Tables

Figure 1	-	Site Map with Existing Groundwater Elevations
Figure 2	-	Site Map with Predicted Groundwater Elevations
Figure 3	-	Cross Section A-A'
Figure 4	-	Groundwater Elevation Monitoring
Table 1	-	Groundwater Observation Well Data Summary
Table 2	-	Relevant Local Water Well Data
Table 3	-	Aquifer Material Characteristics



LEGEND

-  OBSERVATION WELL
-  **617**—GROUNDWATER ELEVATION CONTOUR (FEET, NAVD 88)
-  **A—A'** GEOLOGIC CROSS-SECTION LINE
-  **2** WELLHEAD PROTECTION ZONE
-  **7** SHALLOW RESIDENTIAL WELL
-  **1** TYPE I SUPPLY WELL



NOTES:
GROUNDWATER ELEVATIONS BASED ON LEI DATA COLLECTED MARCH 2020



PERTINENT SITE FEATURES

PARCEL #s 41-20-10-100-004,-005,-014,-015

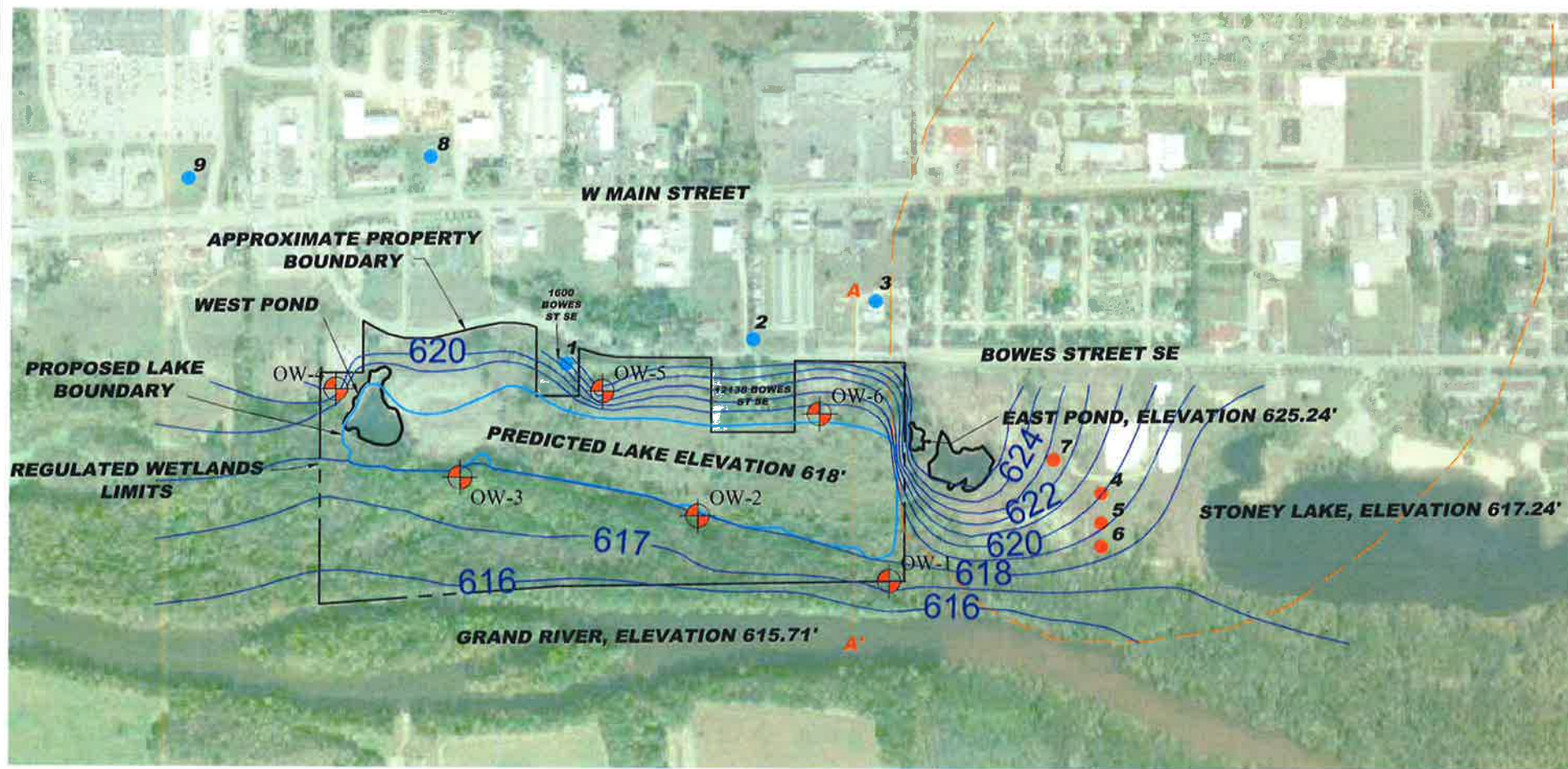
1600 BOWES STREET SE
LOWELL, MI 49331

JOB 20-800

JUNE 2020

FIGURE 1

DWN BY: JRC



LEGEND

- OBSERVATION WELL
- 617 GROUNDWATER ELEVATION CONTOUR (FEET, NAVD 88)
- A-A' GEOLOGIC CROSS-SECTION LINE
- WELLHEAD PROTECTION ZONE
- 2 SHALLOW RESIDENTIAL WELL
- 7 TYPE I SUPPLY WELL



NOTES:

GROUNDWATER ELEVATIONS BASED ON LEI DATA COLLECTED MARCH 2020



PREDICTED GROUNDWATER ELEVATION

PARCEL #s 41-20-10-100-004, -005, -014, -015

1600 BOWES STREET SE
LOWELL, MI 49331

JOB 20-800

JUNE 2020

FIGURE 2

DWN BY: JRC

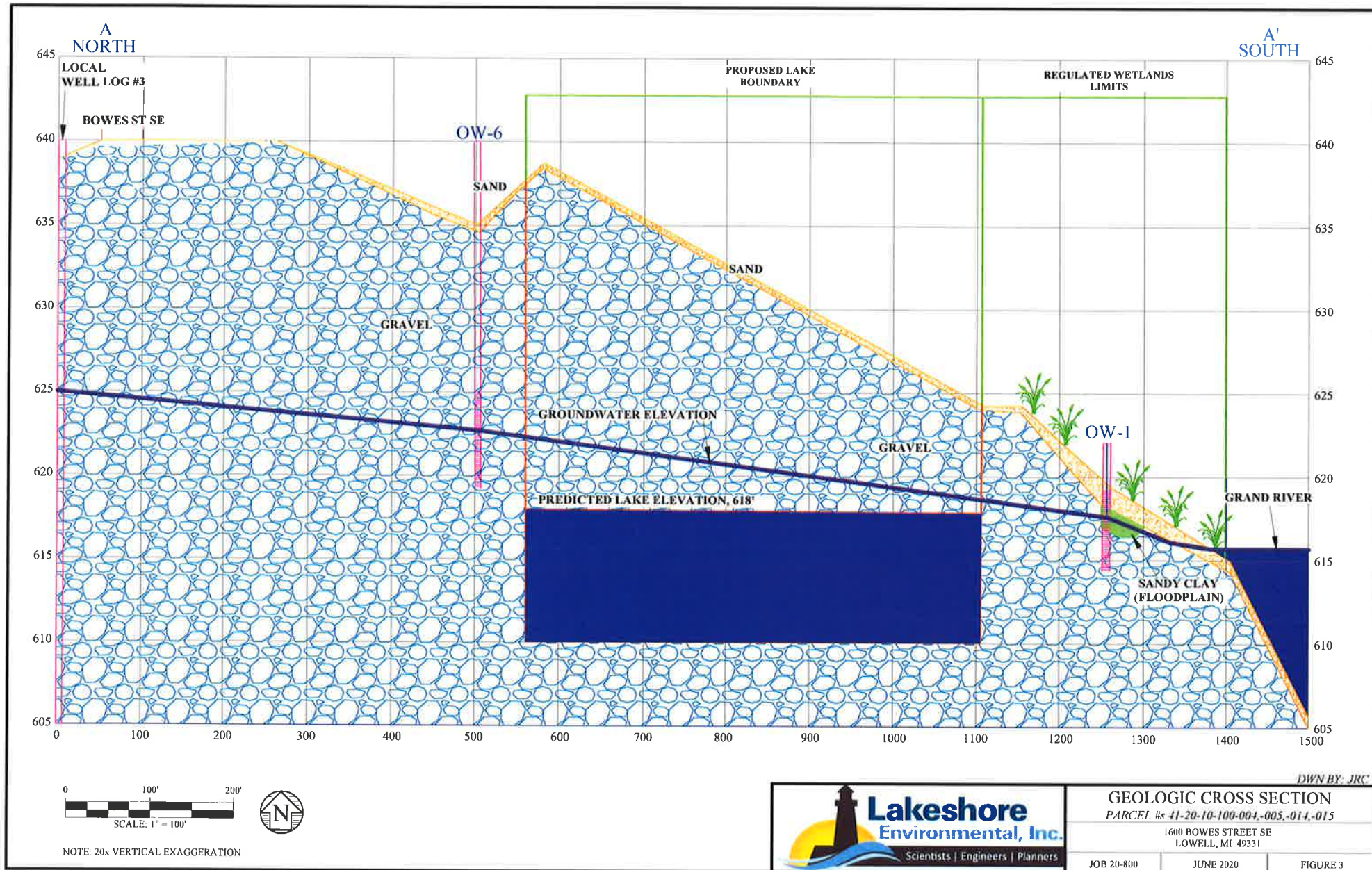


Figure 4 - Groundwater Elevation Monitoring

GR Gravel, Lowell

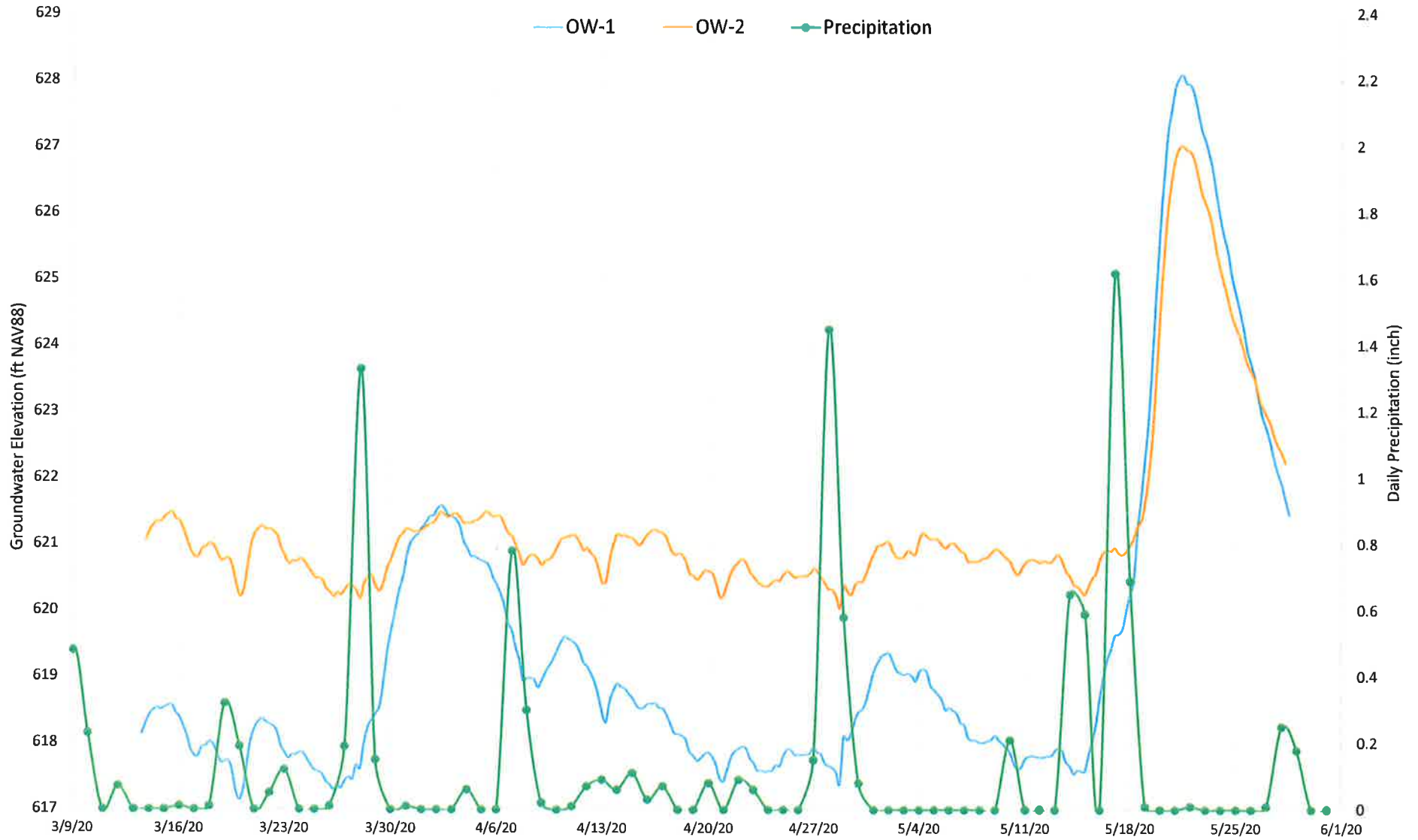


Table 1 - Groundwater Observation Well Data Summary

GR Gravel Co. - Lowell, Michigan

Well ID	Date Installed	Depth of Boring (ft)	Screened Interval (Ft/BGS)	Ground Elevation (USGS)	Top of Casing (USGS)	Most Recent Data for Wells					
						SWL	GWE	SWL	GWE	SWL	GWE
						3/13/2020		3/27/2020		5/28/2020	
OW-1	3/12/2020	5.00	1.0-5.0	619.48	623.18	5.04	618.14	5.57	617.61	2.00	621.18
OW-2	3/13/2020	15.30	10.3-15.3	625.96	630.43	9.37	621.06	9.54	620.89	7.66	622.77
OW-3	3/13/2020	7.75	2.75-7.75	624.18	626.51	4.49	622.02	4.58	621.93	4.00	622.51
OW-4	3/12/2020	15.50	10.5-15.5	628.63	633.06	11.31	621.75	11.28	621.78	8.92	624.14
OW-5	3/13/2020	15.50	10.5-15.5	632.45	636.62	12.28	624.34	12.33	624.29	9.38	627.24
OW-6	3/13/2020	15.70	10.7-15.7	635.97	640.63	18.79	621.84	17.91	622.72	14.67	625.96
West Pond	NA	NA	NA	NA	NA	623.40		622.78		625.69	
East Pond	NA	NA	NA	NA	NA	624.36		625.24		624.51	
Stoney Lake	NA	NA	NA	NA	NA	NM		617.24		621.55	
Grand River	NA	NA	NA	NA	NA	614.00		615.71		621.18	

Notes:

BGS - Below Ground Surface

SWL - Static Water Level

GWE - Groundwater Elevation

NA - Not Applicable

NM - Not Measured

Table 2 : Relevant Local Water Well Data

GR Gravel Co. - Lowell, Michigan

LEI Well Designation	Well ID	Well Owner	Well Address	Aquifer Type (Shallow or Deep Wells)	Well Use	Well Screen Interval (ft BGS)
1	41000001523	James Barber	1600 Bowes St, Lowell, MI 49331	Deep	Household	78-82
2	41000020914	Jim Lacey	2175 Bowes St, Lowell, MI 49331	Shallow	Household	39-45
3	41000001461	Interstate Pipe Maintenance	2051 Bowes St, Lowell, MI 49331	Shallow	Household	43-48
4	41000001466	Michigan Wire Company	2487 W Main, Lowell, MI 49331	Shallow	Household	17-47
5	41000001525	City of Lowell	Lowell Well #1, Lowell, MI 49331	Shallow	Type 1 Public	70-100
6	41000001526	City of Lowell	Lowell Well #2, Lowell, MI 49331	Shallow	Type 1 Public	79-109
7	41000001527	City of Lowell	Lowell Well #3, Lowell, MI 49332	Shallow	Type 1 Public	66-84
8	41000001528	City of Lowell	Lowell Well #5, Lowell, MI 49332	Shallow	Type 1 Public	77-107
9	41000001475	John Whaley	11907 Fulton, Lowell, MI 49331	Shallow	Household	24-28

Notes:

ft BGS - feet below ground surface

LEI well designation in upper right corner of well log (Attachment B)

Table 3 : Aquifer Material Characteristics

GR Gravel Co. - Lowell, Michigan

Observation Well Soil Borings			
Observation Well	ASTM Soil Description	ASTM Soil Classification	Average Hydraulic Conductivity (feet/day)
OW-1	Well-Graded Medium Gravel	GW	131
OW-2	Poorly-Graded Sand with Gravel	SP	117
OW-3	Silty Sand	SM	37
OW-4	Poorly-Graded Sand with Silt and Gravel	SP-SM	147
OW-5	Poorly-Graded Sand with Gravel	SP	114
OW-6	Poorly-Graded Sand with Gravel	SP	114
		Average	110

Attachment A: Site Soil Boring Logs

SOIL BORING / WELL CONSTRUCTION LOG



DRILLING METHOD:
DIRECT PUSH – GEOPROBE

BORING NO.
OW-1

SAMPLING METHOD:
CONTINUOUS – ACETATE LINERS

SHEET 1 OF 1

SURFACE CONDITIONS:
WOODED FLOODPLAIN

DRILLING

START FINISH

TIME TIME
15:40 16:20

DATE DATE
3/12/2020 3/12/2020

SITE NAME: GRAND RAPIDS GRAVEL CO.
LOCATION: 1600 BOWES ST SE
LOWELL, MI 49331

WATER LEVEL DURING DRILLING
3.02'

STATIC GROUNDWATER LEVEL
5.04' FROM TOC

DRILL RIG: GP5400 OPERATOR: NCK

DRILLING CONTRACTOR: LEI

GROUND ELEVATION: 619.48

LEI PROJECT #: 20-800

T.O.C. ELEVATION 623.18

SUPERVISED BY: KCK

GROUNDWATER ELEVATION 618.14

DEPTH IN FEET	SOIL GRAPH	DESCRIPTION OF MATERIAL	WELL CONSTRUCTION
0.0' - 1.2'		0.0-1.2' DARK BROWN SILTY FINE SAND, ORGANICS, ROOTS, STONES (TOPSOIL).	+3.70' STICK UP
1.2' - 2.0'		1.2-2.0' RED/ORANGE VERY FINE SANDY CLAY, MOIST, STIFF, SOME STONES.	BENTONITE SEAL 0.0' TO 1.0'.
2.0' - 2.8'		2.0-2.8' LIGHT BROWN TO WHITE FINE SAND, SOME GRAVEL, MOIST, STIFF	
2.8' - 5.0'		2.8-5.0' COARSE SAND AND GRAVEL, WET, STIFF	GRAVEL FILTER PACK
5.0' - 9.0'		E.O.B AT 5' IN GRAVEL	INSTALLED 2.0" DIAMETER P.V.C. WELL SCREENED INTERVAL 1.0' TO 5.0'

SOIL BORING / WELL CONSTRUCTION LOG



DRILLING METHOD:
DIRECT PUSH — GEOPROBE

BORING NO.
OW-2

SAMPLING METHOD:
CONTINUOUS — ACETATE LINERS

SHEET 1 OF 1

SURFACE CONDITIONS:
WOODED FIELD

DRILLING

START TIME 8:15	FINISH TIME 10:00
-----------------------	-------------------------

SITE NAME: GRAND RAPIDS GRAVEL CO.
LOCATION: 1600 BOWES ST SE
LOWELL, MI 49331

WATER LEVEL DURING DRILLING
10.00'

STATIC GROUNDWATER LEVEL
9.37' FROM TOC

DATE 3/13/20	DATE 3/13/20
-----------------	-----------------

DRILL RIG: GP5400 OPERATOR: NCK

DRILLING CONTRACTOR: LEI

GROUND ELEVATION: 625.96

LEI PROJECT #: 20-800

T.O.C. ELEVATION 630.43

SUPERVISED BY: KCK

GROUNDWATER ELEVATION 621.06

DEPTH IN FEET	SOIL GRAPH	DESCRIPTION OF MATERIAL	WELL CONSTRUCTION
		0.0-2.0' DARK BROWN SILTY FINE SAND WITH ORGANICS, ROOTS, LOOSE, DRY, NO ODOR (TOPSOIL).	+4.47' STICK UP
5'		2.0-6.0' RED VERY FINE SAND WITH STONES, MOIST, STIFF	BENTONITE SEAL 0.0' TO 1.0'.
10'		6.0-16.0' COARSE SAND AND GRAVEL, SOME COBBLES AND STONES, LOOSE, DRY TO 10.0' THEN WET, VERY HARD	NATURAL COLLAPSE 1.0' TO 18.0'
15'		16.0-18.0' GRAY SANDY CLAY, MOIST, STIFF, SOME STONES	INSTALLED 1.0" DIAMETER P.V.C. WELL SCREENED INTERVAL 10.3' TO 15.3'
20'		E.O.B. AT 18' IN SANDY CLAY	
25'			

SOIL BORING / WELL CONSTRUCTION LOG



DRILLING METHOD:
HAND AUGER

BORING NO.
OW-3

SAMPLING METHOD:
CONTINUOUS - ACETATE LINERS

SHEET 1 OF 1
DRILLING

SURFACE CONDITIONS:
WOODED FIELD

START TIME	FINISH TIME
17:41	18:15

SITE NAME: GRAND RAPIDS GRAVEL CO.
LOCATION: 1600 BOWES ST SE
LOWELL, MI 49331

WATER LEVEL DURING DRILLING
2.80'

STATIC GROUNDWATER LEVEL
4.49' FROM TOC

DATE	DATE
3/13/20	3/13/20

DRILL RIG: N/A OPERATOR: NCK

DRILLING CONTRACTOR: LEI

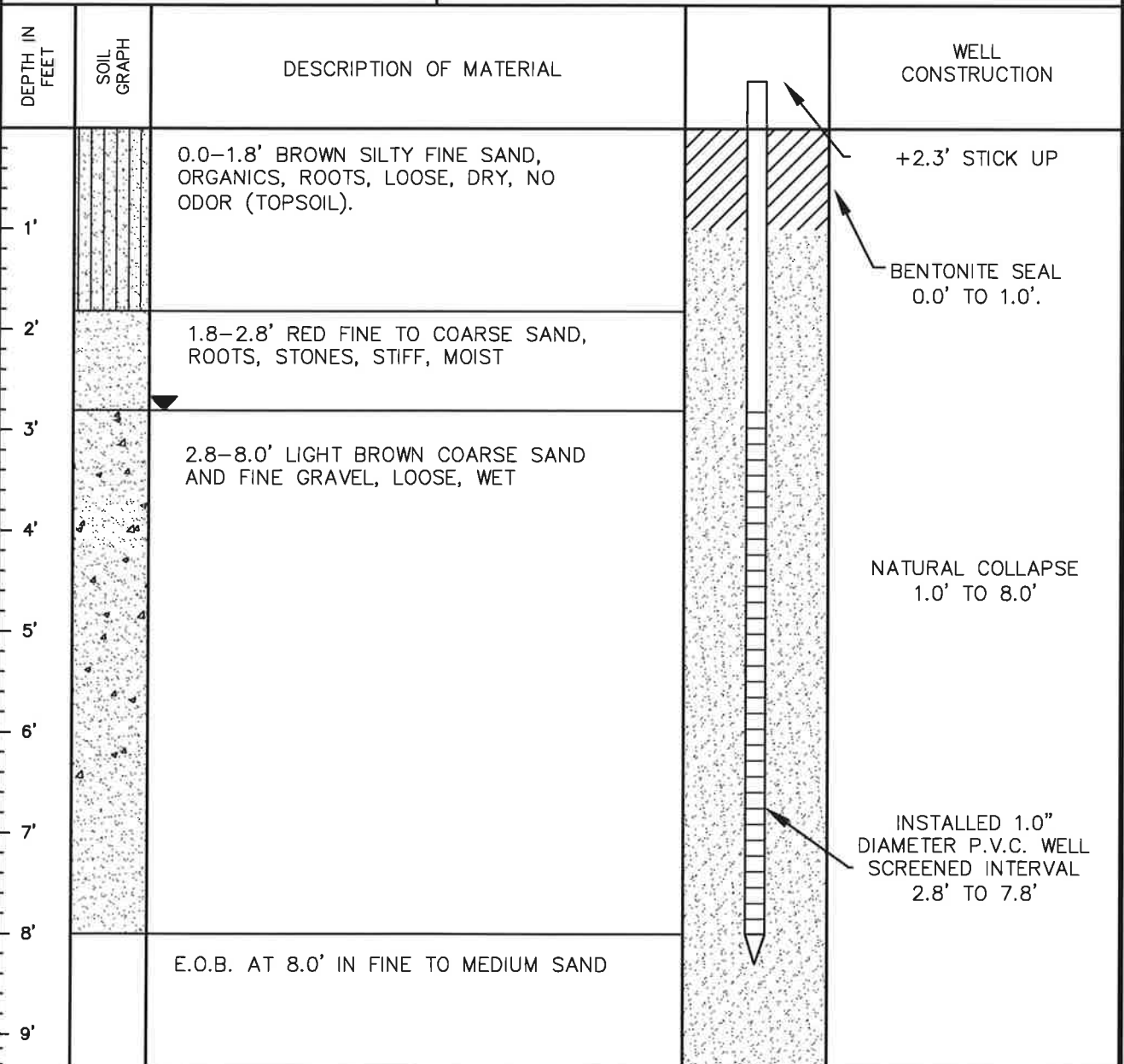
GROUND ELEVATION: 624.18

LEI PROJECT #: 20-800

T.O.C. ELEVATION 626.51

SUPERVISED BY: KCK

GROUNDWATER ELEVATION 622.02



SOIL BORING / WELL CONSTRUCTION LOG



DRILLING METHOD:
DIRECT PUSH - GEOPROBE

BORING NO.
OW-4

SAMPLING METHOD:
CONTINUOUS - ACETATE LINERS

SHEET 1 OF 1

SURFACE CONDITIONS:
WOODED FIELD

DRILLING
START TIME: 15:15
FINISH TIME: 16:30

SITE NAME: GRAND RAPIDS GRAVEL CO.
LOCATION: 1600 BOWES ST SE
LOWELL, MI 49331

WATER LEVEL DURING DRILLING
5.5'

STATIC GROUNDWATER LEVEL
11.31' FROM TOC

DATE: 3/13/20

DRILL RIG: GP5400 OPERATOR: NCK

DRILLING CONTRACTOR: LEI

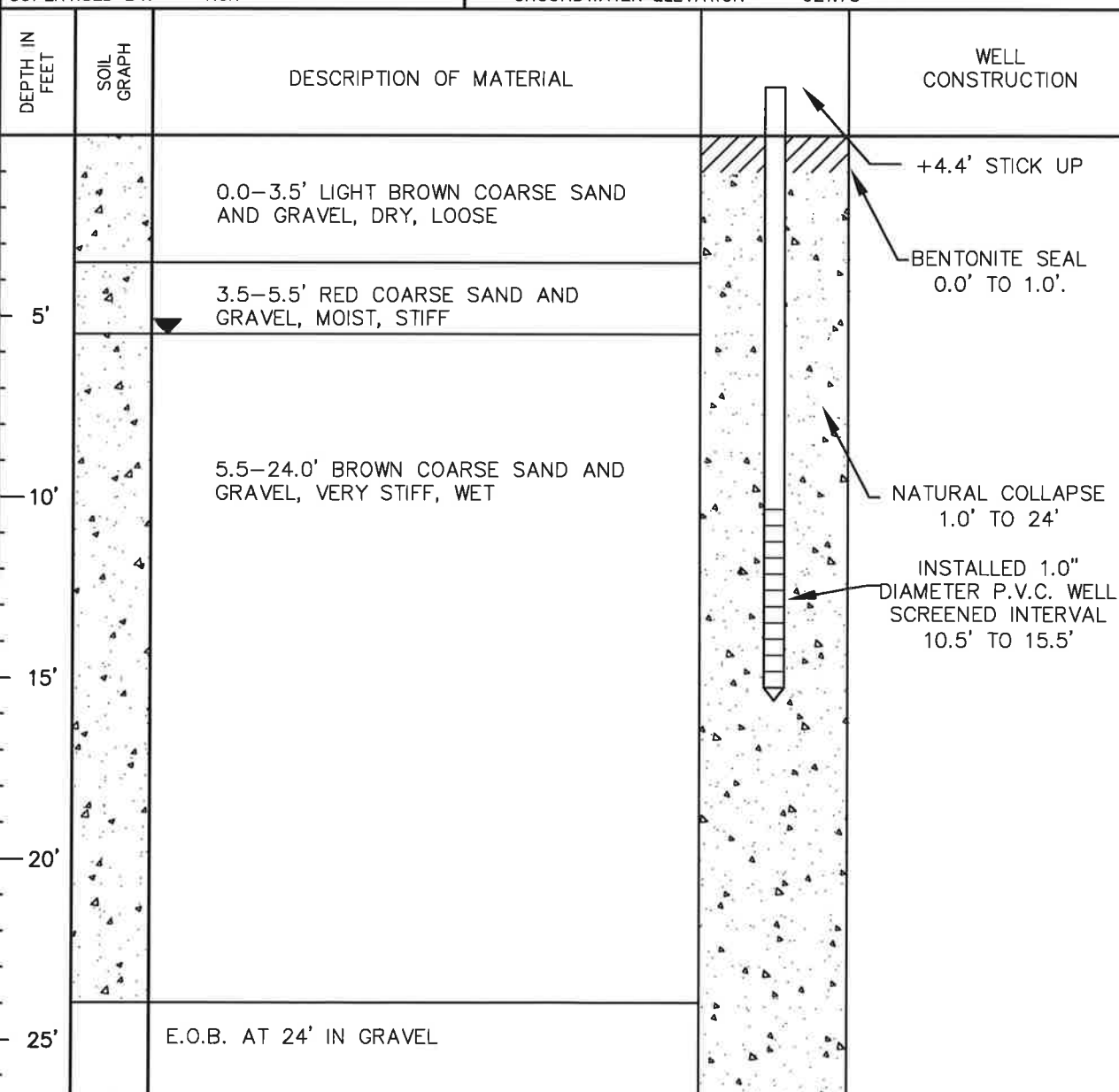
GROUND ELEVATION: 628.63

LEI PROJECT #: 20-800

T.O.C. ELEVATION: 633.06

SUPERVISED BY: KCK

GROUNDWATER ELEVATION: 621.75



SOIL BORING / WELL CONSTRUCTION LOG



DRILLING METHOD:
DIRECT PUSH – GEOPROBE

BORING NO.
OW-5

SAMPLING METHOD:
CONTINUOUS – ACETATE LINERS

SHEET 1 OF 1

SURFACE CONDITIONS:
WOODED FIELD

DRILLING

START TIME 11:00	FINISH TIME 11:40
------------------------	-------------------------

SITE NAME: GRAND RAPIDS GRAVEL CO.
1600 BOWES ST SE
LOCATION: LOWELL, MI 49331

WATER LEVEL DURING DRILLING
10.0'

DATE 3/13/20	DATE 3/13/20
-----------------	-----------------

STATIC GROUNDWATER LEVEL
12.3' FROM TOC

DRILL RIG: GP5400 OPERATOR: NCK

DRILLING CONTRACTOR: LEI

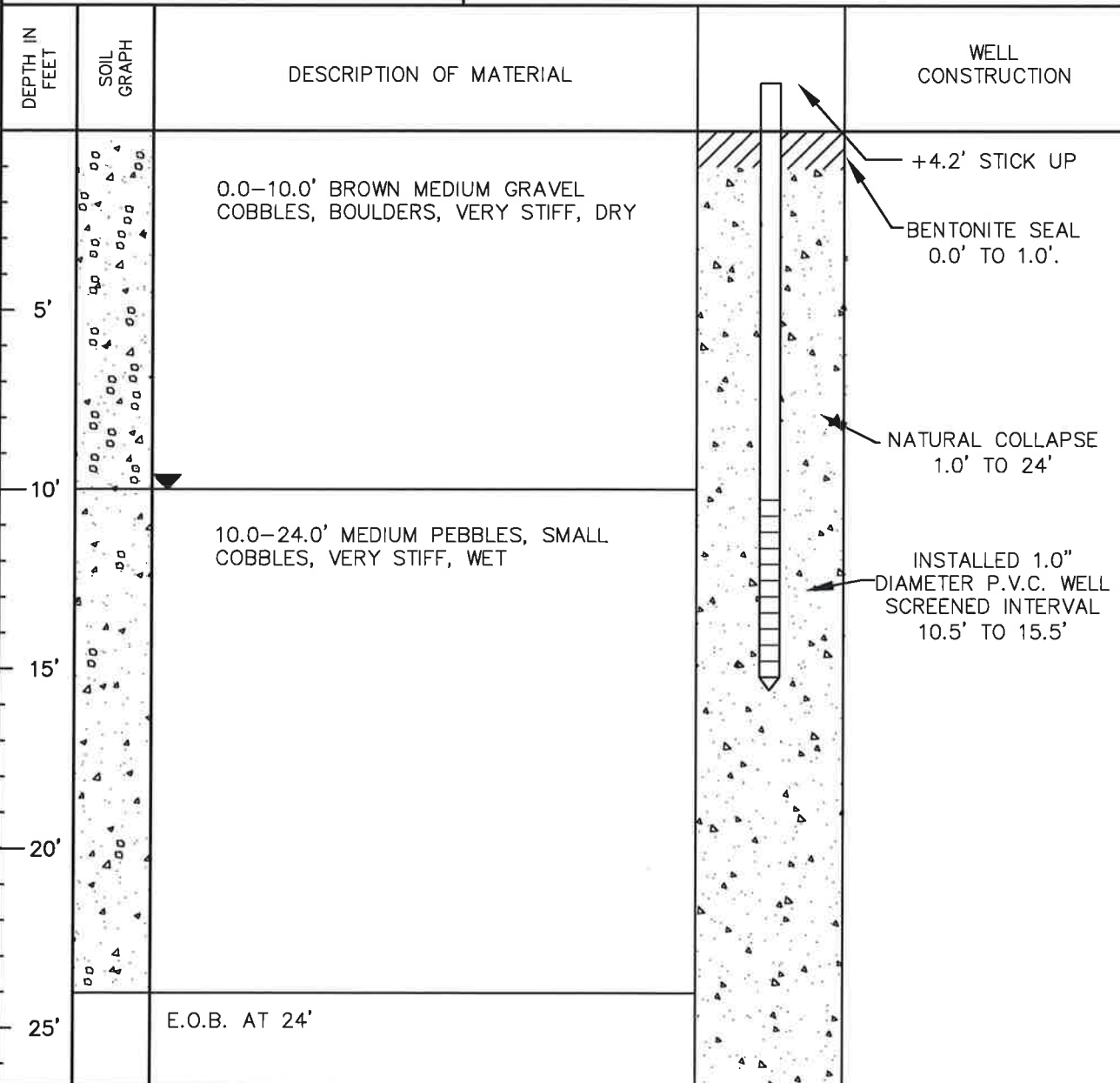
GROUND ELEVATION: 632.45'

LEI PROJECT #: 20-800

T.O.C. ELEVATION 636.62'

SUPERVISED BY: KCK

GROUNDWATER ELEVATION 624.34'



SOIL BORING / WELL CONSTRUCTION LOG



DRILLING METHOD:
DIRECT PUSH - GEOPROBE

BORING NO.
OW-6

SAMPLING METHOD:
CONTINUOUS - ACETATE LINERS

SHEET 1 OF 1

SURFACE CONDITIONS:
WOODED FIELD

DRILLING

START

FINISH

TIME
12:30

TIME
14:30

SITE NAME: GRAND RAPIDS GRAVEL CO.
LOCATION: 1600 BOWES ST SE
LOWELL, MI 49331

WATER LEVEL DURING DRILLING
13.5'

STATIC GROUNDWATER LEVEL
18.8' FROM TOC

DATE

3/13/20

DATE

3/13/20

DRILL RIG: GP5400 OPERATOR: NCK

DRILLING CONTRACTOR: LEI

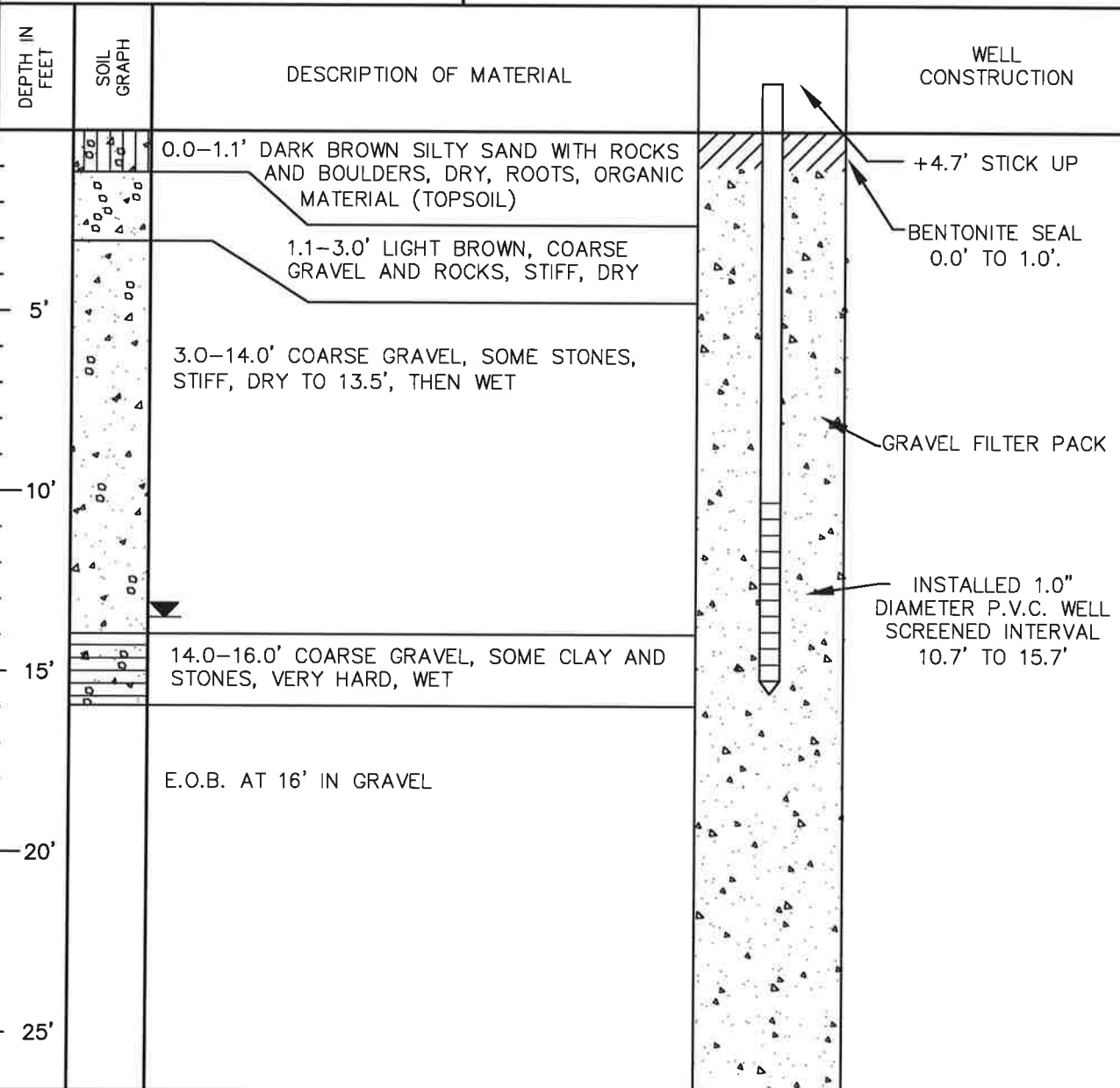
GROUND ELEVATION: 635.97'

LEI PROJECT #: 20-800

T.O.C. ELEVATION 640.63'

SUPERVISED BY: KCK

GROUNDWATER ELEVATION 621.84'



Attachment B: Relevant Local Water Well Logs



Water Well And Pump Record

Completion is required under authority of Part 127 Act 368 PA 1978.



1

Import ID: 41060910010

Failure to comply is a misdemeanor.

Tax No:	Permit No:	County: Kent		Township: Lowell	
Well ID: 41000001523 Elevation: 639 ft. Latitude: 42.9279853218 Longitude: -85.3683900972 Method of Collection: Interpolation-Map		Town/Range: 06N 09W	Section: 10	Well Status:	WSSN:
		Source ID/Well No:			
		Distance and Direction from Road Intersection: .2 M SE FULTON ST 1.3 M W SEGWUN AVE BOWES RD S SIDE RD			
		Well Owner: BABBER, JAMES			
		Well Address: BOWES RD LOWELL, MI 49331		Owner Address: 13413 FOREST RV RD NE LOWELL, MI 49331	

Drilling Method: Cable Tool Well Depth: 82.00 ft. Well Type: Replacement Casing Type: Unknown Casing Joint: Welded Casing Fitting: Drive shoe Diameter: 4.00 in. to 78.00 ft. depth Borehole:	Well Use: Household Date Completed: 5/9/1980 Height: Height:	Pump Installed: Yes Pump Installation Date: Manufacturer: Flint & Walling Model Number: Drop Pipe Length: 53.00 ft. Drop Pipe Diameter: Draw Down Seal Used: No Pressure Tank Installed: No Pressure Relief Valve Installed: No	Pump Installation Only: No HP: Pump Type: Submersible Pump Capacity: 0 GPM Pump Voltage: Drilling Record ID:
--	---	--	---

Static Water Level: 20.00 ft. Below Grade Well Yield Test: Pumping level 20.00 ft. after 3.00 hrs. at 20 GPM	Yield Test Method: Unknown	<table border="1"> <thead> <tr> <th>Formation Description</th> <th>Thickness</th> <th>Depth to Bottom</th> </tr> </thead> <tbody> <tr><td>Gravel</td><td>20.00</td><td>20.00</td></tr> <tr><td>Gravel Water Bearing</td><td>10.00</td><td>30.00</td></tr> <tr><td>Clay Soft</td><td>38.00</td><td>68.00</td></tr> <tr><td>Clay Sand Gravel Cemented</td><td>8.00</td><td>76.00</td></tr> <tr><td>Sand Water Bearing</td><td>6.00</td><td>82.00</td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table>	Formation Description	Thickness	Depth to Bottom	Gravel	20.00	20.00	Gravel Water Bearing	10.00	30.00	Clay Soft	38.00	68.00	Clay Sand Gravel Cemented	8.00	76.00	Sand Water Bearing	6.00	82.00																											
Formation Description	Thickness	Depth to Bottom																																													
Gravel	20.00	20.00																																													
Gravel Water Bearing	10.00	30.00																																													
Clay Soft	38.00	68.00																																													
Clay Sand Gravel Cemented	8.00	76.00																																													
Sand Water Bearing	6.00	82.00																																													

Screen Installed: Yes Screen Diameter: 4.00 in. Screen Material Type: Screen Installation Type: Unknown Slot Length Set Between: 18.00 4.00 ft. 78.00 ft. and 82.00 ft. Fittings: Neoprene packer	Filter Packed: No Blank: 0.00 ft. Above	Well Grouted: Yes Grouting Method: Unknown Grouting Material Bags Additives Depth: Other 0.00 None 0.00 ft. to 0.00 ft.	Geology Remarks:
---	--	---	-------------------------

Wellhead Completion: Pitless adapter	Drilling Machine Operator Name:
Nearest Source of Possible Contamination: Type Distance Direction: Septic tank 100 ft. South	Employment: Unknown

Abandoned Well Plugged: No Reason Not Plugged:	Contractor Type: Unknown Business Name: Business Address:	Reg No:
---	--	----------------

	Water Well Contractor's Certification This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
	Signature of Registered Contractor	Date

General Remarks: WELL HEAD 12" ABOVE GRADE
Other Remarks: Grouting Material 1:Listed as other in Wellkey



Water Well And Pump Record

Completion is required under authority of Part 127 Act 368 PA 1978.
Failure to comply is a misdemeanor.



2

Import ID:

Tax No:		Permit No:		County: Kent		Township: Lowell	
Well ID: 41000020914 Elevation: Latitude: 42.929316 Longitude: -85.364073 Method of Collection: Address Matching-House Number				Town/Range:	Section:	Well Status:	WSSN:
				06N 09W	3	Active	
				Source ID/Well No:			
Distance and Direction from Road Intersection: South off of M-21 on Bowes							
Well Owner: Jim Lacey							
Well Address:				Owner Address:			
2175 Bowes Road Lowell, MI 49331				2175 Bowes Road Lowell, MI 49331			

Drilling Method: Cable Tool	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 45.00 ft.	Pump Installation Date: 10/6/2007	HP: 0.50
Well Type: Replacement	Manufacturer: Red Jacket	Pump Type: Submersible
Casing Type: Steel - black	Model Number: 2 wire 110	Pump Capacity: 10 GPM
Casing Joint: Welded	Drop Pipe Length: 35.00 ft.	Pump Voltage:
Casing Fitting: Drive shoe	Drop Pipe Diameter: 1.00 in.	Drilling Record ID:
Diameter: 4.00 in. to 40.00 ft. depth	Draw Down Seal Used: Yes	
Borehole: 4.00 in. to 45.00 ft. depth	Pressure Tank Installed: Yes	
	Pressure Tank Type: Diaphragm/bladder	
	Manufacturer: Well-Mate	
	Model Number: WM6	Tank Capacity: 20.0 Gallons
	Pressure Relief Valve Installed: Yes	

Static Water Level: 20.00 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test: Yield Test Method: Test pump Pumping level 20.00 ft. after 24.00 hrs. at 10 GPM			
Screen Installed: Yes	Black Topsoil Stoney	2.00	2.00
Screen Diameter: 3.00 in.	Gravel & Stones	24.00	26.00
Filter Packed: No	Gray Clay	15.00	41.00
Blank: Above	Sand	4.00	45.00
Screen Material Type: PVC-saw cut			
Screen Installation Type: Telescoped			
Slot Length Set Between			
12.00 6.00 ft. 39.00 ft. and 45.00 ft.			
Fittings: None			

Well Grouted: Yes	Grouting Method: Driven/dry grout	Geology Remarks:
Grouting Material	Bags Additives Depth	
Bentonite dry granular	1.00 None 0.00 ft. to 39.00 ft.	
Wellhead Completion: Pitless adapter, 12 inches above grade		

Nearest Source of Possible Contamination:	Drilling Machine Operator Name: Ben Nielsen
Type Distance Direction	Employment: Employee
Septic tank 80 ft. Northwest	

Abandoned Well Plugged: Yes	Contractor Type: Water Well Drilling Contractor	Reg No: 34-2098
	Business Name: Geiger Water Wells	
	Business Address: 5043 Whites Bridge, Belding, MI, 48809	
Casing Removed:	Water Well Contractor's Certification	
	This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
	Signature of Registered Contractor	Date

General Remarks:
Other Remarks:



Water Well And Pump Record

Completion is required under authority of Part 127 Act 368 PA 1978.



Import ID: 41060903005

Failure to comply is a misdemeanor.

Tax No:	Permit No:	County: Kent		Township: Lowell	
Well ID: 41000001461 Elevation: 630 ft. Latitude: 42.9297786791 Longitude: -85.3619352881 Method of Collection: Interpolation-Map		Town/Range: 06N 09W	Section: 3	Well Status:	WSSN:
		Source ID/Well No:			
		Distance and Direction from Road Intersection: .5 MI E OF M21 & BOWES RD N SIDE			
		Well Owner: INTERSTATE PIPE MAINTAINCE			
		Well Address: 2051 BOWES RD LOWELL, MI 49331		Owner Address: 2051 BOWES RD LOWELL, MI 49331	

Drilling Method: Rotary Well Depth: 48.00 ft. Well Type: Replacement Casing Type: Steel - black Casing Joint: Welded Casing Fitting: Drive shoe Diameter: 4.00 in. to 42.00 ft. depth Borehole:	Well Use: Household Date Completed: 6/1/1981 Height: Pump Installed: Yes Pump Installation Date: Manufacturer: Other Model Number: Drop Pipe Length: 28.00 ft. Drop Pipe Diameter: Draw Down Seal Used: No Pressure Tank Installed: No Pressure Relief Valve Installed: No	Pump Installation Only: No HP: Pump Type: Submersible Pump Capacity: 0 GPM Pump Voltage: Drilling Record ID:
--	---	---

Static Water Level: 20.00 ft. Below Grade Well Yield Test: Pumping level 30.00 ft. after 1.00 hrs. at 70 GPM	Yield Test Method: Unknown
--	-----------------------------------

Screen Installed: Yes Screen Diameter: 3.00 in. Screen Material Type: Screen Installation Type: Unknown Slot Length Set Between: 10.00 5.00 ft. 43.00 ft. and 48.00 ft. Fittings: Neoprene packer	Filter Packed: No Blank: 1.00 ft. Above
---	--

Well Grouted: Yes Grouting Material: Unknown Bags: 0.00 Additives: None Depth: 0.00 ft. to 0.00 ft.	Grouting Method: Unknown
--	---------------------------------

Wellhead Completion: Pitless adapter	Geology Remarks:
---	-------------------------

Nearest Source of Possible Contamination: Type: Septic tank Distance: 75 ft. Direction: Northwest	Drilling Machine Operator Name: Employment: Unknown
--	--

Abandoned Well Plugged: No Reason Not Plugged:	Contractor Type: Unknown Business Name: Business Address:
---	--

General Remarks: Other Remarks: Pump Manufacturer: WEBER PUMP CO.	Water Well Contractor's Certification This well was drilled under my supervision and this report is true to the best of my knowledge and belief. Signature of Registered Contractor Date
--	---



Water Well And Pump Record

Completion is required under authority of Part 127 Act 368 PA 1978.



Import ID: 41060903020

Failure to comply is a misdemeanor.

Tax No:	Permit No:	County: Kent	Township: Lowell
Well ID: 41000001466 Elevation: 640 ft. Latitude: 42.9315739945 Longitude: -85.3695480068 Method of Collection: Interpolation-Map		Town/Range: 06N 09W	Section: 3
		Well Status:	WSSN:
		Source ID/Well No:	
		Distance and Direction from Road Intersection: 300' N OF W MAIN - 500' E OF ALDEN NASH	
		Well Owner: MICHIGAN WIRE COMPANY	
Well Address: 2487 W MAIN LOWELL, MI 49331		Owner Address: 2487 W MAIN LOWELL, MI 49331	

Drilling Method: Cable Tool	Pump Installed: Yes	Pump Installation Only: No
Well Depth: 47.00 ft.	Pump Installation Date:	HP:
Well Type: Replacement	Manufacturer: Aermotor	Pump Type: Submersible
Casing Type: Steel - black	Model Number:	Pump Capacity:
Casing Joint: Threaded & coupled	Drop Pipe Length: 35.00 ft.	Pump Voltage:
Casing Fitting: Drive shoe	Drop Pipe Diameter:	Drilling Record ID:
Diameter: 6.00 in. to 17.00 ft. depth	Draw Down Seal Used: No	
Borehole:	Pressure Tank Installed: No	
	Pressure Relief Valve Installed: No	

Static Water Level: 10.90 ft. Below Grade	Formation Description	Thickness	Depth to Bottom
Well Yield Test:	Gravel & Cobbles	3.00	3.00
Yield Test Method: Unknown	Gravel	25.00	28.00
Pumping level 5.00 ft. after 4.00 hrs. at 30 GPM	Brown Clay	4.00	32.00
Screen Installed: Yes	Sand & Clay	1.00	33.00
Screen Diameter: 6.00 in.	Gravel & Clay	5.00	38.00
Filter Packed: No	Sand Fine	9.00	47.00
Blank: 0.00 ft. Above	Brown Clay	8.00	55.00
Screen Material Type:	Clay & Gravel	75.00	130.00
Screen Installation Type: Unknown			
Slot			
Length			
Set Between			
10.00			
30.00 ft.			
17.00 ft. and 47.00 ft.			
Fittings: Neoprene packer			

Well Grouted: No	Geology Remarks:
Wellhead Completion: Pitless adapter	

Nearest Source of Possible Contamination:	Drilling Machine Operator Name:
Type	Employment: Unknown
Distance	
Direction	
Septic tank	
100 ft.	
South	

Abandoned Well Plugged: No	Contractor Type: Unknown	Reg No: 41-0384
Reason Not Plugged:	Business Name:	
	Business Address:	

	Water Well Contractor's Certification	
	This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
	Signature of Registered Contractor	Date

General Remarks:
Other Remarks:



Water Well And Pump Record

Completion is required under authority of Part 127 Act 368 PA 1978.



Import ID: 41060910301

Failure to comply is a misdemeanor.

Tax No:	Permit No:	County: Kent		Township: Lowell	
Well ID: 41000001525 Elevation: 641 ft. Latitude: 42.927527 Longitude: -85.357547 Method of Collection: GPS Std Positioning Svc SA Off		Town/Range: 06N 09W	Section: 10	Well Status: Active	WSSN: 3950
		Source ID/Well No: WELL 1			
		Distance and Direction from Road Intersection: WSSN# 03950			
		Well Owner: CITY OF LOWELL			
		Well Address: LOWELL WELL #1 LOWELL, MI 49331		Owner Address: LOWELL, MI 49331	

Drilling Method: Unknown Well Depth: 103.50 ft. Well Type: New Casing Type: Steel - black Casing Joint: Welded Casing Fitting: Drive shoe Diameter: 18.00 in. to 70.00 ft. depth Borehole: 12.00 in. to 103.50 ft. depth	Well Use: Type I public Date Completed: 8/1/1977 Height: 2.00 ft. above grade	Pump Installed: Yes Pump Installation Date: Manufacturer: Unknown Model Number: Drop Pipe Length: Drop Pipe Diameter: Draw Down Seal Used: No Pressure Tank Installed: No Pressure Relief Valve Installed: No	Pump Installation Only: No HP: Pump Type: Unknown Pump Capacity: 600 GPM Pump Voltage: Drilling Record ID:
---	--	--	---

Static Water Level: 27.00 ft. Below Grade Well Yield Test: Pumping level 52.00 ft. after 0.00 hrs. at 600 GPM	Yield Test Method: Unknown	<table border="1"> <thead> <tr> <th>Formation Description</th> <th>Thickness</th> <th>Depth to Bottom</th> </tr> </thead> <tbody> <tr> <td>Gravel</td> <td>32.00</td> <td>32.00</td> </tr> <tr> <td>Sand & Gravel</td> <td>71.50</td> <td>103.50</td> </tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	Formation Description	Thickness	Depth to Bottom	Gravel	32.00	32.00	Sand & Gravel	71.50	103.50																																	
Formation Description	Thickness	Depth to Bottom																																										
Gravel	32.00	32.00																																										
Sand & Gravel	71.50	103.50																																										

Screen Installed: Yes Screen Diameter: 10.00 in. Screen Material Type: Stainless steel-wire wrapped Screen Installation Type: Telescoped Slot Length Set Between: 45.00 30.00 ft. 70.00 ft. and 100.00 ft. Fittings: Neoprene packer	Filter Packed: Yes Blank:
--	--

Well Grouted: Yes Grouting Material: Unknown Bags: 0.00 Additives: None Depth: 0.00 ft. to 103.50 ft.	Grouting Method: Unknown	Geology Remarks:
--	---------------------------------	-------------------------

Wellhead Completion: Unknown	Drilling Machine Operator Name:
-------------------------------------	--

Nearest Source of Possible Contamination: Type: None Distance: Direction:	Employment: Unknown
--	----------------------------

Contractor Type: Unknown Business Name: Business Address:	Reg No:
--	----------------

Water Well Contractor's Certification This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
Signature of Registered Contractor	Date

General Remarks: ORIGINAL WELLID# WAS 10016; CAPACITY OF PUMP ALSO 1100 FOR 148 HORSEPOWER; Other Remarks: Pump Manufacturer: Pump Manufacturer unknown
--



Water Well And Pump Record

Completion is required under authority of Part 127 Act 368 PA 1978.



Import ID: 41060910302

Failure to comply is a misdemeanor.

Tax No:	Permit No:	County: Kent		Township: Lowell	
Well ID: 41000001526 Elevation: 634 ft. Latitude: 42.927157 Longitude: -85.357499 Method of Collection: GPS Std Positioning Svc SA Off		Town/Range: 06N 09W	Section: 10	Well Status: Active	WSSN: 3950
		Source ID/Well No: WELL 2			
		Distance and Direction from Road Intersection: WSSN# 03950			
		Well Owner: CITY OF LOWELL			
		Well Address: LOWELL WELL #2 LOWELL, MI 49331		Owner Address: LOWELL, MI 49331	

Drilling Method: Unknown Well Depth: 110.00 ft. Well Type: New Casing Type: Steel - black Casing Joint: Welded Casing Fitting: Drive shoe Diameter: 16.00 in. to 76.00 ft. depth Borehole: 110.00 ft. depth	Well Use: Type I public Date Completed: 8/1/1977 Height: 3.00 ft. above grade Pump Installed: Yes Pump Installation Date: Manufacturer: Unknown Model Number: Drop Pipe Length: Drop Pipe Diameter: Draw Down Seal Used: No Pressure Tank Installed: No Pressure Relief Valve Installed: No	Pump Installation Only: No HP: Pump Type: Submersible Pump Capacity: 600 GPM Pump Voltage: Drilling Record ID:
--	--	---

Static Water Level: 24.50 ft. Below Grade Well Yield Test: Pumping level 37.00 ft. after 0.00 hrs. at 600 GPM Screen Installed: Yes Screen Diameter: 16.00 in. Screen Material Type: Stainless steel-wire wrapped Screen Installation Type: Unknown Slot Length Set Between: 10.00 30.00 ft. 79.00 ft. and 109.00 ft. Fittings: None	Filter Packed: No Blank: <table border="1"> <thead> <tr> <th>Formation Description</th> <th>Thickness</th> <th>Depth to Bottom</th> </tr> </thead> <tbody> <tr><td>Sand & Gravel</td><td>17.00</td><td>17.00</td></tr> <tr><td>Sand & Stones</td><td>12.00</td><td>29.00</td></tr> <tr><td>Gravel & Stones</td><td>31.00</td><td>60.00</td></tr> <tr><td>Sand & Gravel</td><td>11.00</td><td>71.00</td></tr> <tr><td>Sand</td><td>22.00</td><td>93.00</td></tr> <tr><td>Gravel & Sand</td><td>17.00</td><td>110.00</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	Formation Description	Thickness	Depth to Bottom	Sand & Gravel	17.00	17.00	Sand & Stones	12.00	29.00	Gravel & Stones	31.00	60.00	Sand & Gravel	11.00	71.00	Sand	22.00	93.00	Gravel & Sand	17.00	110.00																								
Formation Description	Thickness	Depth to Bottom																																												
Sand & Gravel	17.00	17.00																																												
Sand & Stones	12.00	29.00																																												
Gravel & Stones	31.00	60.00																																												
Sand & Gravel	11.00	71.00																																												
Sand	22.00	93.00																																												
Gravel & Sand	17.00	110.00																																												

Well Grouted: Yes Grouting Material: Unknown Grouting Method: Unknown Bags: 0.00 Additives: None Depth: 0.00 ft. to 110.00 ft.	Geology Remarks:
---	-------------------------

Wellhead Completion: Unknown	Drilling Machine Operator Name:
Nearest Source of Possible Contamination:	Employment: Unknown
Type: None	
Distance:	
Direction:	

Contractor Type: Unknown Business Name: Business Address:	Reg No: Water Well Contractor's Certification This well was drilled under my supervision and this report is true to the best of my knowledge and belief. Signature of Registered Contractor
	Date

General Remarks: ORIGINAL WELLID# WAS 10017; NO WELL LOGS, ONLY ENGINEER'S SHEET AND LETTER ATTACHED. Screen: 6FT 10 Slot, 5FT 12 Slot, 6FT 18 Slot, 3FT 35 Slot, 2FT 60 Slot, 8FT 100 Slot

Other Remarks: Pump Manufacturer: Pump Manufacturer unknown



Water Well And Pump Record

Completion is required under authority of Part 127 Act 368 PA 1978.



Import ID: 41060910303

Failure to comply is a misdemeanor.

Tax No:	Permit No:	County: Kent	Township: Lowell			
Well ID: 41000001527 Elevation: 630 ft. Latitude: 42.926872 Longitude: -85.357488 Method of Collection: GPS Std Positioning Svc SA Off		Town/Range: 06N 09W	Section: 10	Well Status: Active	WSSN: 3950	Source ID/Well No: WELL 3
		Distance and Direction from Road Intersection: WSSN# 03950				
		Well Owner: CITY OF LOWELL				
		Well Address: LOWELL WELL #3 LOWELL, MI 49331		Owner Address: LOWELL, MI 49331		

Drilling Method: Unknown Well Depth: 87.40 ft. Well Type: New Casing Type: Unknown Casing Joint: Unknown Casing Fitting: None Diameter: 16.00 in. to 0.00 ft. depth Borehole:	Well Use: Type I public Date Completed: 8/1/1977 Height: 0.00 ft. below grade Pump Installed: Yes Pump Installation Date: Manufacturer: Unknown Model Number: Drop Pipe Length: Drop Pipe Diameter: Draw Down Seal Used: No Pressure Tank Installed: No Pressure Relief Valve Installed: No	Pump Installation Only: No HP: Pump Type: Unknown Pump Capacity: 600 GPM Pump Voltage: Drilling Record ID:
--	--	---

Static Water Level: 21.00 ft. Below Grade Well Yield Test: Pumping level 39.00 ft. after 0.00 hrs. at 600 GPM Screen Installed: Yes Screen Diameter: 12.00 in. Screen Material Type: Stainless steel-wire wrapped Screen Installation Type: Unknown Slot Length Set Between: 42.00 18.00 ft. 66.00 ft. and 84.00 ft. Fittings: None	Yield Test Method: Unknown <table border="1"><thead><tr><th>Formation Description</th><th>Thickness</th><th>Depth to Bottom</th></tr></thead><tbody><tr><td>Sand & Gravel</td><td>7.00</td><td>7.00</td></tr><tr><td>Gravel</td><td>68.00</td><td>75.00</td></tr><tr><td>Sand</td><td>4.00</td><td>79.00</td></tr><tr><td>Gravel W/Sand</td><td>6.00</td><td>85.00</td></tr><tr><td>Sand</td><td>2.00</td><td>87.00</td></tr><tr><td>Sand W/Gravel</td><td>4.00</td><td>91.00</td></tr><tr><td>Clay</td><td>1.00</td><td>92.00</td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr></tbody></table>	Formation Description	Thickness	Depth to Bottom	Sand & Gravel	7.00	7.00	Gravel	68.00	75.00	Sand	4.00	79.00	Gravel W/Sand	6.00	85.00	Sand	2.00	87.00	Sand W/Gravel	4.00	91.00	Clay	1.00	92.00																								
Formation Description	Thickness	Depth to Bottom																																															
Sand & Gravel	7.00	7.00																																															
Gravel	68.00	75.00																																															
Sand	4.00	79.00																																															
Gravel W/Sand	6.00	85.00																																															
Sand	2.00	87.00																																															
Sand W/Gravel	4.00	91.00																																															
Clay	1.00	92.00																																															

Well Grouted: Yes Grouting Material: Unknown Grouting Method: Unknown Bags: 0.00 Additives: None Depth: 0.00 ft. to 92.00 ft.	Geology Remarks:
--	-------------------------

Wellhead Completion: Unknown	Drilling Machine Operator Name:
-------------------------------------	--

Nearest Source of Possible Contamination: Type: None Distance: Direction:	Employment: Unknown
--	----------------------------

	Contractor Type: Unknown Business Name: Business Address:	Reg No:
	Water Well Contractor's Certification This well was drilled under my supervision and this report is true to the best of my knowledge and belief.	
	Signature of Registered Contractor Date	

General Remarks: ORIGINAL WELLID# WAS 10018; NO WELL LOG AVAILABLE, ONLY ENGINEER'S SHEET AND ATTACHED LETTER.
Other Remarks: Pump Manufacturer: Pump Manufacturer unknown, Pump Type: Type Unknown



Water Well And Pump Record

Completion is required under authority of Part 127 Act 368 PA 1978.



Import ID: 41060910304

Failure to comply is a misdemeanor.

Tax No:	Permit No:	County: Kent		Township: Lowell	
Well ID: 41000001528 Elevation: 641 ft. Latitude: 42.927918 Longitude: -85.358942 Method of Collection: GPS Std Positioning Svc SA Off		Town/Range: 06N 09W	Section: 10	Well Status: Active	WSSN: 3950
		Source ID/Well No: WELL 4			
		Distance and Direction from Road Intersection: WSSN# 03950			
		Well Owner: CITY OF LOWELL			
		Well Address: LOWELL WELL #5 LOWELL, MI 49331		Owner Address: LOWELL, MI 49331	

Drilling Method: Rotary		Pump Installed: No	
Well Depth: 107.00 ft.		Pressure Tank Installed: No	
Well Type: New		Pressure Relief Valve Installed: No	
Well Use: Type I public			
Date Completed: 2/2/1990			
Casing Type: Steel - black			
Height:			
Casing Joint: Welded			
Casing Fitting: None			
Diameter: 14.00 in. to 77.00 ft. depth			
Borehole: 24.00 in. to 60.00 ft. depth			
Static Water Level: 15.71 ft. Below Grade			
Well Yield Test:			
Yield Test Method: Unknown			
Pumping level 24.00 ft. after 24.00 hrs. at 700 GPM			
Screen Installed: Yes			
Filter Packed: No			
Screen Diameter: 12.00 in.			
Blank: 0.00 ft. Above			
Screen Material Type:			
Screen Installation Type: Unknown			
Slot	Length	Set Between	
35.00	30.00 ft.	77.00 ft. and 107.00 ft.	
Fittings: None			
Well Grouted: Yes			
Grouting Method: Unknown			
Grouting Material	Bags	Additives	Depth
Neat cement	0.00	None	0.00 ft. to 60.00 ft.
Wellhead Completion: Other, 12 inches above grade			
Nearest Source of Possible Contamination:			
Type	Distance	Direction	
None			
Drilling Machine Operator Name:			
Employment: Unknown			
Contractor Type: Unknown		Reg No:	
Business Name:			
Business Address:			
Water Well Contractor's Certification			
This well was drilled under my supervision and this report is true to the best of my knowledge and belief.			
Signature of Registered Contractor		Date	

General Remarks: ORIGINAL WELLID# WAS 10019; CONTRACTOR: RAYMER CO., INC.

Other Remarks: Wellhead Completion: 12 inch Above Grade

Attachment C: Sieve Analyses and Hydraulic Conductivity Calculations

PARTICLE SIZE ANALYSIS*

Client : Grand Rapids Gravel Co.
Lowell, MI

Date : 3/18/2020
Project Number : 20-800
Project Name : GR Gravel
Date Received : 3/17/2020
Test Date : 3/18/2020
Analyzed By : MJC

Sample Date : 3/12/2020
Sample Description : OW-1 Aquifer
Visual Description : Coarse sand and gravel, wet, stiff

Weight of soil sample :	310.0	Grams	In-place Moisture :	Saturated
Weight of dried sample :	295.6	Grams	Percent Moisture :	4.6%
Weight of dried sample after wash :	288.4	Grams		
Percent loss by wash :	2.4	%		

Sieve #	Size (mm)	Weight Retained	Percent Retained	Cum. % Retained	Cum. % Passing	Comments
3/8	9.5	150.9	52.4	52.4	47.6	Medium gravel retained on #3/8 Sieve
4	4.75	19.4	6.7	59.1	40.9	Fine gravel retained on #4 sieve
10	2.0	31.9	11.1	70.2	29.8	Coarse sand retained on #10
40	0.425	35.8	12.4	82.6	17.4	Medium sand retained on #40
100	0.15	39.9	13.9	96.5	3.5	Fine sand retained on #100
200	0.075	2.7	0.9	97.4	2.6	Very fine sand retained on #200
Pan		0.2	0.1	97.5	2.5	Fines passing #200
Loss by Wash		7.2	2.5			

Recovered weight = 288.0 grams

± 7.6 grams (Allowed Variance from Initial)
± 2.6 %

Breakdown by percent weight : Gravel : **59.1%** Sand : **38.3%** Fines : **2.6%**

D₆₀	D₃₀	D₁₀	Cu = D₆₀ / D₁₀ =	72.00
18.00	2.00	0.25	Cc = (D₃₀)² / (D₁₀ x D₆₀) =	0.89

Soil classifies as fine-grained soil if greater than 50 percent passes the #200 sieve.

Soil classifies as a well-graded sand (SW) if Cu > 6 and 3 > Cc > 1.

Soil classifies as a poorly-graded sand (SP) if above criteria is not met.

The soil classifies as : **GW (well-graded meduim gravel)**

* Method: ASTM D422-63 "Particle-size Analysis of Soils"

* Method: ASTM D2216-92 "Laboratory Determination of Water content of Soil and Rock"

* Method: ASTM D2487-93 "Classification of Soils for Engineering Purposes"

* Method: ASTM D2488-93 "Description and Identification of Soils (Visual-Manual Procedure)"

HYDRAULIC CONDUCTIVITY ANALYSIS

Based on Grain Size Analysis, the average hydraulic conductivity for the soil is: **131 feet/day**

PARTICLE SIZE ANALYSIS*

Client : Grand Rapids Gravel Co.
Lowell, MI

Date : 3/18/2020

Project Number : 20-800

Project Name : GR Gravel

Sample Date : 3/13/2020

Date Received : 3/17/2020

Sample Description : OW-2 Aquifer

Test Date : 3/18/2020

Visual Description : Coarse sand and gravel, loose, some
cobbles and stones, very hard

Analyzed By : MJC

Weight of soil sample :	310.0	Grams	In-place Moisture :	Saturated
Weight of dried sample :	280.8	Grams	Percent Moisture :	9.4%
Weight of dried sample after wash :	273.1	Grams		
Percent loss by wash :	2.7	%		

Sieve #	Size (mm)	Weight Retained	Percent Retained	Cum. % Retained	Cum. % Passing	Comments
3/8	9.5	51.2	18.3	18.3	81.7	Medium gravel retained on #3/8 Sieve
4	4.75	6.8	2.4	20.8	79.2	Fine gravel retained on #4 sieve
10	2.0	10.9	3.9	24.7	75.3	Coarse sand retained on #10
40	0.425	48.3	17.3	41.9	58.1	Medium sand retained on #40
100	0.15	152.0	54.4	96.3	3.7	Fine sand retained on #100
200	0.075	2.3	0.8	97.2	2.8	Very fine sand retained on #200
Pan		0.2	0.1	97.2	2.8	Fines passing #200
Loss by Wash		7.7	2.8			

Recovered weight = 279.4 grams

± 1.4 grams (*Allowed Variance from Initial*)

± 0.5 %

Breakdown by percent weight : Gravel : **20.8%** Sand : **76.4%** Fines : **2.8%**

D₆₀

D₃₀

D₁₀

Cu = D₆₀ / D₁₀ = 2.67

0.48

0.25

0.18

Cc = (D₃₀)² / (D₁₀ x D₆₀) = 0.72

Soil classifies as fine-grained soil if greater than 50 percent passes the #200 sieve.

Soil classifies as a well-graded sand (SW) if Cu > 6 and 3 > Cc > 1.

Soil classifies as a poorly-graded sand (SP) if above criteria is not met.

The soil classifies as : SP (Poorly-Graded Sand with Gravel)

* Method: ASTM D422-63 "Particle-size Analysis of Soils"

* Method: ASTM D2216-92 "Laboratory Determination of Water content of Soil and Rock"

* Method: ASTM D2487-93 "Classification of Soils for Engineering Purposes"

* Method: ASTM D2488-93 "Description and Identification of Soils (Visual-Manual Procedure)"

HYDRAULIC CONDUCTIVITY ANALYSIS

Based on Grain Size Analysis, the average hydraulic conductivity for the soil is: 117 feet/day

PARTICLE SIZE ANALYSIS*

Client : Grand Rapids Gravel Co.
Lowell, MI

Date : 3/18/2020

Project Number : 20-800

Project Name : GR Gravel

Sample Date : 3/13/2020

Date Received : 3/17/2020

Sample Description : OW-3 Aquifer

Test Date : 3/18/2020

Visual Description : Light brown coarse sand and fine gravel,
loose

Analyzed By : MJC

Weight of soil sample :	124.6	Grams	In-place Moisture :	Saturated
Weight of dried sample :	112.5	Grams	Percent Moisture :	9.7%
Weight of dried sample after wash :	81.7	Grams		
Percent loss by wash :	27.4	%		

Sieve #	Size (mm)	Weight Retained	Percent Retained	Cum. % Retained	Cum. % Passing	Comments
3/8	9.5	3.7	3.3	3.3	96.7	Medium gravel retained on #3/8 Sieve
4	4.75	3.8	3.4	6.7	93.3	Fine gravel retained on #4 sieve
10	2.0	8.4	7.5	14.1	85.9	Coarse sand retained on #10
40	0.425	24.0	21.3	35.4	64.6	Medium sand retained on #40
100	0.15	38.9	34.5	69.9	30.1	Fine sand retained on #100
200	0.075	3.0	2.7	72.6	27.4	Very fine sand retained on #200
Pan		0.1	0.1	72.7	27.3	Fines passing #200
Loss by Wash		30.8	27.3			

Recovered weight = 112.7 grams

± 0.2 grams (Allowed Variance from Initial)

± 0.2 %

Breakdown by percent weight : Gravel : 6.7% Sand : 65.9% Fines : 27.4%

D₆₀	D₃₀	D₁₀	Cu = D₆₀ / D₁₀ = 36.00
0.36	0.16	0.01	Cc = (D₃₀)² / (D₁₀ x D₆₀) = 7.11

Soil classifies as fine-grained soil if greater than 50 percent passes the #200 sieve.

Soil classifies as a well-graded sand (SW) if Cu > 6 and 3 > Cc > 1.

Soil classifies as a poorly-graded sand (SP) if above criteria is not met.

The soil classifies as : **SM (Silty Sand)**

* Method: ASTM D422-63 "Particle-size Analysis of Soils"

* Method: ASTM D2216-92 "Laboratory Determination of Water content of Soil and Rock"

* Method: ASTM D2487-93 "Classification of Soils for Engineering Purposes"

* Method: ASTM D2488-93 "Description and Identification of Soils (Visual-Manual Procedure)"

HYDRAULIC CONDUCTIVITY ANALYSIS

Based on Grain Size Analysis, the average hydraulic conductivity for the soil is: **37 feet/day**

PARTICLE SIZE ANALYSIS*

Client : Grand Rapids Gravel Co.
Lowell, MI

Date : 3/18/2020

Project Number : 20-800

Project Name : GR Gravel

Date Received : 3/17/2020

Test Date : 3/18/2020

Analyzed By : MJC

Sample Date : 3/13/2020

Sample Description : OW-4 Aquifer

Visual Description : Brown coarse sand and gravel, very stiff

Weight of soil sample :	170.4	Grams	In-place Moisture :	Saturated
Weight of dried sample :	164.1	Grams	Percent Moisture :	3.7%
Weight of dried sample after wash :	145.6	Grams		
Percent loss by wash :	11.3	%		

Sieve #	Size (mm)	Weight Retained	Percent Retained	Cum. % Retained	Cum. % Passing	Comments
3/8	9.5	43.2	26.7	26.7	73.3	Medium gravel retained on #3/8 Sieve
4	4.75	25.5	15.7	42.4	57.6	Fine gravel retained on #4 sieve
10	2.0	19.1	11.8	54.2	45.8	Coarse sand retained on #10
40	0.425	31.8	19.6	73.8	26.2	Medium sand retained on #40
100	0.15	20.5	12.6	86.4	13.6	Fine sand retained on #100
200	0.075	3.4	2.1	88.5	11.5	Very fine sand retained on #200
Pan		0.1	0.1	88.6	11.4	Fines passing #200
Loss by Wash		18.5	11.4			

Recovered weight = 162.1 grams

± 2.0 grams (*Allowed Variance from Initial*)

± 1.2 %

Breakdown by percent weight : Gravel : **42.4%** Sand : **46.1%** Fines : **11.5%**

D₆₀	D₃₀	D₁₀	Cu = D₆₀ / D₁₀ = 101.92
5.30	0.58	0.05	Cc = (D₃₀)² / (D₁₀ x D₆₀) = 1.22

Soil classifies as fine-grained soil if greater than 50 percent passes the #200 sieve.

Soil classifies as a well-graded sand (SW) if Cu > 6 and 3 > Cc > 1.

Soil classifies as a poorly-graded sand (SP) if above criteria is not met.

The soil classifies as : SP-SM (Poorly-Graded Sand with Silt and Gravel)

* Method: ASTM D422-63 "Particle-size Analysis of Soils"

* Method: ASTM D2216-92 "Laboratory Determination of Water content of Soil and Rock"

* Method: ASTM D2487-93 "Classification of Soils for Engineering Purposes"

* Method: ASTM D2488-93 "Description and Identification of Soils (Visual-Manual Procedure)"

HYDRAULIC CONDUCTIVITY ANALYSIS

Based on Grain Size Analysis, the average hydraulic conductivity for the soil is: 147 feet/day

PARTICLE SIZE ANALYSIS*

Client : Grand Rapids Gravel Co.
Lowell, MI

Date : 3/18/2020

Project Number : 20-800

Project Name : GR Gravel

Sample Date : 3/13/2020

Date Received : 3/17/2020

Sample Description : OW-5 Aquifer

Test Date : 3/18/2020

Visual Description : Medium pebbles, small cobbles, very stiff

Analyzed By : MJC

Weight of soil sample :	282.7	Grams	In-place Moisture :	Saturated
Weight of dried sample :	269.7	Grams	Percent Moisture :	4.6%
Weight of dried sample after wash :	255.8	Grams		
Percent loss by wash :	5.2	%		

Sieve #	Size (mm)	Weight Retained	Percent Retained	Cum. % Retained	Cum. % Passing	Comments
3/8	9.5	63.6	23.7	23.7	76.3	Medium gravel retained on #3/8 Sieve
4	4.75	40.8	15.2	38.9	61.1	Fine gravel retained on #4 sieve
10	2.0	27.3	10.2	49.1	50.9	Coarse sand retained on #10
40	0.425	34.2	12.8	61.9	38.1	Medium sand retained on #40
100	0.15	82.3	30.7	92.5	7.5	Fine sand retained on #100
200	0.075	5.8	2.2	94.7	5.3	Very fine sand retained on #200
Pan		0.3	0.1	94.8	5.2	Fines passing #200
Loss by Wash		13.9	5.2			

Recovered weight = 268.2 grams

± 1.5 grams (*Allowed Variance from Initial*)

± 0.6 %

Breakdown by percent weight : Gravel : **38.9%** Sand : **55.8%** Fines : **5.3%**

D₆₀

D₃₀

D₁₀

Cu = D₆₀ / D₁₀ = 26.47

4.50

0.30

0.17

Cc = (D₃₀)² / (D₁₀ x D₆₀) = 0.12

Soil classifies as fine-grained soil if greater than 50 percent passes the #200 sieve.

Soil classifies as a well-graded sand (SW) if Cu > 6 and 3 > Cc > 1.

Soil classifies as a poorly-graded sand (SP) if above criteria is not met.

The soil classifies as : SP (Poorly-Graded Sand with Gravel)

* Method: ASTM D422-63 "Particle-size Analysis of Soils"

* Method: ASTM D2216-92 "Laboratory Determination of Water content of Soil and Rock"

* Method: ASTM D2487-93 "Classification of Soils for Engineering Purposes"

* Method: ASTM D2488-93 "Description and Identification of Soils (Visual-Manual Procedure)"

HYDRAULIC CONDUCTIVITY ANALYSIS

Based on Grain Size Analysis, the average hydraulic conductivity for the soil is: 114 feet/day

PARTICLE SIZE ANALYSIS*

Client : Grand Rapids Gravel Co.
Lowell, MI

Date : 3/18/2020
Project Number : 20-800
Project Name : GR Gravel
Date Received : 3/17/2020
Test Date : 3/18/2020
Analyzed By : MJC

Sample Date : 3/13/2020
Sample Description : OW-6 Aquifer
Visual Description : Coarse gravel, some stones, stiff

Weight of soil sample :	250.4	Grams	In-place Moisture :	Saturated
Weight of dried sample :	235.1	Grams	Percent Moisture :	6.1%
Weight of dried sample after wash :	226.9	Grams		
Percent loss by wash :	3.5	%		

Sieve #	Size (mm)	Weight Retained	Percent Retained	Cum. % Retained	Cum. % Passing	Comments
3/8	9.5	50.3	21.4	21.4	78.6	Medium gravel retained on #3/8 Sieve
4	4.75	36.6	15.6	37.1	62.9	Fine gravel retained on #4 sieve
10	2.0	26.8	11.4	48.5	51.5	Coarse sand retained on #10
40	0.425	34.2	14.6	63.1	36.9	Medium sand retained on #40
100	0.15	76.2	32.5	95.6	4.4	Fine sand retained on #100
200	0.075	2.1	0.9	96.5	3.5	Very fine sand retained on #200
Pan		0.1	0.0	96.5	3.5	Fines passing #200
Loss by Wash		8.2	3.5			

Recovered weight = 234.5 grams
 ± 0.6 grams (*Allowed Variance from Initial*)
 ± 0.3 %

Breakdown by percent weight : Gravel : **37.1%** Sand : **59.4%** Fines : **3.5%**

D₆₀	D₃₀	D₁₀	Cu = D₆₀ / D₁₀ = 21.05
4.00	0.32	0.19	Cc = (D₃₀)² / (D₁₀ x D₆₀) = 0.13

Soil classifies as fine-grained soil if greater than 50 percent passes the #200 sieve.

Soil classifies as a well-graded sand (SW) if $Cu > 6$ and $3 > Cc > 1$.

Soil classifies as a poorly-graded sand (SP) if above criteria is not met.

The soil classifies as : SP (Poorly-Graded Sand with Gravel)

* Method: ASTM D422-63 "Particle-size Analysis of Soils"

* Method: ASTM D2216-92 "Laboratory Determination of Water content of Soil and Rock"

* Method: ASTM D2487-93 "Classification of Soils for Engineering Purposes"

* Method: ASTM D2488-93 "Description and Identification of Soils (Visual-Manual Procedure)"

HYDRAULIC CONDUCTIVITY ANALYSIS

Based on Grain Size Analysis, the average hydraulic conductivity for the soil is: 114 feet/day

Attachment D: Short Term Drawdown Calculations

Volume of Water Flowing from Aquifer into Proposed Mine Excavation

20-800 Grand Rapids Gravel - Lowell Mine

Volume of Ore to be Removed : 322,000 yd³
Percent Water : 24 %
Percent Ore : 76 %
Volume currently ore, which will be occupied by water after proposed lake construction : 244,720 yd³ of water

= 49,423,651 gallons of water

Proposed Excavation Time : 5 years

Volume of water removed : 9,884,730 gallons of water per year

Mining activity each year will roughly occur March 15th to November 15th

Assuming 30 days per month, mining activity = 240 days/year

Therefore 9,884,730 gal divided by 240 days/year

= 41,186 gallons of water removed per day each year

(flow into lake to fill the void created by excavation)

41,186 gallons per day x 1 day / 1,440 minutes = 29 gallons per minute

29	gpm for	240	days each year for
5	years will be typical scenario from mine excavation		

Theoretical Lake Excavation Drawdown Calculation

CLIENT:	GRAND RAPIDS GRAVEL, INC.	DATE:	5/15/2020
PROJECT:	LOWELL MINE	PROJECT NO.:	20-800
LOCATION:	T6N, R9W, SECTION 10	WELL:	Site Excavation
	CITY OF LOWELL, KENT COUNTY, MI		

Assumptions: Assumptions: 1 pumping well located at center of lake
 1D steady-state flow with no lateral boundaries or vertical leakage

Theis Equation

$$s' = \frac{114.6 Q W}{T}$$

$$W = -0.58 - \ln(u) + u - \frac{u^2}{4} + \frac{u^3}{18} - \frac{u^4}{96} + \frac{u^5}{600}$$

$$u = \frac{1.87 r^2 S}{T t}$$

Theis Correction for Unconfined Aquifer

$$s = b \left(1 - \sqrt{1 - \left(\frac{2 s'}{b} \right)} \right)$$

where: s' = confined drawdown (ft)
 Q = pump rate (gpm)
 T = transmissibility (gpd/ft)
 W = well function of u (exponential integral)

t = time pumped (days)
 S = storage coefficient (unitless)
 r = radius from the center of the well (ft)
 s = corrected drawdown for unconfined aquifer (ft)

INPUT

Q = **29 gpm, based on water fill rate of:** 268 yd³/day (5 year mine)
 T = **32,091 gpd/ft, based on:** 110 ft/day (K)
 S = **0.24** 39 ft (b)

Observation Point	t (days)	RADIUS r (ft) (from lake center)	u	W	THEIS DRAWDOWN (ft)	UNCONFINED DRAWDOWN (ft)	UNCONFINED DRAWDOWN (inch)
South Regulated Wetland	240	235	0.0	5.2	0.5	0.53	6.37
2175 Bowes Rd	240	700	0.0	3.0	0.3	0.31	3.70
2051 Bowes Rd	240	1,215	0.1	2.0	0.2	0.20	2.41
East Pond	240	1,360	0.1	1.8	0.2	0.18	2.16
2487 Bowes Rd	240	1,705	0.2	1.4	0.1	0.14	1.67
Lowell Type 1 Well #5	240	1,780	0.2	1.3	0.1	0.13	1.58

Note : All other wells either beyond 1,800 feet or installed in deep, confined aquifer.

Attachment E: Long Term Drawdown Calculations

Lake Evaporation Loss
20-800 Grand Rapids Gravel - Lowell

Using the DEQ Land and Water Management Division Guidance Document for Water Budgets:

$$\begin{aligned} \text{Proposed Lake Area} &= 22.5 \text{ Acres} \\ &= 141,134,400 \text{ in}^2 \end{aligned}$$

Precipitation data for Grand Rapids Gerald R. Ford International Airport
Averaged over a 30 year period:

Month	Liquid Equivalent (in)	Temperature (°F)
January	2.09	24.40
February	1.79	26.80
March	2.37	35.60
April	3.35	48.00
May	3.98	58.70
June	3.77	68.40
July	3.78	72.50
August	3.59	70.80
September	4.28	62.80
October	3.26	51.00
November	3.51	40.10
December	2.50	29.20
Sum =	38.3	in/yr

$$365.00 \text{ days at } 38.3 \text{ in/yr} = 0.10485 \text{ in/day}$$

Evaporation Data from NOAA Technical Report NWS 33 Map 3 of 4: Annual FWS Evaporation

$$\begin{aligned} \text{At the site, Open Surface Water Evaporation approximately} & 32.5 \text{ in/yr} \\ & 365.0 \text{ days at } 32.5 \text{ in/yr} = 0.08904 \text{ in/day} \end{aligned}$$

Evapotranspiration data using the EVAP model from :

Sellinger, C.E., Computer program for Estimating Evapotranspiration Using the Thornwaite Method, NOAA Technical Memorandum ERL GLERL-101, U.S. Dept. of Commerce, Washington, D.C., 9 pp. (1996).

*Assumed 30 days to a month and 12 hour average day length of each month

Input: Precipitation (mm) and Temperature (°C) data from above
Specified Northern Hemisphere, Latitude 42.8847
Soil Moisture Holding Capacity of the soil taken from the NOAA Technical Memorandum to be 100 mm for fine loamy sand with moderately deep-rooted crops.

Output: PET = Potential Evapotranspiration (mm)
Actual ET = Actual Evapotranspiration (mm)

30 Year Average Site Conditions					
Year	Month	Precipitation (mm)	Temperature (°C)	PET	Actual ET
1981-2010	1	53.09	0.00	0.00	0.00
1981-2010	2	45.47	0.00	0.00	0.00
1981-2010	3	60.20	2.00	6.18	6.18
1981-2010	4	85.09	8.89	40.32	40.32
1981-2010	5	101.09	14.83	86.94	86.94
1981-2010	6	95.76	20.22	121.92	95.76
1981-2010	7	96.01	22.50	142.08	96.01
1981-2010	8	91.19	21.56	124.95	117.91
1981-2010	9	108.71	17.11	84.24	84.24
1981-2010	10	82.80	10.56	42.75	42.75
1981-2010	11	89.15	4.50	14.76	14.76
1981-2010	12	63.50	0.00	0.00	0.00

$$\begin{aligned} \text{Sum} &= 584.87 \text{ mm} \\ 584.87 \text{ mm} &= 23.03 \text{ in / 365 days} = 0.06309 \text{ in/day} \end{aligned}$$

Present amount of precipitation that results in aquifer storage

$$\begin{aligned} \text{Storage} &= P - ET = (\text{Precipitation} - \text{Evapotranspiration}) * \text{Lake Area} \\ (0.10485 \text{ in/day} - 0.06309 \text{ in/day}) * 141,134,400 \text{ in}^2 \\ &= 5,894,256 \text{ in}^3/\text{day} = 17.7 \text{ gpm} \end{aligned}$$

Aquifer storage after lake construction and increased evaporation

$$\begin{aligned} \text{Storage} &= P - E = (\text{Precipitation} - \text{Evaporation}) * \text{Lake Area} \\ (0.10485 \text{ in/day} - 0.08904 \text{ in/day}) * 141,134,400 \text{ in}^2 \\ &= 2,231,084 \text{ in}^3/\text{day} = 6.7 \text{ gpm} \end{aligned}$$

Loss in aquifer storage due to removal of vegetation and creation of lake (net loss):

$$= 17.7 \text{ gpm} - 6.7 \text{ gpm} = 11.0 \text{ gpm}$$



Theoretical Lake Evaporation Drawdown Calculation

CLIENT:	GRAND RAPIDS GRAVEL, INC.	DATE:	5/15/2020
PROJECT:	LOWELL MINE	PROJECT NO.:	20-800
LOCATION:	T6N, R9W, SECTION 10	WELL:	Site Excavation
	CITY OF LOWELL, KENT COUNTY, MI		

Assumptions: Assumptions: 1 pumping well located at center of lake
1D steady-state flow with no lateral boundaries or vertical leakage

Theis Equation

$$s' = \frac{114.6 Q W}{T}$$

$$W = -0.58 - \ln(u) + u - \frac{u^2}{4} + \frac{u^3}{18} - \frac{u^4}{96} + \frac{u^5}{600}$$

$$u = \frac{1.87 r^2 S}{T t}$$

Theis Correction for Unconfined Aquifer

$$s = b \left(1 - \sqrt{1 - \left(\frac{2 s'}{b} \right)} \right)$$

where: s' = confined drawdown (ft)

Q = pump rate (gpm)

T = transmissibility (gpd/ft)

W = well function of u (exponential integral)

t = time pumped (days)

S = storage coefficient (unitless)

r = radius from the center of the well (ft)

s = corrected drawdown for unconfined aquifer (ft)

INPUT

Q = **11.0 gpm, based on EVAP storage loss**
 T = **32,091 gpd/ft, based on:** 110 ft/day (K)
 S = **0.24** 39 ft (b)

Observation Point	t (days)	RADIUS r (ft) (from lake center)	u	W	THEIS DRAWDOWN (ft)	UNCONFINED DRAWDOWN (ft)	UNCONFINED DRAWDOWN (inch)
South Regulated Wetland	184	235	0.0	4.9	0.19	0.19	2.32
2175 Bowes Rd	184	700	0.0	2.7	0.11	0.11	1.30
2051 Bowes Rd	184	1,215	0.1	1.7	0.07	0.07	0.81
East Pond	184	1,360	0.1	1.5	0.06	0.06	0.72
2487 Bowes Rd	184	1,705	0.2	1.1	0.04	0.04	0.54
Lowell Type 1 Well #5	184	1,780	0.2	1.1	0.04	0.04	0.51

Note : All other wells either beyond 1,800 feet or installed in deep, confined aquifer.



memo

Grand Rapids Gravel

To: City of Lowell
From: James Dykema
CC: Jim Dykema; Mike Berg
Date: September 1, 2020
Re: Grand Rapids Gravel proposal to mine and process material off Bowes Road in the city of Lowell

Introduction:

Grand Rapids Gravel (GRG) currently owns roughly 65 acres of land on the south side of Bowes Rd on four separate parcels:

1. P.P. No. 41-20-10-100-015
2. P.P. No. 41-20-10-100-014
3. P.P. No. 41-20-10-100-004
4. P.P. No. 41-20-10-100-005

All four parcels are currently zoned as I, General Industrial and GRG is requesting a Special Land Use under section 17.04 of the Zoning Ordinance in order to complete the mining operation of the project.

Project Overview:

The following details are to give an overview of the process GRG envisions occurring after all permits and approvals are obtained. This section can be modified and updated as needed if the City has any concerns over the operation.

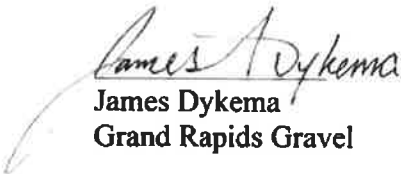
- Residential buildings on the property will be removed. One or two structures may remain to serve as office / garage so other dwellings will not be constructed.
- Site excavation will occur in order to prep the site for the processing equipment.
- Site excavation will include but not be limited to creating a berm along Bowes Rd. and other dust/noise control measures.
- 10 years of removing and processing material will take place onsite.

- This will result in roughly a 22.5-acre lake.
- After the completion of mining and removal of all finished materials, we will request to rezone the property from industrial to residential and create a housing development on the lake. The type of dwellings will be market dependent at said time.
- Trucks will exit to via Bowes Rd to Fulton Street.

Conclusion:

GRG is currently making sure we submit all necessary documents to satisfy the Special Use Zoning Ordinance for the City of Lowell. We envision a 10-year mining project with a housing development to follow shortly after. GRG has done this process at multiple locations in the Greater Grand Rapids area that have resulting in beautiful developments. We are looking forward to creating one of these finished projects in the City of Lowell through this process.

Please feel free to reach out with any questions



James Dykema
Grand Rapids Gravel

December 30, 2019

Mr. Michael Berg
Dykema Excavators
1730 Three Mile Road NE
Grand Rapids MI 49505

RE: Proposal for Professional Engineering Services
Hydrogeologic Study for Expansion of Bowes Street Gravel Mine
Lowell, Michigan

Dear Mr. Berg:

We are pleased to have this opportunity to offer the following proposal for professional engineering services to conduct a hydrogeologic study for the proposed expansion of an existing gravel mining operation on Bowes Street in Lowell, Michigan. It is our understanding that this study will be submitted by you to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) as part of a permit application for creation of a lake larger than 5 acres.

Scope of Work

The scope of work that we are proposing includes the following:

- ***Hydrogeologic background review.*** A review of available public hydrogeologic information will be conducted to determine the basic hydrogeologic conditions of the area. This will include review of well logs from private wells within one mile of the site, geologic maps and precipitation and evaporation records for the area. We will then propose locations for the monitor wells required to be part of the study by EGLE.
- ***Monitor Wells.*** Based on the topography shown on the preliminary site plan for the project, it appears that the water level will be near an elevation of 622 feet above sea level, which ranges from 10 to 20 feet below the existing ground surface. Similarly, excavation will extend to elevation 610, which ranges from about 20 to 30 feet below the existing ground surface.

EGLE typically requires that borings be conducted to 10 feet below the bottom of the excavation and that there be 4 around the perimeter and one near the center. We understand that previously drilled soil borings shown on the site plan were extended deep enough to meet the EGLE depth requirement. Therefore, we plan to install monitor wells to depths of only 20 to 30 feet for measurement of the water table. Although EGLE does not require water quality measurements, these wells would also be available for collecting water samples in the future.

In addition to the perimeter monitor wells, we recommend completion of 1 to 2 stab wells to a depth of 5 to 10 feet in the wetland area to the south to look at the hydrogeologic connection of the groundwater to the wetlands.

The wells should be constructed of 2-inch diameter PVC casing and screens with a locking protective cover on each. Our proposed scope of work includes subcontracting a well drilling company. We will provide guidance to the drilling company and one of our geologists or engineers will make periodic checks on their progress during the installation process.

- **Survey.** *Once the monitor wells are installed, we will conduct a survey of the location of the wells and measure the elevations based on the USGS datum. We will use this information to develop a digital base map. This is needed to determine the elevation and gradient of the water table on the site. The locations will be determined within one foot accuracy and the elevations to within 0.01 foot accuracy. The elevation of the water level in nearby surface waters will also need to be surveyed separately.*
 - **Data analysis.** *With the data gathered above, we will prepare the following:*
 - *Cross sections through the area and the site wells;*
 - *Site piezometric surface map from on site monitor wells;*
 - *Numerical hydrogeologic model; and a*
 - *Water budget for the site, both pre- and post-excavation.*
 - **Hydrogeologic Study/Water Budget.** *The above information will allow us to evaluate the impact that the proposed lake will have on the ground water in the area and to estimate the level of the lake. We will be particularly interested in potential impacts to nearby existing surface water, residential wells, and any wetlands. This analysis will include evaporative losses from the proposed lake. At this time, we plan to use estimated aquifer characteristics made from published literature or use data available from previous studies of the site. We do not plan to conduct an aquifer pumping test. Our proposed method has been accepted by EGGLE in previous work we have completed.*
- The amount of likely impact on surface water is strongly dependent on the existing groundwater gradient in the area of the proposed lake that will equalize after excavation. We are planning to use a three-dimensional numerical model capable of simulating flow through the area both before and after creation of the lake.*
- **Report.** *A draft report will be provided and after review and comments by you, a final report will be prepared. The final report will include all data collected, results of modeling, and a discussion of the results and the conclusions related to potential impacts on the ground water and nearby surface water.*

Mr. Michael Berg
December 30, 2019
Page 3 of 3

Schedule

We are prepared to begin the work as soon as weather and/or site conditions allow. The installation of monitor wells will be done by a private drilling company, so schedule will depend on their availability. The site will also need to be accessible and dry enough for a drill rig to come on to the site. It will likely take about 3 to 4 days to complete the well installation. Drilling through gravel, especially when boulders or cobbles are present can be difficult and can result in auger refusal and then starting the hole over again. This results in additional time and expense. The location and the elevation of the ground and top of casing will then need to be surveyed. Once the monitor wells are surveyed and we have that information, we anticipate it will take approximately 4 to 6 weeks to complete the draft report.

Cost

We propose to perform the work scope of services outlined above for the lump sum of \$26,300. We will not exceed this amount without authorization from you. Should additional services be requested by you or required by conditions encountered, we would contact you and obtain your authorization prior to performing such services.

Please note that our scope of work does not include completing the EGLE permit application or attending any meetings or public hearings.

Authorization

Authorization can be granted by signing the attached Professional Services Agreement. Authorization is also your acceptance of Prein&Newhof's Standard Terms & Conditions, which are enclosed with this letter.

We look forward to working with you on this project. We have completed several similar projects in the past. We have also assisted Courtland, Wright, Richland and Texas Townships in Kent, Ottawa, and Kalamazoo Counties in reviewing lake/gravel mine projects.

If you have any questions or need additional information, please do not hesitate to contact me.

Sincerely,

Prein&Newhof



Peter W. Brink, P.E.


Barbara E. Marczak, P.E.

Enclosures: Professional Services Agreement
Standard Terms & Conditions

Project No.

Professional Services Agreement

This Professional Services Agreement is made this 31st day of December, 2019 ("Agreement") by and between Prein & Newhof, Inc. ("P&N"), of 3355 Evergreen Dr NE, Grand Rapids, Michigan 49525, and Dykema Excavators, Inc. ("Client"), of 1730 Three Mile Road, Grand Rapids, Michigan 49505.

WHEREAS Client intends to:

Complete a hydrogeologic evaluation for for the proposed expansion of an existing gravel mining operation on Bowes Street in Lowell, Michigan

NOW THEREFORE, for and in consideration of the terms and conditions contained herein, the parties agree as follows:

ARTICLE 1 – DESIGNATED REPRESENTATIVES

Client and P&N each designate the following individuals as their representatives with respect to the Project.

For Client

For P&N

Name: Mr. Michael Berg

Title: _____

Phone Number: 616-363-6895

Facsimile Number: _____

E-Mail Address: mberg@dykemaexcavators.com

Name: Peter W. Brink, P.E.

Title: Project Manager

Phone Number: 231-798-0101

Facsimile Number: 231-798-0337

E-Mail Address: pbrink@preinnewhof.com

ARTICLE 2 – GENERAL CONDITIONS

This Agreement consists of this Professional Services Agreement and the following documents which by this reference are incorporated into and made a part of this Agreement.

☒ P&N Standard Terms and Conditions for Professional Services

☒ P&N Proposal dated, December 30, 2019

☐ P&N Standard Rate Schedule

☐ P&N Supplemental Terms and Conditions

☐ Other:

ARTICLE 3 – ENGINEERING SERVICES PROVIDED UNDER THIS AGREEMENT:

Client hereby requests, and P&N hereby agrees to provide, the following services:

- ☒ P&N Scope of Services per Proposal dated, December 30, 2019
☐ Scope of Services defined as follows:

ARTICLE 4 – COMPENSATION:

- ☒ Lump Sum for Services Described in Article 3 above - \$26,300.00.
Additional services to be billed per P&N's Standard Rate Schedule in effect on the date the additional service are performed.
- ☐ Hourly Billing Rates plus Reimbursable Expenses per P&N's Standard Rate Schedule in effect on the date services are performed.
- ☐ Other:

ARTICLE 5 – ADDITIONAL TERMS (If any)

none (pwb)

This Agreement constitutes the entire Agreement between P&N and Client and supersedes all prior written or oral understandings. This Agreement may not be altered, modified or amended, except in writing properly executed by authorized representatives of P&N and Client.

Accepted for:

Prein&Newhof, Inc.

By: Barbara E. Marczak

Printed Name: Barbara E. Marczak

Title: Team Leader

Date: 12/31/2019

Accepted for:

Dykema Excavators, Inc.

By: _____

Printed Name: _____

Title: _____

Date: _____

Standard Terms & Conditions

- A. General** - As used in this Prein&Newhof Standard Terms and Conditions for Professional Services (hereinafter "Terms and Conditions"), unless the context otherwise indicates: the term "Agreement" means the Professional Services Agreement inclusive of all documents incorporated by reference including but not limited to this P&N Standard Terms and Conditions for Professional Services; the term "Engineer" refers to Prein & Newhof, Inc.; and the term "Client" refers to the other party to the Professional Services Agreement.

These Terms and Conditions shall be governed in all respects by the laws of the United States of America and by the laws of the State of Michigan.

- B. Standard of Care** - The standard of care for all professional and related services performed or furnished by Engineer under the Agreement will be the care and skill ordinarily used by members of Engineer's profession of ordinary learning, judgment or skill practicing under the same or similar circumstances in the same or similar community, at the time the services are provided.
- C. Disclaimer of Warranties** - Engineer makes no warranties, expressed or implied, under the Agreement or otherwise.
- D. Construction/Field Observation** - If Client elects to have Engineer provide construction/field observation, client understands that construction/field observation is conducted to reduce, not eliminate the risk of problems arising during construction, and that provision of the service does not create a warranty or guarantee of any type. In all cases, the contractors, subcontractors, and/or any other persons performing any of the construction work, shall retain responsibility for the quality and completeness of the construction work and for adhering to the plans, specifications and other contract documents.
- E. Construction Means and Methods** - Engineer shall not have control or charge of and shall not be responsible for construction means, methods, techniques, sequences, or procedures, or for any safety precautions and programs in connection with the construction work, for the acts or omissions of the Contractor, Subcontractors, or any other persons performing any of the construction work, or for the failure of any of them to carry out the construction work in accordance with the plans, specifications or other contract documents.
- F. Opinions of Probable Costs** - Client acknowledges that Engineer has no control over market or contracting conditions and that Engineer's opinions of costs are based on experience, judgment, and information available at a specific period of time. Client agrees that Engineer makes no guarantees or warranties, express or implied, that costs will not vary from such opinions.

G. Client Responsibilities

1. Client shall provide all criteria, Client Standards, and full information as to the requirements necessary for Engineer to provide the professional services. Client shall designate in writing a person with authority to act on Client's behalf on all matters related to the Engineer's services. Client shall assume all responsibility for interpretation of contract documents and construction observation/field observation during times when Engineer has not been contracted to provide such services and shall waive any and all claims against Engineer that may be connected thereto.
2. In the event the project site is not owned by the Client, the Client must obtain all necessary permission for Engineer to enter and conduct investigations on the project site. It is assumed that the Client possesses all necessary permits and licenses required for conducting the scope of services. Access negotiations may be performed at additional costs. Engineer will take reasonable precaution to minimize damage to land and structures with field equipment. Client assumes responsibility for all costs associated with protection and restoration of project site to conditions existing prior to Engineer's performance of services.
3. The Client, on behalf of all owners of the subject project site, hereby grants permission to the Engineer to utilize a small unmanned aerial system (sUAS) for purposes of aerial mapping data acquisition. The Client is responsible to provide required notifications to the property owners of the subject project site and affected properties where the sUAS services will be performed. The Engineer will operate the sUAS in accordance with applicable State and Federal Laws.

H. Hazardous or Contaminated Materials/Conditions

1. Client will advise Engineer, in writing and prior to the commencement of its services, of all known or suspected Hazardous or Contaminated Materials/Conditions present at the site.
2. Engineer and Client agree that the discovery of unknown or unconfirmed Hazardous or Contaminated Materials/Conditions constitutes a changed condition that may require Engineer to renegotiate the scope of or terminate its services. Engineer and Client also agree that the discovery of said Materials/Conditions may make it necessary for Engineer to take immediate measures to protect health, safety, and welfare of those performing Engineer's services. Client agrees to compensate Engineer for any costs incident to the discovery of said Materials/Conditions.
3. Client acknowledges that Engineer cannot guarantee that contaminants do not exist at a project site. Similarly, a site which is in fact unaffected by contaminants at the time of Engineer's surface or subsurface exploration may later, due to natural phenomena or human intervention, become contaminated. The Client waives any claim against Engineer, and agrees to

defend, indemnify and hold Engineer harmless from any claims or liability for injury or loss in the event that Engineer does not detect the presence of contaminants through techniques commonly employed.

4. The Client recognizes that although Engineer is required by the nature of the services to have an understanding of the laws pertaining to environmental issues, Engineer cannot offer legal advice to the Client. Engineer urges that the Client seek legal assistance from a qualified attorney when such assistance is required. Furthermore, the Client is cautioned to not construe or assume that any representations made by Engineer in written or conversational settings constitute a legal representation of environmental law or practice.
5. Unless otherwise agreed to in writing, the scope of services does not include the analysis, characterization or disposal of wastes generated during investigation procedures. Should such wastes be generated during this investigation, the Client will contract directly with a qualified waste hauler and disposal facility.

I. Underground Utilities – To the extent that the Engineer, in performing its services, may impact underground utilities, Engineer shall make a reasonable effort to contact the owners of identified underground utilities that may be affected by the services for which Engineer has been contracted, including contacting the appropriate underground utility locating entities and reviewing utility drawings provided by others. Engineer will take reasonable precautions to avoid damage or injury to underground utilities and other underground structures. Client agrees to hold Engineer harmless for any damages to below ground utilities and structures not brought to Engineers attention and/or accurately shown or described on documents provided to Engineer.

J. Insurance

1. Engineer will maintain insurance for professional liability, general liability, worker's compensation, auto liability, and property damage in the amounts deemed appropriate by Engineer. Client will maintain insurance for general liability, worker's compensation, auto liability, and property damage in the amounts deemed appropriate by Client. Upon request, Client and Engineer shall each deliver certificates of insurance to the other evidencing their coverages.
2. Client shall require Contractors to purchase and maintain commercial general liability insurance and other insurance as specified in project contract documents. Client shall cause Engineer, Engineer's consultants, employees, and agents to be listed as additional insureds with respect to any Client or Contractor insurances related to projects for which Engineer provides services. Client agrees and must have Contractors agree to have their insurers endorse these policies to reflect that, in the event of payment of any loss or damages, subrogation rights under these Terms and Conditions are hereby waived by the insurer with respect to claims against Engineer.

K. Limitation of Liability - The total liability, in the aggregate, of Engineer and Engineer's officers, directors, partners, employees, agents, and consultants, whether jointly, severally or individually, to Client and anyone claiming by, through, or under Client, for any and all injuries, losses, damages and expenses, whatsoever, arising out of, resulting from, or in any way related to the Project or the Agreement, including but not limited to the performance of services under the Agreement, from any cause or causes whatsoever, including but not limited to the negligence, professional errors or omissions, strict liability or breach of contract or warranty, expressed or implied, of Engineer or Engineer's officers, directors, partners, employees, agents, consultants, or any of them, shall not exceed the amount of the compensation paid to Engineer under this Agreement, or the sum of fifty thousand dollars and no cents (\$50,000.00), whichever is less. Recoverable damages shall be limited to those that are direct damages. Engineer shall not be responsible for or held liable for special, indirect or consequential losses or damages, including but not limited to loss of use of equipment or facility, and loss of profits or revenue.

Client acknowledges that Engineer is a corporation and agrees that any claim made by Client arising out of any act or omission of any director, officer, or employee of Engineer, in the execution or performance of the Agreement, shall be made against Engineer and not against such director, officer, or employee

L. Indemnification – Client shall indemnify Engineer from and against any and all claims, liabilities, losses, and damages, arising from bodily injury or death of any person and/or damage or loss of any property, but only to the extent they result or arise out of the willful or negligent acts, omissions, or errors of Client or its contractors, subcontractors, consultants or anyone for whom the Client is legally liable. Nothing in this Agreement shall require Client to defend Engineer from claims, or to indemnify Engineer for any amount greater than the degree of fault of Client, its contractors, subcontractors, consultants or anyone for whom the Client is legally liable. This indemnity shall survive the expiration and termination of the Agreement. However, this survival shall be no longer than the expiration of the applicable statute of limitations.

M. Documents and Data

1. All documents prepared or furnished by Engineer under the Agreement are Engineer's instruments of service, and are and shall remain the property of Engineer.
2. Hard copies of any documents provided by Engineer shall control over documents furnished in electronic format. Client recognizes that data provided in electronic format can be corrupted or modified by the Client or others, unintentionally or otherwise. Consequently, the use of any data, conclusions or information obtained or derived from electronic media provided by Engineer will be at the Client's sole risk and without any liability, risk or legal exposure to Engineer, its employees, officers or consultants.

3. Any extrapolations, conclusions or assumptions derived by the Client or others from the data provided to the Client, either in hard copy or electronic format, will be at the Client's sole risk and full legal responsibility.
- N. **Differing Site Conditions** - Client recognizes that actual site conditions may vary from the assumed site conditions or test locations used by Engineer as the basis of its design. Consequently, Engineer does not guarantee or warrant that actual site conditions will not vary from those used as the basis of Engineer's design, interpretations and recommendations. Engineer is not responsible for any costs or delays attributable to differing site conditions.
- O. **Terms of Payment** - Unless alternate terms are included in the Agreement, Client will be invoiced on a monthly basis until the completion of the Project. All monthly invoices are payable within 30 days of the date of the invoice. Should full payment of any invoice not be received within 30 days, the amount due shall bear a service charge of 1.5 percent per month or 18 percent per year plus the cost of collection, including reasonable attorney's fees. If Client has any objections to any invoice submitted by Engineer, Client must so advise Engineer in writing within fourteen (14) days of receipt of the invoice. Unless otherwise agreed, Engineer shall invoice Client based on hourly billing rates and direct costs current at the time of service performance. Outside costs such as, but not limited to, equipment, meals, lodging, fees, and subconsultants shall be actual costs plus 10 percent. In addition to any other remedies Engineer may have, Engineer shall have the absolute right to cease performing any services in the event payment has not been made on a current basis.
- P. **Termination** - Either party may terminate services, either in part or in whole, by providing 10 calendar days written notice thereof to the other party. In such an event, Client shall pay Engineer for all services performed prior to receipt of such notice of termination, including reimbursable expenses, and for any shut-down costs incurred. Shut-down costs may, at Engineer's discretion, include expenses incurred for completion of analysis and records necessary to document Engineer's files and to protect its professional reputation.
- Q. **Severability and Waiver of Provisions** - Any provision or part of the Agreement held to be void or unenforceable under any laws or regulations shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Client and P&N, who agree that the Agreement shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision. Non-enforcement of any provision by either party shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of the Agreement.
- R. **Dispute Resolution** - If a dispute arises between the parties relating to the Agreement, the parties agree to use the following procedure prior to either party pursuing other available remedies:
1. Prior to commencing a lawsuit, the parties must attempt mediation to resolve any dispute. The parties will jointly appoint a mutually acceptable person not affiliated with either of the parties to act as mediator. If the parties are unable to agree on the mediator within twenty (20) calendar days, they shall seek assistance in such regard from the Circuit Court of the State and County wherein the Project is located, who shall appoint a mediator. Each party shall be responsible for paying all costs and expenses incurred by it, but shall split equally the fees and expenses of the mediator. The mediation shall proceed in accordance with the procedures established by the mediator.
 2. The parties shall pursue mediation in good faith and in a timely manner. In the event the mediation does not result in resolution of the dispute within thirty (30) calendar days, then, upon seven (7) calendar days' written notice to the other party, either party may pursue any other available remedy.
 3. In the event of any litigation arising from the Agreement, including without limitation any action to enforce or interpret any terms or conditions or performance of services under the Agreement, Engineer and Client agree that such action will be brought in the District or Circuit Court for the County of Kent, State of Michigan (or, if the federal courts have exclusive jurisdiction over the subject matter of the dispute, in the U.S. District Court for the Western District of Michigan), and the parties hereby submit to the exclusive jurisdiction of said court.
- S. **Force Majeure** - Engineer shall not be liable for any loss or damage due to failure or delay in rendering any services called for under the Agreement resulting from any cause beyond Engineer's reasonable control.
- T. **Assignment** - Neither party shall assign its rights, interests or obligations under this Agreement without the express written consent of the other party.
- U. **Modification** - The Agreement may not be modified except in writing signed by the party against whom a modification is sought to be enforced.
- V. **Survival** - All express representations, indemnifications, or limitations of liability included in the Agreement shall survive its completion or termination for any reason.
- W. **Third-Party Beneficiary** - Client and Engineer agree that it is not intended that any provision of this Agreement establishes a third party beneficiary giving or allowing any claim or right of action whatsoever by a third party.

2020				
Open Date	Close Date	Address	Name/Business	Subject
01/6/2020	01/16/2020	930 Sibley	Darla Maloney	Egress Window
02/21/2020	02/21/2020	159 S. West	Suzie Reinbold	Various Repairs
03/7/2020	03/07/2020	220 N. Division	David Brandt	Fence
03/11/2020	03/11/2020	1751 Gee Drive	Tony Beers	Partial finish basement
03/03/2020	03/18/2020	1264 Fun	John VanderWilp	Pole Barn
03/24/2020	03/26/2020	722 N. Washington	Sue Murley	Various Imp Inside
04/14/2020	04/17/2020	917 Lincoln Lake	Michael Johnson	Shed
03/31/2020	04/03/2020	1701 Faith	Dean Milstead	Shed
04/21/2020	04/24/2020	1100 Sibley	Brian Cook	Fence
04/27/2020	04/30/2020	1020 Sibley	Tracie Eikey	Fence
04/27/2020	05/01/2020	1965 W. Main	Meds Café	Temp Sign
04/27/2020	05/12/2020	1100 Sibley	Brian Cook	Deck
05/08/2020	05/08/2020	318 Lincoln Lake	Casmir Delnick	Pool
05/28/2020	06/02/2020	1115 E. Main	Louis D'Agostino	Renovation/Porch
05/28/2020	06/01/2020	312 E. Main	ZPS Investments	Demo
06/02/2020	06/04/2020	1335 W. Main	H&H Management	Renovation
06/11/2020	06/11/2020	203 N. Hudson	Robert Halvorson	Fence
06/09/2020	06/23/2020	2475 Gee Drive	Scott and Brandi Barriger	Covered Porch
06/23/20	06/23/20	257 Donna	Elizabeth Sparks	Reroof
06/08/20	06/23/2020	2050 W. Main	T-Mobile	Signs
06/22/2020	06/23/2020	924 N. Hudson	Emma Wikstrom	Fence
06/16/2020	06/24/2020	96 & 100 W. Main	Scott Brown Enterprises	Interior Demo
07/20/2020	07/20/2020	280 Valley Vista Drive	Cyndie Drake	Shed
07/24/2020	07/24/2020	624 Lafayette	Ann Dimmick	Sun Room
07/28/2020	07/28/2020	312 E. Main	ZPS Investments	Demo
07/28/2020	07/28/2020	109 Riverside	Jeff Altoft	Roof/Siding

08/06/2020	08/06/2020	701 Amity	Mike Steele	Rebuild garage
08/06/2020	08/06/2020	216 W. Main	Amber Rau	Remodel
08/10/2020	08/10/2020	2050 W. Main	Wild Bills Tobacco	Remodel
09/01/2020		570 Foreman St	Serveforce	Fence
09/01/2020		611 N Jefferson	Lou Augustino	Demo
09/01/2020		623 N Jefferson	Lou Augustino	Demo
09/02/2020		145 S Center	Chris Cavanaugh	Home addition
09/02/2020		1240 Grand River Dr	Ed Zigmont	Outdoor Wood Furnace
09/02/2020		216 W. Main St	Amber Rau	Sign - Temporary