



AGENDA PACKET
VILLAGE OF LAKE ZURICH
Planning and Zoning Commission Virtual Meeting

May 19, 2021
07:00 pm

VILLAGE OF LAKE ZURICH

PLANNING AND ZONING COMMISSION VIRTUAL MEETING

MAY 19, 2021
07:00 PM
AGENDA

1. CALL TO ORDER AND ROLL CALL

Chairperson Orlando Stratman, Vice-Chair William Riley, Antonio Castillo, Ildiko Schultz, Craig Dannegger, Joe Giannini and Mike Muir.

2. CONSIDERATION OF MINUTES AND FINDINGS OF THE COMMISSION

A. Minutes of the Planning and Zoning Commission Meeting, on April 21, 2021.

3. PUBLIC MEETING - No items at this time.

4. PUBLIC HEARING

(This agenda item includes proposals presented to the Planning & Zoning Commission requiring public testimony, discussion and recommendation to the Village Board for final action. Written testimony and comments submitted to info@lakezurich.org prior to the start of the meeting will be read into the record.)

A. (Continued Application) 300 North Rand Road/881 North Old Rand Road and 320 North Rand Road (The Sanctuary of Lake Zurich) -- PUD (PZC 2021-03)

Application to consider development of the property with a mixed-use development known as "The Sanctuary of Lake Zurich," containing retail uses within a 4,200 square-foot building and 23 residential townhomes within three buildings.

Applicant: Romeo Kapudija, Miller Street Partners

Owners: Lakeside Condominiums of Lake Zurich, LLC; Holmes Lake Properties, LLC

Attachment: [4A.pdf](#)

B. (New Application) 525 Enterprise Parkway -- Special Use Permit (PZC 2021-05):

Application to allow outdoor storage associated with a permitted landscape and horticultural services contractor.

Applicant: Brian Frank, Milieu Landscaping

Owner: DAC Realty

Attachment: [4B.pdf](#)

C. (New Application) 708 Telser Road -- Text Amendment Special Use Permit (PZC 2021-06):

Application to consider a Text Amendment and a Special Use Permit to allow for the establishment of a crematorium at the currently established building in the I Industrial District providing "Direct Cremation" services.

Applicant: Steve Cook, Journey Cremation

Owner: 708 Telser LLC

Attachment: [4C.pdf](#)

5. OTHER BUSINESS

6. STAFF REPORTS

(This is an opportunity for staff of the Community Development Department to report on matters of interest to the Planning & Zoning Commission)

7. PUBLIC COMMENT

(Comments submitted to info@lakezurich.org prior to the start of the meeting will be read into the record.)

8. ADJOURNMENT



At the Heart of Community

COMMUNITY DEVELOPMENT DEPARTMENT

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Lake Zurich, Illinois 60047

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LakeZurich.org

APPLICATION PZC 2021-03

AGENDA ITEM 4.A

Public Hearing Opened: April 21, 2021
Continued Consideration: May 19, 2021

STAFF REPORT

To: Chairperson Stratman and Members of the Planning & Zoning Commission

From: Sarosh Saher, Community Development Director

CC: Mary Meyer, Building Services Supervisor
Tim Verbeke, Planner

Date: May 19, 2020

Re: **The Sanctuary of Lake Zurich**
300 North Rand Road/881 North Old Rand Road and 320 North Rand Road
Planned Unit Development (PUD)

SUBJECT

Mr. Romeo Kapudija of Miller Street Partners (the “Applicant”) is the applicant for a mixed-use development known as “The Sanctuary of Lake Zurich,” containing commercial uses within a 4,200 square-foot building and 23 residential townhomes within three buildings. The property comprises four parcels with frontage along the lake. The current owners of the property are Lakeside Condominiums of Lake Zurich, LLC and Holmes Lake Properties, LLC.

The public hearing was opened by the PZC on April 21, 2021, but continued at the request of the Applicant to provide additional time to address comments and a request for documentation from the village’s Development Review Team (DRT) and other interested parties.

GENERAL INFORMATION

Requested Action: Planned Unit Development (PUD)
Development Concept Plan
Special Use Permit for Requested Land uses
Site Plan Approval and Exterior Appearance Review

**Staff Report
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Current Zoning:	<u>B-1 Local and Community Business District</u>
Proposed Zoning	<u>B-1 Local and Community Business District (0.93 acres) R-6 Multiple-Family Residential District (1.97 acres)</u>
Current Use:	<u>Vacant Property/Bait Shop</u>
Proposed Use:	<u>Commercial Space; Multiple-Family Residences</u>
Property Location:	<u>300 North Rand Road/881 North Old Rand Road and 320 North Rand Road (all extending over 4 parcels)</u>
Applicants:	<u>Romeo Kapudija of Miller Street Partners</u>
Owners:	<u>Lakeside Condominiums of Lake Zurich, LLC Holmes Lake Properties, LLC</u>
Staff Coordinator:	<u>Tim Verbeke, Planner Sarosh Saher, Community Development Director</u>

LIST OF EXHIBITS

- A. Legal Description
- B. Public Hearing Sign
- C. Site Photos
- D. Aerial Map
- E. Zoning Map
- F. Parcel Map
- G. Development Application and Attachments
- H. Development Review Comments

BACKGROUND

Mr. Romeo Kapudija (the “Applicant”), of Miller Street Partners, is the Applicant for the proposed Planned Unit Development located on the southwest corner of U.S. Route 12 (Rand Road) and Old Rand Road, and legally described in Exhibit A attached hereto (“Subject Property”).

The Applicant filed an application with the Village of Lake Zurich received on April 5, 2021 (the “Application”) seeking:

- A Special Use Permit for a Planned Unit Development (PUD) and Approval of a Development Concept Plan to develop the property with a commercial space and multiple-family residences

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- Rezoning the property within the B-1 Local and Community Business District and R-6 Multiple-Family Residential District
- Special Use Permits to establish various uses including but not limited to drive-through facilities accessory to permitted eating places and outdoor seating accessory to permitted eating places or accessory to a special use within the municipal code
- Exterior Appearance and Site Plan Approval consistent with a Development Concept Plan

Existing Conditions

The combined properties comprise 4 parcels with total area of 176,888 sq.ft. (4.04 acres), of which approximately 50,263 sq.ft. (1.15 acres) is lake bottom property. The total remaining buildable area is 126,625 sq.ft. (2.9 acres). *Note: this property data is derived from Lake County GIS.*

The combined property is currently vacant with the exception of a brick commercial building located at its southerly end formerly used as a bait shop. It is zoned within the B-1 Local and Community Business District and LP Lake Protection District. It has two points of vehicular access off Rand Road. A few additional signs of the previous development remain in the form of a building pad and portion of the paved vehicular areas.

Proposal

The Applicant is proposing a concept for mixed-used development consisting of townhomes and a commercial building.

Townhome Buildings

The townhomes comprise 23 units within three buildings as follows:

- Building A – 8 units total with 6 units of 2,000 square feet and 2 units of 2,405 square feet
- Building B – 8 units total with 6 units of 2,000 square feet and 2 units of 2,405 square feet
- Building C – 7 units total with 5 units of 2,000 square feet and 2 units of 2,405 square feet

The larger 2,405 square-foot units of each building comprise the end units and are 24 feet in width. The interior 2,000 square-foot units are 20 feet in width. The interior configuration of all units will be similar in that they will contain the garage and family room on the ground floor level, living, dining and galley kitchen on the main level (1st floor) and three bedrooms on the upper level (2nd floor).

The buildings are 3 stories in height with a maximum height of 35 feet. The townhomes will be constructed using contemporary materials and design and will include exterior fiber cement siding (“Nichiha”) with metal panel systems around large aluminum windows. Portions of the roof will be constructed in standing seam metal. The elevations containing the main entrances (at the 2nd level) are proposed to face the interior of the lot. Both front and rear elevations will be detailed with balconies (terraces) accessed by French windows to maximize lake and interior lot views.

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The townhome buildings are proposed to be located towards the rear of the property with frontage along the lake. The private drive entrances to the residential component is proposed to be gated to restrict vehicular access only to residents and their guests. The townhouse buildings are set back from the lake shore (edge of water at its ordinary high-water mark) for a distance of between 30 and 33 feet thereby providing a buffer between the water's edge and the building. However, pedestrian paths traverse through the buffer at certain points and in areas leading to the piers. The buffer will be planted with planning material per the requirements of the US Army Corps of Engineering and the Lake County Watershed Development Ordinance.

The units are proposed to be developed with anticipated price points beginning in the upper \$500,000s.

The development will be provided with three piers containing 8 boat slips each on the lake for a total of 24 boat slips. No commercial marina or boat ramp is proposed. The three piers are intended for the purpose of private access of the individual homeowners within the townhouses.

Commercial Building

A commercial building consisting of a single story 4,200 square-foot building with a drive-through facility and outdoor seating is proposed at the corner facing Rand and Old Rand Road where the need for visibility is higher. The commercial building is proposed to be constructed in modular brick with aluminum storefront doors and windows. An outdoor (partially covered) plaza and seating area is proposed at the west end of the commercial building. The proposal suggests that the commercial building will contain two commercial establishments in the form of a quick service restaurant and a drive through establishment or a single high-end restaurant.

The two land uses are proposed to be separated by a landscaped area and onsite vehicle circulation. Landscaped areas are also proposed along the periphery of the site to screen the parking areas.

Off-street Parking

Parking for the residential component is proposed as follows:

- 2 spaces within an enclosed 2-car garage within each townhome unit (46 garage spaces)
- 2 spaces on the approach in front of each 2-car garage (46 driveway spaces)
- 16 spaces for visitor parking

Total residential parking – 108 spaces

Parking for the commercial component is proposed as follows:

- 60 spaces for the 4,200 square feet of commercial space (minimum 1 space per 3 persons, based on a seating capacity of 15 square feet per person)

The parking spaces and sidewalks are proposed to be constructed using permeable pavers throughout the development. This is a sustainable measure that will facilitate stormwater management and is a best management practice to improve the quality of discharged stormwater. A total of approximately 0.5 acre of paved area is proposed to be constructed using permeable pavers.

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Pursuant to public notice published on April 3, 2021, in the Daily Herald, a public hearing had been scheduled with the Lake Zurich Planning & Zoning Commission for April 21, 2021, to consider the Application. On April 5, 2021, the Village posted a public hearing sign on the Subject Property (Exhibit B).

The public hearing was opened on April 21, 2021, but continued to May 19, 2021 to allow the applicant additional time to address the comments of the Development Review Team (DRT).

- A. Courtesy Review.** The Applicant, Mr. Kapudija first presented his concept to the Village Board at a Courtesy Review on December 7, 2020. At that time, the proposal included eight townhomes along the lake with a standalone 4,000 square-foot commercial building. The properties under consideration at that time were only the two northerly parcels at 300 North Rand Road and 881 North Old Rand Road. The video stream of the meeting can be viewed at the following link: <https://play.champds.com/lakezurichil/event/9>

At that courtesy review, Mr. Kapudija was also asked if he had reached out to the owners of the property to the south at 320 N Rand Road, to potentially propose a larger development by combining both properties. Mr. Kapudija had subsequently initiated a partnership with them and returned to the Village Board with a Courtesy update on February 16, 2021. The video stream of the meeting can be viewed at the following link: <https://play.champds.com/lakezurichil/event/16>

- B. Zoning and Development History.** The property is currently zoned within a business district and has been historically used for commercial purposes.

Records (historical aerial maps) show that since 1946 the corner parcel on the property had been improved with a smaller commercial building and its parking lot which was home to an establishment known as “Breezy Point.” Over the next fifty years that property had many different restaurants and configurations ending with Taylor Street Café. Shortly thereafter, the adjacent parcel was developed with a 20-unit motel known as “Beach Motel.” The motel building was built along the frontage of Old Rand Road with a parking lot at the rear facing the lake. The property also contained an “L” shaped pier for launching smaller water craft onto the lake. The corner building and the motel ceased operations, were demolished and all their features were removed between 1997 and 2000. The property has remained vacant since that time.

The parcel to the south along Rand Road was first developed with a bait shop in the 1950s known as “Lakeshore Bait & Boat.” The facility offered the services of a bait shop and boat rental facility. Between the 1980s and 2006 the property saw different owners and uses including a lunch counter, a pier with rental boat slips for up to 30 boats, the sale of tropical plants, health food, boat storage and minor repair.

(historical information provided courtesy of Mr. Phil Gardner, Ela Historical Society)

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In 1996 a proposal for a hotel known as “The Beverly Inn” was approved by the village, but never proceeded to construction. Since then the village has had numerous development inquiries on the property but none resulted in a formal submittal.

Between 2017 and 2020, village staff had been in conversation with a developer who proposed various iterations for the development of the property, the most recent of which was presented to the Village Board for courtesy review in 2020. That proposal had not proceeded any further since that time.

- C. Surrounding Land Use and Zoning.** The properties to the north, south and west are located within the B-1 district. The property to the north across Old Rand Road is being developed with the new Life Time physical fitness facility. The property to the south is currently vacant and used by the West Lake Beach Club. Farther south are the townhomes of Sandy Point Condominiums zoned within the R-6 multiple-family residential district consisting of 24 attached single-family residential units developed within 2- and 3-unit buildings.

The properties to the west across Rand Road are currently improved with smaller commercial uses also zoned within the B-1 business district.

The property to the northeast is zoned within the R-6 Multiple Family Residential District and is improved with the residences of Bayshore Village Condominiums consisting of 30 units within 3 buildings.

The lake is located to the east of the property.

- D. Lake Access.** The subject property has historically enjoyed lake access by means of piers and boat launches as early as the 1940s. Historical aerial maps of the property indicate that a number of piers were constructed on the combined properties in various lengths and configurations ranging from 1 pier in the late 1970s and 1980s to 6 piers in the 1990s and three longer piers in the early 2000s. The larger piers appear to have been removed by around 2008 and replaced with a new pier was installed at the southern parcel in recent years.
- E. Trend of Development.** The mixed-use development is proposed along the northern portion of Route 12 (Rand Road) gateway as it enters Lake Zurich. That portion of the corridor is developed with multiple commercial and retail uses along Rand Road with medium density single-family and multiple family residential development in the adjacent areas of the corridor. The property is located at a prominent corner of the intersection of Rand Road and Old Rand Road.
- F. Zoning District.** The proposed residential component will consist of multi-family townhouses. Based on the bulk requirements of the zoning code, this component will be zoned within the R-6 multiple-family residential district. This zoning classification provides for townhouse, two-family, and multiple-family residential development. The R-

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6 district is intended to function principally as a transition between single- family detached houses and other zoning districts and to provide for lower density townhouse and two-family building types, which may result in higher densities than in single-family developments.

- G.** The current zoning classification within the B-1 Local and Community Business District will remain for the proposed commercial building on the corner of the development. The B-1 Local and Community Business District is intended to serve the everyday shopping needs of Village residents as well as to provide opportunities for specialty shops attractive to the wider suburban residential community around the Village. It permits uses that are necessary to satisfy most basic, frequently occurring shopping needs. It also permits compatible uses that, although not used as frequently, would be desirably located in close proximity to potential users. The district is located principally on primary or secondary thoroughfares, is relatively small in size, and has bulk standards that provide for compatibility with nearby residential uses.

GENERAL FINDINGS

Staff of the Community Development Department’s development review team has evaluated the development against the various standards and provisions of the Lake Zurich Municipal Code and offers findings on specific sections of the Code.

9-22-5: STANDARDS FOR PLANNED UNIT DEVELOPMENTS (PUD).

Planned unit developments are included in the zoning code as a distinct category of special use. As such, they are authorized for the same general purposes as all other special uses and in recognition of the fact that traditional bulk, space, and yard regulations that may be useful in protecting the character of substantially developed and stable areas may impose rigidities on the development or redevelopment of parcels or areas that lend themselves to an individual, planned approach.

- A. Special Use Permit Standards: No special use permit for a planned unit development shall be recommended or granted pursuant to this chapter unless the applicant shall establish that the proposed development will meet each of the standards made applicable to special use permits pursuant to chapter 19 of this title.

Staff Response: Please refer to the “Standards for Special Use Permits” contained within this report.

- B. Additional Standards for All Planned Unit Developments: No special use permit for a planned unit development shall be recommended or granted unless the applicant shall establish that the proposed development will meet each of the following additional standards:

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1. Unified Ownership Required: The entire property proposed for planned unit development treatment shall be in single ownership or under such unified control as to ensure that the entire property will be developed as a unified whole. All owners of the property shall be included as joint applicants on all applications and all approvals shall bind all owners. The violation of any owner as to any tract shall be deemed a violation as to all owners and all tracts.

Staff Response: Standard met. The entire property that is subject to the PUD is under contract to be purchased by the Applicant, Mr. Romeo Kapudija of Miller Street Partners.

2. Minimum Area: The applicant shall have the burden of establishing that the subject property is of sufficient size and shape to be planned and developed as a unified whole capable of meeting the objectives for which planned unit developments may be established pursuant to this section.

Staff Response: 4 parcels with total area of 176,888 sq.ft. (4.04 acres), of which approximately 50,263 sq.ft. (1.15 acres) is lake bottom property. The total remaining buildable area is 126,625 sq.ft. (2.9 acres). The buildable area is an irregularly shaped assemblage of parcels, whose shape is defined by the two relatively straight roadways along the north and west, and by the shoreline of the lake along the east. The property possesses sufficient size and shape to be developed as a single planned unit development containing both the commercial and residential components as proposed.

3. Covenants and Restrictions to Be Enforceable by Village: All covenants, deed restrictions, easements, and similar restrictions to be recorded in connection with the planned unit development shall provide that they may not be modified, removed, or released without the express consent of the board of trustees and that they may be enforced by the village as well as by future landowners within the proposed development.

Staff Response: Standard met. Easements for onsite improvements will be provided at the time of Final Plan consideration. Management of the commercial/retail lease spaces will be undertaken by each property owner and/or its management company. The residential townhouse component of the development will be managed by a Homeowners Association that will be required to adopt its declarations of covenants, rights, and restrictions. The declarations will need to be reviewed and approved by the village prior to Final Plan approval.

4. Public Open Space and Contributions: Whenever the official comprehensive plan, zoning map, or official map indicates that development of a planned unit development will create a need for land for public purposes of the village within the proposed planned unit development, the board of trustees may require that such

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area be designated and to the extent such need is specifically and uniquely attributable to the proposed development, dedicated to the village for such use. In addition, the board of trustees may require evidence that all requirements of village ordinances pertaining to the dedication of land or the contribution of cash in connection with subdivisions or developments of land have been met as respects the proposed planned unit development.

Staff Response: Standard met. The developer has not proposed any open space within the developable portion of the property. However, its adjacency to the lake provides a private amenity to the residents of the townhomes. However, the undeveloped (lake bottom) portion of the property does not constitute acceptable open space by the Village as dedicated public land. Park impact fees are therefore charged by the village in lieu of or in combination with the dedication of land to the village for park purposes (public parks), per Section 10-4-5 of the municipal code. Storm water detention areas, areas subject to natural resource protections, areas in the floodway or floodplain, and wetland are not accepted as dedication for park purposes.

The developer has been provided with the estimates for contribution of funds (park impact fees) to be paid in lieu of land dedication.

5. Common Open Space:
- a. Amount, Location, And Use: The failure of a planned unit development to provide common open space shall be considered to be an indication that it has not satisfied the objectives for which such developments may be approved pursuant to this zoning code. When common open space is provided in a planned unit development, the amount and location of such open space shall be consistent with its intended function as set forth in the application and planned unit development plans. No such open space shall be used for the construction of any structure or improvement except such structures and improvements as may be approved in the final plan as appropriate to the intended leisure and recreational uses for which such open space is intended.
 - b. Preservation: Adequate safeguards, including recorded covenants or dedication of development rights, shall be provided to prevent the subsequent use of common open space for any use, structure, improvement, or development other than that shown on the approved final plan. The restrictions must be permanent and not for a given period of years and must run with the land. Such covenants and dedications may provide that they may be released, but only with the express written consent of the board of trustees.
 - c. Ownership And Maintenance: The final plan shall include such provisions for the ownership and maintenance of such open space and improvements as are reasonably necessary to ensure their continuity, care, conservation,

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maintenance, and operation in accordance with predetermined standards and to ensure that remedial measures will be available to the village if such open space or improvements are permitted to deteriorate or are not maintained in a condition consistent with the best interests of the planned unit development or the village.

- d. Property Owners' Association: When the requirements of subsection B5c of this section are to be satisfied by the ownership or maintenance of such open space or improvements by a property owners' association, such association shall meet each of the following standards:
- i. The bylaws and rules of the association and all declarations, covenants, and restrictions to be recorded must be approved as part of the final plan prior to becoming effective. Each such document shall provide that it shall not be amended in any manner that would result in it being in violation of the requirements of this subsection B5d (1); and
 - ii. The association must be established and all covenants and restrictions must be recorded prior to the sale of any property within the area of the planned unit development designated to have the exclusive use of the proposed open space or improvements; and
 - iii. The association must be responsible for casualty and liability insurance, taxes, and the maintenance of the open space and improvements to be deeded to it; and
 - iv. Membership in the association must be mandatory for each property owner and any successive owner having a right to the use or enjoyment of such open space or improvements; and
 - v. Every property owner having a right to the use or enjoyment of such open space or improvements must pay its pro rata share of the cost of the association by means of an assessment to be levied by the association that meets the requirements for becoming a lien on the property in accordance with state statutes; and
 - vi. The association must have the right to adjust the assessment to meet changed needs. The membership vote required to authorize such adjustment shall not be fixed at more than two-thirds (2/3) of the members voting on the issue; and
 - vii. The village must be given the right to enforce the covenants; and
 - viii. The village must be given the right, after ten (10) days' written notice to the association, to perform any maintenance or repair work that the association has neglected to perform, to assess the membership for such work and to have a lien against the property of any member failing to pay such assessment. For this purpose alone,

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the village shall have all the rights and powers of the association and its governing body under the agreements and declarations creating the association.

Staff Response: Standard Met. The townhouse component of the development contains common open space that includes private streets, land between the townhouse buildings, pedestrian pathways, the buffer open space between the lake and the buildings, and stormwater management facilities. These areas are proposed to be owned and maintained by a Homeowner's Association (HOA). The specific responsibilities of the HOA will be provided for through declarations of covenants, rights and restrictions that will be required to be submitted for review and approval at the time of final plan consideration.

6. Landscaping and Perimeter Treatment: Any area of a planned unit development not used for structures or circulation elements shall be landscaped or otherwise improved. The perimeter of the planned unit development shall be treated so as to ensure compatibility with surrounding uses by means such as provision of compatible uses and structures, setbacks, screening, or natural or manmade buffers.

Staff Response: Standard met. The developer is proposing various landscape amenities within the development. These include perimeter landscaping around the parking lots and interior landscaped islands separating the commercial and residential components. Additionally, foundation landscaping is proposed around each building within the development.

Landscape material will be provided in the form of shade trees, ornamental trees, large shrubs, small shrubs, ornamental grasses, and perennials.

Pedestrian paths are proposed along the lake shore and around the residential buildings as amenities for the residents. These paths connect to outdoor amenities such as outdoor seating areas. The commercial component also proposes an outdoor seating area as an amenity to the patrons of the proposed restaurants.

The development is proposed to be screened from the adjacent property to the east (Bayshore Village) by means of a privacy fence and adjacent landscape material to reduce the barrier effect of the fence. No fence is proposed between the development and the open space of West Lake Beach Club.

7. Private Streets: Private streets are prohibited unless expressly approved by the board of trustees. If so approved, they shall meet all construction standards applicable to public streets. No such streets shall be approved except upon the condition that they shall be owned and maintained by a property owners' association meeting the requirements set forth in subsection B5d of this section.

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Staff Response: Standard met. This standard is written within the framework of single-family detached homes, whose subdivisions are developed with public streets.

However, due to the nature of the subdivision and at the recommendation of the village Development Review Team (DRT), all streets within the development are proposed to be maintained as private streets. Such streets will be constructed to village construction standards applicable to public streets, and shall be owned and maintained by the HOA.

8. Sidewalks: A sidewalk meeting the standards of the Lake Zurich subdivision ordinance shall be provided along at least one side of every street in or abutting a planned unit development; provided, however, that such sidewalk may be constructed in a street right of way or as a specific element of the design of the planned unit development.

Staff Response: Standard met. The existing public sidewalks along Rand Road and Old Rand Road will remain and be modified/reconstructed where access points are established or removed.

The internal private residential areas will also be provided with pedestrian sidewalks. These will be connected to the public sidewalks along Old Rand Road. Public sidewalks will be constructed with a width of 5 feet, while private sidewalks (along the lake and in-between residences will be constructed with a width of 4 feet.

9. Utilities: All utility lines shall be installed underground.

Staff Response: Currently, all private and public utilities proposed to serve the development itself are proposed to be installed underground.

There are existing regional overhead electrical cables that run along the western lot line (Rt 12, Rand Road) and are proposed to remain as the developer has not indicated an intent in burying these utilities along Rand Road.

- C. Additional Standards for Specific Planned Unit Developments: When the district regulations authorizing any planned unit development use in a particular district impose standards to be met by such planned unit development in such district, a special use permit for such development shall not be recommended or granted unless the applicant shall establish compliance with such standards. (Ord., 10-2004)

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Staff Response: Standard Met. There are no additional standards imposed through the establishment of the residential and commercial uses that are proposed within such district.

9-19-3: STANDARDS FOR SPECIAL USE PERMITS.

Staff has reviewed the plan and found that the amendment will continue to remain in substantial conformance with the standards for Special Use Permits as outlined below.

A. General Standards: No special use permit for a planned unit development shall be recommended or granted unless the applicant shall establish substantial conformance with the following:

1. Zoning Code and Plan Purposes. The proposed use and development will be in harmony with the general and specific purposes for which this zoning code was enacted and for which the regulations of the district in question were established and with the general purpose and intent of the official comprehensive plan.

Staff Response: Standard met. The development will be in substantial conformance with the purpose and intent of the respective Business and Residential Districts.

One of the purposes and intents of the Zoning Code is to implement and foster the goals and policies of the Village's Official Comprehensive Plan. The commercial component of the development will continue to remain in substantial conformance with the purpose and intent of the B-1 Local & Community Business District and the land use designation of the adopted Comprehensive Plan.

However, the remaining residential component will be rezoned within the R-6 multiple-family residential district. Even though this is not in keeping with the land use designation of the comprehensive plan, it is in keeping with the trend of development in the area.

2. No Undue Adverse Impact. The proposed use and development will not have a substantial or undue adverse effect upon adjacent property, the character of the area, or the public health, safety, and general welfare.

Staff Response: Standard met. The proposed commercial component of the development will have no undue adverse effect upon any adjacent properties. Commercial uses currently exist to the north and west of the commercial component.

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The residential component will not have a negative impact on the public health, safety, or general welfare of the residents within the development or to the land uses to the east and south of the subject property. To further minimize the impact of the project on the immediately adjacent residential uses to the east, a fence and landscape material is being proposed along the common east lot line with Bayshore Village.

The residential component of the development is designed and located to serve as a transition from the commercial component at the corner to the condominium residences to the east and will complement such adjacent residential land uses.

3. No Interference with Surrounding Development. The proposed use and development will be constructed, arranged, and operated so as not to dominate the immediate vicinity or to interfere with the use and development of neighboring property in accordance with the applicable district regulations.

Staff Response: Standard met. The proposed structures within the development will be constructed and arranged so as not to dominate the immediate vicinity, but instead strive for compatibility with surrounding uses.

4. Adequate Public Facilities. The proposed use and development will be served adequately by essential public facilities and services such as streets, public utilities, drainage structures, police and fire protection, refuse disposal, parks, libraries, and schools, or the applicant will provide adequately for such services.

Staff Response: Standard met. The proposed development will be served adequately by essential public facilities and services such as streets, utilities and stormwater management. The applicant has also agreed to adequately compensate the Village and other taxing bodies in the form of impact fee contributions towards the school district, library district and village parks.

5. No Traffic Congestion. The proposed use and development will not cause undue traffic congestion nor draw significant amounts of traffic through the surrounding streets.

Staff Response: Standard met. The property is located at the southwest corner of Rand Road and Old Rand Road and is currently vacant with one older commercial structure on the southwest corner. The proposed development will increase the density of development thereby resulting in a greater number of residents and visitors resulting vehicles that will be served by the adjacent commercial corridor.

Route 12 (Rand Road) is under the jurisdiction of the Illinois Department of Transportation (IDOT) and is classified as a Strategic Regional Arterial (SRA). It is designed to accommodate in excess of 40,100 vehicles per day.

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Old Rand Road is a local road under the jurisdiction of the village and currently carries an average daily volume of 4,200 vehicles. It has a lower posted speed limit of 35 miles per hour.

To determine the necessity of improvements needed or not to access the property as proposed, the developer conducted a traffic impact study which provided the following summarized inferences:

- The traffic that will be generated by the proposed mixed-use development can be accommodated by the area roadway system.
- Geometric improvements and signal modifications are not required at the intersections of Rand Road with Old Rand Road/Ravinia Terrace. Overall, the proposed development will increase the volume of traffic traversing this intersection by less than one percent during the peak hours.
- Roadway and traffic control improvements are not required at the intersection of Old Rand Road with Pine Tree Road and Old Rand Road with the Bayshore Village westerly access drive/proposed Life Time Fitness three-quarter access drive.
- As part of the proposed development, the existing northbound right-turn lane on Rand Road at its signalized intersection with Old Rand Road will be extended through the proposed right-in/right-out access drive. This turn lane will provide 70 feet of storage and 150 feet of taper at the access drive.
- When the projected traffic volumes are compared to the turn lane warrant guidelines published in the IDOT BDE Manual, an exclusive right-turn lane is not warranted at the proposed right-in/right-out access drive on Old Rand Road.
- The locations of the proposed access drive will be adequate in accommodating the traffic estimated to be generated by the proposed development and will minimize interaction between residents and commercial patrons.

6. No Destruction of Significant Features. The proposed use and development will not result in the destruction, loss, or damage of any natural, scenic, or historic feature of significant importance.

Staff Response: Standard met. While the proposed development will result in the demolition of the existing commercial building on the property, the building has not been identified as a designated historic property.

There are currently no wetland or natural resource protection areas within the buildable portion of the property. The property was used for various commercial uses since the 1940s.

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The developer has proposed preserving existing healthy trees on the site where possible. Additionally, sustainable and environmentally sensitive measures are being proposed to ensure the control of stormwater quality being released into the lake.

7. Compliance with Standards. The proposed use and development comply with all additional standards imposed on it by the particular provision of this Code authorizing such use.

Staff Response: Standard met. The proposed development will comply with all other additional standards imposed by other governmental agencies and through the building codes on multiple family residential dwelling units and commercial/retail space.

8. Positive Effect. The proposed special use creating a positive effect for the zoning district, its purpose, and adjacent properties shall be placed before the benefits of the petitioner.

Staff Response: Standard met. The proposed development will assist in redeveloping and revitalizing a long-vacant but significant property within the Rand Road corridor with high value due to its proximity to the lake. This development will enhance Lake Zurich as a place for commercial activity (restaurants), and quality housing.

- B. Special Standards for Specified Special Uses. When the district regulations authorizing any special use in a particular district impose special standards to be met by such use in such district, a permit for such use in such district shall not be recommended or granted unless the applicant shall establish compliance with such special standards.

Staff Response: Not Applicable. There are no special standards for the residential or the commercial use that are currently proposed to be established within the development.

- C. Considerations. In determining whether the applicant's evidence establishes that the foregoing standards have been met, the Plan Commission and the Board of Trustees shall consider:

1. Benefit. Whether and to what extent the proposed use and development at the particular location requested is necessary or desirable to provide a service or a facility that is in the interest of the public convenience or that will contribute to the general welfare of the neighborhood or community.

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Staff Response: Standard met. The proposed development will bring additional housing and commercial options to the village, while introducing a higher and better use to an otherwise vacant property.

2. Alternative Locations. Whether the purposes of the zoning code can be met by the location of the proposed use and development in some other area or zoning district that may be more appropriate than the proposed site.

Staff Response: Standard met. The development is very specific to the subject property on which it is being proposed.

The developer has found and the Village is conceptually amenable to the land use and lot configuration that this property can sustain and be productively used. Based on its size, design, land use and operation, there are no alternative locations for this development to be more appropriately established.

3. Mitigation of Adverse Impacts. Whether all steps possible have been taken to minimize any substantial or undue adverse effects of the proposed use and development on the immediate vicinity through building design, site design, landscaping, and screening.

Staff Response: Standard met. The developer has designed this development in a manner that will minimize any substantial adverse impact on the immediate vicinity.

IDENTIFICATION AND ANALYSIS OF ZONING RELIEF FOR THE PLANNED UNIT DEVELOPMENT (PUD)

On analysis of the proposed development against the various standards contained within the municipal code, staff has identified the following modifications to the zoning code.

1. Bulk Regulations.

- a. Section 9-3-11.A.a and b. requires the maximum height of a residential building in the R-6 district no greater than 30 feet and for a maximum of 2.5 stories. The development proposes new townhouse buildings with a maximum height of 35 feet with 3 stories.

The number of stories is consistent with the residential condominiums to the east and the maximum height is lower than the maximum height of the life time building to the north across Old Rand Road which is being constructed to a height of 39'-11".

- b. Section 9-3-11.C.1.b. the minimum front and corner side yard in the R-6 district is 25 feet. Additionally, Section 9-4-10.F 8 requires that all yards along every lot line

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abutting Rt 12 (Rand Road) be no less than 50 feet. The development proposes parking lots that are constructed to within 5 feet of the street lot line.

Side and rear lot lines are proposed in conformance with the zoning code.

2. Exterior Lighting.

- a. Section 9-8B-3 C requires that the maximum illumination at the property line when a luminaire has a cutoff angle less than ninety degrees (90°) is 0.50 foot-candles. The development proposes a maximum illumination of 3.0 foot-candles along portions of the frontage of the property with Rand Road.

While it should be noted that the proposed development is on a busy arterial road intersection with its proposed commercial component surrounded by similar non-residential land uses to the north and west, the property to the east is residentially developed. A maximum of 0.6 foot-candles is noted along the eastern property line.

3. Parking Space Design.

- a. Section 10-6-20 E.2. requires each off-street parking space be designed as a minimum nine feet (9') wide by twenty feet (20') long and not less than one hundred eighty (180) square feet; provided, however, that the minimum length of a perimeter space or space perpendicular to a landscape area shall be eighteen feet (18'). The development proposes perimeter spaces perpendicular to a landscape area, but designed with a maximum depth of 16.5 feet.

Additionally, the parking pads in front of garage should typically be designed with a depth of 20 feet in front of the garage door. The development proposes an 18-foot minimum depth in front of the garages of the residential units.

Staff has evaluated this condition prevalent within the neighboring municipality of Arlington Heights and found the reduction in parking space depth by 1.5 feet to be acceptable for mid-size vehicles. Larger vehicles with wheel bases and frames exceeding 18 feet will encroach into the drive aisle.

4. Pier Design

- a. Section 9-7-C-3.A.1.d. requires that total deck area of a pier not exceed two hundred (200) square feet. The development is proposing three piers, each of which is approximately 400 square feet.
- b. Section 9-7-C-3.A.1.h requires that no pier shall project into any waterway more than fifty feet (50') from the mean high-water elevation at the bank of such waterway. The three piers extend between 60 and 75 feet into the lake from the water's edge.

RECOMMENDATION

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The recommendation of the Planning and Zoning Commission should be based on the standards included in the following Sections of the Lake Zurich Municipal Code:

- Section 9-22-5: Standards for Planned Unit Developments
- Section 9-19-3: Standards for Special Use Permits

Staff has determined that all standards for approval have been met and recommends that the Planning and Zoning Commission make these standards a part of the official record of the Application.

Staff of the Community Development Department therefore recommends the approval of Application PZC 2020-05, subject to the following conditions:

1. Substantial conformance with the following documentation submitted as part of the application subject to revisions and updates required by Village Staff and applicable governmental agencies:
 - a. Cover letter and Zoning Application dated April 5, 2021, prepared and submitted by Mr. Romeo Kapudija of Miller Street Partners
 - b. Exhibit A: Legal Description of the Subject Property.
 - c. Preliminary Site Plan, Building Elevations, Views and Signage prepared by Funke Architects dated April 8, 2021
 - d. Preliminary Landscape Plan prepared by Blue Stem Design Inc., dated April 6, 2021.
 - e. Boundary and Topographic Survey prepared by Haeger Engineering dated March 10, 2021.
 - f. Preliminary Plat of Subdivision prepared by Haeger Engineering, dated March 31, 2021.
 - g. Preliminary Engineering Report prepared by Haeger Engineering, dated March 31, 2021.
 - h. Preliminary Engineering exhibits prepared by Haeger Engineering, Sheets C1.0 to C6.0 dated March 31, 2021.
 - i. Wetland Delineation Report prepared by Haeger Engineering, dated April 8, 2021.
 - j. Traffic Impact Study prepared by KLOA, Inc., dated April 8, 2021.
 - k. Preliminary Lighting plan prepared by Chicago Lightworks, dated April 13, 2021
 - l. Site Lighting and Photometric Plan prepared by Haeger Engineering, dated April 7, 2021.
2. All signage shall conform to the requirements of the sign code (Title 12 : Signs). Free standing ground mounted signs shall be designed as monument style signs with the appropriate amount of landscape material maintained in good condition.
3. All trees, hedges, signs or other obstructions which could prevent persons driving vehicles on Route 12 and Old Rand Road from obtaining a clear view of traffic when approaching

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the intersection or a pedestrian crosswalk shall be maintained at a low height and signs shall be adequately set back from the corner.

4. The following shall be submitted or confirmed prior to the submission of the Final Plan:
 - a. The construction of all proposed piers shall conform to the requirements of Section 9-7C-3.A.1. "Piers" of the Lake Zurich Municipal Code unless allowed through modifications to the code.
 - b. Details of the proposed shoreline improvements, dock/pier improvements (including but not limited to location, design, construction/landscape materials and operation).
 - c. Detailed justification analysis pertaining to the proposed buffer in relation to Lake County Watershed Development Ordinance and US Army Corps of Engineers
5. The development shall be adequately screened from the adjacent property to the east by means of a privacy fence no higher than 6 feet in height.
6. Prior to Final Plan approval, the final illumination and lighting plans shall be submitted for review. The following additional requirements shall apply to the development.
 - a. No wall-mounted exterior illumination to be installed on the east elevation of the buildings facing east and south, and no free-standing illumination (area lights) to be installed along the easterly and southerly boundaries of the site, which are adjacent to neighboring residential and open space property.
 - b. The maximum height of light standards shall not to exceed 20 feet, and light standard shields should direct light away from the adjacent properties to the east and south.
7. The Developer shall establish a Home Owners Association (HOA), prior to the issuance of any certificate of occupancy or sale of a unit or interest in the Subject Property, which will be responsible for upkeep of the private common areas including the private streets and driveways, the on-site detention facilities, landscape material within common open space and the sea wall. The provisions for such HOA shall be established prior to approval of the Final Plan as defined in Section 9-22-4.C of the Lake Zurich Zoning Code (the "Final Plan"), and shall be subject to the review and approval of the Village.
8. All streets within the subdivision shall be maintained as private streets. Such streets shall be constructed according to Village construction standards applicable to public streets, and shall be owned and maintained by the HOA.
9. As part of Final Plan approval, the Developer shall enter into a binding development agreement with the Village agreeing to install all the required improvements and providing surety for such improvements, in a format as approved by the Village. In addition to the requirements outlined in Chapter 5 of the Land Development Code entitled "Procedure for Subdivision Approval," specifically Section 10-5-7 entitled "Agreements and Guarantee of Improvements," such agreement shall additionally contain the following additional provisions:

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- Establishment of a “backup” open space, stormwater management, snow removal, sea wall and private roadway repair and replacement Special Service Area (SSA) to ensure that these areas and features are cared for and maintained in the event of a future HOA dissolution or its lack of required maintenance of these areas.
10. The Developer shall be responsible to obtain initial comment and consent of the locations of the access points to the property on Route 12 (Rand Road) from the Illinois Department of Transportation (IDOT) before moving forward with the Development. If Developer intends to move forward with the Development prior to the receipt of IDOT approvals and permits, it shall do so at its own risk. Modifications to the location and design of the access points as required by IDOT shall be the responsibility of and completed by the Developer in substantial conformance with this approval. The Developer shall acknowledge that if no approval from IDOT is received, then the Subject Property shall be restored back to its original state as defined by and agreed to by the Village.
 11. The Developer shall be responsible for payment of the all Impact Fees and as a condition of the approval of the PUD and Final Plat. The school impact fees, park impact fees, and library impact fees are paid pro-rata and due at the time a building permit is issued for the applicable building and shall include the fees for all units contained within each residential building.
 12. The Development shall be in compliance with all other applicable codes and ordinances of the Village of Lake Zurich, including general and continuing compliance with Title 10 of the Village Code, the Land Development Code, and all of the engineering and land improvement requirements, standards and specifications set forth in Chapter 6 of said Land Development Code, unless otherwise approved or provided for in the final engineering plans for the Subject Property.

Respectfully Submitted,

Tim Verbeke, Planner
Sarosh Saher, Community Development Director

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LAKE ZURICH PLANNING & ZONING COMMISSION
FINAL FINDINGS & RECOMMENDATIONS

The Sanctuary of Lake Zurich
300 North Rand Road/881 North Old Rand Road and 320 North Rand Road
May 19, 2021

The Planning & Zoning Commission recommends approval of Application [PZC 2021-03](#), and the Planning & Zoning Commission adopts the findings as contained within the Staff Report dated [May 19, 2021](#) for this Application & subject to any changes or approval conditions as listed below:

1. Substantial conformance with the following documentation submitted as part of the application subject to revisions and updates required by Village Staff and applicable governmental agencies:
 - a. Cover letter and Zoning Application dated April 5, 2021, prepared and submitted by Mr. Romeo Kapudija of Miller Street Partners
 - b. Exhibit A: Legal Description of the Subject Property.
 - c. Preliminary Site Plan, Building Elevations, Views and Signage prepared by Funke Architects dated April 8, 2021
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 - g. Preliminary Engineering Report prepared by Haeger Engineering, dated March 31, 2021.
 - h. Preliminary Engineering exhibits prepared by Haeger Engineering, Sheets C1.0 to C6.0 dated March 31, 2021.
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 - k. Preliminary Lighting plan prepared by Chicago Lightworks, dated April 13, 2021
 - l. Site Lighting and Photometric Plan prepared by Haeger Engineering, dated April 7, 2021.
2. All signage shall conform to the requirements of the sign code (Title 12 : Signs). Free standing ground mounted signs shall be designed as monument style signs with the appropriate amount of landscape material maintained in good condition.
3. All trees, hedges, signs or other obstructions which could prevent persons driving vehicles on Route 12 and Old Rand Road from obtaining a clear view of traffic when approaching the intersection or a pedestrian crosswalk shall be maintained at a low height and signs shall be adequately set back from the corner.

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4. The following shall be submitted or confirmed prior to the submission of the Final Plan:
 - a. The construction of all proposed piers shall conform to the requirements of Section 9-7C-3.A.1. "Piers" of the Lake Zurich Municipal Code unless allowed through modifications to the code.
 - b. Details of the proposed shoreline improvements, dock/pier improvements (including but not limited to location, design, construction/landscape materials and operation).
 - c. Detailed justification analysis pertaining to the proposed buffer in relation to Lake County Watershed Development Ordinance and US Army Corps of Engineers

5. The development shall be adequately screened from the adjacent property to the east by means of a privacy fence no higher than 6 feet in height.

6. Prior to Final Plan approval, the final illumination and lighting plans shall be submitted for review. The following additional requirements shall apply to the development.
 - a. No wall-mounted exterior illumination to be installed on the east elevation of the buildings facing east and south, and no free-standing illumination (area lights) to be installed along the easterly and southerly boundaries of the site, which are adjacent to neighboring residential and open space property.
 - b. The maximum height of light standards shall not to exceed 20 feet, and light standard shields should direct light away from the adjacent properties to the east and south.

7. The Developer shall establish a Home Owners Association (HOA), prior to the issuance of any certificate of occupancy or sale of a unit or interest in the Subject Property, which will be responsible for upkeep of the private common areas including the private streets and driveways, the on-site detention facilities, landscape material within common open space and the sea wall. The provisions for such HOA shall be established prior to approval of the Final Plan as defined in Section 9-22-4.C of the Lake Zurich Zoning Code (the "Final Plan"), and shall be subject to the review and approval of the Village.

8. All streets within the subdivision shall be maintained as private streets. Such streets shall be constructed according to Village construction standards applicable to public streets, and shall be owned and maintained by the HOA.

9. As part of Final Plan approval, the Developer shall enter into a binding development agreement with the Village agreeing to install all the required improvements and providing surety for such improvements, in a format as approved by the Village. In addition to the requirements outlined in Chapter 5 of the Land Development Code entitled "Procedure for Subdivision Approval," specifically Section 10-5-7 entitled "Agreements and Guarantee of Improvements," such agreement shall additionally contain the following additional provisions:
 - Establishment of a "backup" open space, stormwater management, snow removal, sea wall and private roadway repair and replacement Special Service Area (SSA)

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to ensure that these areas and features are cared for and maintained in the event of a future HOA dissolution or its lack of required maintenance of these areas.

- 10. The Developer shall be responsible to obtain initial comment and consent of the locations of the access points to the property on Route 12 (Rand Road) from the Illinois Department of Transportation (IDOT) before moving forward with the Development. If Developer intends to move forward with the Development prior to the receipt of IDOT approvals and permits, it shall do so at its own risk. Modifications to the location and design of the access points as required by IDOT shall be the responsibility of and completed by the Developer in substantial conformance with this approval. The Developer shall acknowledge that if no approval from IDOT is received, then the Subject Property shall be restored back to its original state as defined by and agreed to by the Village.
- 11. The Developer shall be responsible for payment of the all Impact Fees and as a condition of the approval of the PUD and Final Plat. The school impact fees, park impact fees, and library impact fees are paid pro-rata and due at the time a building permit is issued for the applicable building and shall include the fees for all units contained within each residential building.
- 12. The Development shall be in compliance with all other applicable codes and ordinances of the Village of Lake Zurich, including general and continuing compliance with Title 10 of the Village Code, the Land Development Code, and all of the engineering and land improvement requirements, standards and specifications set forth in Chapter 6 of said Land Development Code, unless otherwise approved or provided for in the final engineering plans for the Subject Property.

- Without any further additions, changes, modifications and/or approval conditions.
- With the following additions, changes, modifications and/or approval conditions:

Planning & Zoning Commission Chairman

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EXHIBIT A
LEGAL DESCRIPTION OF SUBJECT PROPERTY

P.I.N. 14-18-400-005

THAT PART OF THE SOUTHEAST QUARTER OF SECTION 18, TOWNSHIP 43 NORTH, RANGE 10, EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: BEGINNING ON THE EAST LINE OF U.S. ROAD NO. 12, 603.5 FEET SOUTH OF THE NORTH LINE AND 54.5 FEET EAST FROM THE WEST LINE OF SAID SOUTHEAST QUARTER OF SECTION 18; THENCE NORTH 88 DEGREES 57 MINUTES EAST ALONG THE SOUTH LINE EXTENDED WEST OF RAND ROAD, 218 FEET; THENCE SOUTH 0 DEGREES 20 MINUTES EAST 127.9 FEET; THENCE SOUTH 45 DEGREES 20 MINUTES EAST 165 FEET TO A POINT IN LAKE ZURICH; THENCE SOUTH 88 DEGREES 57 MINUTES WEST IN SAID LAKE, 70.7 FEET; THENCE NORTH 45 DEGREES 20 MINUTES WEST 165 FEET; THENCE SOUTH 88 DEGREES 57 MINUTES WEST, 136.9 FEET TO THE EAST LINE OF SAID U.S. ROAD NO. 12; THENCE NORTHERLY ALONG SAID EAST LINE OF U.S. ROAD NO. 12, 127.98 FEET, TO THE POINT OF BEGINNING, IN LAKE COUNTY, ILLINOIS.

P.I.N. 14-18-400-006

ALL OF VACATED LOT 5 AND A PART OF VACATED LOTS 1, 2, 3, 4, AND 18 IN BLOCK 21 IN FRANK W. KINGSLEY ZURICH HEIGHTS GOLF CLUB ESTATES, A SUBDIVISION OF PART OF THE SOUTH HALF OF SECTION 18, TOWNSHIP 43 NORTH, RANGE 10, EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS BEGINNING AT A POINT ON THE SOUTH LINE OF RAND ROAD WHICH IS NORTH 88 DEGREES 57 MINUTES EAST 272.5 FEET FROM A POINT ON THE WEST LINE OF AND 604.5 FEET SOUTH FROM THE NORTHWEST CORNER OF THE SOUTHEAST QUARTER OF SAID SECTION 18, (SAID POINT OF BEGINNING BEING THE NORTHEAST CORNER OF A TRACT OF LAND DESCRIBED IN DEED RECORDED AS DOCUMENT 490001); THENCE SOUTH 0 DEGREES 20 MINUTES EAST 127.9 FEET; THENCE SOUTH 45 DEGREES 20 MINUTES EAST 165 FEET TO A POINT IN LAKE ZURICH; THENCE NORTH 88 DEGREES 57 MINUTES EAST PARALLEL TO THE SOUTH LINE OF RAND ROAD, 140 FEET, MORE OR LESS, TO THE EAST LINE OF SAID LOT 1, BLOCK 21; THENCE NORTH ALONG SAID EAST LINE 244.6 FEET TO THE NORTHEAST CORNER OF SAID LOT 1, BLOCK 21; THENCE WEST ALONG THE SOUTH LINE OF RAND ROAD, 225 FEET TO THE POINT OF BEGINNING, IN LAKE COUNTY, ILLINOIS.

P.I.N. 14-18-400-007

PARCEL 1A: THAT PART OF THE SOUTHEAST QUARTER OF SECTION 18, TOWNSHIP 43 NORTH, RANGE 10, EAST OF THE THIRD PRINCIPAL MERIDIAN IN THE VILLAGE OF LAKE ZURICH, LAKE COUNTY, ILLINOIS DESCRIBED AS: BEGINNING AT A POINT ON THE WEST LINE OF SAID SOUTHEAST QUARTER OF SECTION 18, 852.4 FEET SOUTH FROM THE NORTHWEST CORNER THEREOF; THENCE NORTH 88 DEGREES, 57 MINUTES EAST, PARALLEL TO THE NORTH LINE OF BLOCK 21 IN ZURICH HEIGHTS GOLF CLUB ESTATES (NOW VACATED) 331.3 FEET; THENCE SOUTH 195.98 FEET; THENCE SOUTH 88 DEGREES, 57 MINUTES WEST, 331.3 FEET TO

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SAID WEST LINE OF THE SOUTHEAST QUARTER OF SECTION 18; THENCE NORTH 195.98 FEET TO THE PLACE OF BEGINNING, EXCEPTING THEREFROM THAT PART THEREOF LYING BETWEEN SAID WEST LINE OF THE SOUTHEAST QUART OF SECTION 18 AND THE EAST LINE OF U.S. ROUTE 12.

PARCEL 1B: THAT PART OF THE SOUTHEAST QUARTER OF SECTION 18, TOWNSHIP 43 NORTH, RANGE 10, EAST OF THE THIRD PRINCIPAL MERIDIAN IN THE VILLAGE OF LAKE ZURICH, LAKE COUNTY, ILLINOIS DESCRIBED AS: BEGINNING ON THE WEST LINE OF SAID SOUTHEAST QUARTER OF SECTION 18, AT A POINT 732.4 FEET SOUTH FROM THE NORTHWEST CORNER THEREOF; THENCE NORTH 88 DEGREES, 57 MINUTES EAST PARLLEL WITH THE NORTH LINE OF BLOCK 21 IN ZURICH HEIGHTS GOLF CLUB ESTATES (NOW VACATED) TO A POINT THAT IS 116.9 FEET EAST OF THE EAST LINE OF U.S. ROAD #12; THENCE SOUTH 45 DEGREES, 20 MINUTES EAST, ALONG THE SOUTHWESTERLY LINE OF LAND DESCRIBED IN DEED RECORDED AS DOCUMENT 490002, 165 FEET; THENCE SOUTH 3.3 FEET; THENCE SOUTH 88 DEGREES, 57 MINUTES WEST, 331.3 FEET TO SAID WEST LINE OF THE SOUTHEAST QUARTER OF SECTION 18; THENCE NORTH 120 FEET TO THE PLACE OF BEGINNING, EXCEPTING THEREFROM THAT PART THEREOF LYING BETWEEN SAID WEST LINE OF THE SOUTHEAST QUARTER OF SECTION 18 AND THE EAST LINE OF U.S. ROUTE 12.

P.I.N. 14-18-400-008

THAT PART OF THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 18, TOWNSHIP 43 NORTH, RANGE 10, EAST OF THE THIRD PRINCIPAL MERIDIAN DESCRIBED AS FOLLOWS: COMMENCING AT A POINT 732.4 FEET SOUTH AND 54.5 FEET EAST OF THE NORTHWEST CORNER; THENCE NORTH 88 DEGREES, 57 MINUTES EAST 136.9 FEET; THENCE SOUTH 45 DEGREES 20 MINUTES EAST, 165 FEET TO THE POINT OF BEGINNING; THENCE SOUTH ALONG A LINE PARALLEL WITH THE WEST LINE OF BLOCK 22 TO THE NORTH LINE OF BLOCK 23; TEHNCE EAST ALONG SAID NORTH LINE TO THE WEST LINE OF BLOCK 22; THENCE NORTH ALONG THE SAID WEST LINE TO A POINT 224.6 FEET SOUTH OF THE SOUTH LINE OF OLD RAND ROAD; THENCE WEST TO THE POINT OF BEGINNING, SITUATED IN THE COUNTY OF LAKE, STATE OF ILLINOIS.

Parcels Involved: 14-18-400-005, 14-18-400-006, 14-18-400-007 and 14-18-400-008.

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EXHIBIT B

PUBLIC HEARING NOTIFICATION SIGNS ON PROPERTY



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Current Views of the site.



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Historical Views of the site
(Courtesy of Phil Gardner, Ela Historical Society)





At the Heart of Community

PUBLIC WORKS DEPARTMENT

505 Telser Road
Lake Zurich, Illinois 60047

(847) 540-1696
LakeZurich.org

April 14, 2021

Tim Verbeke, Planner
Village of Lake Zurich
505 Telser Road
Lake Zurich, Illinois 60047

PRELIMINARY ENGINEERING REVIEW #1

DEVELOPMENT: **Kapudija Mixed-Use Development (Sanctuary of Lake Zurich)
300 and 320 N Route 12
Lake Zurich, IL 60047**

ITEMS RECEIVED:

- 1) **Zoning Application submitted by Romeo Kapudija**
- 2) **Boundary and Topographic Survey prepared by Haeger Engineering, dated March 10, 2021**
- 3) **Kapudija Development Preliminary Plat of Subdivision prepared by Haeger Engineering, dated March 31, 2021**
- 4) **Kapudija Development Preliminary Engineering Plans prepared by Haeger Engineering, dated March 31, 2021**
- 5) **Kapudija Development Route 12 and Old Rand Road Preliminary Engineering Report prepared by Haeger Engineering, dated March 31, 2021**

On behalf of the Village of Lake Zurich, Manhard Consulting has completed a preliminary review of the above referenced material for conformance with the Village ordinances and general accepted engineering practices. We reserve the right to generate additional comments on future submittals. The comments below are preliminary in nature. A detailed review will be provided with the final engineering plan submittal. By copy of this letter, we request that the Developer address all comments in a response letter and submit the appropriate revisions for further review.

The following additional documents are required by Village Code for submittal at the preliminary plan stage:

1. Soil Analysis – see Code Section 10-5-4: B.3.
2. Protective Covenants – see Code Section 10-5-4 : B.4.
3. Tree Survey – see Code Section 10-6-18: B. for survey requirements

We have the following comments on the Preliminary Plans and submitted documents:

General

- 1) The developer will be required to provide verification and/or submit documentation of approval or sign off letters from all agencies other than the Village of Lake Zurich that exercise

- jurisdiction over this development (i.e., USACOE, IEPA, etc.). Please submit a copy of all approvals received to-date and list any approvals pending in the response letter.
- 2) Illinois Route 22 is the jurisdiction of the Illinois Department of Transportation. A permit will be required for all improvements and accesses associated with the development that will be constructed within the agencies' rights-of-way. The Village of Lake Zurich should be copied on project correspondences and a copy of all approvals and permits should be provided to the Village.
 - 3) It shall be the property owner's responsibility to ensure compliance with the 2010 ADA Standards for Accessible Design and the Illinois Accessibility Code and subsequent amendments. Detailed grades must be provided with final engineering for all pedestrian crossings.
 - 4) A traffic study is required to evaluate the potential impacts the proposed development may have on the adjacent highways and area.
 - 5) An Engineer's Opinion of Probable Cost (EOPC) for the proposed site improvements should be provided.
 - 6) The townhome development, including all roadways, open spaces, and driveways are located in a single outlot and easement. This does not conform to the typical right-of-way dedication for these types of roads following the Village's Code. The applicant should identify any modifications from the Village's ordinance requirements.
 - 7) An Autoturn analysis should be completed to ensure the proposed site layout will accommodate moving, delivery and fire trucks.
 - 8) The submittal should include proposed shoreline improvements, dock improvements, and a detailed justification analysis pertaining to the buffer in relation to WDO and USACE requirements.

Boundary and Topographic Survey

- 9) The surveyor's note 4 states that the survey was conducted during heavy snow cover. There is also some existing information missing, such as sanitary inverts. The topographic survey should be updated to reflect field conditions without snow cover.
- 10) The surveyor's note 5 states that a title commitment policy was not provided and may not reflect all existing easements on the site. This information should be provided on the survey, and document numbers for all existing easements and subdivisions should be included

Site Plan Preliminary Engineering (Sheet C3.0)

- 11) It is recommended there be pedestrian access interconnecting the retail parcel, the townhomes and the public right-of-ways.
- 12) The proposed sidewalks should be a minimum of 5-feet wide per the Village code and meet material standards.
- 13) The bump outs at the end of each dead-end road should be sized to support turn-arounds.
- 14) The single parking stall at the southwestern corner of the site does not provide adequate space to back out.
- 15) The materials specified for paving differ from the ordinance requirements. The design engineer should provide structural numbers for the pervious concrete, driveway, roadway and parking lot for consideration by the Village.
- 16) Each off-street parking space shall be a minimum nine feet (9') wide by twenty feet (20') long and not less than one hundred eighty (180) square feet; provided, however, that the minimum length of a perimeter space or space perpendicular to a landscape area shall be eighteen feet (18'). There are also irregular stalls located on the retail parcel that create concern for safe maneuverability in the parking lot.

Grading Plan Preliminary Engineering (Sheet C4.0)

- 17) The proposed townhomes should include basement floor or lowest floor elevations to show appropriate flood protection. Elevations for the lowest floor should be at least 2 feet above the BFE of Lake Zurich, and the plans should include the BFE and proposed buffers.
- 18) Additional information should be provided to show the drainage patterns of the site, including but not limited to: contours in open areas, drainage arrows on pavement areas, roof drainage direction shown, 100-year overflow routes, high points, and entrance slopes.

Utility Plan Preliminary Engineering (Sheet C5.0)

- 19) Indicate the approximate location of lighting on the plan.
- 20) Additional information must be provided relating to the age, condition, and material of the existing sanitary main onsite, and televising records should be provided. The developer should be required to have the pipe condition verified for use.
- 21) Proposed elevations, slopes, inverts, cover, and materials should be provided for all proposed utilities.
- 22) Valves shall be installed at every six hundred feet (600') or less along all water distribution mains. Additional valves shall be installed, as needed, so that no more than two (2) fire hydrants and/or twenty-five (25) dwelling units are affected by isolation of any section of water distribution main.
- 23) There is a cluster of utilities, east of the retail space at the existing sanitary manhole, that is of concern for utility conflicts and separation requirements. This area, as well as all other crossing areas, should be confirmed to meet IEPA separation requirements.
- 24) The frontage has overhead utilities located adjacent to the property. The developer should consider burying the overhead utilities to avoid conflicts with ingress/egress the roadways.
- 25) Please refer to the Utilities Division review for additional water and sanitary sewer comments.

Preliminary Engineering Report

- 26) Flows for the water and sewer mains should be provided and verification of existing water system capacity and the downstream capacity of the sanitary sewer system should be noted in the report.
- 27) A preliminary stormwater report should be provided. The final stormwater report shall be consistent with Section 400 of the Watershed Development Ordinance (WDO), including a Watershed Development Permit, and shall be submitted with final engineering.
- 28) Per Article 500.07, pursuant to state law, a property owner of a parcel being subdivided adjacent to a state or county road right-of-way shall notify the proper highway authority in writing of the proposed subdivision, and request that the proper highway authority provide, at the cost of the highway authority or otherwise provided by law, the amount of additional capacity in any stormwater detention facility to be constructed in the subdivision for the future availability of the highway authority for meeting stormwater detention requirements of any future public construction on the highway.
- 29) As discussed during the pre-application meeting, the WDO does allow credit for existing impervious surfaces on the site, but proposed permeable pavement / concrete is not considered a fully pervious surface that can be substituted for detention. Detention will need to be provided for the proposed site improvements. The runoff to Old Rand Road is tributary to an existing 12" storm sewer line that may not have capacity.
- 30) Water quality sampling will need to be provided in accordance with WDO section 602.03. (Lake Zurich is on the Appendix D list for TSS).
- 31) RVR and water quality standards must be met per the WDO.

Preliminary Plat of Subdivision

- 32) The plat should include a subdivision name.
- 33) The Plat should include easement and outlot descriptions, including restrictions for the public utilities, stormwater management system(s), wetland buffers, and RVR / WQ areas prohibiting any modification to these areas. If stormwater management systems are included on the commercial parcel, they must also be restricted.
- 34) It is understood that the plat is preliminary and certificates and other items required for recordation will be submitted and reviewed in final engineering. No response is required.

If you should have any questions, please do not hesitate to contact me.

Yours truly,
MANHARD CONSULTING



Jodi McCarthy, PE, CFM, CPESC
Senior Project Manager

cc: Sarosh Saher, Community Development Director
Betty Harrison, EQC Supervisor
Nadine Gerling, Permit Coordinator
Nicholle Petroff, Office Manager
Mary Meyer, Building Services Supervisor

P:\201.001 Village of Lake Zurich\Permits\320 N Old Rand Rd\201.001xxx - Townhome Development\Preliminary Eng Rev_1v2 -300 and 320 N Old Rand 04.14.21.docx

Village of Lake Zurich
Utilities Division of
Public Works

Memo

To: Tim Verbeke, Planner
From: Betty Harrison, EQC Supervisor
Date: April 5, 2021
Re: April Commission Meeting

1. 320 & 400 N Rand Rd

- No portion of a structure or building can be more than two hundred fifty feet from the nearest fire hydrant.
- Water main will be C900 with a tracing wire.
- All utility crossing must be delineated and proper spacing and/or pipe material must be employed.
- A ten-foot horizontal distance between the storm sewer and water main must be maintained.
- A dedicated easement is required for public utilities.
- Existing sanitary sewer must be properly abandoned.
- An inspection manhole is required for the retail building. This cannot be the manhole on the sewer main.
- B-boxes and sanitary sewer clean outs cannot be in driveways.
- Access to the public utilities cannot be closed off via the security gates.
- A Letter of Credit (LOC) is required. The LOC will be 110% of the Engineer's Estimate of Probable Cost.
- Residential connection fee based on 1 ½-inch water service; \$ 3,500 water connection fee; \$ 5,000 sewer connection fee. Lake County sewer connection fee \$ 4,030.
- Commercial connection fee based on 2 inch water service; \$ 10,000 water connection fee; \$ 14,000 sewer connection fee. Lake County sewer connection fee based on submittal of actual retail usage.



At the Heart of Community

FIRE DEPARTMENT
Fire Prevention Bureau

1075 N. Old McHenry Road
Lake Zurich, Illinois 60047
Fire.bureau@lakezurich.org
(847) 540-5073
LakeZurich.org

April 8, 2021

Tim Verbeke
Village of Lake Zurich
505 Telser Road
Lake Zurich, IL 60047

**RE: PR21-073 – RT. 12 & OLD RAND
KAPUDIJA DEVELOPMENT - PRELIMINARY COMMENTS**

Tim:

Thank you for the drawings. After review, I have the following comments:

1. Provide an aerial ladder turning template for review.
2. The interior road shall be at 24 feet in width not 20 feet as shown.
3. All units will be required to have a 13-D residential fire sprinkler system.
4. The security gate shall be equipped with a Knox opening system.
5. The security gate shall open to the full 24 foot width.
6. The retail building shall have a sprinkler riser room. The location shall be approved by my office. The room will contain the sprinkler risers, fire alarm panel and Knox key box.
7. If there are multiple occupants in the retail space, they shall be divided with separate flow switches per unit.
8. Provide a fire hydrant at the retail space.
9. The drawings only indicate two fire hydrants. Provide hydrants at the end of each drive.
10. Further comments will be provided upon final review.

If there are any questions, please contact my office.

Sincerely,

A handwritten signature in black ink that reads "Robert Kleinheinz".

Robert Kleinheinz
Fire Prevention Specialist
Lake Zurich Fire Department

From: Sarosh Saher
To: Romeo Kapusija
Cc: Michael Anderson; Jeffrey Farke
Subject: RE: Sanctuary of LI - additional comments on landscaping, parking and bulk requirements
Date: Tuesday, May 4, 2021 11:28:00 AM
Attachments: [lmap002.png](#)
[lmap003.png](#)
[lmap004.png](#)
[lmap005.png](#)
[lmap006.png](#)
[lmap021.png](#)

Hi Romeo - here are further comments on the proposed project following the conversations we have had regarding parking spaces and driveway width. The landscape comments are in addition to what we have previously discussed.

You will note that in certain instances, I have indicated "modification will be required." That means that, through the PUD process, we are willing to recommend modifications to the codes to allow for the development to take place. We are still in the process of evaluating the reduced parking space depth and driveway width. I discussed a few ideas with Mike Anderson, and have also included some of those below.

A. Bulk Regulations Review

Max height - required 35 feet - proposed 35 feet - ok
 Max stories - allowed 2 - proposed 3 - modification will be required

Minimum Yards

Front and corner side yard requirements

- Old Rand Road - 25 feet required - Building is at approx 50 feet - ok; but Parking at 5 feet - modification will be required
- Rand Road - 50 feet required - Building at approx 52 feet; but parking at 5 feet - modification will be required (9-4-10.F.8. Special Yards Abutting Route 12 And Route 22: Notwithstanding any other provision of this section, all yards along every lot line abutting Route 12 or abutting Route 22 between Lake Road and the westernmost village limits shall be not less than 50 feet.)
- Side yard (interior) - 10 feet required - 9.6 proposed at south end - modification will be required (but abuts open space - Westlake Beach club)
 15 feet provided at east end - ok
 Rear yard - 25 feet - n/a

Minimum landscaped surface area % (all other uses) 40% - stormwater management should address this.

B. Signage and landscaping at the corner

View Obstructions at Intersections: All trees, hedges, billboards or other obstructions which prevent persons driving vehicles on public streets, alleys or highways from obtaining a clear view of traffic when approaching an intersection or pedestrian crosswalk.
 Ensure that this is addressed for traffic safety reasons - recommendations, keep shrubs low and sign adequately set back.

C. Lake Protection (LP) District requirements

Piers - we need to see the proposed pier configuration. Piers were not included in the current proposal
 Must follow requirements in Section 7C-3: A. 1. Piers:
 Also, Is a boat launch ramp being proposed?

D. Landscaping Review

Full compliance with the codes is required since this is a new project.
 An opacity of 30% is being used at interior lots line and along street lot lines - ok

Currently 5 feet of minimum landscaped area width is provided along both street lot lines - Rand Road and Old Rand Road. Code requires 10 feet min landscaped area width when an opacity of 30% is used - modification will be required.

The requirement for trees in the landscape plan calculations is fine. However, based on the available land area to install shrubs, the number falls short. At 35% opacity, 2 units per 100 feet of shrubs are also required - requiring the number of shrubs as follows:

- Rt 12 - 81
- Old Rand Road - 81
- East lot line - 27
- South lot line - 27

However, considering that this is a PUD, the staff recommends that the adjacent properties to the east and the south be properly screened by landscaping and other features. A modification will be required. However, as mitigation, we recommend a fence along the east and south borders along with landscaped material to soften the barrier effect of a fence. The request for a fence is also being made by the adjacent property owners at Bayshore Village.

E. Illumination - please explain what the Avg/Min and Avg/Max means

	Avg	Max	Min	Avg/Min	Avg/Max
• Commercial Parking Fc	1.2	2.5	0.1	12.1	25.0
• Residential Parking North Fc	1.4	5.2	0.2	6.9	26.0
• Residential Parking South Fc	0.8	3.5	0.1	8.2	35.0

- Maximum illumination At Any Point Within Interior Of Property: The maximum permitted illumination at any time at any point within the property shall be 10.0 foot-candles.
- Exhibit shows max illumination of 2.0 fc along Old Rand Road, max allowed 0.5 fc. A modification will be required.
- Otherwise, remaining portion of site ok; Max noted is 4.7
- Light standard shields should direct light away from the adjacent properties to the east and south.

F. Parking

Our codes for parking and circulation are as follows:
 The minimum aisle width for two-way traffic is 24 feet. This is also a fire department requirement.

Code requirements for parking space design - Each off street parking space shall be a minimum nine feet (9') wide by twenty feet (20') long and not less than one hundred eighty (180) square feet; provided, however, that the minimum length of a perimeter space or space perpendicular to a landscape area shall be eighteen feet (18')

16.5 feet perpendicular to a landscaped area is proposed - Mike Anderson has pointed out Arlington Heights standards - I visited these locations to get first hand experience of the conditions. I parked in three of the four locations provided by Mike and can evaluate further for Lake Zurich. In my opinion they did not appear to be excessively small.

Additionally, the parking pads in front of garage are typically designed at 20 feet - 17 feet min depth is proposed in front of certain units. This may cause vehicles to stick out into the private drive.

In reviewing the site plans, we note that the number of parking spaces proposed is in excess of what is required - in particular for residential.

- Residential parking requirement - 1.5 for each efficiency dwelling unit plus 2 for each 1- or 2-bedroom dwelling unit plus 3 for each 3 or more bedroom dwelling unit plus 1 space for each 10 spaces required

At a minimum, we require 1 parking space per bedroom. I was unable to determine the mix of 2- and 3-bedroom units in total, but each unit is also provided with a family room with bathroom and closet, that would technically constitute a bedroom. So using an average of 4 bedrooms/unit equivalent to 4 parking spaces per unit - 2 in garage and 2 on the driveway in front of garage would work - for a total of 92 spaces is required for the residential units.

Visitor parking is required at 1 for every 10 residential parking spaces which requires 10 for 92 spaces. You have proposed 25 parking spaces in the residential areas. Reduction of 15 parking spaces could potentially facilitate providing for additional depth of parking spaces in front of residential units and width of driveway at 24 feet. You could also increase pervious area on site thereby potentially resulting in some reduction in stormwater storage requirements.

Similarly for the retail parking, it appears that you are contemplating a restaurant use in the building. We noted that you used 1 space for every 65 sq.ft. of gross restaurant floor area for a total of 65 spaces (4,200 sq.ft. restaurant. However, our code requirement is 1 space for each 3 persons of design capacity. If you are able to determine the design capacity of the restaurant and outdoor seating that may reduce the number of spaces required. Additionally, determining an optimum (perhaps reduced) outdoor seating area could potentially reduce the footprint of the building thereby providing more room for parking space depth or drive aisle width.

Reducing the number of spaces proposed will allow for the following:

- Widening the private residential drive to 24 feet
- Introducing landscape islands in the long retail parking rows, to mitigate the 5 foot wide landscaped area width. The landscaped islands should be the size of a parking space and can contain a tree, shrubs and ground cover.

I shared some of these comments verbally to Mike Anderson on Friday after receiving more information on the parking. I would be happy to discuss this more with Mike, Jeff and you.

Thanks.
 Sarosh

Sarosh B. Saher, AICP
 Community Development Director | Village of Lake Zurich | 505 Teiser Road, Lake Zurich, IL 60047
sarosh.saher@lakezurich.org | Direct: 847-540-1754
 Engage with Lake Zurich at LakeZurich.org/Connect

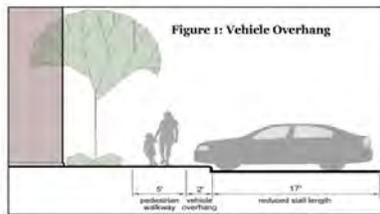
From: Michael Anderson <mike_a@jaegerengineering.com>
Sent: Friday, April 30, 2021 7:59 AM
To: Sarosh Saher <Sarosh.Saher@lakezurich.org>
Subject: Sanctuary of LZ - parking space overhang request

Sarosh – per our conversation yesterday, here’s some information on the reduced parking space sizes that we’re proposing.

Several municipalities allow for reduction of parking spaces where spaces overhang into landscaping or sidewalk areas. On the current proposed site plan we’re only proposing the reduce spaces where the spaces overhang into landscaping areas, not sidewalks. Here’s some excerpts from other zoning codes on the issue:

Lincolnshire

- C. **Size:** Every parking space shall conform to the parking dimensions identified on the Off-street Parking Chart found at the end of this Chapter, exclusive of access drive aisles, ramps, etc., and have a minimum vertical clearance of seven (7) feet. For parking spaces adjacent to a curb, the parking space length shall be shortened by two (2) feet to provide sufficient vehicle overhang (see Figure 1). For parking spaces where vehicle overhang is adjacent to a pedestrian walkway, the walkway width shall be a minimum of seven (7) feet to provide unobstructed pedestrian access (see Figure 1).



Libertyville:

CL	W	L	H	A one-way/two-way	SL	DL
0' (Parallel)	9'-0"	23'-0"	8'-0"	12'-0"/22'-0"	21'-0"/31'-0"	30'-0"/40'-0"
45°	9'-0"	17'-6"	8'-0"	12'-6"/24'-0"	30'-0"	47'-6"
60°	9'-0"	19'-0"	8'-0"	14'-6"/24'-0"	33'-0"	51'-6"
90°	9'-0"	19'-0"	8'-0"	22'-6"/24'-0"	43'-0"	62'-0"

*Two-way traffic authorized.

Notes: 1. For parking spaces located along the perimeter of a parking area or lot and abutting landscaped open space, the required parking stall length shall be 17'-0".

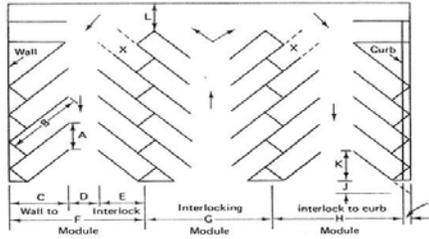
Arlington Heights:

10.2-7 Size. A required off street parking space shall be at least nine feet in width and at least 18 feet in length, exclusive of access drives or aisles, ramps, columns, or office or work areas. The length of a parking space can be reduced to 16-12 feet including wheel stop if additional space of one and one half feet in length is provided for car overhang. At least three feet, excluding any car overhang space, must be provided for any planting screen. The parking shall have a vertical clearance of at least seven feet.

Hoffman Estates

4. **Size of Spaces.** Every off-street parking space shall measure nine feet in width by 18 feet in length. Those spaces adjacent to landscaped areas shall measure ten feet in width. See Section 10-5-2-B(3) for accessible parking space requirements for persons with disabilities.
 - a. Where spaces overhang landscaped areas, spaces may be reduced in length by one and one-half feet.
 - b. For low turnover parking areas (such as designated employee parking areas), in office and manufacturing uses only, parking spaces with reduced widths of eight and one-half feet may be provided, subject to Village Board approval. Such spaces shall be limited to a maximum of 50 percent of the total parking within such low turnover areas. Visitor spaces shall not be considered as low turnover parking.
5. **Accessible Parking Spaces.** Accessible parking spaces for persons with disabilities shall be provided in accordance with the applicable federal and state requirements, and as detailed herein.
 - a. Accessible parking spaces shall be at least 15 feet wide including an eleven-foot wide parking space with a four-foot wide access aisle. The standard eight foot parking space with adjacent eight foot wide access aisle may be considered in some cases. Adjacent parking spaces shall not share a common access aisle. All access aisles shall be diagonally striped and shall be provided with a gradual transition to an accessible route to the precise destination. Such spaces shall also measure 18 feet in length. Where such spaces overhang landscaped areas, spaces may be reduced in length by one and one-half feet.

Buffalo Grove



X = Stall not accessible in certain layouts
 Parking layout dimensions (in ft) for 9-ft stalls
 at various angles

Dimension	On Diagram	Angle			
		Angle 45°	Angle 60°	Angle 75°	Angle 90°
Stall width parallel to aisle	A	12.7	10.4	9.3	9.0
Stall length of line	B	25.0	22.0	20.0	18.0
Stall depth to wall	C	17.5	19.0	19.5	18.0
Angle width between stall lines	D	12.0	16.0	23.0	24.0
Stall depth to interlock	E	15.9	17.5	18.8	18.0
Module, wall to interlock	F	44.8	52.5	61.8	60.0
Module, interlocking	G	42.6	51.0	61.8	60.0
Module, interlock to curb line	H	41.8	50.2	58.8	60.0
Bumper interlock to curb line	I	2.0	2.3	2.8	2.0
Offset	J	6.3	2.7	0.5	0.0
Setback	K	11.0	8.3	5.0	0.0
Cross aisle, one-way	L	16.0	14.0	14.0	14.0
Cross aisle, two-way	—	24.0	24.0	24.0	24.0

Mike Anderson, P.E., LEED AP
 Vice-President

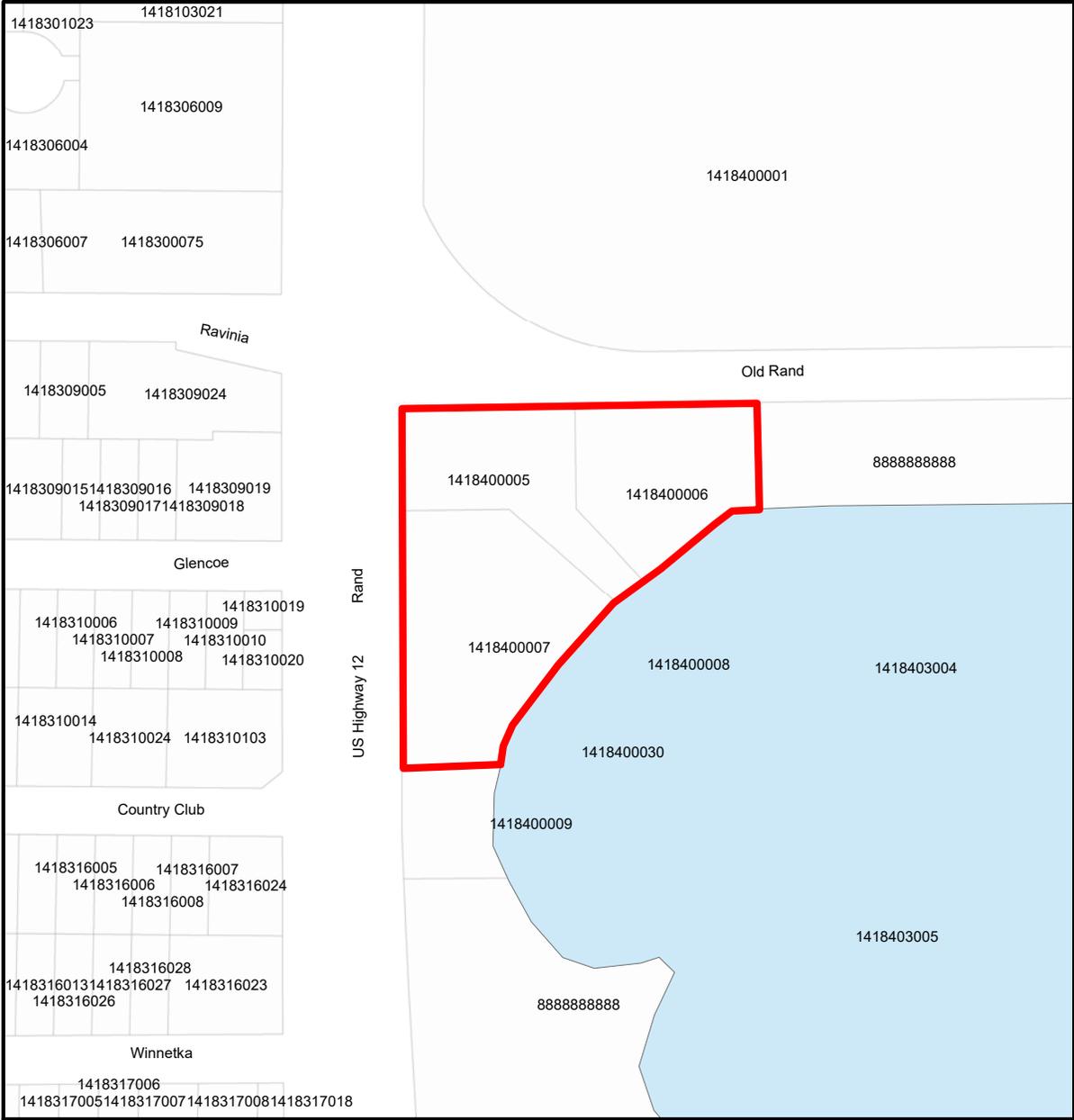
HAEGER ENGINEERING

100 East State Parkway
 Schaumburg, IL 60173
 direct: 847.230.3170 cell: 847.812.9398
 main: 847.394.6600 fax: 847.394.6608



Sanctuary at Lake Zurich

300-320 N Rand 881 N Old Rand



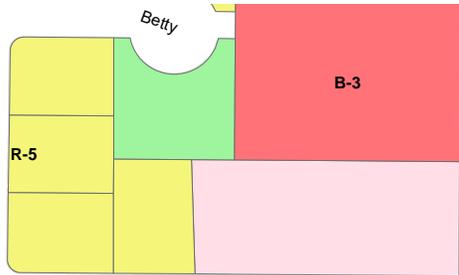
COMMUNITY SERVICES DEPARTMENT
Building and Zoning Division
505 Telser Road, Lake Zurich, Illinois 60047

(847) 540-1696
Fax: (847) 726-2182
LakeZurich.org

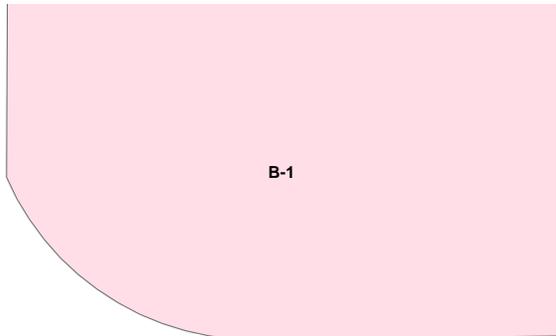


Sanctuary at Lake Zurich

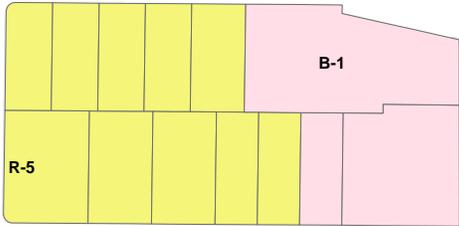
300-320 N Rand 881 N Old Rand



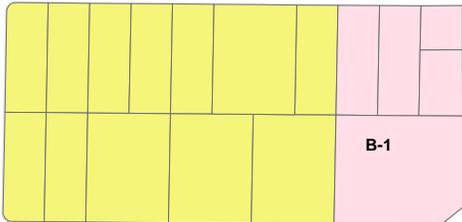
Ravinia



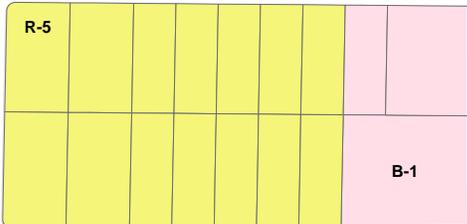
Old Rand



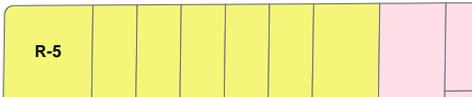
Glencoe



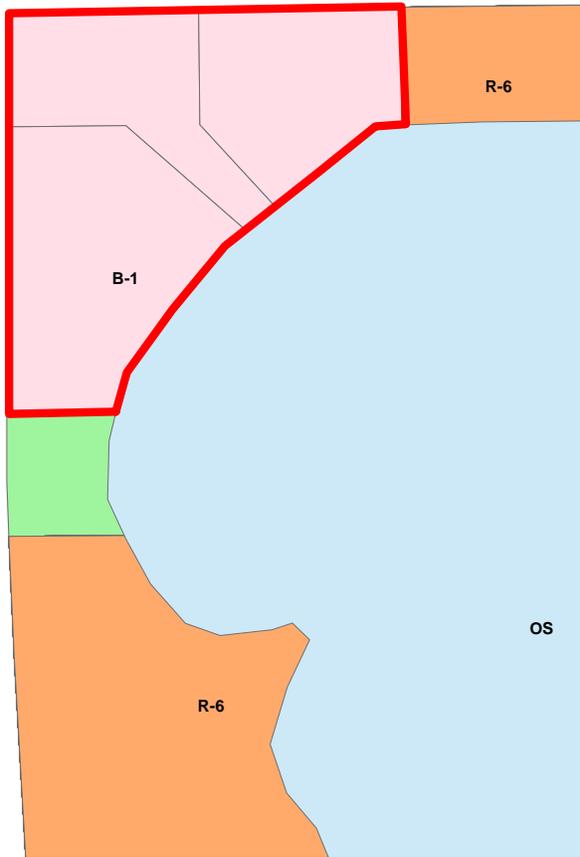
Country Club



Winnetka



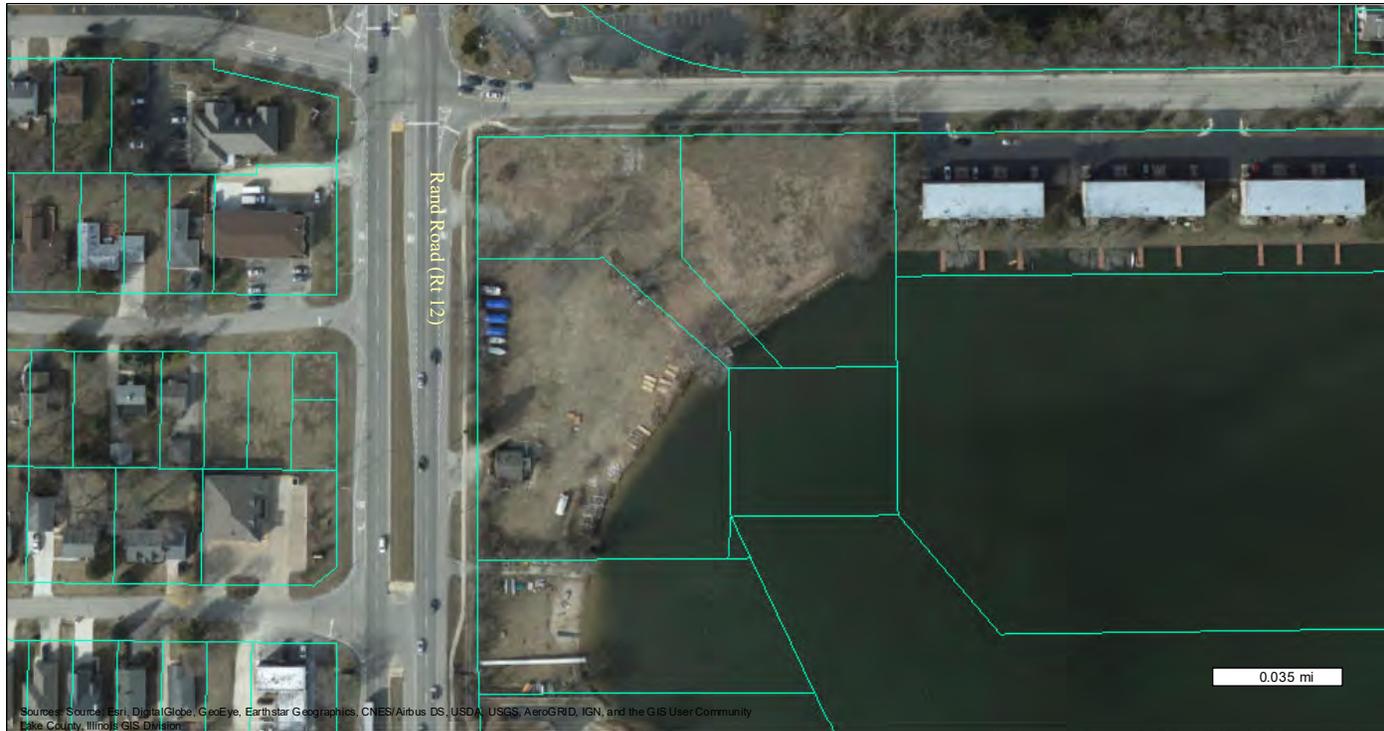
US Highway 12



COMMUNITY SERVICES DEPARTMENT
Building and Zoning Division
505 Telser Road, Lake Zurich, Illinois 60047

(847) 540-1696
Fax: (847) 726-2182
LakeZurich.org

Lake County, Illinois



Lake County, Illinois



Map Printed on 6/9/2020



 Tax Parcel Lines
Tax Parcel Information

Disclaimer: The selected feature may not occur anywhere in the current map extent. A Registered Land Surveyor should be consulted to determine the precise location of property boundaries on the ground. This map does not constitute a regulatory determination and is not a base for engineering design. This map is intended to be viewed and printed in color.



MILLER STREET PARTNERS

601 Dundee Ave,
East Dundee, IL 60118

T 847-426-2662

C 312-296-2966

Romeo@millerstreetpartners.com

April 5, 2021
Orlando Stratman
Chair of the Planning & Zoning Commission
Village of Lake Zurich
70 East Main Street
Lake Zurich, Illinois 60047

Mr. Stratman,

I hope this letter finds you well. I am seeking a zoning change for the property located at 300 N Rand Road/881 N Old Rand and 320 N Rand Road. The property is currently a vacant lot and is primarily utilized as boat storage during the non boating season.

My company Miller Street Partners is seeking a Special Use Permit for a Planned Unit Development (PUD). We are proposing to develop 23 residential townhomes along the shoreline on the East side of the parcel and are also proposing a 4000 SF retail development on the North West corner of the parcel. The retail component will most likely become a high end restaurant or a national food chain location such as Starbucks or a Panera Bread as an example. We are confident that this would be the best intended use of the property and hope that you would be willing to support our efforts.

If you have any questions regarding this proposal, I can be reached on my cell phone at 312-296-2966 or via email at romeo@millerstreetpartners.com. Thank you!

Sincerely yours,

Romeo Kapudija



ZONING APPLICATION

Community Development Department
505 Telser Rd.
Lake Zurich, IL 60047
Phone: (847) 540-1696
Fax: (847) 540-1769

(Please Type or Print)

1. Address of Subject Property: 300 N Rand Road/881 N Old Rand Road and 320 N Rand Road
2. Please attach complete legal description
3. Property Identification number(s): 14-18-400-005, -006, -007, -008
4. Owner of record is: LAKESIDE CONDOMINIUMS Phone: 847-867-9111
E-Mail _____ Text _____ Address: _____
5. Applicant is (if different from owner): Romeo Kapudija Phone: 312-296-2966
E-Mail: romeo@millerstreetpartners.com Address: 601 Dundee Ave, East Dundee IL
6. Applicant's interest in the property (owner, agent, realtor, etc.): Developer
7. All existing uses and improvements on the property are: TBD
8. The proposed uses on the property are: 23 Townhomes and 4000 SF Retail
9. List any covenants, conditions, or restrictions concerning the use, type of improvements, setbacks, area, or height requirements placed on the Subject Property and how of record and the date of expiration of said restrictions:
10. Describe any contract or agreement of any nature relevant to the sale or disposal of the Subject Property:
11. For applications requiring a public hearing, please attach a list which contains the PIN, owner, and owner's mailing address of all properties located within 250 feet (excluding all Public Right-of-Ways) of the Subject Property.

THE APPLICANT'S SIGNATURE BELOW INDICATES THE INFORMATION CONTAINED IN THIS APPLICATION AND ON ANY ACCOMPANYING DOCUMENTS IS TRUE AND CORRECT. THE APPLICANT ALSO ACKNOWLEDGES IF THE CONSULTANT EXPENSES EXCEED THE INITIAL ESCROW DEPOSIT, THE APPLICANT WILL REIMBURSE THE ACCOUNT IMMEDIATELY.

Romeo Kapudija
(Name of applicant)

(Signature of applicant)

Subscribed and sworn to before me this 5 day of April, 2021.

(Notary Public)

My Commission Expires 07/18/22
OFFICIAL SEAL
SUSAN LEONARD
NOTARY PUBLIC - STATE OF ILLINOIS
MY COMMISSION EXPIRES: 07/18/22

BY: VINCENT SANSONETTI MANAGER
(Name of Owner, if different)

Fred Spahr
(Signature of Owner, if different)

Subscribed and sworn to before me this _____ day of _____, 2021.

(Notary Public)

My Commission Expires _____



ZONING APPLICATION

Community Development Department
505 Teagar Rd.
Lake Zurich, IL 60047
Phone: (847) 543-1596
Fax: (847) 543-1769

(Please Type or Print)

1. Address of Subject Property: 300 N Rand Road/881 N Old Rand Road and 320 N Ri

2. Please attach complete legal description

3. Property identification numbers: 14-18-400-005, -006, -007, -008

4. Owner of record is: LAKESIDE CONDOMINIUMS Phone: 847-867-9111

5. E-Mail: _____ Tax: _____ Address: _____

6. Applicant is (if different from owner): Romeo Kapudija Phone: 312-296-2966

E-Mail: romeo@millerstreetparis Address: 601 Dundee Ave, East Dundee IL

7. Applicant's interest in the property (owner, agent, realtor, etc.): Developer

8. All existing uses and improvements on the property are: TBD

9. The proposed uses on the property are: 23 Townhomes and 4000 SF Retail

10. List any covenants, conditions, or restrictions concerning the use, type of improvements, setbacks, area, or height requirements placed on the Subject Property and how of record and the date of expiration of said restrictions.

11. Describe any contract or agreement of any nature relevant to the sale or disposal of the Subject Property.

12. For applications requiring a public hearing, please attach a list which contains the PIN, owner, and owner's mailing address of all properties located within 250 feet (excluding all Public Right-of-Ways) of the Subject Property.

THE APPLICANT'S SIGNATURE BELOW INDICATES THE INFORMATION CONTAINED IN THIS APPLICATION AND ON ANY ACCOMPANYING DOCUMENTS IS TRUE AND CORRECT. THE APPLICANT ALSO ACKNOWLEDGES IF THE CONSULTANT EXPENSES EXCEED THE INITIAL ESCROW DEPOSIT, THE APPLICANT WILL REIMBURSE THE ACCOUNT IMMEDIATELY.

Romeo Kapudija

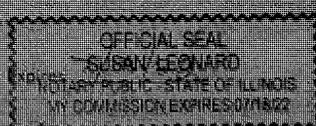
(Name of applicant)

(Signature of applicant)

Subscribed and sworn to before me this 05 day of April, 2021

(Notary Public)

My Commission Expires



(Signature of Owner, if different)

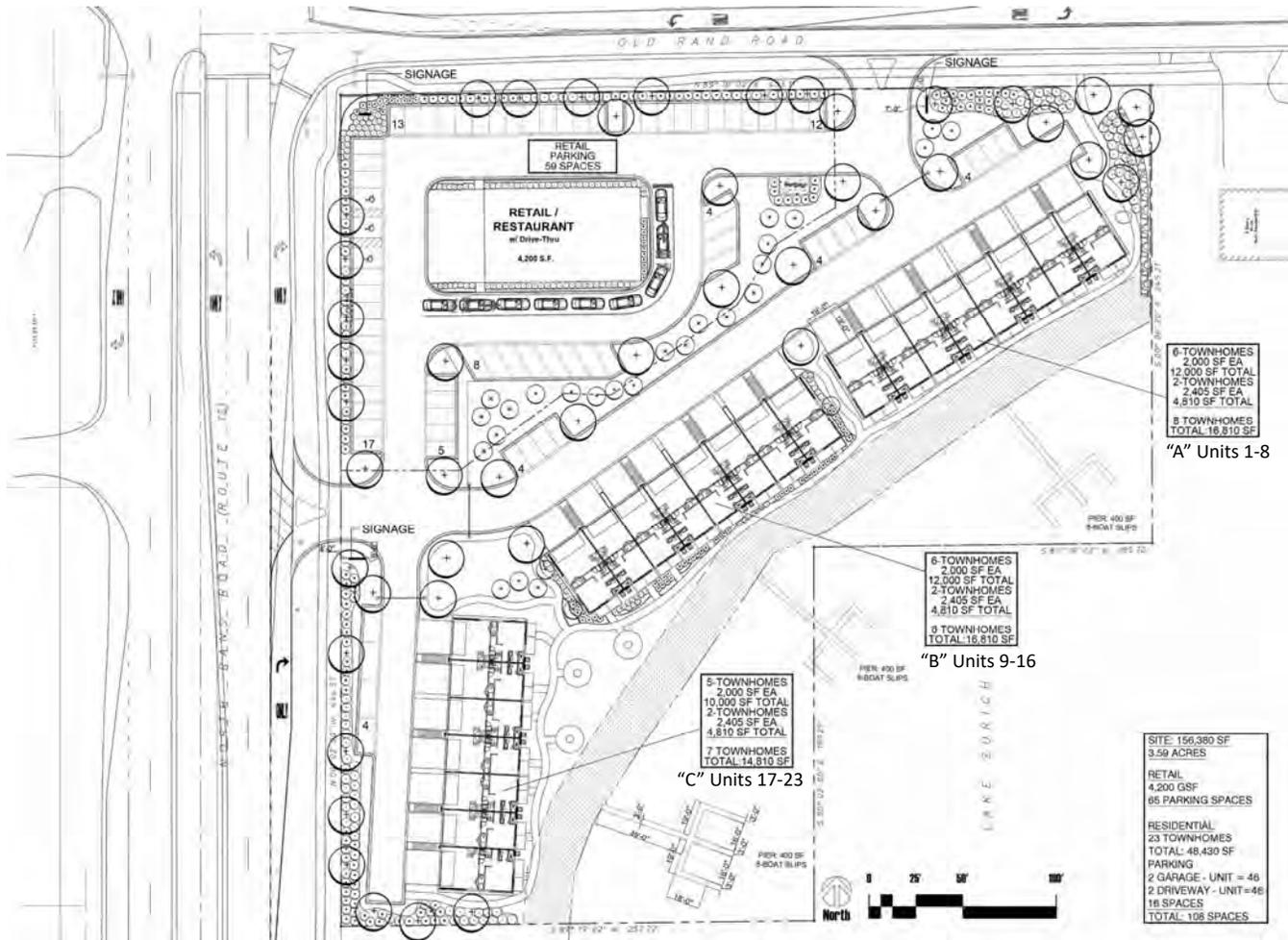
(Name of Owner, if different)

Subscribed and sworn to before me this _____ day of _____, 2021.

(Notary Public)

My Commission Expires _____

PLAN APPROVAL 5.19.2021



Site Plan

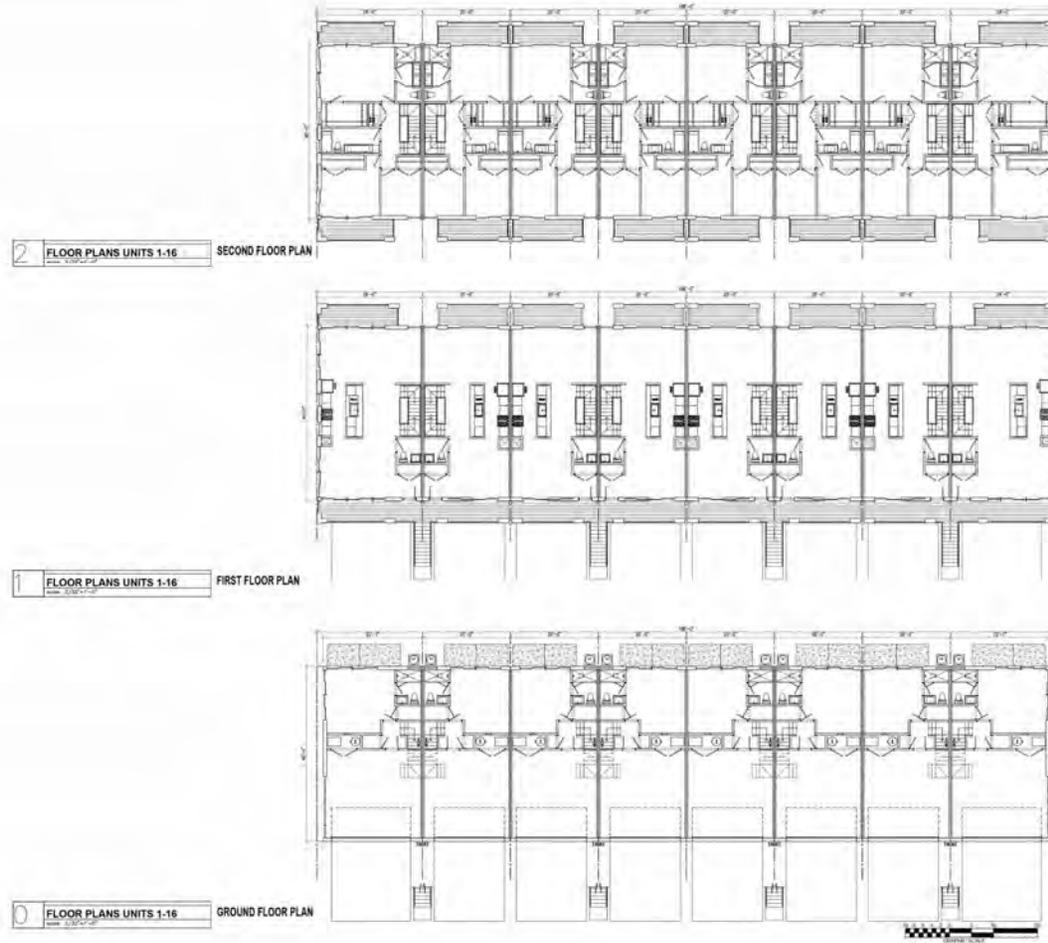


Romeo Kapudija
 MILLER STREET PARTNERS
 601 Dundee Ave,
 East Dundee IL 60118
Millerstreetpartners.com

The Sanctuary of Lake Zurich
 RT 12 and Old Rand Road- Lake Zurich Illinois

funkearchitects.com

PLAN APPROVAL 5.19.2021



Townhome Overall Plan



Romeo Kapudija
 MILLER STREET PARTNERS
 601 Dundee Ave,
 East Dundee IL 60118
Millerstreetpartners.com

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PLAN APPROVAL 5.19.2021



Townhome Unit "1" Plans

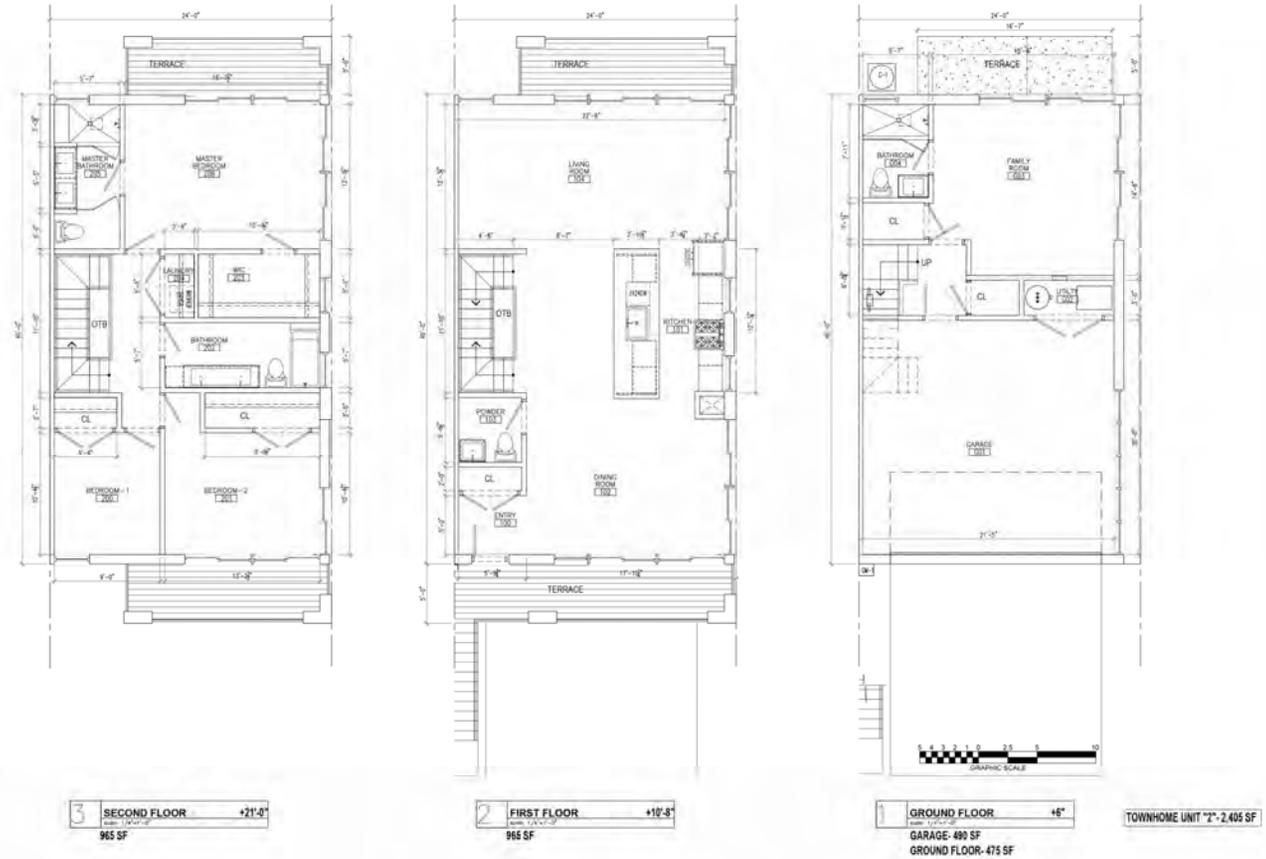


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Townhome Unit "2" Plans



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PLAN APPROVAL 5.19.2021



Townhome Elevations



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PLAN APPROVAL 5.19.2021



Retail Elevations



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RETAIL MATERIALS



ALUMINUM STOREFRONT WINDOWS AND DOOR



MODULAR BRICK



OUTDOOR PLAZA AND SEATING

TOWNHOME MATERIALS



ALUMINUM WINDOWS



NICHIHA FIBER CEMENT SIDING



STANDING SEAM METAL ROOF ACCENT



DRI-DESIGN METAL PANEL SYSTEM

Materials



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PLAN APPROVAL 5.19.2021



Aerial Northwest



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PLAN APPROVAL 5.19.2021



Aerial Southwest



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RT 12 and Old Rand Road- Lake Zurich Illinois

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PLAN APPROVAL 5.19.2021



Aerial Southeast



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PLAN APPROVAL 5.19.2021



Retail



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Corner Old Rand and RT 12



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RT 12 and Old Rand Road- Lake Zurich Illinois

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PLAN APPROVAL 5.19.2021



View from Lake



Romeo Kapudija
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East Dundee IL 60118
Millerstreetpartners.com

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RT 12 and Old Rand Road- Lake Zurich Illinois

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PLAN APPROVAL 5.19.2021



View from Lake



Romeo Kapudija
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East Dundee IL 60118
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RT 12 and Old Rand Road- Lake Zurich Illinois

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PLAN APPROVAL 5.19.2021



View from Southwest Corner- Townhome Building "C"



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East Dundee IL 60118
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The Sanctuary of Lake Zurich
RT 12 and Old Rand Road- Lake Zurich Illinois

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PLAN APPROVAL 5.19.2021



View from RT 12 Townhome Building "C"



Romeo Kapudija
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East Dundee IL 60118
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RT 12 and Old Rand Road- Lake Zurich Illinois

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PLAN APPROVAL 5.19.2021



View from RT 12 – West entrance



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East Dundee IL 60118
Millerstreetpartners.com

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RT 12 and Old Rand Road- Lake Zurich Illinois

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PLAN APPROVAL 5.19.2021



View from Old Rand Rd- North Entrance



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PLAN APPROVAL 5.19.2021



Monument Signage- Retail

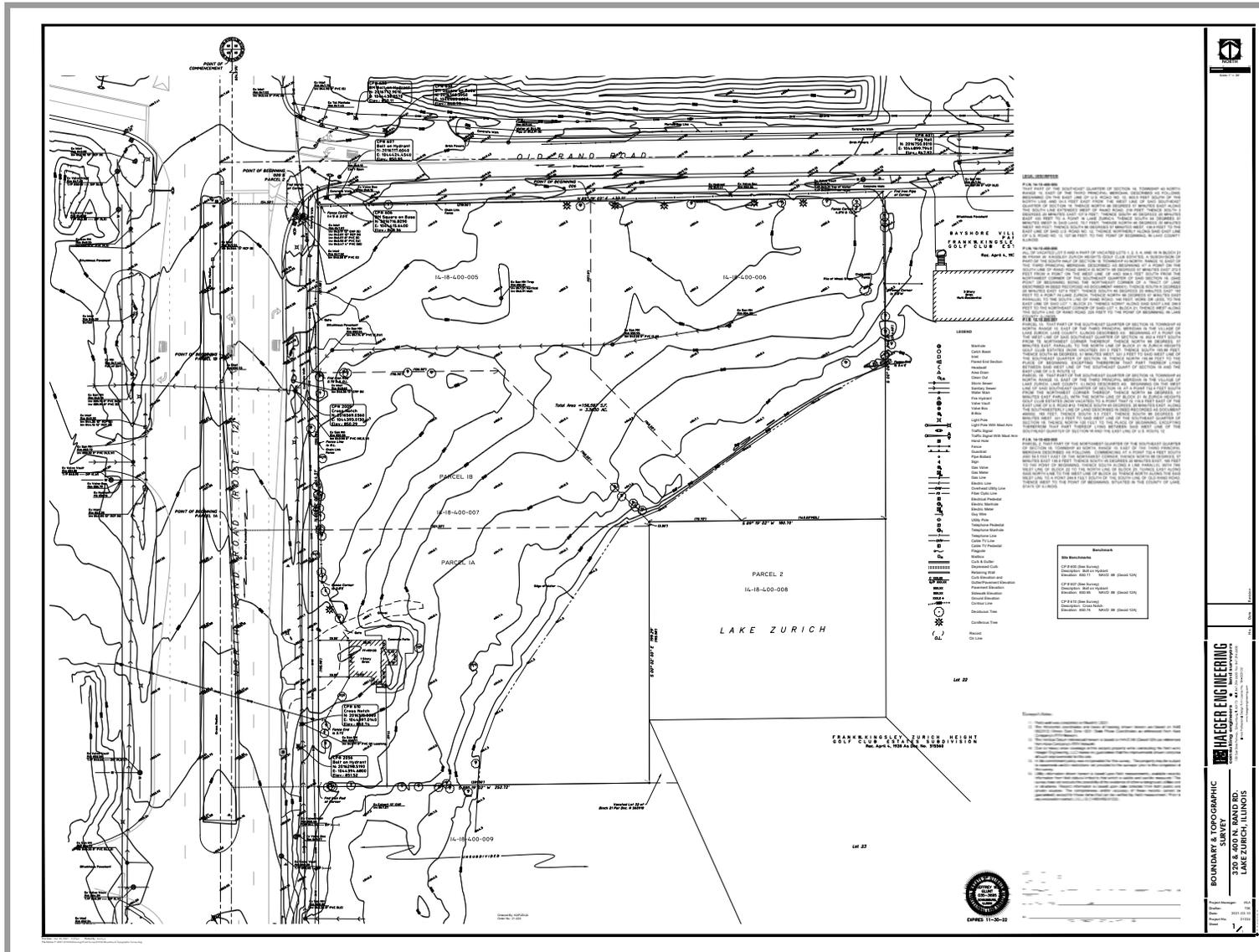
Monument Signage- Residential



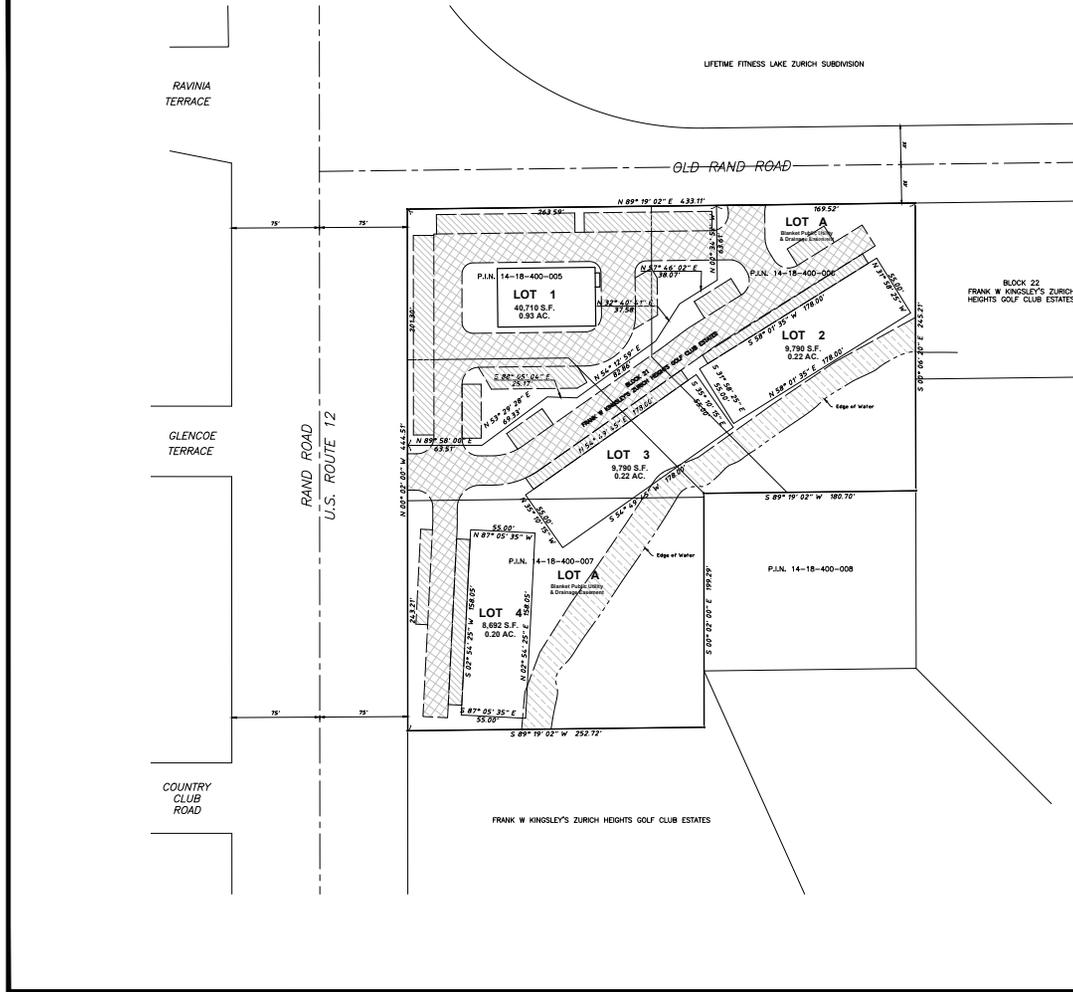
Romeo Kapudija
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RT 12 and Old Rand Road- Lake Zurich Illinois

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PRELIMINARY PLAT OF SUBDIVISION THE SANCTUARY OF LAKE ZURICH



EASEMENT HATCH LEGEND

- Proposed Permanent Non-Exclusive Roadway Ingress & Egress and Stormwater Management Easement Area
- Proposed Permanent Non-Exclusive Stormwater Management Easement
- Proposed Wetland Buffer Area to be Approved by Lake County SMC and US Army Corps

P.L.N. 14-18-400-005
 THAT PART OF THE SOUTHWEST QUARTER OF SECTION 16, TOWNSHIP 43 NORTH, RANGE 16, EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS FOLLOWS: BEGINNING ON THE EAST LINE OF U.S. ROAD NO. 12, 200.0 FEET SOUTH OF THE NORTH LINE AND 50.0 FEET EAST FROM THE WEST LINE OF SAID SOUTHWEST QUARTER OF SECTION 16, THENCE NORTH 88 DEGREES 15 MINUTES EAST ALONG THE SOUTH LINE EXTENDING NORTH OF SAID ROAD 238.1 FEET; THENCE SOUTH 88 DEGREES 15 MINUTES EAST 227.0 FEET; THENCE SOUTH 45 DEGREES 30 MINUTES EAST 100.0 FEET TO A POINT IN LAKE ZURICH; THENCE SOUTH 88 DEGREES 15 MINUTES WEST IN SAID LAKE, 70.0 FEET; THENCE NORTH 40 DEGREES 30 MINUTES WEST 100.0 FEET; THENCE SOUTH 88 DEGREES 15 MINUTES WEST, 100.0 FEET TO THE EAST LINE OF SAID U.S. ROAD NO. 12; THENCE NORTHERLY ALONG SAID EAST LINE OF U.S. ROAD NO. 12, 107.0 FEET, TO THE POINT OF BEGINNING, IN LAKE COUNTY, ILLINOIS.

P.L.N. 14-18-400-006
 ALL OF VACATED LOT 3 AND A PART OF VACATED LOTS 1, 2, 3, 4, AND 16 IN BLOCK 22 IN FRANK WY KINGSLEY'S ZURICH HEIGHTS GOLF CLUB ESTATES, A SUBDIVISION OF PART OF THE SOUTH HALF OF SECTION 16, TOWNSHIP 43 NORTH, RANGE 16, EAST OF THE THIRD PRINCIPAL MERIDIAN, DESCRIBED AS BEGINNING AT A POINT ON THE SOUTHWEST CORNER OF SAID NORTH 88 DEGREES 15 MINUTES EAST 272.0 FEET FROM A POINT ON THE WEST LINE OF SAID 50.0 FEET SOUTH FROM THE NORTHWEST CORNER OF THE SOUTHWEST QUARTER OF SAID SECTION 16, LAND POINT OF BEGINNING BEING THE NORTHWEST CORNER OF A TRACT OF LAND DESCRIBED IN SAID DOCUMENT AND BEING THENCE SOUTH 88 DEGREES 15 MINUTES WEST 227.0 FEET; THENCE SOUTH 45 DEGREES 30 MINUTES EAST 100.0 FEET TO A POINT IN LAKE ZURICH; THENCE NORTH 88 DEGREES 15 MINUTES PARALLEL TO THE SOUTHWEST CORNER OF SAID ROAD, 100.0 FEET; THENCE SOUTH 88 DEGREES 15 MINUTES WEST, 100.0 FEET TO THE WEST LINE OF SAID U.S. ROAD NO. 12; THENCE WEST ALONG SAID WEST LINE OF U.S. ROAD NO. 12, 107.0 FEET, TO THE POINT OF BEGINNING, IN LAKE COUNTY, ILLINOIS.

P.L.N. 14-18-400-007
 PARCEL 1A, THAT PART OF THE SOUTHWEST QUARTER OF SECTION 16, TOWNSHIP 43 NORTH, RANGE 16, EAST OF THE THIRD PRINCIPAL MERIDIAN IN THE VILLAGE OF LAKE ZURICH, LAKE COUNTY, ILLINOIS DESCRIBED AS: BEGINNING AT A POINT ON THE WEST LINE OF SAID SOUTHWEST QUARTER OF SECTION 16, 100.0 FEET SOUTH FROM THE NORTHWEST CORNER THEREOF; THENCE NORTH 88 DEGREES 15 MINUTES EAST, PARALLEL TO THE NORTH LINE OF BLOCK 22 IN ZURICH HEIGHTS GOLF CLUB ESTATES (NOW VACATED) 312.0 FEET; THENCE SOUTH 10.00 DEGREES WEST, 100.0 FEET; THENCE WEST, 100.0 FEET TO SAID WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 16; THENCE NORTH 88 DEGREES 15 MINUTES WEST, 100.0 FEET TO THE PLACE OF BEGINNING, EXCEPTING THEREFROM THAT PART THEREOF LYING BETWEEN SAID WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 16 AND THE EAST LINE OF U.S. ROUTE 12.

P.L.N. 14-18-400-008
 PARCEL 1B, THAT PART OF THE SOUTHWEST QUARTER OF SECTION 16, TOWNSHIP 43 NORTH, RANGE 16, EAST OF THE THIRD PRINCIPAL MERIDIAN IN THE VILLAGE OF LAKE ZURICH, LAKE COUNTY, ILLINOIS DESCRIBED AS: BEGINNING ON THE WEST LINE OF SAID SOUTHWEST QUARTER OF SECTION 16, AT A POINT 70.0 FEET SOUTH FROM THE NORTHWEST CORNER THEREOF; THENCE NORTH 88 DEGREES 15 MINUTES EAST PARALLEL TO THE NORTH LINE OF BLOCK 22 IN ZURICH HEIGHTS GOLF CLUB ESTATES (NOW VACATED) TO A POINT THAT IS 100.0 FEET EAST OF THE EAST LINE OF U.S. ROAD NO. 12; THENCE SOUTH 88 DEGREES 15 MINUTES EAST, ALONG THE SOUTHWESTERLY LINE OF SAID LINE DESCRIBED IN SAID DOCUMENT AND BEING, 100.0 FEET; THENCE SOUTH 88 DEGREES 15 MINUTES WEST, 100.0 FEET TO SAID WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 16; THENCE NORTH 88 DEGREES 15 MINUTES WEST, 100.0 FEET TO THE PLACE OF BEGINNING, EXCEPTING THEREFROM THAT PART THEREOF LYING BETWEEN SAID WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 16 AND THE EAST LINE OF U.S. ROUTE 12.

P.L.N. 14-18-400-009
 THAT PART OF THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 16, TOWNSHIP 43 NORTH, RANGE 16, EAST OF THE THIRD PRINCIPAL MERIDIAN DESCRIBED AS FOLLOWS: COMMENCING AT A POINT 70.0 FEET SOUTH AND 50.0 FEET EAST OF THE NORTHWEST CORNER, THENCE NORTH 88 DEGREES 15 MINUTES EAST 100.0 FEET; THENCE SOUTH 88 DEGREES 15 MINUTES EAST, 100.0 FEET TO THE POINT OF BEGINNING, THENCE SOUTH 45 DEGREES 30 MINUTES WEST TO THE WEST LINE OF BLOCK 22 TO THE NORTH LINE OF BLOCK 22; THENCE EAST ALONG SAID NORTH LINE TO THE WEST LINE OF BLOCK 22; THENCE NORTH ALONG SAID WEST LINE TO A POINT 220.0 FEET SOUTH OF THE NORTH LINE OF OLD RAND ROAD; THENCE WEST TO THE POINT OF BEGINNING, BEING IN THE COUNTY OF LAKE, STATE OF ILLINOIS.

HAGER ENGINEERING
 100 East Liberty Street, Suite 100, Chicago, IL 60611
 Phone: (773) 327-4400
 Fax: (773) 327-4405
 Email: info@hagereng.com
 License: Professional Engineer No. 120000333

**THE SANCTUARY OF LAKE ZURICH
 PRELIMINARY PLAT
 OF SUBDIVISION**

Project Manager: MJA
 Engineer: 03.31.2021
 Date: 21-024
 Sheet: 1

THE SANCTUARY OF LAKE ZURICH ROUTE 12 & OLD RAND ROAD LAKE ZURICH

PRELIMINARY ENGINEERING REPORT



Project:

The Sanctuary of Lake Zurich

Location:

Southeast Corner of
US-12 Rand Road & Old Rand Road

Prepared For:

Romeo Kapudija
601 Dundee Ave
East Dundee, IL 60118

Date:

March 31, 2021
Revised: May 13, 2021

Prepared By:

Mike Anderson, P.E.
Haeger Project No.: 21-024



EXPIRES 11-30-21





PROJECT OVERVIEW

The proposed project is on a 3.59-ac parcel of land at the southeast corner of US-12 Rand Road and Old Rand Road within the corporate limits of the Village of Lake Zurich. The project proposes a mixed-use development on the land with a 0.95-acre retail lot for a 4,200-sf retail building with outdoor space and 65 parking spaces. The remainder of the property proposes three townhome buildings totaling 23 residential units.

EXISTING CONDITIONS

The 3.59-acre parcel contains ownership within the adjacent Lake Zurich – 0.65-acre of land is within the lake area and 2.94 acres is upland. The property presently contains an existing building and informal parking area at its southern end. The northern portion of the property was previously a retail development, most recently a restaurant with parking lot – this development was demolished between 1999-2001 based on historic photos of the area.

SANITARY SEWER & WATER SUPPLY

The property presently has Village of Lake Zurich watermain and sanitary sewer available to it, running along the US-12 frontage and the Old Rand Road frontage. A relatively new sanitary sewer was constructed inside of the property around 2005 which will be reused. Proposed connections to the existing watermain are proposed on each frontage creating a looped connection through the site.

STORMWATER MANAGEMENT

The majority of the site currently sheds into the lake via surface sheet flow. No storm sewers were encountered on the property during topographic survey investigation. A small portion of the property at the northeast corner of the site sheds to the northeast, into the southern Old Rand Road right-of-way.

As mentioned, the site previously contained a retail development which was demolished around 1999-2001. We have provided an exhibit showing an aerial photo from 1994 showing the previous impervious coverage of building and parking lot. Based on evidence from the current topographic survey and the historic photos, we have estimated the total existing upland site impervious area to be 1.54 acre in October 1992 when the Lake County WDO was enacted. As discussed with Village staff we are proposing to provide stormwater detention for the project excluding this 1.54 acre impervious area.

The development site plan proposes 1.28 acres of impervious area (rooftops and standard pavement), 0.51 acre of pervious pavement (parking spaces, driveways, patios & sidewalks) and 0.96 acre of landscaped pervious area. With the 1.54 acre previous impervious area excluded from the detention calculation, stormwater detention is proposed for the remainder site pervious pavement and pervious areas, 0.51 ac of site pervious pavement and 0.92 acre of landscaped pervious area, totaling 1.43 acres of developed land with a developed curve number of 80. This results in required storage volume of 0.55 ac-ft with a maximum release rate of 0.21 cfs from the site.

The proposed site will utilize permeable pavement (porous concrete) within all proposed passenger car parking spaces, patios and sidewalks to provide stormwater management along with oversized storm sewers within the site. The proposed pavement section includes 12 inches of CA-7 aggregate with no fines, which provides water storage in the stone void space at a ratio of 0.36. Traditional pavement is proposed for all drive aisles within the project, but with the same CA-7 open graded stone base as proposed for the pervious pavement section, which is interconnected.



The total volume of storage available in the total combined 12-inch CA-7 stone base of the pervious and standard pavement sections (52,665 s.f.) is 18,960 cubic feet, or 0.44 acre-feet of storage. Additionally approximately 750 lineal feet of oversized 36-inch storm sewer is proposed to provide an additional 0.12 ac-ft of storage volume, providing a total storage volume of 0.56 ac-ft.

All proposed pavement underdrains will be routed into site storm sewer which will be directed into a water quality hydrodynamic separator device to remove suspended solids. We note that the use of permeable pavement itself provided suspended solid removal. The stormwater management system will discharge into an infiltration trench along the east property line which when inundated will discharge via the surface of the infiltration trench at elevation 844.5, which is located approximately 15-ft from the shoreline of the lake. No new storm sewer discharge connection into the lake is proposed with the development. The combination of these elements will address County stormwater quality RVR requirements.

FLOODPLAIN IMPACTS

The FEMA flood map for the area indicates that the 100-year flood elevation of the lake is elevation 844.0. No part of the upland area of the property is below this elevation, and as such no fill below the floodplain is proposed with the project.

WETLAND / WATERS OF THE U.S.

The lake will be considered a Waters of the United States, jurisdictional to the US Army Corps of Engineers. As mentioned above, no impacts are proposed to the shoreline or the lake and as such we have requested a Letter of No Objection from the US Army Corps for the project.

The Lake County WDO also has requirements for providing buffers from wetland or Waters of the U.S. which is typically 50 feet, but able to be mitigated to a minimum of half of the amount. We propose to provide a minimum 25-foot wetland buffer along the shoreline of the project from the Ordinary High Water Mark. This is done to match the setbacks used in the two adjoining properties to the south and east, both of which are multifamily residential developments. The building setbacks from the lake shoreline in these adjacent developments vary between 20 feet to 30 feet, and as such the minimum 25-ft buffer is proposed. We note that with the aforementioned stormwater management section that the use of permeable pavement, stormwater storage and routing through a water quality device will provide a net benefit to the water quality on the proposed site, along with the use of native plantings within the buffer area and no new direct discharge connections into the lake, which will justify the wetland buffer mitigation that is requested for the project.



Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271
<http://dnr.state.il.us>

JB Pritzker, Governor

Colleen Callahan, Director

April 12, 2021

Robert Vanni
 Robert Vanni
 Midwest Ecological, Inc.
 PO Box 321
 Gilberts, IL 60136

RE: The Sanctuary of Lake Zurich
Project Number(s): 2112444
County: Lake

Dear Applicant:

This letter is in reference to the project you recently submitted for consultation. The natural resource review provided by EcoCAT identified protected resources that may be in the vicinity of the proposed action. The Department has evaluated this information and concluded that adverse effects are unlikely. Therefore, consultation under 17 Ill. Adm. Code Part 1075 is terminated.

However, soil erosion and sediment control BMP's should be properly implemented and strictly followed to protect water quality to protect water quality in Lake Zurich.

This consultation is valid for two years unless new information becomes available that was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary.

The natural resource review reflects the information existing in the Illinois Natural Heritage Database at the time of the project submittal, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, you must comply with the applicable statutes and regulations. Also, note that termination does not imply IDNR's authorization or endorsement of the proposed action.

Please contact me if you have questions regarding this review.

Bradley Hayes
 Division of Ecosystems and Environment
 217-785-5500



DEPARTMENT OF THE ARMY
CHICAGO DISTRICT, CORPS OF ENGINEERS
231 SOUTH LA SALLE STREET
CHICAGO, ILLINOIS 60604-1437

REPLY TO
ATTENTION OF:

May 5, 2021

Operations Division
Regulatory Branch
LRC-2021-00354

SUBJECT: Jurisdictional Determination for the Sanctuary at Lake Zurich Property Located at 881 North Old Rand Road in Lake Zurich, Lake County, Illinois (Latitude 42.238523, Longitude -87.99014)

Romeo Kapudija
Holmes LLC
601 Dundee Avenue
East Dundee, Illinois 60118

Dear Mr. Kapudija:

This is in response to your request that the U.S. Army Corps of Engineers complete a jurisdictional determination for the above-referenced site submitted on your behalf by Midwest Ecological. The subject project has been assigned number LRC-2021-00354. Please reference this number in all future correspondence concerning this project.

Following a review of the information you submitted, this office has determined that the subject property contains "waters of the United States".

Lake Zurich has been determined to be under the jurisdiction of this office and therefore, subject to Federal regulation.

This office concurs with the submitted wetland delineation, and wetland boundaries at the subject site. This confirmation is valid for a period of five years from the date of this letter unless new information warrants revision of the delineation prior to the expiration date.

For a detailed description of our determination please refer to the enclosed decision document. This determination covers only your project as depicted in the Wetland Delineation Report dated April 8, 2021, prepared by Midwest Ecological.

This determination is valid for a period of five (5) years from the date of the letter, unless new information warrants revision of the determination before the expiration date or a District Commander has identified, after public notice and comment, that specific geographic areas with rapidly changing environmental conditions merit re-verification on a more frequent basis.

This letter is considered an approved jurisdictional determination for your subject site. If you object to this determination, you may appeal, according to 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and a Request for Appeal (RFA) form. If you request to appeal the above determination, you must submit a completed RFA form to the Great Lakes/Ohio River Division Office at the following address:

Jacob Siegrist
Regulatory Appeals Review Officer
US Army Corps of Engineers
Great Lakes and Ohio River Division
550 Main Street, Room 10-714
Cincinnati, Ohio 45202-3222
Phone: (513) 684-2699 Fax: (513) 684-2460

In order to be accepted, your RFA must be complete, meet the criteria for appeal and be received by the Division Office within sixty (60) days of the date of the NAP. If you concur with the determination in this letter, submittal of the RFA form to the Division office is not necessary.

This determination has been conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular site identified in this request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service prior to starting work.

It is your responsibility to obtain any required state, county, or local approvals for impacts to wetland areas not under the Department of the Army jurisdiction. For projects in unincorporated areas of Lake County, please contact Lake County Planning, Building and Development at (847) 377-2600. For projects in incorporated areas of Lake County, please contact the Lake County Stormwater Management Commission at (847) 377-7700.

Pursuant to Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers regulates the discharge of dredged or fill material into waters of the United States, including wetlands. A Department of the Army permit is required for any proposed work involving the discharge of dredged or fill material within the jurisdiction of this office. To initiate the permit process, please submit a joint permit application form along with detailed plans of the proposed work. Information concerning our program, including the application form and an application checklist, can be found at and downloaded from our website:
<http://www.lrc.usace.army.mil/Missions/Regulatory.aspx>

If you have any questions, please contact Mr. Michael J. Machalek of my staff by telephone at (312) 846-5534 or email at Mike.J.Machalek@usace.army.mil.

Sincerely,

Kathleen G. Chernich
Chief, East Section
Regulatory Branch

Enclosures

Copy Furnished w/out Enclosures

Lake County Stormwater Management Commission (Kurt Woolford)
Lake County Planning, Building and Development Department (Eric Steffen)
Midwest Ecological (Rob Vanni)

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND
REQUEST FOR APPEAL**

Applicant: Romeo Kapudija, Holmes LLC		File Number: LRC-2021-00354	Date: May 5, 2021
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of Permission)	A	
	PROFFERED PERMIT (Standard Permit or Letter of Permission)	B	
	PERMIT DENIAL	C	
X	APPROVED JURISDICTIONAL DETERMINATION	D	
	PRELIMINARY JURISDICTIONAL DETERMINATION	E	

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A. INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit or a Letter of Permission (LOP), you may sign the permit document and return it to the district commander for final authorization. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district commander. Your objections must be received by the district commander within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district commander will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district commander will send you a proffered permit for your reconsideration, as indicated in Section B below.

B. PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit or a Letter of Permission (LOP), you may sign the permit document and return it to the district commander for final authorization. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division commander. This form must be received by the division commander within 60 days of the date of this notice.

C. PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division commander. This form must be received by the division commander within 60 days of the date of this notice.

D. APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division commander. This form must be received by the division commander within 60 days of the date of this notice.

E. PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

<p>If you have questions regarding this decision and/or the appeal process you may contact:</p> <p>Regulatory Branch Chicago District Corps of Engineers 231 South LaSalle Street, Suite 1500 Chicago, IL 60604-1437 Phone: (312) 846-5530 Fax: (312) 353-4110</p>	<p>If you only have questions regarding the appeal process you may also contact:</p> <p>Jacob Siegrist Regulatory Appeals Review Officer US Army Corps of Engineers Great Lakes and Ohio River Division 550 Main Street, Room 10524 Cincinnati, Ohio 45202-3222 Phone: (513) 684-2699 Fax: (513) 684-2460</p>
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RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Commanders personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15-day notice of any site investigation, and will have the opportunity to participate in all site investigations.

<p>_____</p> <p>Signature of appellant or agent.</p>	<p>Date:</p>	<p>Telephone number:</p>
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**HISTORIC EXHIBIT
IMPERVIOUS SURFACE 1997**

LAKE ZURICH

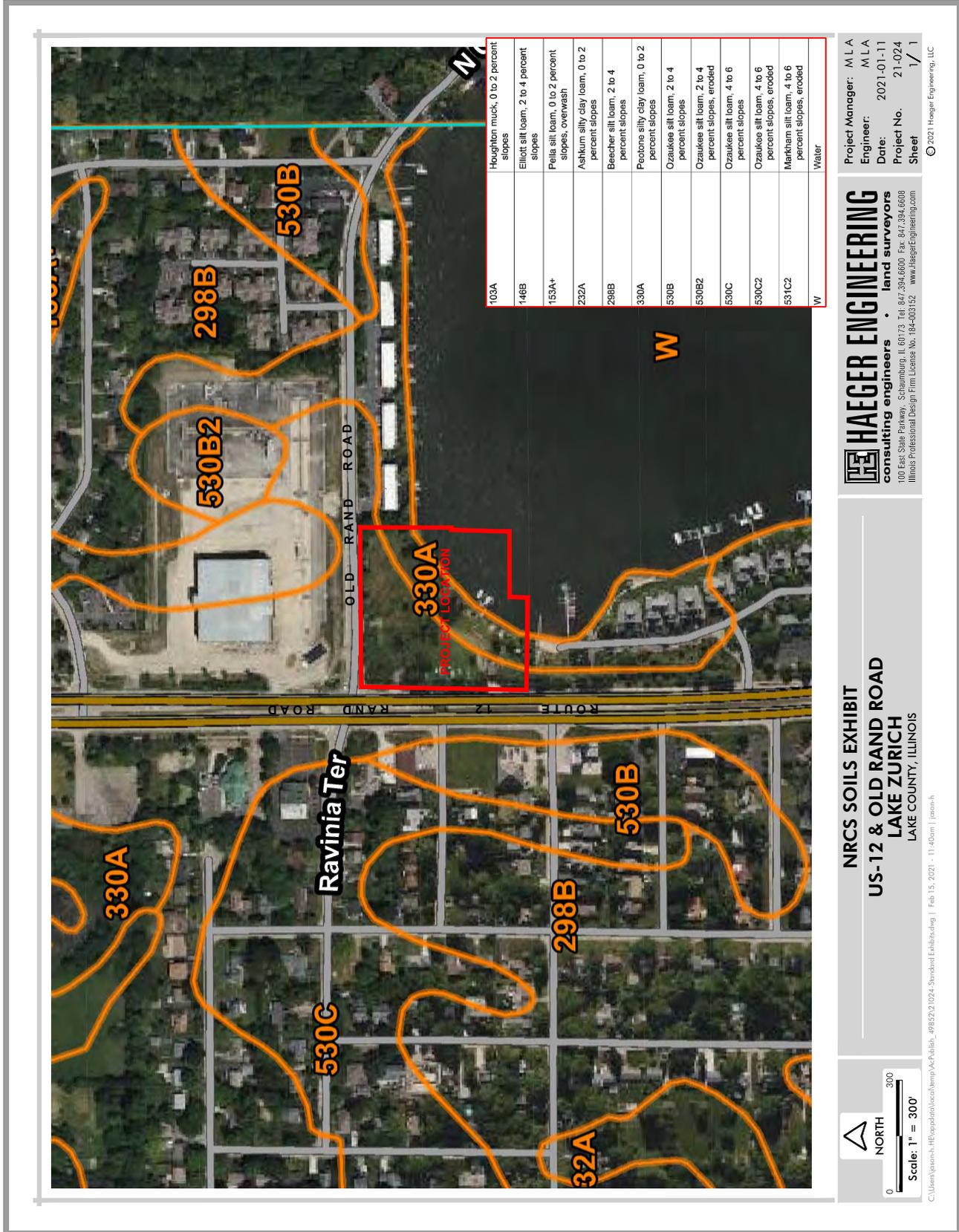
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Project Manager: MLA
 Engineer:
 Date: 04.29.2021
 Project No. 21-024
 Sheet 1 / 1

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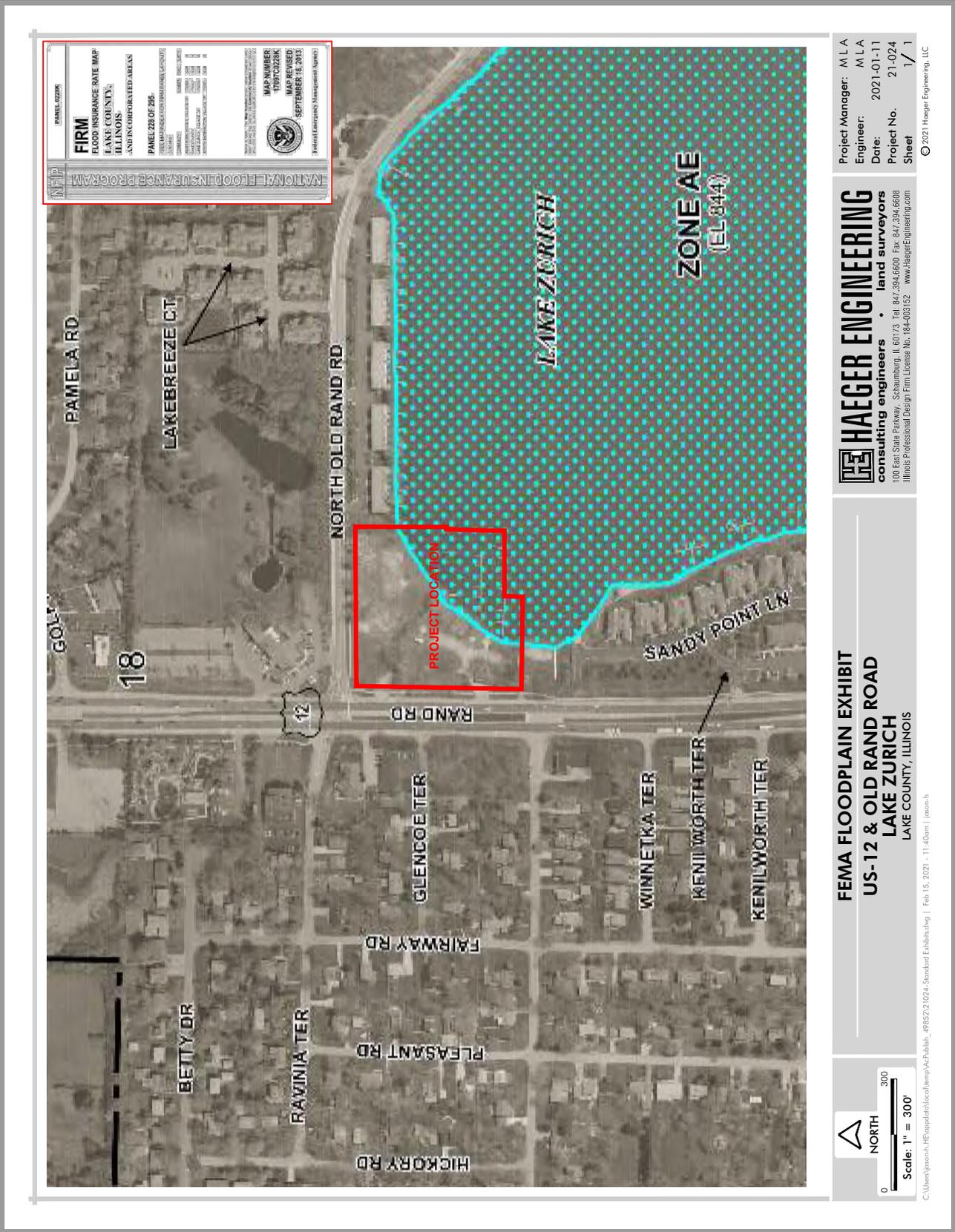
Project Manager: M LA
 Engineer: M LA
 Date: 2021-01-11
 Project No. 21-024
 Sheet 1 / 1

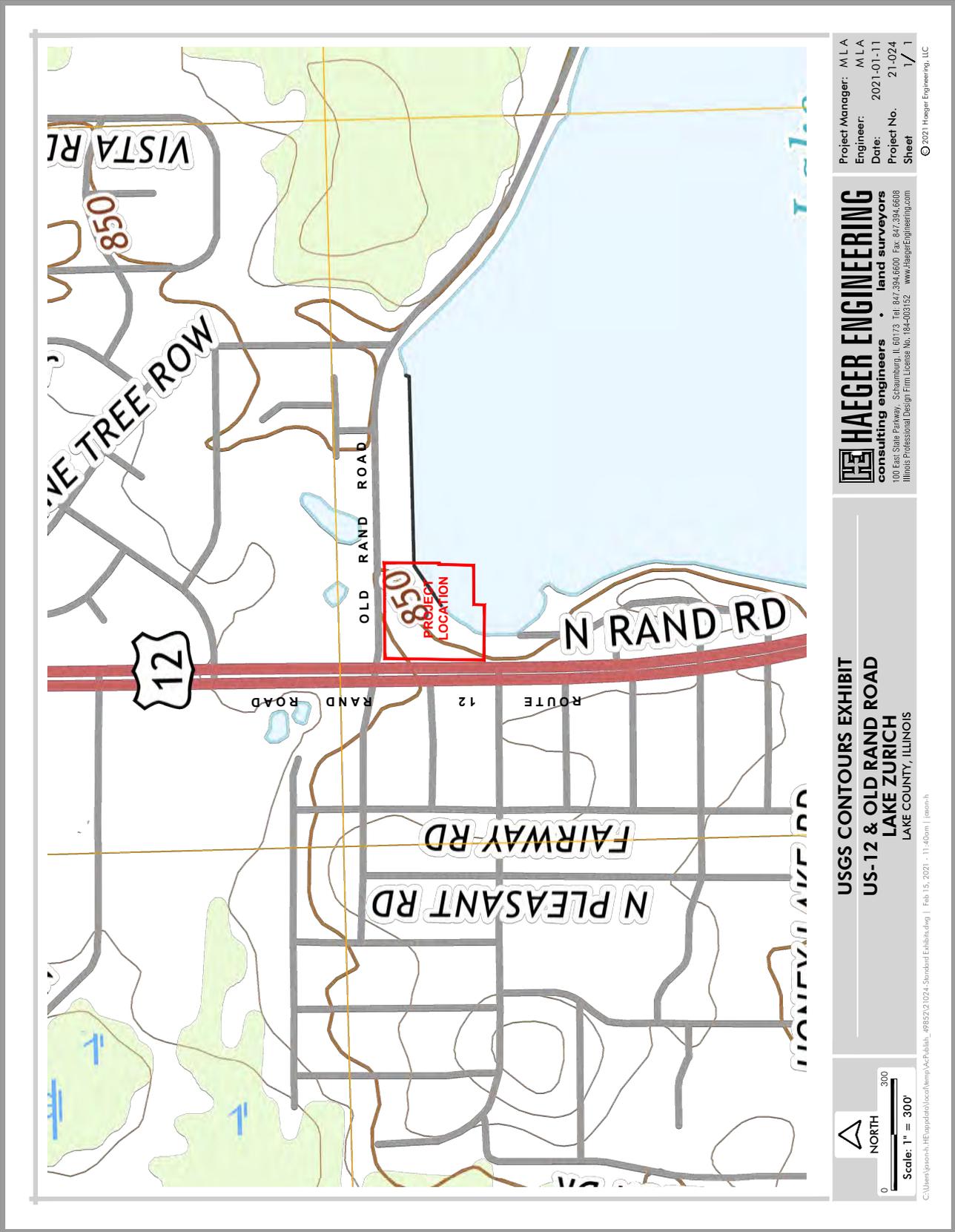
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NRCS SOILS EXHIBIT
US-12 & OLD RAND ROAD
LAKE ZURICH
 LAKE COUNTY, ILLINOIS

NORTH
 0 300
Scale: 1" = 300'

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Project Manager: M.L.A
 Engineer: M.L.A
 Date: 2021-01-11
 Project No. 21-024
 Sheet 1 / 1

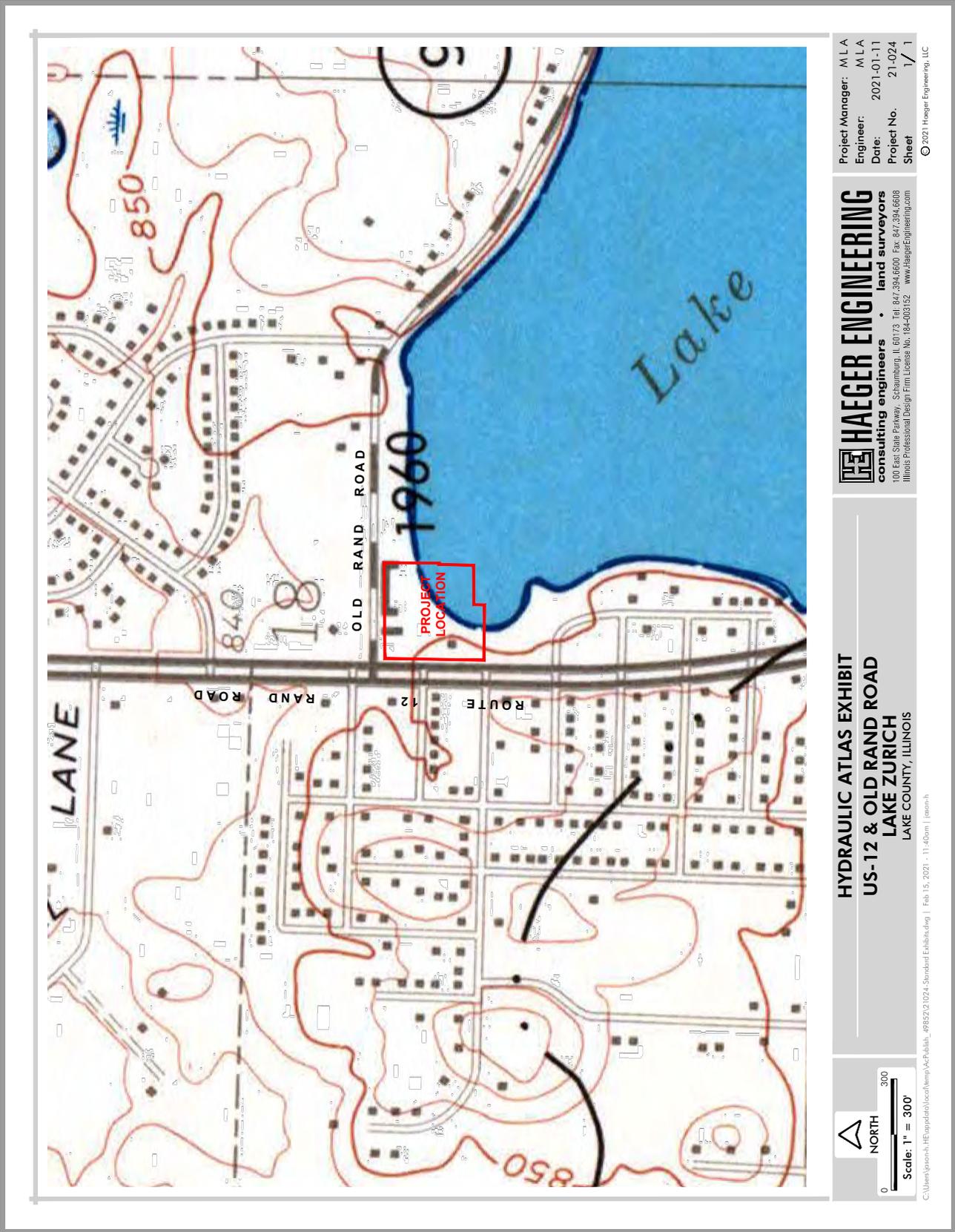
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USGS CONTOURS EXHIBIT
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 LAKE COUNTY, ILLINOIS

NORTH
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 Engineer: M.L.A.
 Date: 2021-01-11
 Project No. 21-024
 Sheet 1 / 1

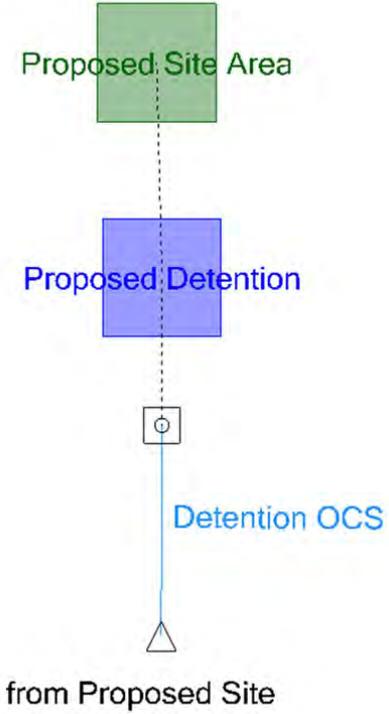
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HYDRAULIC ATLAS EXHIBIT
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LAKE ZURICH
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PROPOSED CONDITIONS MODEL
2-Year 24-Hour & 100-Year 24-Hour Events

Project Summary	
Title	Kapudjia Development
Engineer	DJV
Company	Haeger Engineering LLC
Date	5/13/2021
Notes: Proposed Conditions PondPack Report	

Table of Contents		
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875 - 100 Year Critical Storm	Time-Depth Curve, 100.00 years (100 yr 24 hr)	3
875 - 2 Year Critical Storm	Time-Depth Curve, 2.00 years (2 yr 24 hr)	4
Proposed Site Area	Runoff CV-Area, 100.00 years (100 yr 24 hr)	5
Proposed Detention	Elevation vs. Volume Curve, 100.00 years (100 yr 24 hr)	6
Proposed Detention OCS	Outlet Input Data, 100.00 years (100 yr 24 hr)	7

21024-Proposed Conditions.ppc
5/13/2021

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PondPack CONNECT Edition
[16.02.00.01]
Page 1 of 9

Subsection: Master Network Summary

Catchments Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
Proposed Site Area	2 yr 24 hr	2.00	0.180	15.90	0.28
Proposed Site Area	100 yr 24 hr	100.00	0.734	15.90	0.98

Node Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)
from Proposed Site	2 yr 24 hr	2.00	0.175	24.10	0.05
from Proposed Site	100 yr 24 hr	100.00	0.700	21.40	0.21

Pond Summary

Label	Scenario	Return Event (years)	Hydrograph Volume (ac-ft)	Time to Peak (hours)	Peak Flow (ft ³ /s)	Maximum Water Surface Elevation (ft)	Maximum Pond Storage (ac-ft)
Proposed Detention (IN)	2 yr 24 hr	2.00	0.180	15.90	0.28	(N/A)	(N/A)
Proposed Detention (OUT)	2 yr 24 hr	2.00	0.175	24.10	0.05	100.99	0.141
Proposed Detention (IN)	100 yr 24 hr	100.00	0.734	15.90	0.98	(N/A)	(N/A)
Proposed Detention (OUT)	100 yr 24 hr	100.00	0.700	21.40	0.21	103.88	0.552

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[16.02.00.01]
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Subsection: Time-Depth Curve
Label: 875 - 100 Year Critical Storm
Scenario: 100 yr 24 hr

Return Event: 100.00 years
Storm Event: 24 hr 100 yr

Time-Depth Curve: 24 hr 100 yr	
Label	24 hr 100 yr
Start Time	0.00 hours
Increment	0.24 hours
End Time	24.00 hours
Return Event	100.00 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.24 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)				
0.00	0.00	0.04	0.08	0.13	0.17
1.20	0.21	0.26	0.31	0.35	0.40
2.40	0.45	0.50	0.55	0.60	0.65
3.60	0.70	0.75	0.80	0.85	0.91
4.80	0.96	1.01	1.07	1.12	1.18
6.00	1.23	1.28	1.34	1.39	1.44
7.20	1.50	1.55	1.61	1.66	1.73
8.40	1.79	1.86	1.92	1.99	2.06
9.60	2.13	2.21	2.29	2.38	2.46
10.80	2.57	2.67	2.78	2.89	3.00
12.00	3.12	3.27	3.43	3.58	3.74
13.20	3.90	4.07	4.24	4.41	4.59
14.40	4.77	4.95	5.14	5.32	5.50
15.60	5.69	5.87	6.05	6.22	6.39
16.80	6.56	6.72	6.86	7.00	7.14
18.00	7.28	7.38	7.46	7.58	7.67
19.20	7.75	7.82	7.89	7.96	8.01
20.40	8.06	8.10	8.15	8.19	8.22
21.60	8.26	8.29	8.33	8.36	8.39
22.80	8.42	8.45	8.48	8.51	8.54
24.00	8.57	(N/A)	(N/A)	(N/A)	(N/A)

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Subsection: Time-Depth Curve
 Label: 875 - 2 Year Critical Storm
 Scenario: 2 yr 24 hr

Return Event: 2.00 years
 Storm Event: 24 hr 2 yr

Time-Depth Curve: 24 hr 2 yr	
Label	24 hr 2 yr
Start Time	0.00 hours
Increment	0.24 hours
End Time	24.00 hours
Return Event	2.00 years

CUMULATIVE RAINFALL (in)
Output Time Increment = 0.24 hours
Time on left represents time for first value in each row.

Time (hours)	Depth (in)				
0.00	0.00	0.02	0.03	0.05	0.07
1.20	0.08	0.10	0.12	0.14	0.16
2.40	0.18	0.19	0.21	0.23	0.25
3.60	0.27	0.29	0.31	0.33	0.35
4.80	0.37	0.39	0.42	0.44	0.46
6.00	0.48	0.50	0.52	0.54	0.56
7.20	0.58	0.60	0.63	0.65	0.67
8.40	0.70	0.72	0.75	0.78	0.80
9.60	0.83	0.86	0.89	0.93	0.97
10.80	1.00	1.04	1.08	1.13	1.17
12.00	1.21	1.27	1.34	1.40	1.46
13.20	1.52	1.59	1.65	1.72	1.79
14.40	1.86	1.93	2.00	2.07	2.14
15.60	2.22	2.29	2.36	2.42	2.49
16.80	2.56	2.62	2.67	2.73	2.78
18.00	2.84	2.87	2.91	2.95	2.99
19.20	3.02	3.05	3.07	3.10	3.12
20.40	3.14	3.16	3.18	3.19	3.21
21.60	3.22	3.23	3.25	3.26	3.27
22.80	3.28	3.29	3.31	3.32	3.33
24.00	3.34	(N/A)	(N/A)	(N/A)	(N/A)

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5/13/2021

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Page 4 of 9

Subsection: Runoff CN-Area
 Label: Proposed Site Area
 Scenario: 100 yr 24 hr

Return Event: 100.00 years
 Storm Event: 24 hr 100 yr

Runoff Curve Number Data

Soil/Surface Description	CN	Area (acres)	C (%)	UC (%)	Adjusted CN
Pervious Type D	80.000	0.920	0.0	0.0	80.000
Permeable Pavement	80.000	0.510	0.0	0.0	80.000
COMPOSITE AREA & WEIGHTED CN -->	(N/A)	1.430	(N/A)	(N/A)	80.000

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Subsection: Elevation vs. Volume Curve
 Label: Proposed Detention
 Scenario: 100 yr 24 hr

Return Event: 100.00 years
 Storm Event: 24 hr 100 yr

Elevation-Volume

Pond Elevation (ft)	Pond Volume (ac-ft)
100.00	0.000
104.00	0.570

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Subsection: Outlet Input Data
 Label: Proposed Detention OCS
 Scenario: 100 yr 24 hr

Return Event: 100.00 years
 Storm Event: 24 hr 100 yr

Requested Pond Water Surface Elevations

Minimum (Headwater)	100.00 ft
Increment (Headwater)	0.10 ft
Maximum (Headwater)	104.00 ft

Outlet Connectivity

Structure Type	Outlet ID	Direction	Outfall	E1 (ft)	E2 (ft)
Orifice-Circular	Proposed Detention OCS - Orifice 1	Forward	TW	100.00	104.00
Orifice-Circular	Proposed Detention OCS - Orifice 2	Forward	TW	101.00	104.00
Tailwater Settings	Tailwater			(N/A)	(N/A)

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5/13/2021

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Page 7 of 9

Subsection: Outlet Input Data
 Label: Proposed Detention OCS
 Scenario: 100 yr 24 hr

Return Event: 100.00 years
 Storm Event: 24 hr 100 yr

Structure ID: Proposed Detention OCS - Orifice 1	
Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	100.00 ft
Orifice Diameter	1.35 in
Orifice Coefficient	0.610

Structure ID: Proposed Detention OCS - Orifice 2	
Structure Type: Orifice-Circular	
Number of Openings	1
Elevation	101.00 ft
Orifice Diameter	1.60 in
Orifice Coefficient	0.610

Structure ID: TW	
Structure Type: TW Setup, DS Channel	
Tailwater Type	Free Outfall

Convergence Tolerances	
Maximum Iterations	50
Tailwater Tolerance (Minimum)	0.01 ft
Tailwater Tolerance (Maximum)	0.10 ft
Headwater Tolerance (Minimum)	0.01 ft
Headwater Tolerance (Maximum)	0.10 ft
Flow Tolerance (Minimum)	0.001 R ^{1/3}
Flow Tolerance (Maximum)	10.000 R ^{1/3}

Index

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- B75 - 100 Year Critical Storm (Time-Depth Curve, 100.00 years (100 yr 24 hr))...3
- B75 - 2 Year Critical Storm (Time-Depth Curve, 2.00 years (2 yr 24 hr))...4
- M
- Master Network Summary...2
- P
- Proposed Detention (Elevation vs. Volume Curve, 100.00 years (100 yr 24 hr))...6
- Proposed Detention OCS (Outlet Input Data, 100.00 years (100 yr 24 hr))...7, 8
- Proposed Site Area (Runoff CN-Area, 100.00 years (100 yr 24 hr))...5

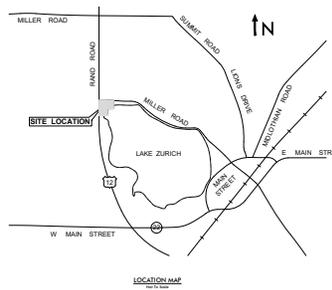
SANCTUARY OF LAKE ZURICH PRELIMINARY ENGINEERING PLANS

SECTION 18 TOWNSHIP 43 NORTH RANGE 10 EAST LAKE ZURICH, ILLINOIS LAKE COUNTY

DEVELOPER / SUBDIVIDER:
Romco Kapujsa
601 Dundee Ave
East Dundee, IL 60118
Tel: 815-298-2066

PREPARED BY:
Haeger Engineering LLC
Romco Kapujsa
100 E. State Parkway
Schmalsburg, IL 60179
Tel: 847-394-6600
Fax: 847-394-6609
www.haegerengineering.com

VILLAGE OF LAKE ZURICH
70 E. Main Street
Lake Zurich, IL 60047
Tel: 847-438-5141



NO.	DESCRIPTION
C1.0	TITLE SHEET
C2.0	EXISTING CONDITIONS & DEMOLITION PLAN
C3.0	PRELIMINARY SITE PLAN
C4.0	PRELIMINARY GRADING PLAN
C5.0	PRELIMINARY UTILITY PLAN
C6.0	TYPICAL DETAILS

Existing Symbol	Description	Proposed Symbol
○	Storm Sewer Manhole	●
○	Catch Basin	●
○	Inlet	●
○	Flange End Section	●
○	Headwall	●
○	Area Drain	●
○	Sanitary Sewer Manhole	●
○	Clean Out	●
○	Storm Sewer	—
○	Storm Sewer Service	—
○	Perforated Underdrain	—
○	Sanitary Sewer	—
○	Sanitary Sewer Service	—
○	Consigned Sewer	—
○	Force Main	—
○	Water Main	—
○	Water Main Service	—
○	Fire Hydrant	—
○	Valve Vault	—
○	Valve Box	—
○	S-Box	—
○	Well Head	—
○	Light Pole	—
○	Light Pole With Mast Arm	—
○	Traffic Signal	—
○	Traffic Signal With Mast Arm	—
○	Hand Hole	—
○	Fence	—
○	Guardrail	—
○	Pipe Ballast	—
○	Sign	—
○	Gas Valve	—
○	Gas Line	—
○	Electric Line	—
○	Overhead Utility Line	—
○	Fiber Optic Line	—
○	Electrical Pedestal	—
○	Electric Manhole	—
○	Guy Wire	—
○	Telephone Pedestal	—
○	Telephone Manhole	—
○	Telephone Line	—
○	Cable TV Line	—
○	Cable TV Pedestal	—
○	Flagpole	—
○	Mailbox	—
○	Handicapped Parking Stall	—
○	Number of Parking Stalls	—
○	Curb & Gutter	—
○	Reversible Plain Curb & Gutter	—
○	Depressed Curb	—
○	Rising Inlet	—
○	Curb Elevation and	—
○	Outlet/Pavement Elevation	—
○	Pavement Elevation	—
○	Slowdown Elevation	—
○	Ground Elevation	—
○	Top of Wall Elevation	—
○	Bottom of Wall Elevation	—
○	Open Lid Frame & Grate	—
○	Closed Lid Frame & Lid	—
○	French Grate	—
○	Garage Floor	—
○	Top of Foundation	—
○	Grade	—
○	Hardscape Flow	—
○	Softscape Flow	—
○	Contour Line	—
○	Wetland	—
○	Wetland Buffer	—
○	Normal Water Level	—
○	High Water Level	—
○	Flood Plain	—
○	Flood Way	—
○	Deciduous Tree	—
○	Coniferous Tree	—
○	Bush	—
○	Brushline	—
○	Soil Boring	—
○	Over Land Flow Route	—
○	Recommended Change Hand With Driveway Slope	—



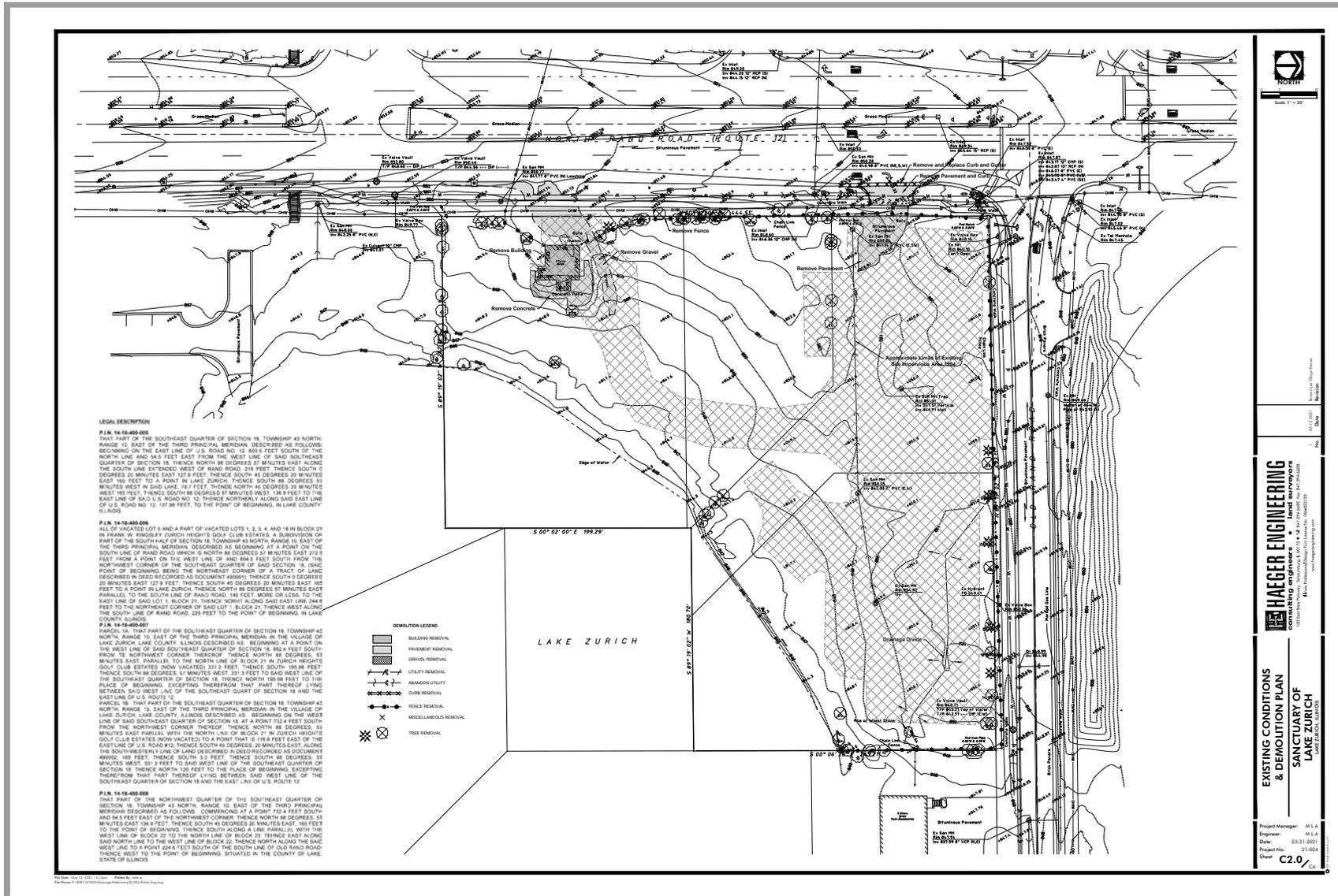
Know what's below.
Call before you dig.

Note: Call 811 at least 48 hours, excluding weekends and holidays, before you dig.

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TITLE SHEET
SANCTUARY OF LAKE ZURICH
LAKE ZURICH, ILLINOIS

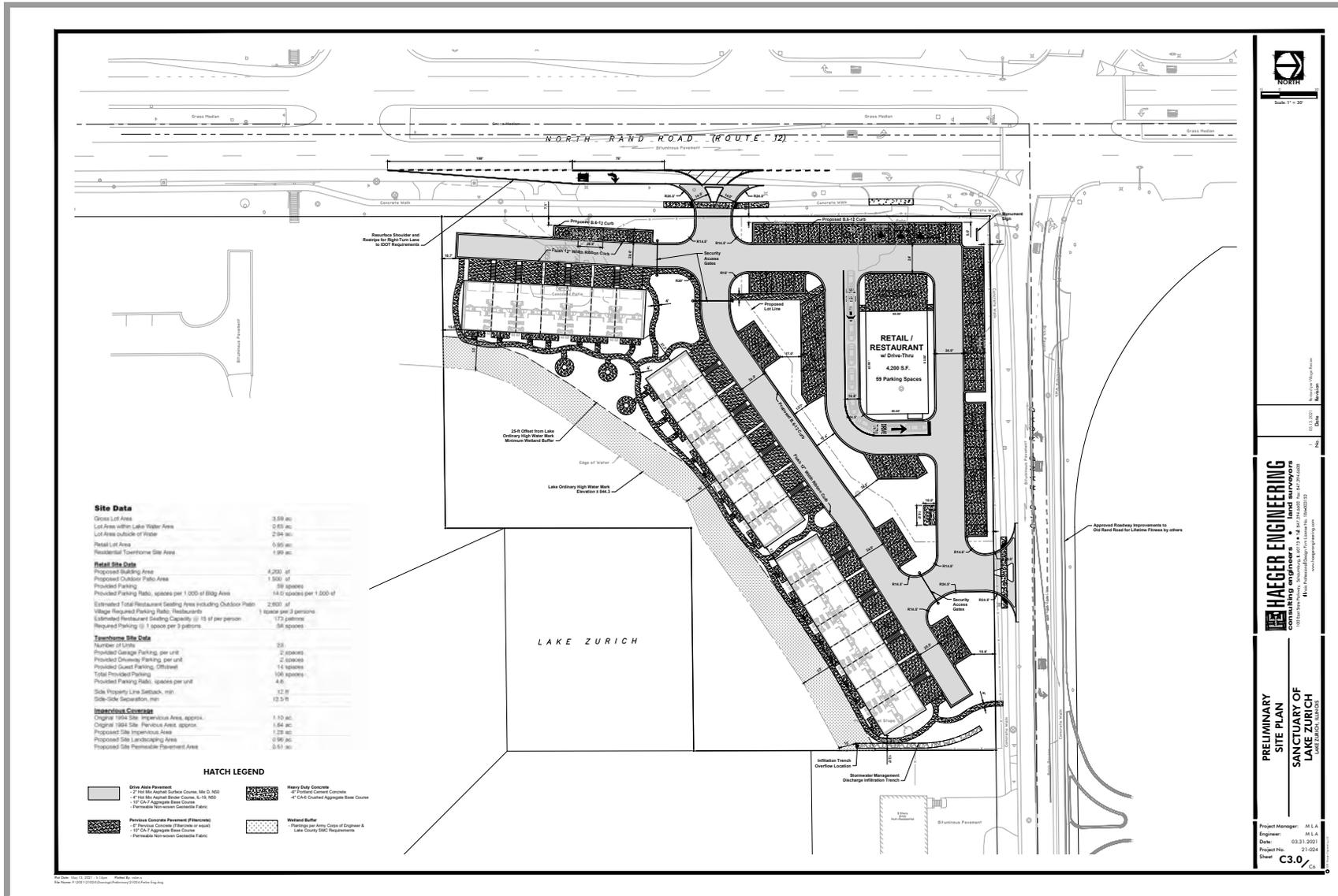
Project Manager: H.L.A.
Engineer: H.L.A.
Date: 03.31.2021
Project No.: 21-024
Sheet: **C1.0**



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EXISTING CONDITIONS & DEMOLITION PLAN
SANCTUARY OF OLD LAKE ZURICH
 LAKE ZURICH, ILLINOIS

Project Manager: M.L.A.
 Engineer: M.L.A.
 Date: 03.31.2024
 Project No.: 21-024
 Sheet: **C2.0**



Site Data

Gross Lot Area	3.99 ac
Lot Area within Lake Water Area	0.85 ac
Lot Area outside of Water	2.94 ac
Retail Lot Area	0.90 ac
Residential Townhome Site Area	1.99 ac

Retail Site Data

Proposed Building Area	4,200 sf
Proposed Outdoor Patio Area	1,500 sf
Provided Parking	89 spaces
Provided Parking Ratio, spaces per 1,000-sf of Bldg Area	14.0 spaces per 1,000-sf
Estimated Total Restaurant Seating Area including Outdoor Patio	2,600 sf
Village Required Parking Ratio, Restaurants	1 space per 3 persons
Estimated Restaurant Seating Capacity @ 18 sf per person	172 patrons
Required Parking @ 1 space per 3 patrons	88 spaces

Townhome Site Data

Number of Units	35
Provided Garage Parking, per unit	2 spaces
Provided Driveway Parking, per unit	2 spaces
Provided Guest Parking, Off-street	14 spaces
Total Provided Parking	108 spaces
Provided Parking Ratio, spaces per unit	4.8
Side Property Line Setback, min	12 ft
Side-Side Separation, min	12.5 ft

Impervious Coverage

Original 1984 Site Impervious Area, approx.	1.10 ac
Original 1984 Site Pavement Area, approx.	1.84 ac
Proposed Site Impervious Area	1.28 ac
Proposed Site Landscaping Area	0.96 ac
Proposed Site Permeable Paved Area	0.51 ac

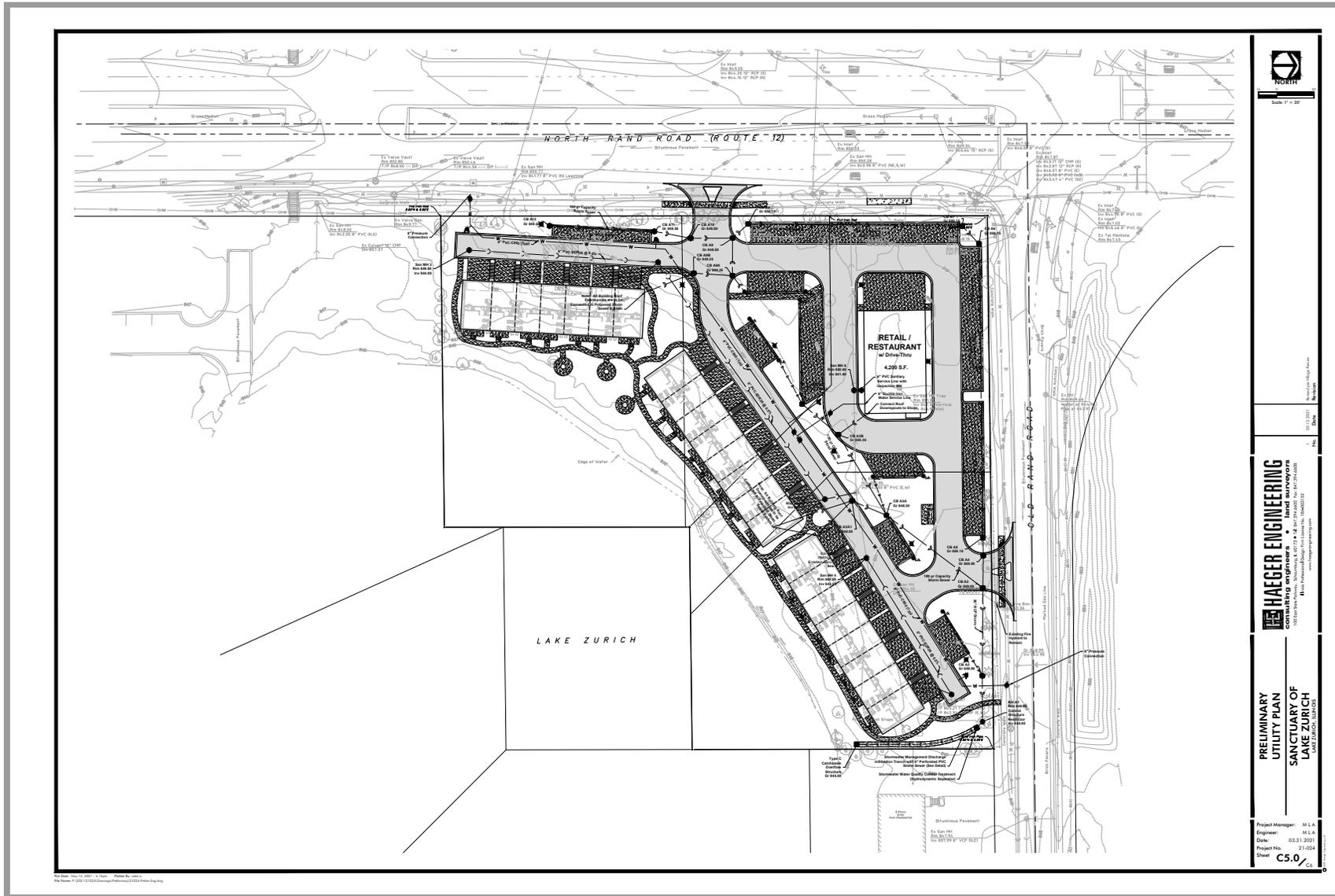
HATCH LEGEND

<ul style="list-style-type: none"> Open Area Pavement 1" x 4" x 8" Asphalt Surface Course, Min. 6" 100 4" Hot Mix Asphalt Base Course, 1-1/2" 100 1" CA-7 Aggregate Base Course Permeable Non-slope Retention Fabric 	<ul style="list-style-type: none"> Heavy Duty Concrete 6" 6000-psi Concrete 4" CA-6 Gravel Aggregate Base Course
<ul style="list-style-type: none"> Pavement Concrete Pavement (Pavement) 6" Heavy Concrete (Pavement or Heavy) 1" CA-7 Aggregate Base Course Permeable Non-slope Retention Fabric 	<ul style="list-style-type: none"> Wetland Buffer Plantings per Area, Class of Engineer & Lake County DNR Requirements


 Date: 11-7-20

HAEGER ENGINEERING
 PRELIMINARY SITE PLAN
 SANCTUARY OF LAKE ZURICH
 LAKE ZURICH, ILLINOIS

Project Manager: M.L.A.
 Engineer: M.L.A.
 Date: 03.31.2021
 Project No.: 21-024
 Sheet: **C3.0**

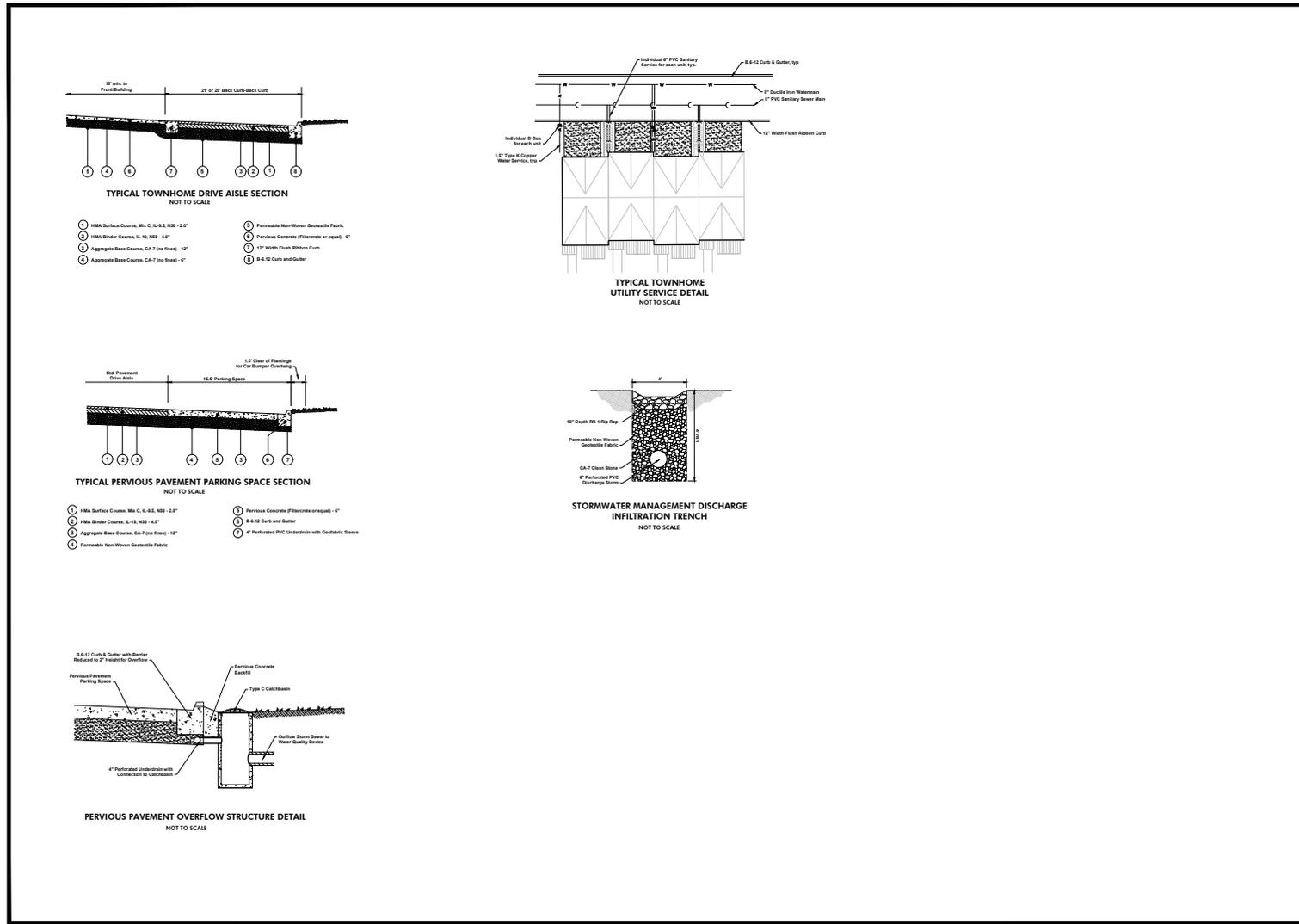


Date: 11-7-20

HAEGER ENGINEERING
 1000 Lake County Parkway, Suite 1000, Lake County, IL 60157
 Phone: 630-224-4400 Fax: 630-224-4405
 Email: info@haeger-engineering.com Website: www.haeger-engineering.com

**PRELIMINARY
 UTILITY PLAN
 SANCTUARY OF
 LAKE ZURICH
 LAKE ZURICH, ILLINOIS**

Project Manager: M.L.A.
 Engineer: M.L.A.
 Date: 03.31.2021
 Project No.: 21-024
 Sheet: **C5.0**



03/31/2021
 H. L. A.
 H. L. A.

HAEGER ENGINEERING

1000 Lake Mary Parkway, Suite 100, Lake Mary, FL 32746
 407.329.4400
 www.haegerengineering.com

TYPICAL DETAILS
SANCTUARY OF LAKE ZURICH
 LAKE ZURICH BLOCK

Project Manager: H. L. A.
 Engineer: H. L. A.
 Date: 03.31.2021
 Project No.: 21-024
 Sheet: **C6.0**

WETLAND DELINEATION REPORT

PREPARED FOR:



**HAEGER
ENGINEERING**

SUBJECT SITE:

The Sanctuary of Lake Zurich
300 & 320 N Rand Road and 881 N Old Rand Road
Lake Zurich, Lake County Illinois
Latitude 42.238523 - Longitude -87.990140

April 8, 2021



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WETLAND DELINEATION REPORT

EXECUTIVE SUMMARY

In response to the request of Haeger Engineering, Midwest Ecological, Inc. (MEI) has performed and completed a wetland delineation for the vacant parcel located in Lake Zurich Illinois. The site is located within Section 18, Township 43 North, Range 10 East of the Third Principal Meridian within Ela Township, Lake Zurich. Utilizing the methods and criteria established by the U.S. Army Corps of Engineers (USACE) in their Corps of Engineers Wetlands Delineation Manual (1987), Midwest Regional Supplement (2008), United States Department of Agriculture/Natural Resource Conservation Service, in their Wetland Mapping Conventions – NRCS, Illinois (1998) a wetland investigation of the property was performed. Based on the on-site investigation using the information obtained from the field samples Midwest Ecological, Inc. (MEI) identified a small portion of Lake Zurich totaling **0.65 acres** in size.

Site	On-site Acreage	Native Mean Conservatism	Floristic Quality Index	Anticipated Regulatory Agency	ADID (Y/N)
Lake Zurich (Open Water)	0.65 acres (466 LF shoreline)	*	*	USACE	No

Please Note: Lake Zurich is larger than is identified in the report. Lake Zurich has a size of approximately 228 total acres. The acreages and quality noted within this report only pertains to the study area and not the entire Lake Zurich resource.

It should be noted that under the current guidelines, any disturbance of a wetland area requires a permit through the US Army Corps of Engineers, Lake County Stormwater Management Commission or Village of Lake Zurich. However, mitigation may or may not be required, depending on the overall impact (> 0.10) to the wetland, Waters of the United States or Isolated Wetland of Lake County. This jurisdiction of the identified wetland is at the discretion of the ACOE.

PURPOSE OF VISIT

The purpose of the site visit is to determine if any Wetlands (various types), Open water pockets, Creeks or Rivers exist on-site and to determine their approximate size, location, quality and jurisdiction. Wetlands encountered were delineated using standard methods sanctioned by the United States Army Corps of Engineers in their Corps of Engineers Wetlands Delineation Manual (1987), Regional Supplement (2008) and Wetland Mapping Conventions – NRCS, Illinois (1998).

DEFINITION OF A WETLAND

The U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protections Agency (EPA) define wetlands as:

“areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions...” (33 CFR 328.3[b], 1977).

Although not defined by regulation, “normal circumstances” are interpreted by both the USACE and the Natural Resources Conservation Service to be “the soil and hydrologic conditions that are normally present, without regard to whether the vegetation has been removed” (7 CFR 12.31[b][2][i]).

METHODOLOGY

Prior to visiting the site, Midwest Ecological, Inc. (MEI) performed a review of the aforementioned National Wetland Inventory map, Lake County Soil Survey map and aerial photograph in order to determine existing site conditions. Site visits were then conducted by an Environmental Wetland Specialist from MEI on April 5, 2021. The USACE Wetland Delineation Manual, dated January 1987, identifies the mandatory technical criteria for wetland identification. The three essential characteristics of a wetland are: 1) hydrophytic vegetation; 2) hydric soils; and 3) wetland hydrology. These characteristics are described below:

Hydrophytic Vegetation: The hydrophytic vegetation criterion is based on a separation of plants into five basic groups:

- 1) Obligate wetland plants (OBL) almost always occur (estimated probability >99%) in wetlands under natural conditions;
- 2) Facultative wetland plants (FACW) usually occur in wetlands (estimated probability 67-99%), but occasionally are found in non-wetlands;
- 3) Facultative plants (FAC) are equally likely to occur in wetland or non-wetlands (estimated probability 34-66%);
- 4) Facultative upland plants (FACU) usually occur in non-wetlands (estimated probability 67-99%), but occasionally are found in wetlands (estimated probability 1-33%); and
- 5) Obligate upland plants (UPL) almost always occur (estimated probability >99%) in non-wetlands under natural conditions.

Within each data point, vegetation is sampled in plots of varying size based on the type of vegetation being sampled. The following plot sizes are recommended by the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Midwest Region:

Trees	- 30-ft radius
Saplings/Shrubs	- 15-ft radius
Herbaceous Plants	- 1 m ² plot
Woody vines	- 30-ft radius

If greater than 50% of the plants present in each stratum or layer of the plant community are FAC (with the exception of FAC-), FACW, or OBL the subject area is considered a wetland in terms

of vegetation (Dominance Test). If the vegetation does not meet the requirements of the Dominance Test, the Prevalence Index (PI) should be utilized.

The PI evaluates the coverage, on a weighted basis of coverage over all strata, of the vegetation within the plot. The PI ranges between 1.0 and 5.0, with a 3.0 or less indicating hydrophytic vegetation is present. If the PI is greater than 3.0, the dominance test is failed, but there are still hydric soil and wetland hydrology presence, the observation of morphological adaptations by vegetation can be used to indicate that the hydrophytic vegetation criteria is met.

Morphological adaptations are changes in the structure of vegetation in response to conditions outside the normal character of the plant. These adaptations include adventitious roots, multi-stemmed trunks, shallow root systems developed at or near the surface, and buttressing in tree species. To meet this indicator, more than 50% of the individuals of FACU species must exhibit the morphological adaptations. Care must be given that the adaptations observed are due wetter conditions that the species is used to as opposed to other factors such as shallow roots present because of erosion of the surface.

Hydric Soils: Hydric soils are defined in the manual as "soils that are saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions in the upper part." Hydric soil indicators are distinctive characteristics that persist in the soil during both wet and dry periods and are used to identify hydric soils in the field. Field indicators include color, mottling, gleying, and sulfidic odor. A specific set of indicators has been developed by the USDA Natural Resource Conservation Service (Field Indicators of Hydric Soils in the United States) which provides a detailed description of how to identify the indicators in during a site visit. A soil meets the definition of a hydric soil if it exhibits at least one of these indicators.

Wetland Hydrology: Indicators of hydric soil and hydrophytic vegetation typically reflect the middle and long-term conditions of a site, but not the short-term conditions. The wetland hydrology criterion is often the most difficult to determine because of climatological variation. Typically, the presence of water for a week or more during the growing season creates anaerobic conditions indicative of wetland hydrology. Anaerobic conditions lead to the prevalence of wetland plants. The 2010 USACE Regional Supplement for the Midwest Region provides specific indicators in four different groups for wetland hydrology: Observation of Surface Water or Saturated Soils, Evidence of Recent Inundation, Evidence of Current or Recent Soil Saturation, and Evidence from Other Site Conditions or Data. If a site exhibits 1 primary indicator or 2 secondary indicators, then it meets the hydrology criteria for a wetland.

REFERENCE MATERIALS

The following materials were reviewed and utilized to assist in the field reconnaissance and completion of this report. See Appendix A for the Reference Materials (Exhibits 1 through 7).

Location

The 3.75-acre parcel has a common address of 300 & 320 N Rand Road and 881 N Old Rand Road, Lake Zurich, Lake County Illinois. Geographically, the site is located within Section 18,

Township 43 North, Range 10 East of the Third Principal Meridian within Ela Township, Lake Zurich, Lake County, Illinois (Latitude 42.238523 - Longitude -87.990140).

National & Lake County Advanced Identification Wetland Inventory Maps

The National & Lake County Advanced Identification Wetland Maps were reviewed to determine the location of wetland areas on the subject site. It should be noted that these maps are only large-scale guides, actual wetland locations and types may vary. Ultimate qualification occurs during field reconnaissance.

Per our review of the NWI map, Lake Zurich is found within the study area.

LLOWH – Lacustrine, Limnetic, Open Water, Permanently Flooded

Per our review of the Lake County Advanced Identification Map, the study area is consistent with the NWI Map. According to the ADID Map, Lake Zurich is not considered High Quality Aquatic Resources (HQAR).

Lake County Soil Survey Map

The Soil Survey of Lake County, Illinois was investigated to determine the location of hydric soils on the subject site. Mapped hydric soils can indicate wetland areas. The following soils were found to be present on the subject site during our investigation.

298 B – Beecher silt loam, 2-4% slopes (somewhat poorly drained)

330 A – Peotone silty clay loam, 0-3% slopes (**very poorly drained, hydric**)

W – Water

United States Geological Survey Map

The United States Geological Survey Map & Hydrological Atlas (HA-208) as illustrated on the Lake Zurich Quad U.S.G.S. Map and Hydrological Atlas. These maps were reviewed to determine the historical local drainage patterns. Upon review of this drainage pattern, all drainage is conveyed to Lake Zurich.

Flood Insurance Rate Map

The Flood Insurance Rate Maps (F.I.R.M.), for Lake County, Illinois, Community Panel No. 17097C0228 K effective date September 18, 2013 were reviewed to determine the location of regulatory floodplains and floodways within the subject site. Mapped floodplains can be indicative of wetland hydrology.

Based on the F.I.R.M. Map, the study area contains Zone AE floodplain within the boundary of Lake Zurich (elevation 844').

WETLAND FIELD DELINEATION

An on-site wetland delineation of the property was conducted on April 5, 2021. Wetland boundaries were determined using the ACOE guidelines and the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) guidelines, as stated previously. The routine method of wetland delineation was used, incorporating information on vegetation, hydrology and soils. The full width of the property was traversed and when a suspected wetland was encountered, the plant species present were determined by making several random passes through the area. If wetland plant species were found to be comprised of 50% or more of plant cover (i.e., wetland vegetation was dominant), the suspected wetland was further examined for the necessary field indicators of hydric soil and hydrology. The wetland boundaries were then defined and all observed plant species were recorded.

The plant taxonomic nomenclature and the Natural Area Index (NAI) used in this report follow's the Chicago Region FQA Index (2017). A more detailed survey would be necessary for a more complete plant list and while more species might be obtained from additional surveys, this would not change the areas delineated as wetlands.

Study Area: The 3.75-acre study area is located at the SE corner of N. Old Rand Road and N. Rand Road. The parcel is primarily upland and is used for outside storage, boat parking, boat docks, fishing, swimming and picnicking. The parcel is regularly maintained and mostly consists of manicured turf grass. Lake Zurich lake is found on the east property line and consists of open water. The south half of the shoreline consists of a narrow beach while the north half is defined by large boulders.

Lake Zurich (Open Water): Lake Zurich is a 232 acre spring fed, glacial lake, found within the Village of Like Zurich, Lake County Illinois. Lake Zurich is part of the Flint Lake drain and is within the Fox River watershed. The portion of Lake Zurich, found within the study area, consists of a sandy and muck bottom. The shoreline is easily defined and consists of a small sandy beach and boulder shoreline. The water level appears to be relatively stable as scour lines or flooding was not observed. Minor erosion, siltation and sediment accumulations was noted within the established boundary. The flagged boundary, found within the study area, is **0.65 acres** in size and includes 466 lineal foot of shoreline.

CONCLUSIONS

The site was evaluated using U.S. Army Corps of Engineers and USDA guidelines for identifying wetlands. After evaluation of all data obtained, the site contains one (1) open water lake which is a Jurisdictional Waters of the United States, totaling **0.65 acres** in size. The total size of Lake Zurich is approximately 228 acres and is primarily open water.

FEDERAL REGULATIONS

Jurisdictional Waters of the United States will be regulated under Section 404 of the Clean Water Act and the Section 401 Water Quality Certification requirements. Under Section 404, the

United States Army Corps of Engineers regulates the discharge of dredged or fill material into jurisdictional Waters of the United States (WOUS).

Letter of No-Objection (LONO): The project may require a letter of No-Objection (LONO) from the Chicago District Army Corps of Engineers to facilitate the residential subdivision. If the proposed project avoids impact to the WOUS, then a LONO can be petitioned.

Regional Permit 1 (RP1) authorizes the construction of residential, commercial and institutional developments and associated infrastructure, such as roads, utilities, detention areas, and recreation areas. Authorization under RP1 is subject to the following requirements which shall be addressed in writing and submitted with the notification:

- a. The impact to waters of the U.S. shall not exceed 1.0 acre. For projects that impact over 0.10 acres of waters of the U.S., the permittee is required to provide compensatory mitigation.
- b. Projects that impact no more than 0.5 acres of waters of the U.S., and do not impact any high-quality aquatic resources, will be processed under Category I.
- c. Projects that impact over 0.5 acres up to 1.0 acre of waters of the U.S., or impacts high-quality aquatic resources, will be processed under Category II.

The permittee shall establish and/or enhance an upland buffer of native plants (or other appropriate vegetation approved by the District) adjacent to all created, restored, enhanced or preserved waters of the U.S., including wetlands. Created buffers should be established on 6:1 (horizontal: vertical) or gentler slopes. The following buffer widths are required:

- 1) For any waters of the U.S. determined to be a high-quality aquatic resource, the buffer shall be a minimum of 100 feet.
- 2) For any waters of the U.S. that do not qualify as wetland (e.g. lakes, rivers, ponds, etc.), the buffer shall be a minimum of 50 feet from the Ordinary High Water Mark (OHWM).
- 3) For any jurisdictional wetland from 0.25 acres up to 0.50 acres in size, the buffer shall be a minimum of 30 feet.
- 4) For any jurisdictional wetland over 0.50 acres in size, the buffer shall be a minimum of 50 feet.

The District may allow buffer widths below the above-required minimums on a case-by-case basis. However, it is the responsibility of the applicant to provide supporting documentation as to why the buffer requirement could not be met. Stormwater retention/detention facilities and nature trails may be located within the outer 50% of the buffer. The District may allow Best Management Practices, small boat launches and piers/docks to be located in buffers.

Activities to be covered under the RPP will fall under one of two categories:

Category I: Activities with minimal impacts requiring review by the District. Authorization may include special conditions to ensure compliance with the RPP. The District has the discretion to

process a Category I activity under Category II when it has concerns for aquatic resources under the Section 404(b)(1) Guidelines or for any factor of the public interest.

Category II: Activities with minimal impacts requiring more rigorous review by the District and coordination with resource agencies. Authorization may include special conditions to ensure compliance with the RPP.

Activities that do not fall into one of the above categories, by definition, have more than minimal impacts and are therefore subject to the Individual Permit review process.

LAKE COUNTY REGULATIONS

The four categories of wetland type regulated under the Lake County Unified Development ordinance (UDO), and Lake County Watershed Development Ordinance (WDO) are as follows:

- (a) Category-I: Wetland impacts less than or equal to 1 acre and does not impact high-quality aquatic resources;
- (b) Category-II: Wetland impacts greater than 1 acre and less than 2 acres and does not impact high-quality aquatic resources;
- (c) Category-III: Wetland impacts greater than or equal to 2 acres or impacts high-quality aquatic resources; and
- (d) Category-IV: Wetland impacts for the restoration, creation and enhancement of wetlands provided that there are net gains in aquatic resource function. Category-IV activities include shoreline and stream bank erosion restoration described in Article IV, Section C.2.d.3.

The WDO requires mitigation for wetland impacts greater than or equal to 0.10 acre of Isolated Wetlands of Lake County (IWLC). Mitigation shall provide replacement of the wetland environment lost to development at the following proportional rates (i.e., creation acreage to wetland impact acreage):

- 1) A minimum of 1.5:1 for wetland impacts under Categories I, II and III that are not high quality aquatic resources, except 1:1 for approved and fully certified wetland mitigation bank credits;
- 2) A minimum of 3:1 for wetland impacts that are high quality aquatic resources;
- 3) A minimum of 6:1 for wetland impacts that are forested wetlands.

Mitigation credit may also be obtained for enhancement. For example, the enhancement of farmed wetlands meeting the size criteria of the WDO may be used for up to 80% of the mitigation requirement. Enhancement of existing non-farmed wetlands may be credited up to 25% of the enhanced wetland acreage completed, provided the wetland impacted acreage created on-site is a minimum 1:1 ratio. Buffer width requirements for water bodies are as follows:

- 1) For all water bodies or wetlands with a total surface area greater than one third (1/3) acre but less than one (1) acre, a minimum buffer width of thirty (30) feet shall be established.

- 2) For all water bodies or wetlands with a total surface area greater than or equal to one (1) acre but less than two and one half (2 ½) acres, a minimum buffer width of forty (40) feet shall be established.
- 3) For all water bodies or wetlands with a total surface area greater than or equal to two and one half (2½) acres, a minimum buffer width of fifty (50) feet shall be established.
- 4) Non-linear high quality aquatic resources shall have a minimum buffer width of one hundred (100) feet.

Linear buffers shall be designated along both sides of all channels meeting the definition of Wetlands of Lake County. The buffer width shall be determined as follows:

- 1) When the channel has a watershed greater than 20-acres but less than one square mile, the minimum buffer shall be 50 feet on each side of the channel.
- 2) When the channel has a watershed greater than one square mile, the minimum buffer shall be 30 feet on each side of the channel.
- 3) Linear high quality aquatic resources and streams with an Index of Biotic Integrity (IBI) greater than 40 shall have a minimum buffer width of 100 feet on each side of the channel. (Initial IBI based on IEPA Illinois Water Quality Report, biannual. A site-specific IBI assessment may override this report.)

Should you have any questions, please do not hesitate to contact our office.

Sincerely,

Midwest Ecological, Inc. (MEI)



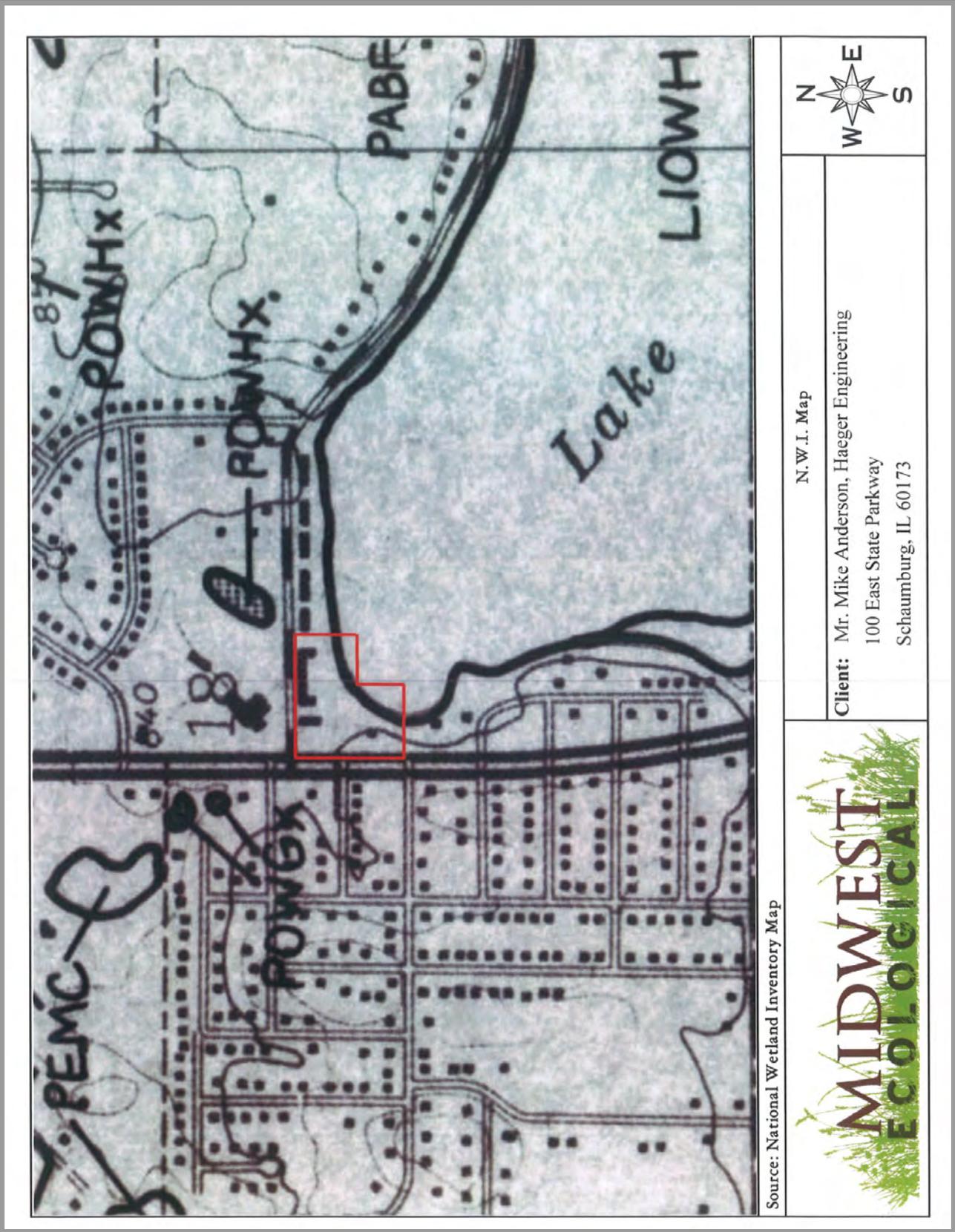
Robert L. Vanni
Senior Environmental Resources Specialist
Lake County Certified #C-059



APPENDIX A
Exhibits







Source: National Wetland Inventory Map

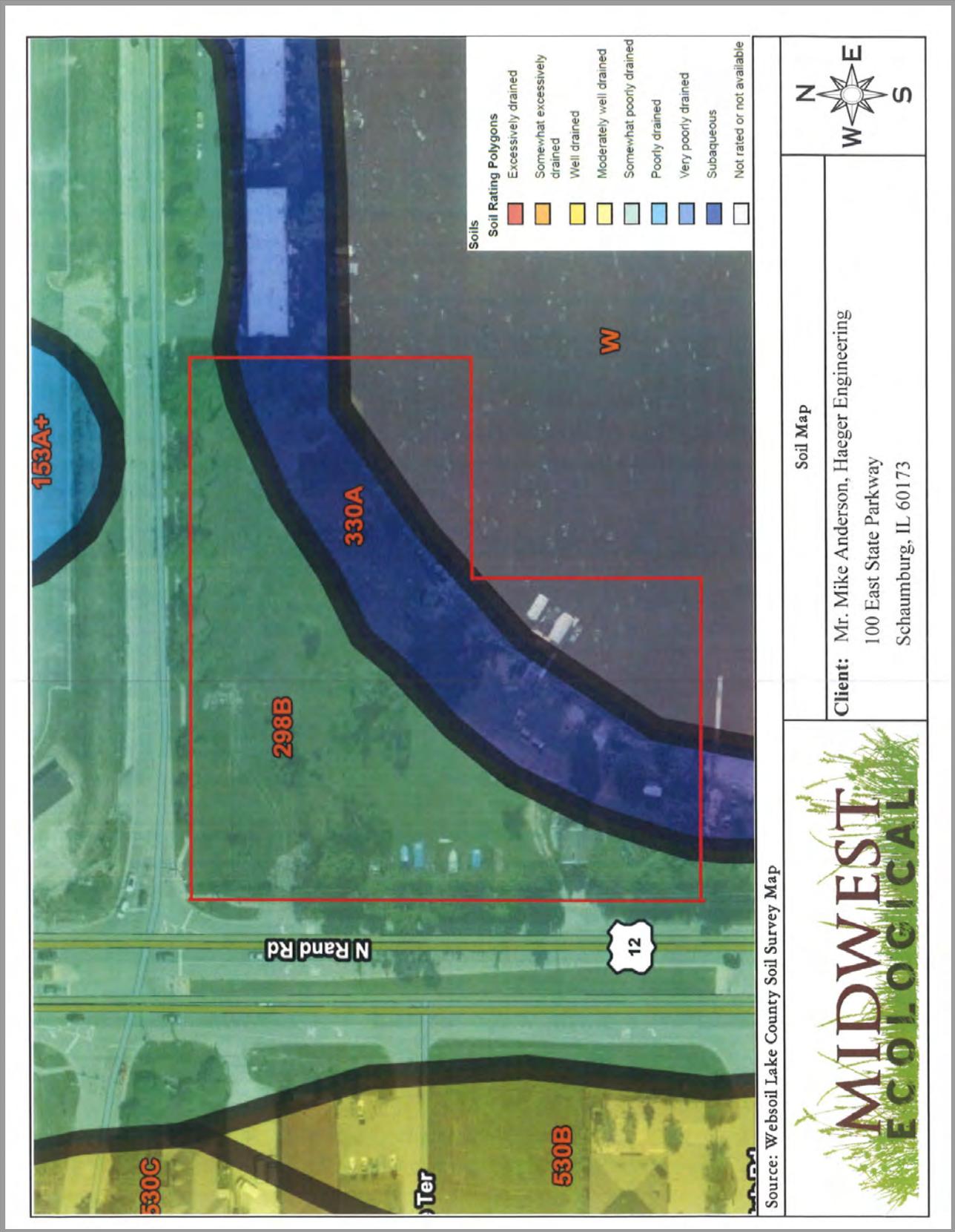


N.W.I. Map

Client: Mr. Mike Anderson, Haeger Engineering
 100 East State Parkway
 Schaumburg, IL 60173









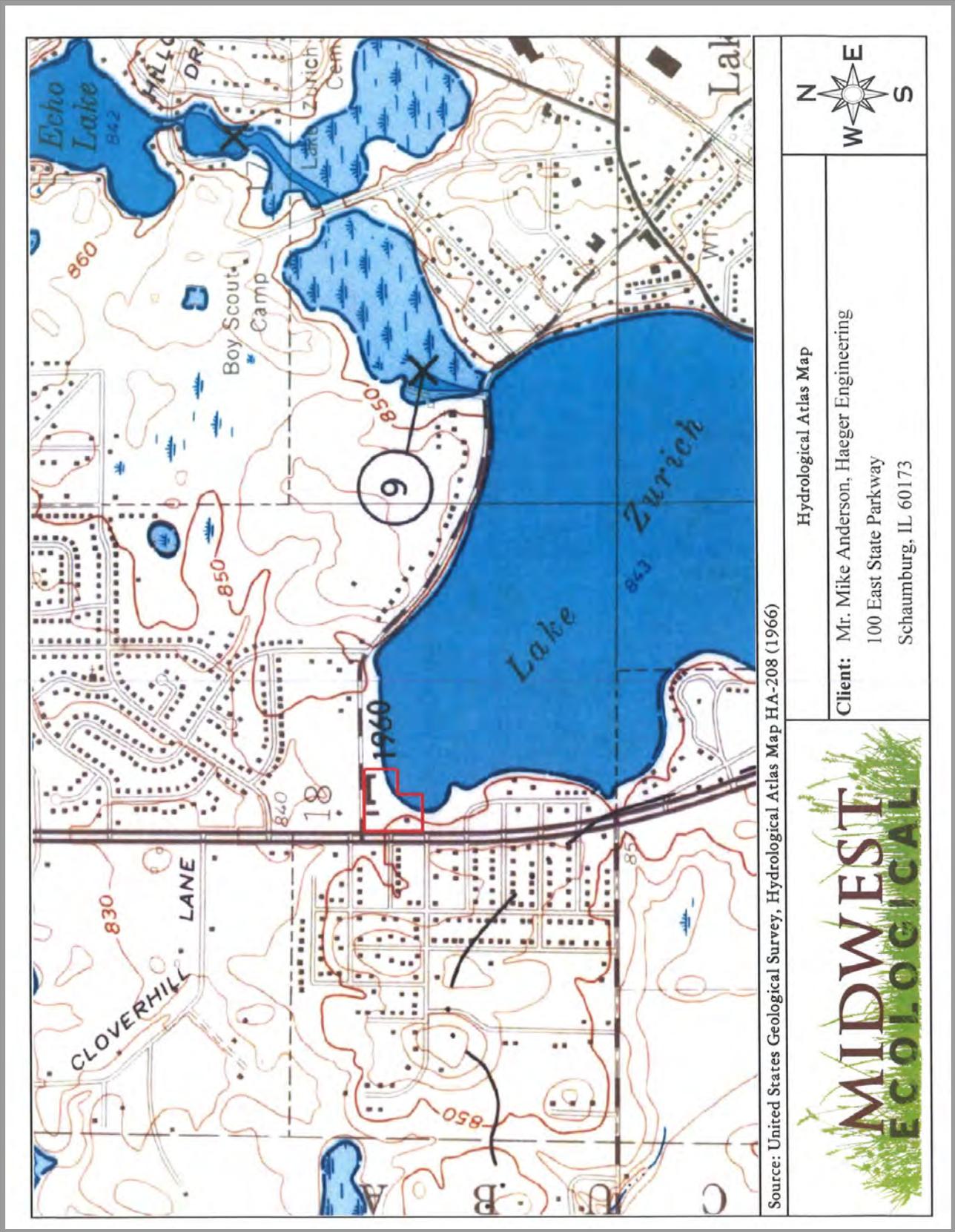
Source: United States Geological Survey Map (2015)



U.S.G.S. Map

Client: Mr. Mike Anderson, Haeger Engineering
 100 East State Parkway
 Schaumburg, IL 60173





Source: United States Geological Survey, Hydrological Atlas Map HA-208 (1966)

Hydrological Atlas Map

Client: Mr. Mike Anderson, Haeger Engineering
100 East State Parkway
Schaumburg, IL 60173







APPENDIX B
Photographs



Lake Zurich consists of a minor beach and boulder shoreline. Photographs are facing North.



Lake Zurich consists of a minor beach and boulder shoreline. Photographs are facing South.



The majority of the parcel consists of manicured upland lawn. Outside boat storage, vehicle parking and picnic areas were observed.



APPENDIX C
Data Sheets

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: The Sanctuary of Lake Zurich City/County: Lake Zurich/Lake Sampling Date: 4-5-2021
 Applicant/Owner: Haeger Engineering State: Illinois Sampling Point: DP1
 Investigator(s): Robert Vanni Section, Township, Range: S 18, T 43, R 10
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): None
 Slope (%): 0-2 Lat: 42.203121 Long: -88.111187 Datum: _____
 Soil Map Unit Name: Beecher silt loam (298B) NWI classification: No
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks)
 Are Vegetation _____ Soil _____ or Hydrology _____ significantly disturbed? Are 'Normal Circumstances' present? Yes No _____
 Are Vegetation _____ Soil _____ or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes _____ No <input checked="" type="checkbox"/>		
Wetland Hydrology Present?	Yes _____ No <input checked="" type="checkbox"/>		
Remarks: The majority of the site contains manicured turf grass.			

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1 _____				Number of Dominant Species That Are OBL, FACW, or FAC:	<u>1</u> (A)
2 _____				Total Number of Dominant Species Across All Strata:	<u>3</u> (B)
3 _____				Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>33</u> (A/B)
4 _____				= Total Cover	
5 _____				= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)				Prevalence Index worksheet:	
1 _____				Total % Cover of:	Multiply by:
2 _____				OBL species _____	x 1 = _____
3 _____				FACW species _____	x 2 = _____
4 _____				FAC species <u>34</u>	x 3 = <u>102</u>
5 _____				FACU species <u>66</u>	x 4 = <u>264</u>
				UPL species _____	x 5 = _____
				Column Totals: <u>100</u> (A)	<u>366</u> (B)
				Prevalence Index = B/A = <u>3.66</u>	
Herb Stratum (Plot size: _____)				Hydrophytic Vegetation Indicators:	
1 <u>Schedonorus arundinaceus</u>	<u>33</u>	<u>Yes</u>	<u>FACU</u>	___ 1 - Rapid Test for Hydrophytic Vegetation	
2 <u>Schedonorus pratensis</u>	<u>33</u>	<u>Yes</u>	<u>FACU</u>	___ 2 - Dominance Test is >50%	
3 <u>Poa pratensis</u>	<u>34</u>	<u>Yes</u>	<u>FAC</u>	___ 3 - Prevalence Index is >3.0	
4 _____				___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
5 _____				___ Problematic Hydrophytic Vegetation ¹ (Explain)	
6 _____				Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.	
7 _____				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	
8 _____					
9 _____					
10 _____					
Woody Vine Stratum (Plot size: _____)					
1 _____					
2 _____					
				= Total Cover	
Remarks: (Include photo numbers here or on a separate sheet.) Hydrophytic vegetation was not observed within the sample.					

SOIL

Sampling Point: DP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-9"	10 YR 3/2	100					SIL	
9-16"	10 YR 4/3	98	10 YR 5/6	2	C	M	SiCL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:
Hydric soil was not observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required, check all that apply):		Secondary Indicators (minimum of two required):
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present?	Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Water Table Present?	Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): >16"	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology was not observed within the sample point.

SOIL

Sampling Point DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6"	10 YR 3/2	100					SIL	
6-14"	10 YR 2/1	95	10 YR 4/1	5	C	M	SiCL	traces of sand

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input checked="" type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input checked="" type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:
 Hydric soil was observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required, check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Gauge or Well Data (D9) <input type="checkbox"/> Other (Explain in Remarks)

<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
--	--

Field Observations:
 Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? Yes No Depth (inches): >14" _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Wetland hydrology was not observed within the sample point.



APPENDIX D
Habitat Evaluation

OBSERVER: Rob Vanni
DATE: April 5, 2021
LOCATION: Lake Zurich (Open Water)

WILDLIFE HABITAT/USE EVALUATION SCORE SHEET

To assess the existing and/or potential wildlife habitat use of the subject wetland, the applicant must first complete this score sheet. The attached documentation provides examples of each scoring parameter.

A separate sheet must be completed for each wetland being considered.

Applicants must document their basis for scoring decisions with field surveys, current photographs, aerial photographs, and other appropriate information.

A. Utilization by Wildlife

Wildlife Use	Score
Significant	3
Evident	2
Low	1
Occasional	0.5
Non-Existent	0

SUB-TOTAL SCORE = 2

Response: Wildlife was emerging due to the warmer conditions of Spring.

B. Interspersion of Vegetative Cover

Interspersion	Score
High	3
Medium	2
Low	1

SUB-TOTAL SCORE = 1.0

C. Vegetative Cover to Open Water

Cover	Score
>95% Cover	0.5
76% - 95% Cover, Peripheral	1.5
76% - 95% Cover, Various	2.5
26% - 75% Cover, Peripheral	2.0
26% - 75% Cover, Patches	3.0
5% - 25% Cover, Peripheral	1.0
<5% Cover	0.5

SUB-TOTAL SCORE = 0.5

Response: The delineated resource consists of open water and sandy beach. MEI Did not identify an emergent or aquatic vegetation at the time of our investigation.

TOTAL SCORE (A+B+C) = 3.5

Total score \geq 5.00 apply Ludwig Wildlife Methodology
 Total score $<$ 5.00 no further wildlife analysis is necessary

Wildlife habitat use evaluation of any particular wetland should consider both the actual wildlife uses and an analysis of the habitat values related to wildlife. Habitat evaluation provides consideration of conditions for species of wildlife that may not be currently using a wetland, but preferred habitat for feeding, nesting, rearing of young, or cover is present.

Wildlife habitat/use, ideally, should be analyzed over an entire year and for some wetlands, several years' conditions should be documented. However, obvious time constraints do not allow this. Therefore, if the evaluator does not have personal knowledge of the wetland during other seasons/years and does not have training in wildlife, a degreed wildlife biologist or ecologist should be requested to complete this section of the evaluation.

A. Utilization by Wildlife

Complete the table on the evaluation form for each wildlife group for the uses listed across the top of the table using the following point system. Consider all seasons of the year in this evaluation.

Use by wildlife group within each habitat is significant in that loss or reduction of the habitat would have an adverse effect (i.e., loss of individuals) on the population of the species or overall wildlife population in the general area (township). **SCORE = 3**

Use by wildlife group within each habitat is evident or probable and loss or reduction of the habitat would have an adverse effect (i.e., loss of individuals) on the local wildlife population (surrounding sections). **SCORE = 2**

Use by wildlife group within each habitat is incidental or low in that loss or reduction of the habitat would have a negligible effect (i.e., loss of individuals) on the local wildlife population. **SCORE = 1**

Use by wildlife group within each habitat is nonexistent at any time during any year. NOTE: Use 0.5 to signify occasional use. **SCORE = 0**

B. Interspersion of Vegetative Cover

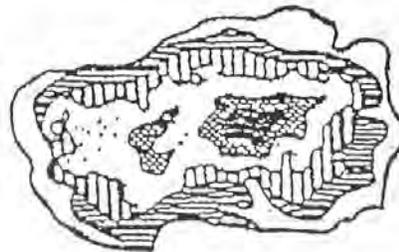
From recent aerial photographs of the wetland, determine which of the following criteria best describes the vegetative forms of the site. Determine from conditions at the peak of the growing season.

	COMMUNITY TYPE 1
	COMMUNITY TYPE 2
	COMMUNITY TYPE 3
	COMMUNITY TYPE 4
	COMMUNITY TYPE 5
	COMMUNITY TYPE 6

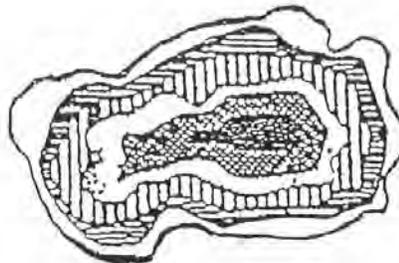
High interspersed vegetation. Edge is abundant and consists of several species. Life form zones of vegetation are broken into segments of variable size and shape. Subforms of vegetation are small and scattered. SCORE = 3



Moderate interspersed vegetation. Edge is moderate in length and diversity with some irregularity in the distribution of subform stands, but vegetation life forms remain largely intact. SCORE = 2



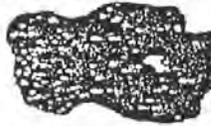
Low interspersed vegetation. Length and types of edge are at a minimum. The wetland consists of concentric life forms and subforms. Subform stands are large and continuous. SCORE = 1



C. Vegetative Cover to Open Water

From a recent aerial photograph of the wetland, determine which of the following criteria best describes the vegetation/open water characteristics of the wetland. NOTE: Wetland cover types: white areas indicate water (with or without surface plants); black areas indicate emergents, shrubs, or trees.

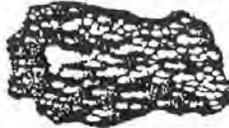
Cover occupies more than 95% of wetland **SCORE = 0.5**



Cover occupies 76 - 95% of wetland occurring in peripheral band **SCORE = 1.5**



Cover occupies 76 - 95% of wetland with scattered open water **SCORE = 2.5**



Cover occupies 26 - 75% of wetland occurring in peripheral band **SCORE = 2.0**



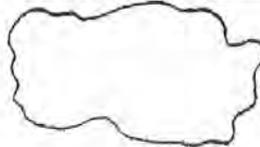
Cover occupies 26 - 75% of wetland occurring in dense patches or diffuse in open stands **SCORE = 3.0**

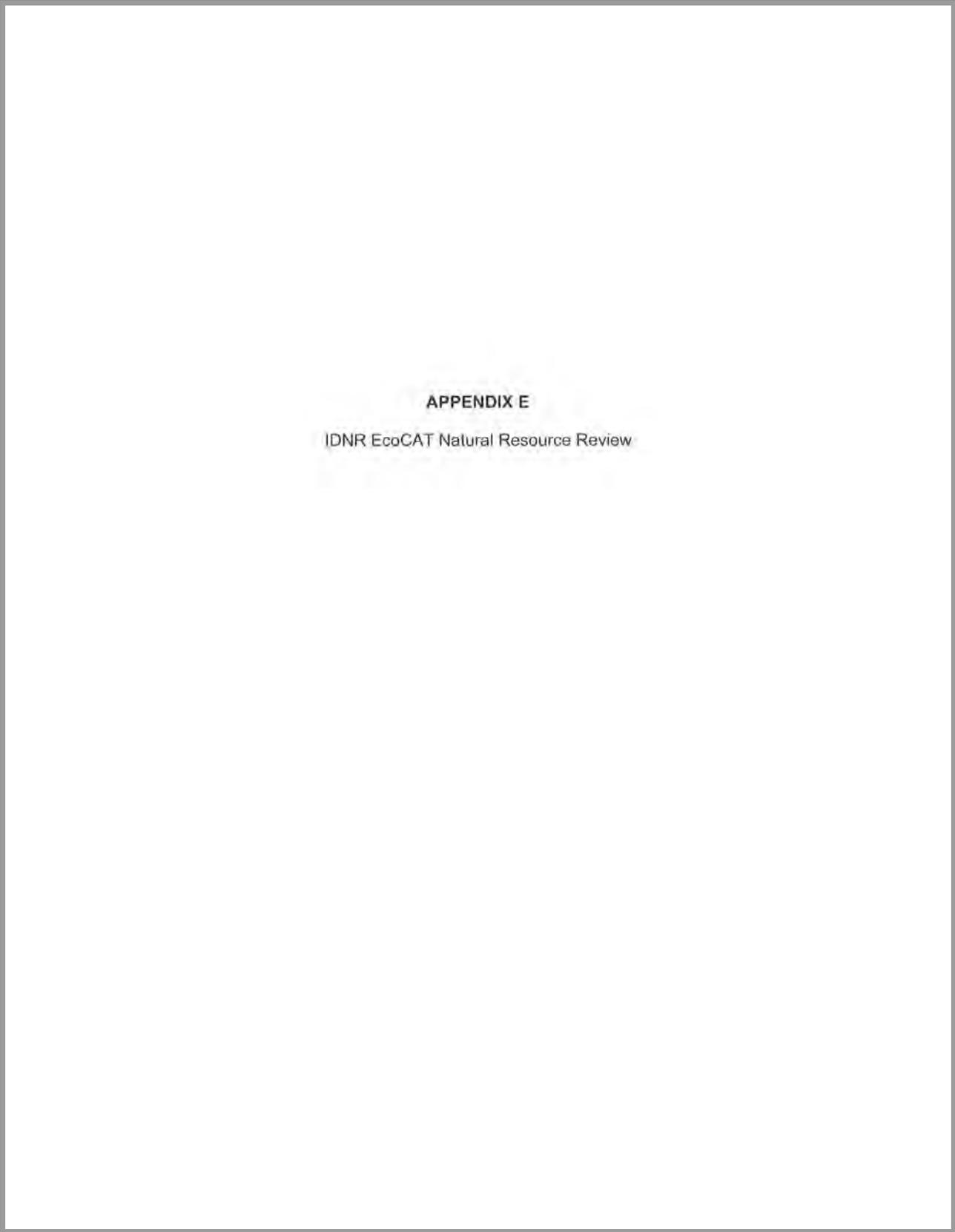


Cover occupies 5 - 25% of wetland occurring in peripheral band or diffuse in open stands **SCORE = 1.0**



Cover occupies less than 5% of wetland **SCORE = 0.5**





APPENDIX E
IDNR EcoCAT Natural Resource Review



Applicant: Robert Vanni
Contact: Robert Vanni
Address: Midwest Ecological, Inc.
 PO Box 321
 Gilberts, IL 60136

IDNR Project Number: 2112444
Date: 04/08/2021

Project: The Sanctuary of Lake Zurich
Address: 300 & 320 N Rand Road , Lake Zurich

Description: The construction of the a residential and commercial development.

Natural Resource Review Results

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Western Banded Killifish (*Fundulus diaphanus menona*)

An IDNR staff member will evaluate this information and contact you to request additional information or to terminate consultation if adverse effects are unlikely.

Location

The applicant is responsible for the accuracy of the location submitted for the project.

County: Lake

Township, Range, Section:
 43N, 10E, 18



**IL Department of Natural Resources
 Contact**
 Bradley Hayes
 217-785-5500
 Division of Ecosystems & Environment

Government Jurisdiction
 U.S. Army Corps of Engineers

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

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IDNIR Project Number: 2112444

1. The IDNR EcoCAT website was developed so that units of local government, state agencies and the public could request information or begin natural resource consultations on-line for the Illinois Endangered Species Protection Act, Illinois Natural Areas Preservation Act, and Illinois Interagency Wetland Policy Act. EcoCAT uses databases, Geographic Information System mapping, and a set of programmed decision rules to determine if proposed actions are in the vicinity of protected natural resources. By indicating your agreement to the Terms of Use for this application, you warrant that you will not use this web site for any other purpose.

2. Unauthorized attempts to upload, download, or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act.

3. IDNR reserves the right to enhance, modify, alter, or suspend the website at any time without notice, or to terminate or restrict access.

Security

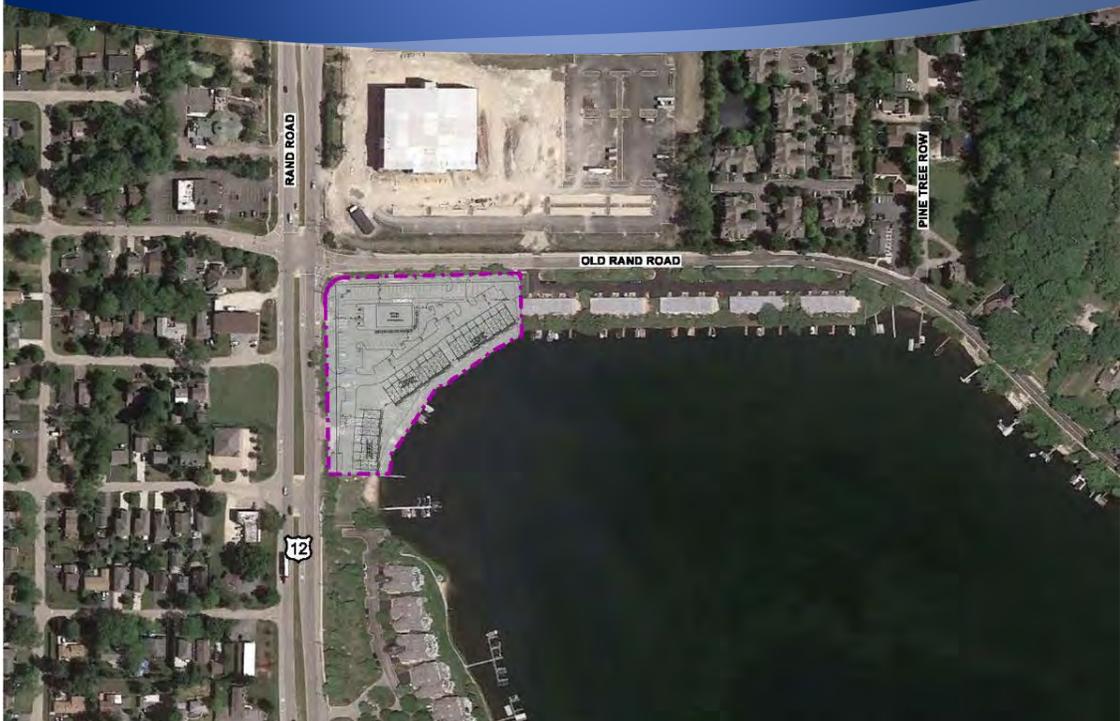
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Traffic Impact Study Proposed Mixed-Use Development Lake Zurich, Illinois



Prepared For:



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1. Introduction

This report summarizes the methodologies, results, and findings of a traffic impact study conducted by Kenig, Lindgren, O'Hara, Aboona, Inc. (KLOA, Inc.) for a proposed mixed-use development in Lake Zurich, Illinois.

As proposed, the development will consist of approximately 23 townhome units and a 4,200 square-foot retail building with a drive-through. Access to the development will be provided via a right-in/right-out access drive off Rand Road and via a right-in/right-out access drive off Old Rand Road. The retail portion of the development will provide a total of 65 parking spaces. The residential portion of the development will provide a total of 116 parking spaces consisting of 46 garage spaces, 46 driveway apron spaces, and 24 guest parking spaces.

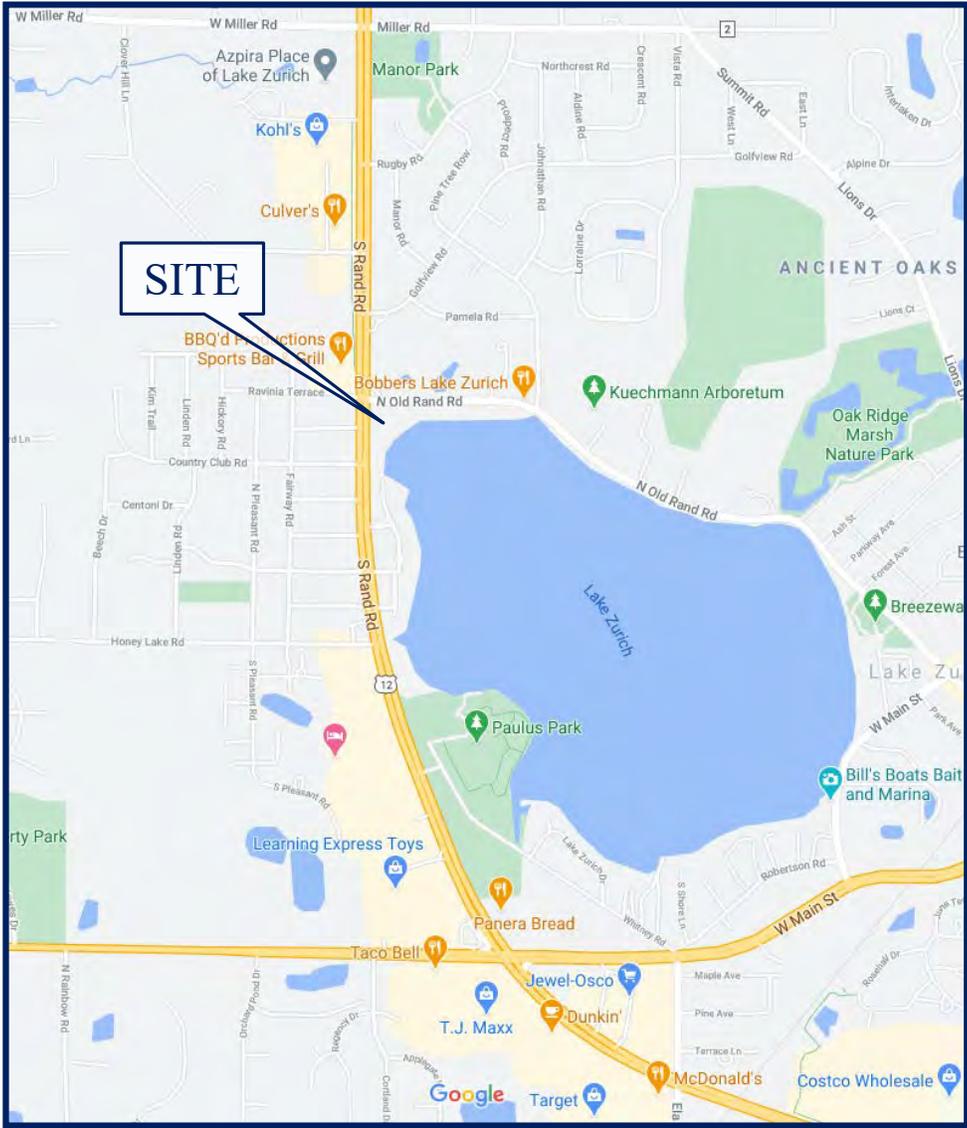
The purpose of this study was to examine background traffic conditions, assess the impact that the proposed development will have on traffic conditions in the area, and determine if any roadway or access improvements are necessary to accommodate the traffic generated by the proposed development. **Figure 1** shows the location of the site in relation to the area roadway system. **Figure 2** shows an aerial view of the site.

The sections of this report present the following:

- Existing roadway conditions
- A description of the proposed development
- Directional distribution of the development generated traffic
- Vehicle trip generation for the development
- Future traffic conditions including access to the development
- Traffic analyses for the weekday morning and weekday evening peak hours
- Recommendations with respect to adequacy of the site access and adjacent roadway system

Traffic capacity analyses were conducted for the weekday morning and weekday evening peak hours for the following conditions:

1. Year 2021 Base Conditions – Analyze the capacity of the existing roadway system using existing peak hour traffic volumes in the surrounding area, adjusted to reflect traffic volumes Pre-COVID-19 conditions.
2. Year 2027 Projected Conditions – Analyze the capacity of the future roadway system using projected traffic volumes that include the existing traffic volumes, ambient traffic growth and the traffic estimated to be generated by other area developments.
3. Year 2027 Projected Conditions – Analyze the capacity of the future roadway system using projected traffic volumes that include the existing traffic volumes, ambient traffic growth and the traffic estimated to be generated by other area developments, and the traffic estimated to be generated by the full buildout of the proposed development.



Site Location

Figure 1

Mixed-Use Development
Lake Zurich, Illinois





Aerial View of Site Location

Figure 2

2. Existing Conditions

Existing traffic and roadway conditions were documented based on field visits and traffic counts conducted by KLOA, Inc. The following provides a detailed description of the physical characteristics of the roadways including geometry and traffic control, adjacent land uses and peak hour traffic flows along area roadways.

Site Location

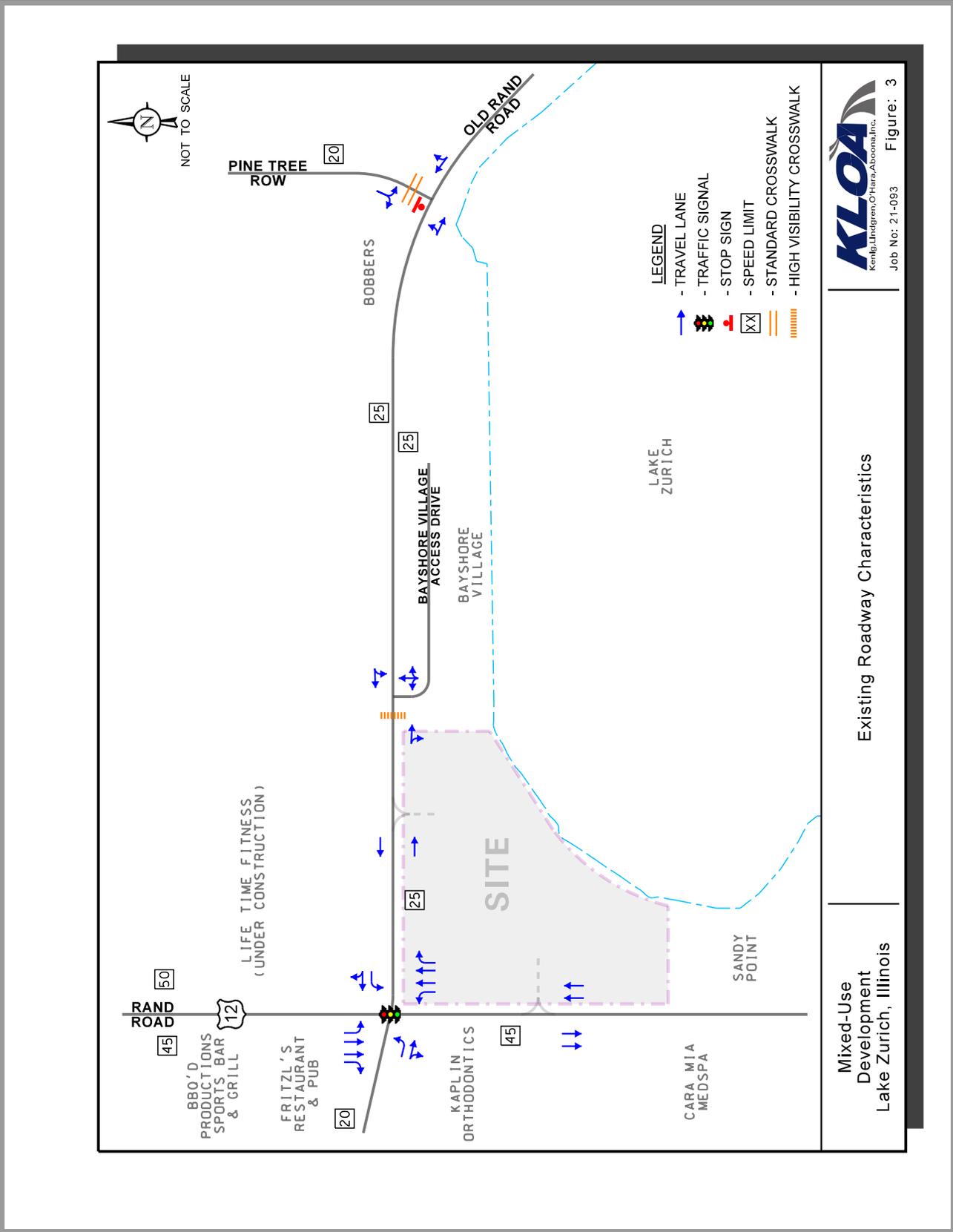
The site, which is primarily vacant, is located in the southeast quadrant of the intersection of Rand Road with Old Rand Road/Ravinia Terrace and is bordered by Lake Zurich to the southeast. Land uses in the vicinity of the site include BBQ'd Productions Sport Bar and Grill, Fritzl's Restaurant and Pub, Kaplin Orthodontics, Cara Mia Medspa and residential homes to the west, Sandy Point to the south, and Bayshore Village to the east, and a currently under construction Life Time Fitness to the north.

Existing Roadway System Characteristics

The characteristics of the existing roadways that surround the proposed development are illustrated in **Figure 3** and described below.

Rand Road (US Route 12) is generally a north-south other principal arterial roadway, that in the vicinity of the site provides two travel lanes in each direction, separated by a raised landscape median. At its signalized intersection with Old Rand Road/Ravinia Terrace, Old Rand Road provides an exclusive left-turn lane, two through lanes, and an exclusive right-turn lane on the northbound and southbound approaches. Rand Road is under the jurisdiction of the Illinois Department of Transportation (IDOT), is classified as a Strategic Regional Arterial (SRA) route, carries an average annual daily traffic (AADT) volume of 40,100 vehicles (IDOT AADT 2019), and has a posted speed limit of 45 miles per hour.

Old Rand Road is generally an east-west major collector roadway that provides one travel lane in each direction and extends from Rand Road, where it reconnects with Rand Road approximately one mile to the southeast. At its signalized intersection with Rand Road, Old Rand Road provides an exclusive left-turn lane and a shared through/right-turn lane on the westbound approach. The west leg of this intersection is Ravinia Terrace which provides one travel lane in each direction, terminates approximately 1,200 feet west of Rand Road, and provides an exclusive left-turn lane and a shared through/right-turn lane at its signalized intersection with Rand Road. At its unsignalized intersection with Pine Tree Row, Old Rand Road provides a shared left-turn/through lane on the eastbound approach and a shared through/right-turn lane on the westbound approach. Old Rand Road is under the jurisdiction of the Village of Lake Zurich, carries an AADT volume of 4,200 vehicles (IDOT AADT 2019), and has a posted speed limit of 25 miles per hour. Ravinia Terrace is under the jurisdiction of the Village of Lake Zurich and has a posted speed limit of 20 miles per hour.



Existing Roadway Characteristics

Mixed-Use Development
Lake Zurich, Illinois

Pine Tree Row is a north-south local roadway that provides one travel lane in each direction and extends from Old Rand Road north to its terminus at Rugby Road. At its unsignalized intersection with Old Rand Road, Pine Tree Row provides a shared left/right-turn lane that is under stop-sign control. Pine Tree Row is under the jurisdiction of the Village of Lake Zurich and has a posted speed limit of 20 miles per hour.

Existing Traffic Volumes

In order to determine current vehicle, pedestrian, and bicycle conditions within the study area, KLOA, Inc. utilized peak period traffic, pedestrian, and bicycle counts for the following intersections:

- Rand Road with Old Rand Road/Ravinia Terrace
- Old Rand Road with Pine Tree Row
- Old Rand Road with the Bayshore Village Westerly Access Drive

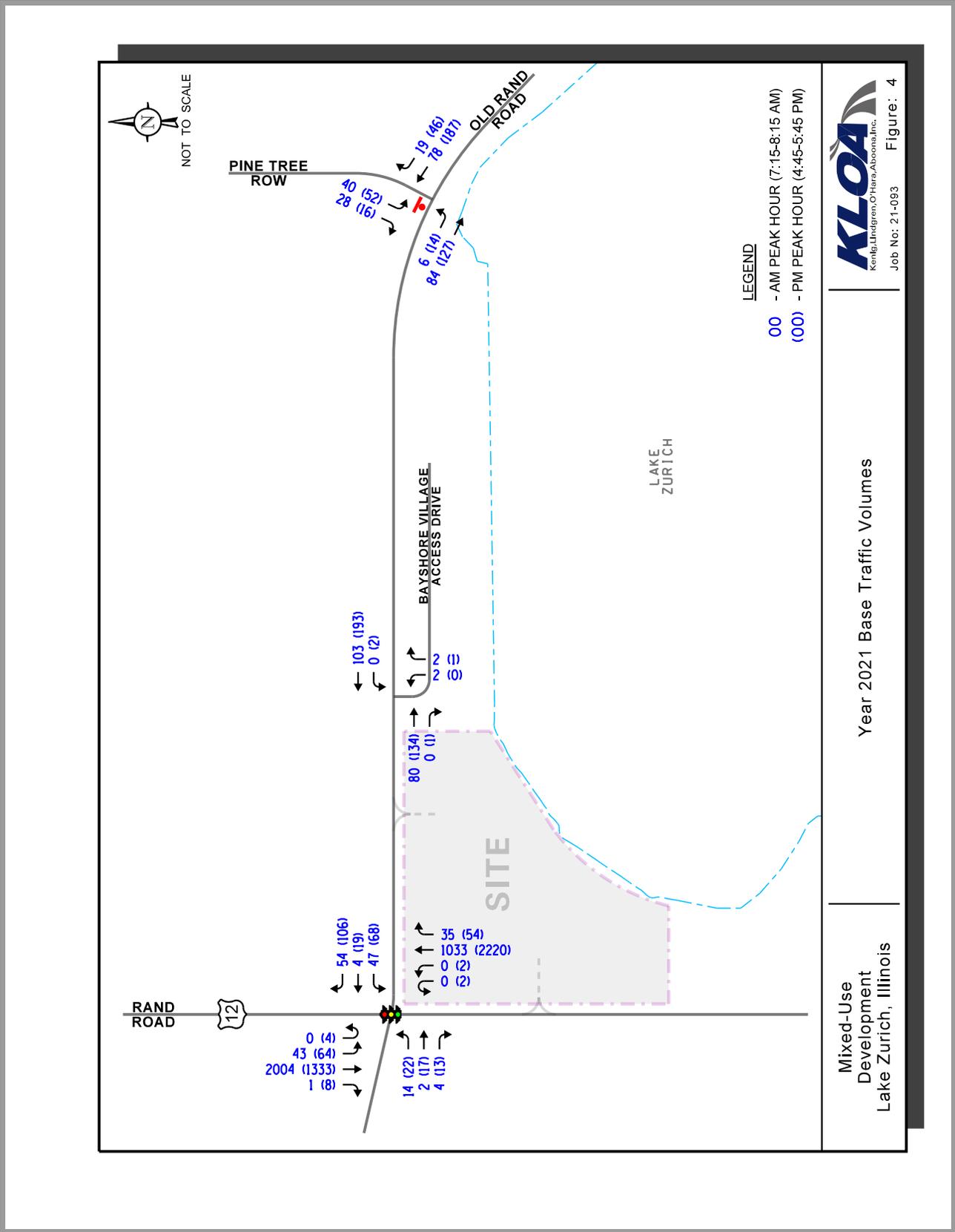
The counts were conducted in April 2021 during the weekday morning (7:00 A.M. to 9:00 A.M.) and weekday evening (4:00 P.M. to 6:00 P.M.) peak periods. The results of the traffic counts show that the weekday morning peak hour generally occurs between 7:15 A.M. and 8:15 A.M. and the weekday evening peak hour generally occurs between 4:45 P.M. to 5:45 P.M.

Due to the ongoing COVID-19 pandemic, it is anticipated that traffic volumes within the area are not reflective of typical conditions. As such, the Year 2021 traffic counts at the intersections of Rand Road with Old Rand Road and Old Rand Road with Pine Tree Row were compared to counts previously conducted by KLOA, Inc at these intersections in 2016 and 2015, respectively, and with counts previously conducted by Gewalt Hamilton Associates, Inc. (GHA) at both intersections in 2017. The counts conducted prior to Year 2021 were increased by a regional growth factor, as discussed later, to estimate Year 2021 base traffic volumes.

The results of the comparison showed that the Year 2021 weekday morning and weekday evening peak hour traffic volumes traversing the intersections were approximately 20 percent less than the 2015, 2016 and 2017 counts adjusted with a regional growth factor. As such, the Year 2021 weekday morning and weekday evening peak hour traffic volumes at all three intersections were increased by 20 percent. **Figure 4** illustrates the Year 2021 base traffic volumes.

Proposed Roadway Improvements

It should be noted that as part of the proposed Life Time Fitness, that is currently under construction within the northeast quadrant of the intersection of Rand Road with Old Rand Road, Old Rand Road is being widened along the north side of the street to provide an exclusive left-turn lane serving the proposed three-quarter access drive serving Life Time Fitness. As part of this widening, the existing westbound left-turn lane storage on Old Rand Road at its signalized intersection with Rand Road will be increased to 215 feet, the existing southbound left-turn lane storage will be increased to 275 feet, and pedestrian facilities will be provided along the north and east legs of the intersection.



Crash Data Analysis

KLOA, Inc. obtained crash data¹ for the most recent available five years (2015 to 2019) for the intersections of Rand Road with Old Rand Road and Old Rand Road with Pine Tree Row. The crash data for the intersections is summarized in **Tables 1** and **2**, respectively. A review of the crash data indicated that no fatalities were reported at either intersection.

Table 1
RAND ROAD WITH OLD RAND ROAD/RAVINIA TERRACE – CRASH SUMMARY

Year	Type of Crash Frequency							Total
	Angle	Head On	Object	Rear End	Sideswipe	Turning	Other	
2015	0	0	1	2	0	0	0	3
2016	0	1	0	6	0	0	0	7
2017	0	0	1	2	0	0	1	4
2018	1	0	0	3	0	2	1	7
2019	0	0	0	4	0	1	0	5
Total	1	1	2	17	0	3	2	26
Average	<1	<1	<1	3.4	0	<1	<1	5.2

Table 2
OLD RAND ROAD WITH PINE TREE ROW – CRASH SUMMARY

Year	Type of Crash Frequency							Total
	Angle	Head On	Object	Rear End	Sideswipe	Turning	Other	
2015	0	0	0	0	0	0	0	0
2016	0	0	1	1	0	0	0	2
2017	0	0	0	0	0	0	0	0
2018	0	0	0	1	0	0	0	1
2019	0	0	0	0	0	0	0	0
Total	0	0	1	2	0	0	0	3
Average	0	0	<1	<1	0	0	0	<1

¹ IDOT DISCLAIMER: The motor vehicle crash data referenced herein was provided by the Illinois Department of Transportation. Any conclusions drawn from analysis of the aforementioned data are the sole responsibility of the data recipient(s).

3. Traffic Characteristics of the Proposed Development

To evaluate the impact of the subject development on the area roadway system, it was necessary to quantify the number of vehicle trips the site will generate during the peak hours and then determine the directions from which the proposed traffic will approach and depart the site.

Proposed Site and Development Plan

As proposed the development consists of approximately 23 townhome units and a 4,200 square-foot retail building with a drive-through. For the purposes of this evaluation, it was assumed that approximately 1,500 square-feet of the retail building will be occupied by a quick-service restaurant with drive-through and that the remainder of the building will be occupied by a general retail use.

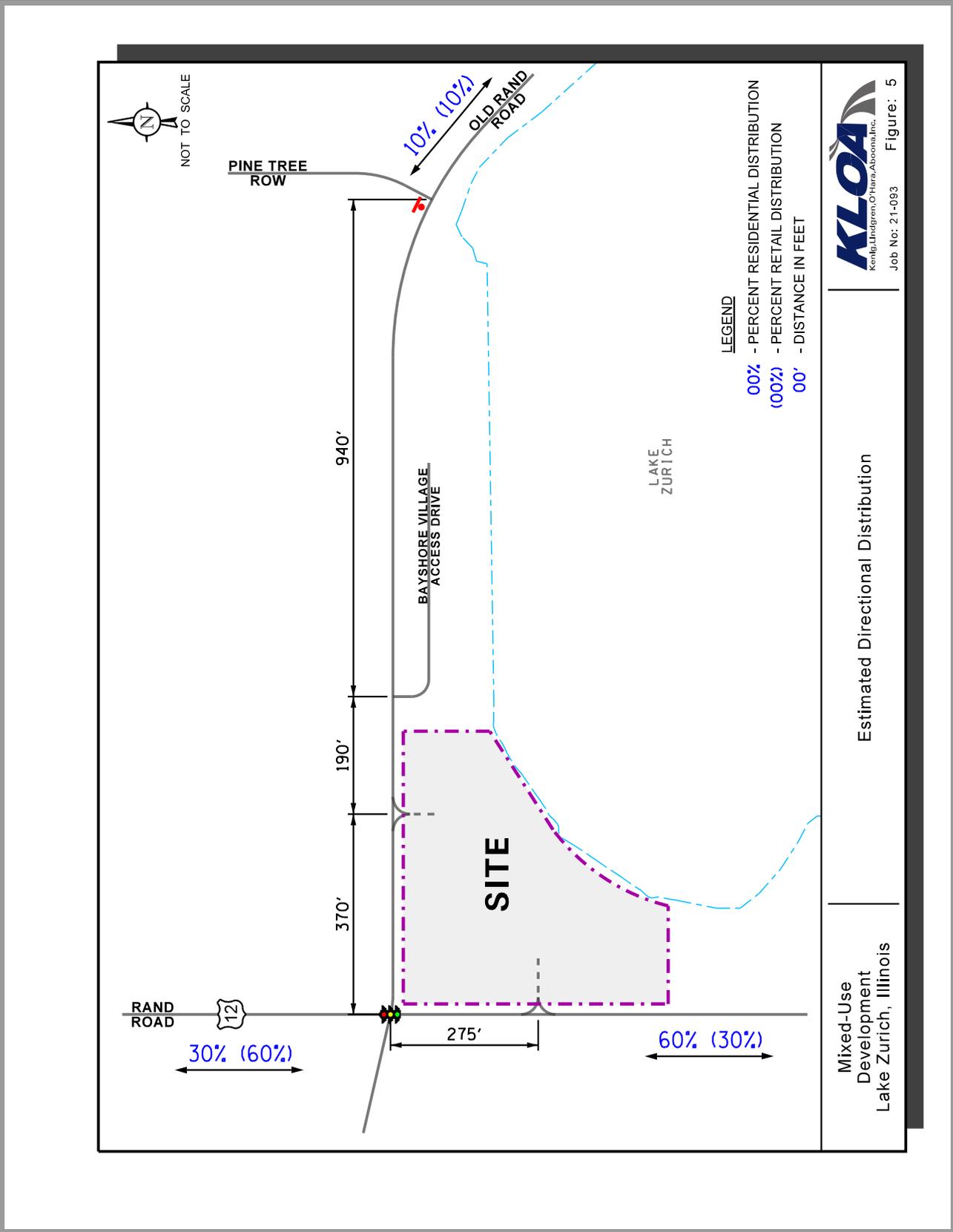
Access to the development will be provided via a right-in/right-out access drive off Rand Road located approximately 275 feet south of Old Rand Road and via a right-in/right-out access drive off Old Rand Road located approximately 370 feet east of Rand Road. Both access drives will provide one inbound lane and one outbound lane and outbound movements should be under stop-sign control. Turning movements at the access drive on Rand Road will be physically restricted to right-turning movements only via a raised triangular median and via the existing landscaped median along Rand Road. Turning movements at the access drive on Old Rand Road will be physically restricted to right-turning movements only via a raised triangular median. As part of the proposed development, the existing northbound left-turn lane on Rand Road at Old Rand Road will be extended through the proposed access drive and will provide 70 feet of storage and 150 feet of taper.

The retail portion of the development will provide a total of 65 parking spaces. The residential portion of the development will provide a total of 116 parking spaces consisting of 46 garage spaces, 46 driveway apron spaces, and 24 guest parking spaces.

A site plan illustrating the proposed mixed-use development and proposed access is included in the Appendix.

Directional Distribution

The directional distribution of how traffic will approach and depart the site was estimated based on the general travel patterns through the study area derived from the peak hour traffic volumes, taking into consideration the proposed access restrictions. **Figure 5** shows the established directional distribution for the site in addition to the distances, measured in feet, between the study area intersections.



Development Traffic Generation

The estimate of vehicle traffic to be generated by the proposed development is based upon the proposed land use types and sizes. Trip generation data published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th Edition was utilized for both the proposed retail building and proposed townhomes. As previously indicated, for the purposes of this evaluation, it was assumed that approximately 1,500 square-feet of the proposed retail building will be occupied by a quick-service restaurant with a drive-through. Land-Use Code 220 (Multifamily Housing Low-Rise) was utilized for the proposed townhomes units, Land-Use Code 934 (Fast Food Restaurant with Drive-Through Window) was utilized for the proposed quick-service restaurant, and Land-Use Code 820 (Shopping Center) was utilized for the proposed retail space.

It should be noted that surveys conducted by ITE have shown that some of the trips made to quick-service restaurants and retail establishments are diverted from the existing traffic on the roadway system. This is particularly true during the weekday morning and evening peak hours when traffic is diverted from the home-to-work and work-to-home trips. Such diverted trips are referred to as pass-by traffic. Based on information published by ITE, approximately 25 percent of retail trips and 50 percent of quick-service restaurant trips are pass-by trips. However, a pass-by reduction was only applied to the trips generated by the proposed restaurant space in order to provide a conservative analysis.

Table 3 summarizes the estimated vehicle trip generation for each phase of the proposed development.

Table 3
ESTIMATED SITE-GENERATED TRAFFIC VOLUMES

ITE Land Use Code	Type/Size	Weekday Morning Peak Hour			Weekday Evening Peak Hour			Daily Two-Way Trips		
		In	Out	Total	In	Out	Total	In	Out	Total
220	Multifamily Housing (23 Units)	3	9	12	10	6	16	67	67	134
934	Quick Service Restaurant (1,500 s.f.)	30	30	60	25	24	49	353	353	706
820	Retail (2,700 s.f.)	<u>2</u>	<u>1</u>	<u>3</u>	<u>5</u>	<u>5</u>	<u>10</u>	<u>51</u>	<u>51</u>	<u>102</u>
	Subtotal	35	40	75	40	35	75	471	471	942
	<i>50 percent pass-by reduction¹</i>	<u>-15</u>	<u>-15</u>	<u>-30</u>	<u>-12</u>	<u>-12</u>	<u>-24</u>	<u>-176</u>	<u>-176</u>	<u>-352</u>
	Total New Trips	20	25	45	28	23	51	295	295	590

¹ – Applied to the trips generated by the proposed quick-service restaurant

4. Projected Traffic Conditions

The total projected traffic volumes take into consideration the existing traffic volumes, increase in background traffic due to growth, and the traffic estimated to be generated by the proposed development.

Development Traffic Assignment

The estimated weekday morning and weekday evening peak hour traffic volumes that will be generated by the proposed development were assigned to the roadway system in accordance with the previously described directional distribution (Figure 5). **Figure 6** illustrates the traffic assignment for the proposed townhome units, **Figure 7** illustrates the new traffic assignment for the proposed retail space and **Figure 8** illustrates the pass-by traffic assignment for the proposed retail space.

Background Traffic Conditions

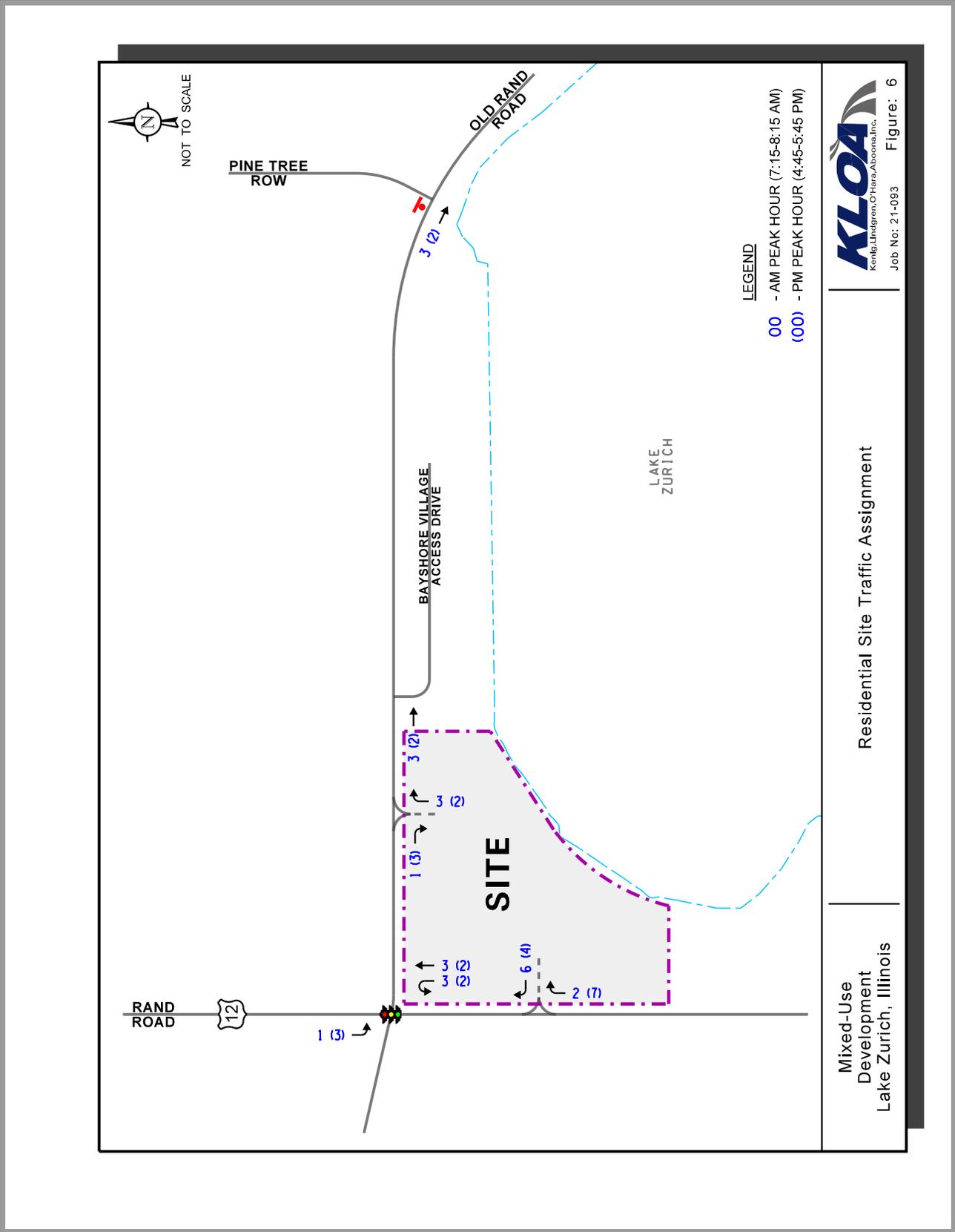
The existing traffic volumes (Figure 4) were increased by a regional growth factor to account for the increase in existing traffic related to regional growth in the area (i.e., not attributable to any particular planned development). Based on ADT projections provided by the Chicago Metropolitan Agency for Planning (CMAP), the existing traffic volumes are projected to increase by a compound annual growth rate of approximately 0.7 percent per year. As such, the Year 2021 base traffic volumes were increased by four percent to represent Year 2027 (buildout plus five years) conditions. A copy of the CMAP projections letter is included in the Appendix.

Additionally, as previously indicated, a Life Time Fitness is currently under construction in the northeast quadrant of the intersection of Rand Road with Old Rand Road. As proposed, the Life Time Fitness consists of an 125,000 square-foot, members only health and fitness club. Access to the development will be provided via a right-in/right-out access drive off Rand Road, a three-quarter access drive on Old Rand Road (aligned opposite the Bayshore Village westerly access drive), and a full movement access drive off Golfview Road. The volume of traffic estimated to be generated by the Life Time Fitness, as summarized in the June 2018 traffic study prepared by GHA, was included in the background traffic conditions to estimate Year 2027 no-build traffic volumes.

Figure 7 illustrates the Year 2027 no-build traffic volumes which include the Year 2021 base traffic volumes increased by a regional growth factor and the traffic estimated to be generated by Life Time Fitness.

Year 2027 Total Projected Traffic Volumes

The development-generated traffic (Figures 6, 7 and 8) was added to the Year 2027 no-build traffic volumes (Figure 9) to determine the Year 2027 total projected traffic volumes as illustrated in **Figure 10**.



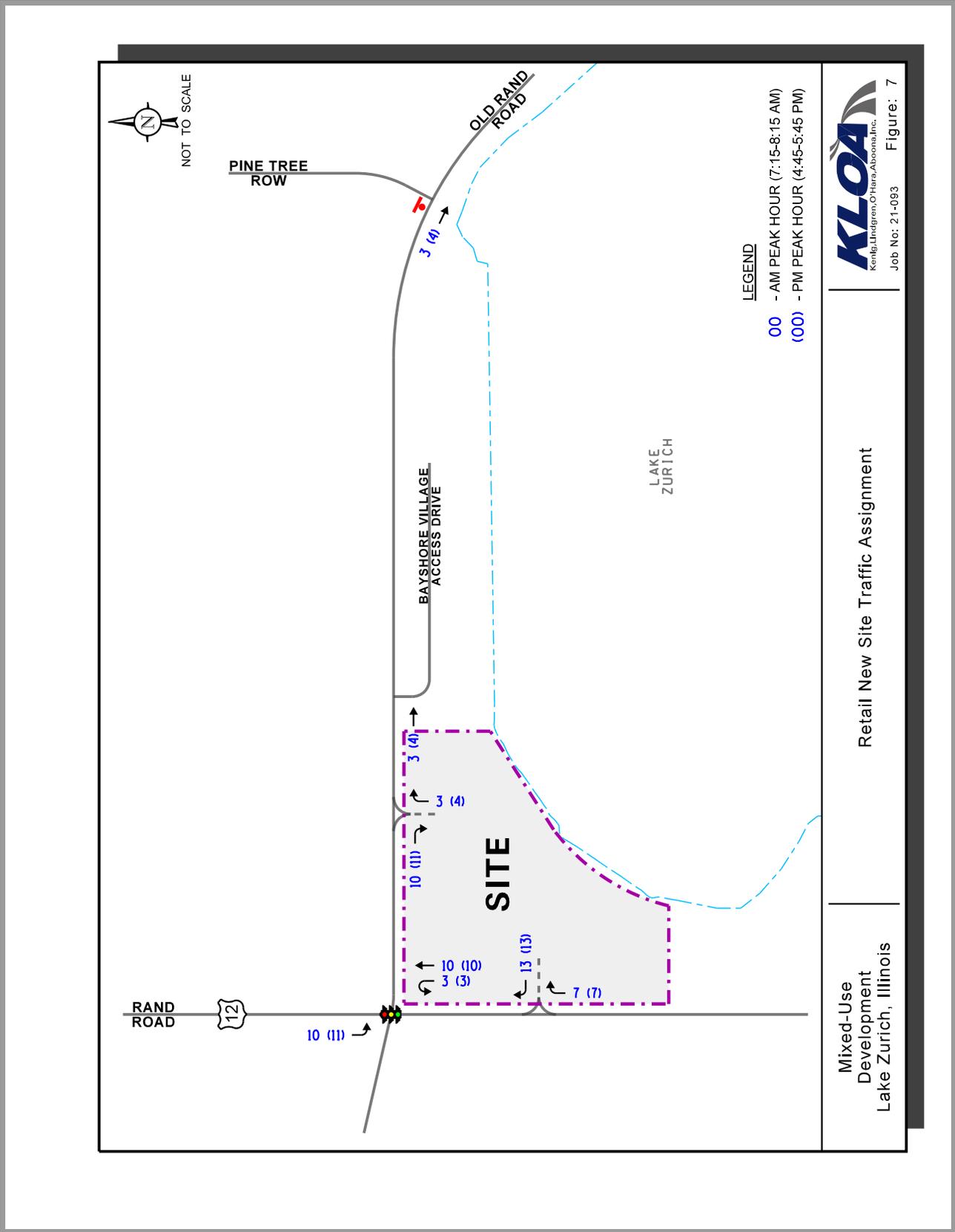
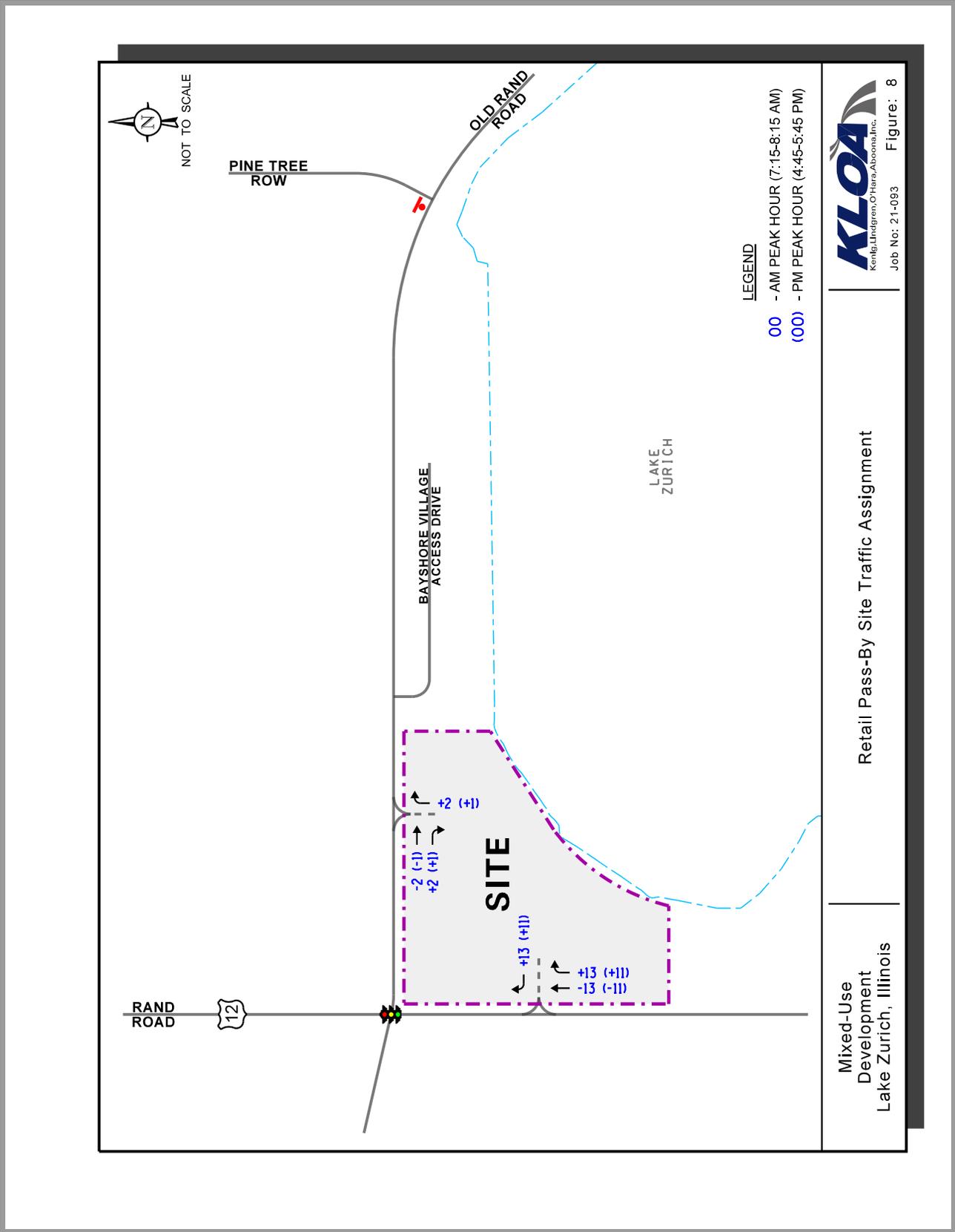


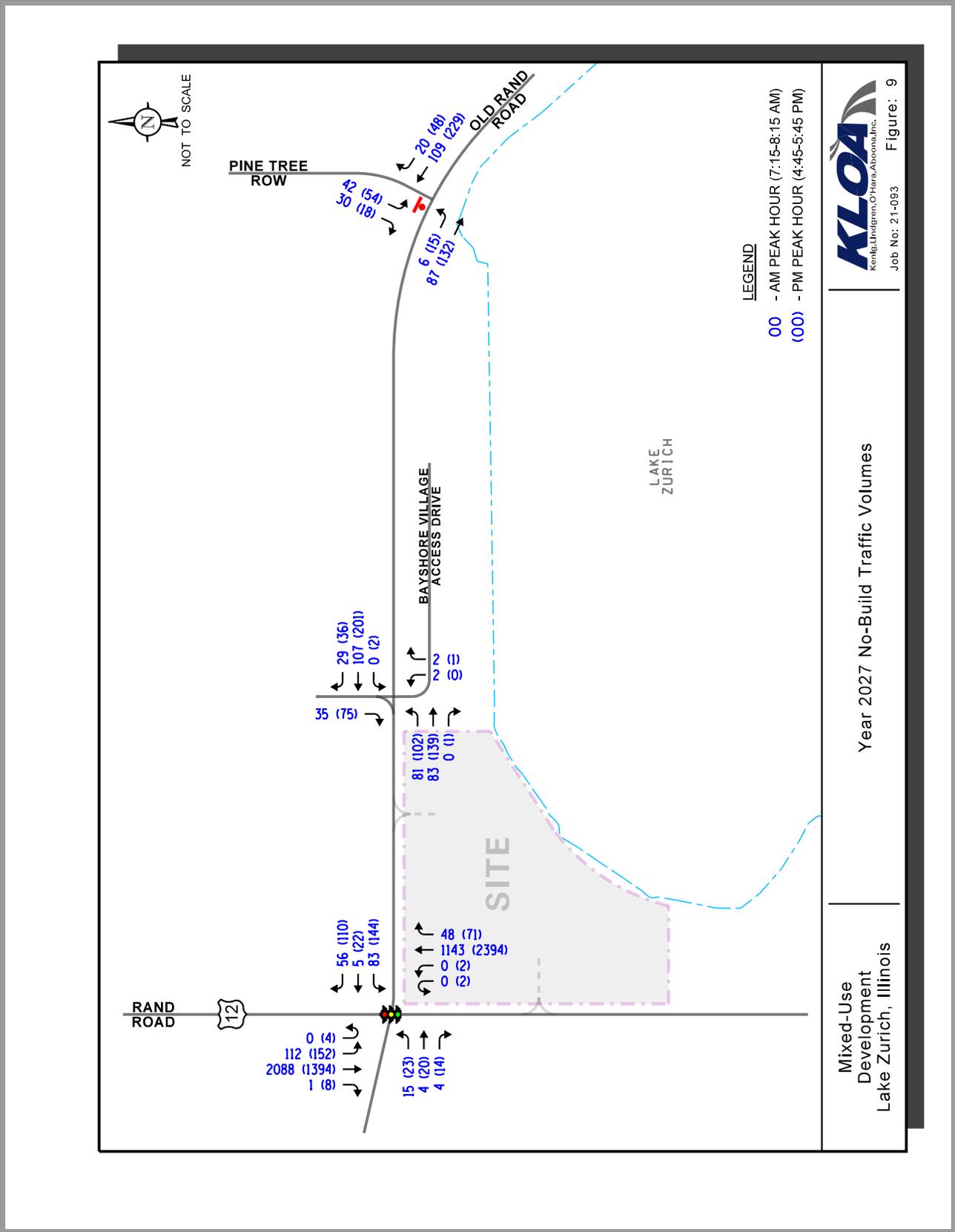
Figure: 7

Job No: 21-083

Retail New Site Traffic Assignment

Mixed-Use Development
Lake Zurich, Illinois

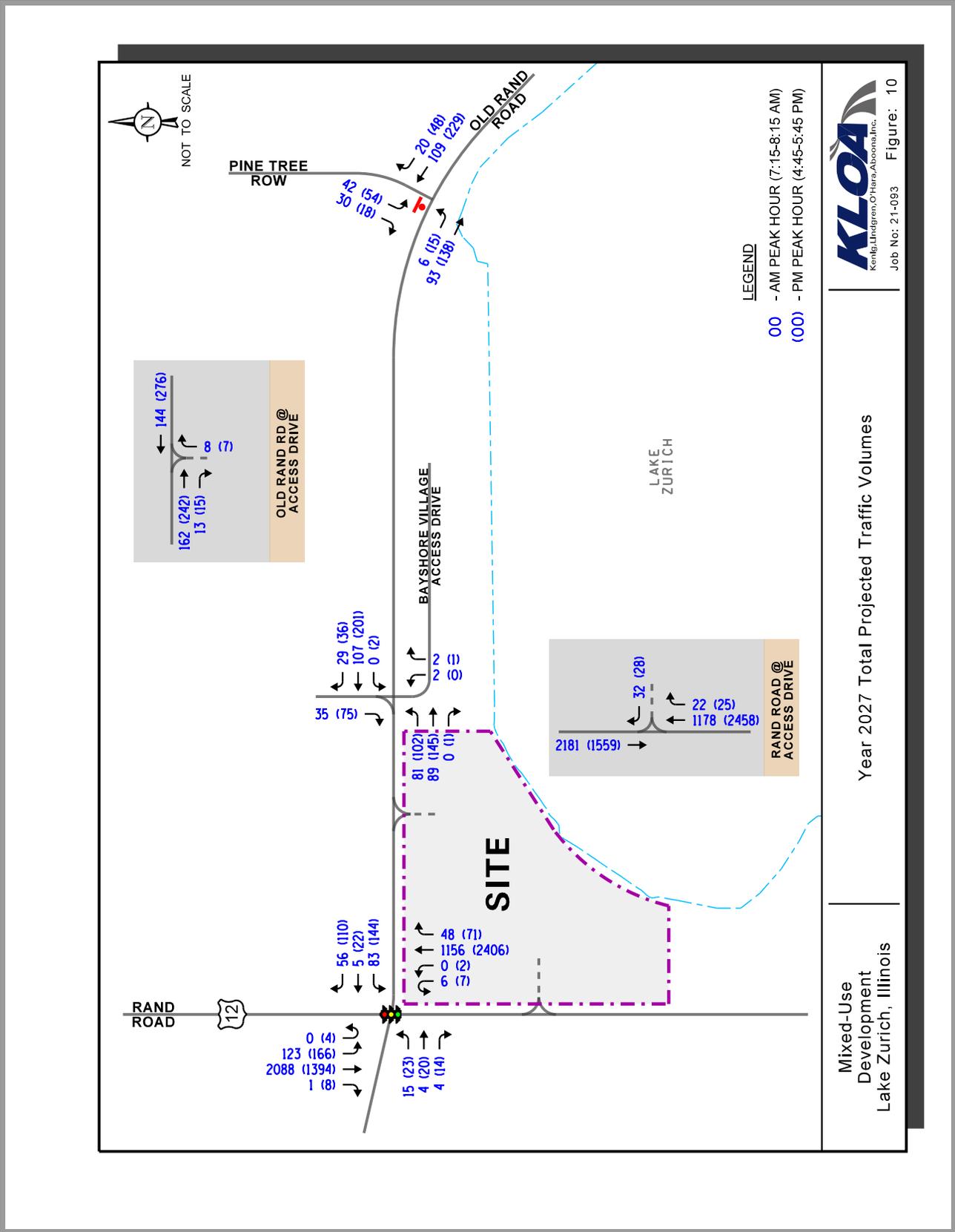




Job No: 21-083 Figure: 9

Year 2027 No-Build Traffic Volumes

Mixed-Use Development
Lake Zurich, Illinois



5. Traffic Analysis and Recommendations

The following provides an evaluation conducted for the weekday morning and weekday evening peak hours. The analysis includes conducting capacity analyses to determine how well the roadway system and access drives are projected to operate and whether any roadway improvements or modifications are required.

Traffic Analyses

Roadway and adjacent or nearby intersection analyses were performed for the weekday morning and weekday evening peak hours for the existing (Year 2021), Year 2027 no-build and Year 2027 total projected conditions.

The traffic analyses were performed using the methodologies outlined in the Transportation Research Board's *Highway Capacity Manual (HCM)*, 6th Edition and analyzed using the Synchro/SimTraffic 10 software. The analysis for the traffic-signal controlled intersection of Rand Road with Old Rand Road/Ravinia Terrace were accomplished using actual cycle lengths, phasing, and offsets to determine the average overall vehicle delay and levels of service.

The analyses for the unsignalized intersections determine the average control delay to vehicles at an intersection. Control delay is the elapsed time from a vehicle joining the queue at a stop sign (includes the time required to decelerate to a stop) until its departure from the stop sign and resumption of free flow speed. The methodology analyzes each intersection approach controlled by a stop sign and considers traffic volumes on all approaches and lane characteristics.

The ability of an intersection to accommodate traffic flow is expressed in terms of level of service, which is assigned a letter from A to F based on the average control delay experienced by vehicles passing through the intersection. The *Highway Capacity Manual* definitions for levels of service and the corresponding control delay for signalized intersections and unsignalized intersections are included in the Appendix of this report.

Summaries of the traffic analysis results showing the level of service and overall intersection delay (measured in seconds) for the Year 2021 Base, Year 2027 no-build and Year 2027 total projected conditions are presented in **Tables 4** through **7**. A discussion of each intersection follows. Summary sheets for the capacity analyses are included in the Appendix.

It should be noted that the analyses for Year 2027 no-build and total projected conditions include the proposed geometric improvements planned as part of the proposed Life Time development.

Table 4
CAPACITY ANALYSIS RESULTS – RAND ROAD WITH OLD RAND ROAD/RAVINIA TERRACE – SIGNALIZED

	Peak Hour	Eastbound			Westbound			Northbound			Southbound			Overall	
		L	T	R	L	T	R	L	T	R	L	T	R		
Year 2021 Base Traffic Volumes	Weekday Morning Peak Hour	E 56.4	E 60.7		D 53.0	E 71.4		--	B 11.2	A 9.3		E 72.3	B 10.1	A 5.0	B – 13.3
		E – 57.6			E – 63.1			B – 11.1			B – 11.5				
Year 2021 Base Traffic Volumes	Weekday Evening Peak Hour	D 49.0	E 64.6		D 54.2	F 82.9		E 71.2	D 41.9	B 10.8		F 91.8	B 10.6	A 7.9	C – 33.4
		E – 58.1			E – 72.7			D – 41.3			B – 14.5				
Year 2027 No-Build Traffic Volumes	Weekday Morning Peak Hour	E 56.5	E 60.9		E 57.1	E 71.5		--	B 16.5	B 11.8		E 76.5	B 12.2	A 5.0	B – 17.9
		E – 57.9			E – 63.2			B – 16.3			B – 15.5				
Year 2027 No-Build Traffic Volumes	Weekday Evening Peak Hour	D 49.0	E 65.1		E 69.6	F 85.1		E 71.2	F 97.0	B 11.7		F 99+	B 11.1	A 7.9	E – 66.6
		E – 58.6			E – 77.0			F – 94.5			C – 20.9				
Year 2027 Projected Traffic Volumes	Weekday Morning Peak Hour	E 56.5	E 60.9		E 57.1	E 71.5		E 66.2	B 17.1	B 12.0		E 77.0	B 14.8	A 8.0	B – 19.9
		E – 57.9			E – 63.2			B – 17.1			B – 18.3				
Year 2027 Projected Traffic Volumes	Weekday Evening Peak Hour	D 49.0	E 65.1		E 69.6	F 85.1		E 74.4	F 99.3	B 11.7		F 99+	B 12.9	A 9.4	E – 69.4
		E – 58.6			E – 77.0			F – 96.7			C – 25.2				

Letter denotes Level of Service L – Left Turns R – Right Turns
Delay is measured in seconds. T – Through

Table 5
CAPACITY ANALYSIS RESULTS – EXISTING CONDITIONS – UNSIGNALIZED

Intersection	Weekday Morning Peak Hour		Weekday Evening Peak Hour	
	LOS	Delay	LOS	Delay
Old Rand Road with Pine Tree Row				
• Southbound Approach	A	9.7	B	12.3
• Eastbound Left Turn	A	7.4	A	7.9
Old Rand Road with Bayshore Village Westerly Access Drive				
• Northbound Approach	A	9.2	A	9.1
• Westbound Left Turn	--	--	A	7.5
LOS = Level of Service Delay is measured in seconds.				

Table 6
CAPACITY ANALYSIS RESULTS – NO-BUILD CONDITIONS – UNSIGNALIZED

Intersection	Weekday Morning Peak Hour		Weekday Evening Peak Hour	
	LOS	Delay	LOS	Delay
Old Rand Road with Pine Tree Row				
• Southbound Approach	B	10.0	B	13.1
• Eastbound Left Turn	A	7.5	A	8.0
Old Rand Road with Bayshore Village//Life Time Access Drives				
• Northbound Approach	B	10.8	A	9.1
• Southbound Approach	A	9.2	B	10.4
• Eastbound Left-Turn	A	7.7	A	8.2
• Westbound Left Turn	--	--	A	7.6
LOS = Level of Service Delay is measured in seconds.				

Table 7
CAPACITY ANALYSIS RESULTS – PROJECTED CONDITIONS – UNSIGNALIZED

Intersection	Weekday Morning Peak Hour		Weekday Evening Peak Hour	
	LOS	Delay	LOS	Delay
Old Rand Road with Pine Tree Row				
• Southbound Approach	B	10.1	B	13.1
• Eastbound Left Turn	A	7.5	A	8.0
Old Rand Road with Bayshore Village//Life Time Access Drives				
• Northbound Approach	B	10.9	A	9.2
• Southbound Approach	A	9.2	B	10.4
• Eastbound Left-Turn	A	7.7	A	8.2
• Westbound Left Turn	--	--	A	7.6
Rand Road with Proposed Right-In/Right-Out Access Drive				
• Westbound Approach	B	13.9	D	33.4
Old Rand Road with Proposed Right-In/Right-Out Access Drive				
• Northbound Approach	A	9.2	A	9.7
LOS = Level of Service Delay is measured in seconds.				

Discussion and Recommendations

The following is an evaluation of the analyzed intersections based on the projected traffic volumes and the capacity analyses performed.

Rand Road with Old Rand Road/Ravinia Terrace

The results of the capacity analysis indicate that overall, this intersection currently operates at level of service (LOS) B during the weekday morning peak hour and at LOS C during the weekday evening peak hours. The northbound and southbound approaches currently operate at LOS B during the peak hours, with the exception of the northbound approach which operates at LOS D during the weekday evening peak hour, and the eastbound and westbound approaches currently operate at LOS E during the peak hours.

Under Year 2027 no-build conditions, with the previously described improvements as part of the Life Time Fitness development, this intersection overall is projected to continue operating at LOS B during the weekday morning peak hour and is projected to operate at LOS E during the weekday evening peak hour. The northbound and southbound approaches are projected to operate at LOS C or better during the peak hours with the exception of the northbound approach which is projected to operate at LOS F during the weekday evening peak hour. The resulting level of service during the weekday evening peak hour is primarily due to the existing northbound through volumes increased by the regional growth factor which results in the northbound through lanes operating at a V/C ratio greater than one.

The eastbound and westbound approaches are projected to continue operating at LOS E during the peak hours. It should be noted that the southbound approach is projected to operate at LOS E during the weekday morning peak hour and at LOS F during the weekday evening peak hour.

Under Year 2027 total projected conditions, this intersection overall is projected to continue operating at LOS B during the weekday morning peak hour and at LOS E during the weekday evening peak hour with increase in delay of approximately two and three seconds, respectively. The northbound and southbound approaches are projected to continue operating at the levels of service experienced under Year 2027 no-build conditions with increases in delay of approximately three seconds or less. The eastbound and westbound approaches are projected to continue operating at LOS E during the peak hours and the southbound left-turning movements is projected to continue operating at LOS F.

Overall, the proposed development is only projected to increase the volume of traffic traversing this intersection by less than one percent during the peak hours and as such, will have a limited impact on the operations of this intersection.

Old Rand Road with Pine Tree Row

The results of the capacity analysis indicate that overall, the southbound approach currently operates at LOS A during the weekday morning peak hour and at LOS B during the weekday evening peak hours. Under Year 2027 no-build conditions, the southbound approach is projected to operate at LOS B during the peak hours with increases in delay of less than one second.

Under Year 2027 total projected conditions, the southbound approach is projected to continue operating at LOS B during the peak hours with increases in delay of less than one second. Eastbound left-turning movements from Old Rand Road onto Pine Tree Row are projected to continue operating at LOS A during peak hours with increases in delay of less than one second and 95th percentile queues of one to two vehicles.

As such, this intersection has sufficient reserve capacity to accommodate the traffic estimated to be generated by the proposed development and no roadway or traffic control improvements will be required.

Old Rand Road with Bayshore Village Westerly Access Drive/Life Time Fitness Access Drive

The results of the capacity analysis indicate that overall, outbound movements from the Bayshore Village westerly access drive onto Old Rand Road currently operate at LOS A during the weekday morning and weekday evening peak hours. Under Year 2027 no-build conditions, outbound movements from the Bayshore Village westerly access drive are projected to operate at LOS B during the weekday morning peak hour and at LOS A during the weekday evening peak hours with increases in delay of less than two seconds.

Under Year 2027 total projected conditions, outbound movements from the Bayshore Village westerly access drive are projected to continue operating at LOS B during the weekday morning peak hour and at LOS B during the weekday evening peak hour with increases in delay of less than one second over no-build conditions. Westbound left-turning movements from Old Rand Road onto the Bayshore Village westerly access drive are projected to continue operating at LOS A or better during the peak hours with 95th percentile queues of one to two vehicles.

Under Year 2027 no-build and total projected peak hours, outbound movements from the proposed Life Time Fitness access drive onto Old Rand Road are projected to operate at LOS A during the weekday morning peak hour and at LOS B during the weekday evening peak hour with 95th percentile queues of one to two vehicles. Furthermore, eastbound left-turning movements from Old Rand Road onto the Life Time Fitness access drive are projected to operate at LOS A during the peak hours with 95th percentile queues of one to two vehicles which will continue to be accommodated by the 125 feet of left-turn lane storage that will be provided.

As such, the traffic estimated to be generated by the proposed development will have a limited impact on the operations of these access drives and no roadway or traffic control improvements will be required.

Rand Road with Proposed Right-In/Right-Out Access Drive

The proposed right-in/right-out access drive on Rand Road will be located approximately 275 feet (centerline to centerline) south of Old Rand Road. This access drive will be physically restricted to right-turning movements via a raised triangular median and given the existing raised landscape median along Rand Road. As part of the proposed development, the existing northbound left-turn lane on Rand Road at Old Rand Road will be extended through the proposed access drive and will provide 70 feet of storage and 150 feet of taper.

Given the proposed site-layout, the location of this access drive will minimize interaction between residents and retail patrons as patrons will be able to access retail parking without traversing any residential driveways or guest parking spaces. Additionally, this access drive will be located south of the existing northbound left-turn lane storage on Rand Road at its signalized intersection with Old Rand Road, which will allow for outbound vehicles to enter the northbound left-turn lane at the beginning of the lane.

The results of the capacity analysis indicate that outbound movements from the proposed right-in/right-out access drive onto Rand Road are projected to operate at LOS B during the weekday morning peak hour and at LOS D during the weekday evening peak hour with 95th percentile queues of one to two vehicles.

As such, this access drive will be adequate in accommodating the traffic estimated to be generated by the proposed development, will ensure flexible access is provided, and will have a limited impact on the operations of Rand Road.

Old Rand Road with Proposed Right-In/Right-Out Access Drive

The proposed right-in/right-out access drive on Old Rand Road will be located approximately 370 feet (centerline to centerline) east of Rand Road. This access drive will be physically restricted to right-turning movements only via a raised triangular median. The location of this access drive will provide maximum spacing from the signalized intersection of Rand Road with Old Rand Road and will provide adequate access for the development while minimizing intersection between residents and retail patrons.

The results of the capacity analysis indicate that outbound movements from the proposed access drive onto Old Rand Road are projected to operate at LOS A during the weekday morning and weekday evening peak hours with 95th percentile queues of one to two vehicles.

When the Year 2027 total projected traffic volumes are compared to the turn lane warrant diagrams published in Chapter 36 of the IDOT Bureau of Design and Environment Manual, an exclusive eastbound right-turn lane is not warranted during either peak hour.

As such, this access drive will be adequate in accommodating the traffic estimated to be generated by the proposed development, will ensure flexible access is provided, and will have a limited impact on the operations of Old Rand Road.

6. Conclusion

Based on existing conditions and the traffic capacity analyses for the full buildout of the development, the findings and recommendations of this study are outlined below:

- The traffic that will be generated by the proposed mixed-use development can be accommodated by the area roadway system.
- Geometric improvements and signal modifications are not required at the intersections of Rand Road with Old Rand Road/Ravinia Terrace. Overall, the proposed development will increase the volume of traffic traversing this intersection by less than one percent during the peak hours.
- Roadway and traffic control improvements are not required at the intersection of Old Rand Road with Pine Tree Road and Old Rand Road with the Bayshore Village westerly access drive/proposed Life Time Fitness three-quarter access drive.
- As part of the proposed development, the existing northbound right-turn lane on Rand Road at its signalized intersection with Old Rand Road will be extended through the proposed right-in/right-out access drive. This turn lane will provide 70 feet of storage and 150 feet of taper at the access drive.
- When the projected traffic volumes are compared to the turn lane warrant guidelines published in the IDOT BDE Manual, an exclusive right-turn lane is not warranted at the proposed right-in/right-out access drive on Old Rand Road.
- The locations of the proposed access drive will be adequate in accommodating the traffic estimated to be generated by the proposed development and will minimize interaction between residents and retail patrons.

Appendix

Traffic Count Summary Sheets
Site Plan
CMAP 2050 Projections Letter
Level of Service Criteria
Capacity Analysis Summary Sheets

Traffic Count Summary Sheets



Kenig Lindgren O'Hara Aboona, Inc.
9575 W. Higgins Rd., Suite 400
Rosemont, Illinois, United States 60018
(847)518-9990

Count Name: Rand Road with Old Rand Road
Site Code:
Start Date: 04/05/2021
Page No: 1

Turning Movement Data

Start Time	Old Rand Road Eastbound					App. Total	Old Rand Road Westbound					Rand Road Northbound					Rand Road Southbound					App. Total	Int. Total		
	U-Turn	Left	Thru	Right	Peis		U-Turn	Left	Thru	Right	Peis	U-Turn	Left	Thru	Right	Peis	U-Turn	Left	Thru	Right	Peis				
4:00 PM	0	4	5	5	1	14	0	20	2	31	0	53	0	0	480	11	0	461	0	4	274	2	0	280	838
4:15 PM	0	2	5	2	0	9	0	11	3	23	0	37	0	1	487	8	0	496	1	8	317	5	0	331	873
4:30 PM	0	3	1	4	0	8	0	9	2	28	0	39	0	1	405	12	0	418	1	13	243	2	1	259	724
4:45 PM	0	3	4	2	0	9	0	9	1	17	0	27	0	0	402	8	0	410	0	8	294	3	0	305	751
Hourly Total	0	12	15	13	1	40	0	49	8	99	0	156	0	2	1774	39	0	1815	2	33	1128	12	1	1175	3186
5:00 PM	0	5	4	6	0	15	0	12	5	28	0	45	1	1	520	12	0	534	0	15	292	1	1	308	902
5:15 PM	0	5	3	2	1	10	0	18	5	27	0	50	0	1	404	11	0	416	2	14	282	1	0	299	775
5:30 PM	0	5	2	1	0	8	0	18	5	16	0	39	1	0	524	11	0	536	1	13	243	2	0	259	842
5:45 PM	0	4	1	2	0	7	0	18	1	24	0	43	0	1	336	18	0	355	0	11	227	0	0	238	643
Hourly Total	0	19	10	11	1	40	0	66	16	95	0	177	2	3	1784	52	0	1841	3	53	1044	4	1	1104	3162
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	0	3	0	3	0	6	0	5	0	4	0	9	0	0	156	5	0	161	0	4	409	1	0	414	590
7:15 AM	0	5	0	0	0	5	0	11	0	10	0	21	0	0	216	5	0	221	0	7	414	0	0	421	668
7:30 AM	0	4	2	2	0	8	0	10	1	11	2	22	0	0	220	6	0	226	0	8	468	0	0	476	732
7:45 AM	0	2	0	0	0	2	0	13	1	12	0	26	0	0	198	5	0	203	0	12	416	1	0	429	660
Hourly Total	0	14	2	5	0	21	0	39	2	37	2	78	0	0	790	21	0	811	0	31	1707	2	0	1740	2650
8:00 AM	0	1	0	1	0	2	0	5	1	12	0	18	0	0	227	12	0	239	0	8	372	0	0	380	639
8:15 AM	0	3	3	1	0	7	0	9	0	17	0	26	0	0	213	12	0	225	0	9	399	2	1	410	668
8:30 AM	0	2	9	1	0	12	0	5	1	11	0	17	0	0	244	8	0	252	0	14	404	2	0	420	701
8:45 AM	0	0	1	0	1	1	0	9	0	8	1	17	0	0	201	7	1	208	0	11	337	0	0	348	574
Hourly Total	0	6	13	3	1	22	0	28	2	48	1	78	0	0	885	39	1	924	0	42	1512	4	1	1558	2582
Grand Total	0	51	40	32	3	123	0	182	28	279	3	489	2	5	5233	151	1	5391	5	159	5391	22	3	5577	11590
Approach %	0.0	41.5	32.5	26.0	-	-	0.0	37.2	5.7	57.1	-	-	0.0	0.1	97.1	2.8	-	-	0.1	2.9	96.7	0.4	-	-	-
Total %	0.0	0.4	0.3	0.3	-	1.1	0.0	1.6	0.2	2.4	-	4.2	0.0	0.0	45.2	1.3	-	46.6	0.0	1.4	46.6	0.2	-	48.2	-
Lights	0	50	40	32	-	122	0	181	28	275	-	484	1	5	4936	150	-	5092	5	157	5116	22	-	5300	10998
% Lights	-	98.0	100.0	100.0	-	99.2	-	99.5	100.0	98.6	-	99.0	50.0	100.0	94.3	99.3	-	94.5	100.0	98.7	94.9	100.0	-	95.0	95.0
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	4	0	-	4	0	0	17	0	-	17	21
% Buses	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.1	0.0	-	0.1	0.0	0.0	0.3	0.0	-	0.3	0.2
Single-Unit Trucks	0	1	0	0	-	1	0	1	0	4	-	5	1	0	139	1	-	141	0	2	102	0	-	104	251
% Single-Unit Trucks	-	2.0	0.0	0.0	-	0.8	-	0.5	0.0	1.4	-	1.0	50.0	0.0	2.7	0.7	-	2.6	0.0	1.3	1.9	0.0	-	1.9	2.2
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	154	0	-	154	0	0	156	0	-	156	310
% Articulated Trucks	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	2.9	0.0	-	2.9	0.0	0.0	2.9	0.0	-	2.8	2.7
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0



Kenig Lindgren O'Hara Aboona, Inc.
9575 W. Higgins Rd., Suite 400
Rosemont, Illinois, United States 60018
(847)518-9990

Count Name: Rand Road with Old Rand Road
Site Code:
Start Date: 04/05/2021
Page No. 3

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Old Rand Road Eastbound					Old Rand Road Westbound					Rand Road Northbound					Rand Road Southbound					Int. Total						
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total		U-Turn	Left	Thru	Right	App. Total	
4:45 PM	0	3	4	2	0	9	0	9	1	17	0	27	0	0	402	8	410	0	8	294	3	305	0	0	0	0	0
5:00 PM	0	5	4	6	0	15	0	12	5	28	0	45	1	1	520	12	534	0	15	292	1	308	0	0	0	0	0
5:15 PM	0	5	3	2	1	10	0	18	5	27	0	50	0	1	404	11	416	2	14	282	1	299	0	0	0	0	0
5:30 PM	0	5	2	1	0	8	0	18	5	16	0	39	0	1	524	11	536	1	13	243	2	259	0	0	0	0	0
Total	0	18	13	11	1	42	0	57	16	88	0	161	2	2	1850	42	1896	3	50	1111	7	1171	0	0	0	0	0
Approach %	0.0	42.9	31.0	26.2	-	-	0.0	35.4	9.9	54.7	-	-	0.1	0.1	97.6	2.2	-	0.3	4.3	94.9	0.6	-	-	-	-	-	-
Total %	0.0	0.6	0.4	0.3	-	1.3	0.0	1.7	0.5	2.7	-	4.9	0.1	0.1	56.6	1.3	58.0	0.1	1.5	34.0	0.2	35.8	-	-	-	-	-
PHF	0.000	0.900	0.813	0.458	-	0.700	0.000	0.792	0.800	0.786	-	0.805	0.500	0.500	0.883	0.875	0.884	0.375	0.833	0.945	0.563	0.950	0.000	0.000	0.000	0.000	0.000
Lights	0	18	13	11	-	42	0	56	16	88	-	160	1	2	1812	42	1857	3	50	1073	7	1133	0	0	0	0	0
% Lights	-	100.0	100.0	100.0	-	100.0	-	98.2	100.0	100.0	-	98.4	50.0	100.0	97.9	100.0	97.9	100.0	100.0	96.6	100.0	96.6	-	-	-	-	-
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	7	0	7	0	0	0	0	0
% Buses	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.6	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Single-Unit Trucks	0	0	0	0	0	0	0	1	0	0	0	1	1	0	19	0	20	0	0	15	0	15	0	0	0	0	0
% Single-Unit Trucks	-	0.0	0.0	0.0	-	0.0	-	1.8	0.0	0.0	-	0.6	50.0	0.0	1.0	0.0	1.1	0.0	0.0	1.4	0.0	1.3	0.0	0.0	0.0	0.0	0.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	17	0	0	16	0	16	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.9	0.0	0.9	0.0	0.0	1.4	0.0	1.4	0.0	0.0	0.0	0.0	0.0
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Road	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Kenig Lindgren O'Hara Aboona, Inc.
9575 W. Higgins Rd., Suite 400

Count Name: Rand Road with Old Rand Road
Site Code:
Start Date: 04/05/2021
Page No. 4

Rosemont, Illinois, United States 60018
(847)518-9990

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Old Rand Road Eastbound					Old Rand Road Westbound					Rand Road Northbound					Rand Road Southbound					Int. Total		
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total			
7:15 AM	0	5	0	0	5	0	11	0	10	0	0	0	216	5	0	0	7	414	0	0	421	668	
7:30 AM	0	4	2	2	8	0	10	1	11	2	22	0	220	6	0	0	8	488	0	0	476	732	
7:45 AM	0	2	0	0	2	0	13	1	12	0	26	0	198	5	0	203	0	416	1	0	429	660	
8:00 AM	0	1	0	1	2	0	5	1	12	0	18	0	227	12	0	239	0	372	0	0	380	639	
Total	0	12	2	3	17	0	39	3	45	2	87	0	861	28	0	889	0	1670	1	0	1706	2699	
Approach %	0.0	70.6	11.8	17.6	-	0.0	44.8	3.4	51.7	-	-	0.0	96.9	3.1	-	-	0.0	2.1	97.9	0.1	-	-	
Total %	0.0	0.4	0.1	0.1	0.6	0.0	1.4	0.1	1.7	-	3.2	0.0	0.0	31.9	1.0	32.9	0.0	1.3	61.9	0.0	-	63.2	
PHF	0.000	0.600	0.250	0.375	0.531	0.000	0.750	0.750	0.938	0.837	0.000	0.000	0.948	0.653	0.830	0.000	0.729	0.892	0.250	0.866	0.922	-	
Lights	0	11	2	3	16	0	39	3	43	-	85	0	733	27	-	760	0	35	1595	1	-	1631	
% Lights	-	91.7	100.0	100.0	94.1	-	100.0	100.0	95.6	-	97.7	-	85.1	96.4	-	85.5	-	100.0	95.5	100.0	-	-	95.6
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	-	6	
% Buses	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.4	0.0	0.0	-	0.4	
Single-Unit Trucks	0	1	0	0	1	0	0	0	2	2	2	0	65	1	66	0	0	26	0	0	-	26	
% Single-Unit Trucks	-	8.3	0.0	0.0	5.9	-	0.0	0.0	4.4	2.3	-	-	7.5	3.6	7.4	-	0.0	1.6	0.0	-	1.5	3.5	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	63	0	63	0	0	43	0	-	43	106	
% Articulated Trucks	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	7.3	0.0	7.1	-	0.0	2.6	0.0	-	2.5	3.9	
Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	
% Bicycles on Road	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	
Pedestrians	-	-	-	-	2	-	-	-	-	2	-	-	-	-	100.0	-	-	-	-	-	-	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	-	-	-	-



Count Name: Old Rand Road with Pine Tree
 Row Code:
 Site Code:
 Start Date: 04/05/2021
 Page No: 1

Kenig Lindgren O'Hara Aboona, Inc.
 9575 W. Higgins Rd., Suite 400
 Rosemont, Illinois, United States 60018
 (847)518-9990

Turning Movement Data

Start Time	Old Rand Road Eastbound						Old Rand Road Westbound						Pine Tree Row Southbound					
	U-Turn	Left	Thru	Peds	App. Total	Int. Total	U-Turn	Thru	Right	Peds	App. Total	Int. Total	U-Turn	Left	Right	Peds	App. Total	Int. Total
4:00 PM	0	3	22	0	25	64	0	47	17	0	64	106	0	5	12	3	17	106
4:15 PM	0	5	19	0	24	50	0	39	11	0	50	85	1	6	4	6	11	85
4:30 PM	0	3	22	0	25	44	0	37	7	0	44	76	0	3	4	6	7	76
4:45 PM	0	1	20	1	21	31	0	26	5	0	31	68	0	12	4	4	16	68
Hourly Total	0	12	83	1	95	189	0	149	40	0	189	335	1	26	24	19	51	335
5:00 PM	0	5	28	1	33	54	0	45	9	0	54	96	0	7	2	2	9	96
5:15 PM	0	3	33	3	36	64	0	44	20	0	64	119	0	15	4	10	19	119
5:30 PM	0	3	25	0	28	45	0	41	4	0	45	85	0	9	3	9	12	85
5:45 PM	0	3	30	0	33	60	0	45	15	0	60	105	0	9	3	11	12	105
Hourly Total	0	14	116	4	130	223	0	175	48	0	223	405	0	40	12	32	52	405
BREAK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	0	0	8	0	8	7	0	6	1	0	7	29	0	11	3	3	14	29
7:15 AM	0	1	13	0	14	19	0	16	3	0	19	47	0	9	5	0	14	47
7:30 AM	0	0	16	0	16	15	0	12	3	0	15	46	0	8	7	1	15	46
7:45 AM	0	0	19	0	19	24	0	17	7	0	24	61	0	10	8	1	18	61
Hourly Total	0	1	56	0	57	65	0	51	14	0	65	183	0	38	23	5	61	183
8:00 AM	0	4	22	0	26	23	0	20	3	0	23	58	0	6	3	1	9	58
8:15 AM	0	2	22	1	24	23	0	20	3	0	23	58	0	7	4	1	11	58
8:30 AM	0	1	25	0	26	21	0	16	5	0	21	60	0	9	4	5	13	60
8:45 AM	0	1	24	1	25	20	0	15	5	0	20	53	0	7	1	3	8	53
Hourly Total	0	8	83	2	101	87	0	71	16	0	87	229	0	29	12	10	41	229
Grand Total	0	35	346	7	383	564	1	446	118	0	564	1152	1	133	71	66	205	1152
Approach %	0.0	9.1	90.9	-	-	-	0.0	79.1	20.9	-	-	-	0.5	64.9	34.6	-	-	-
Total %	0.0	3.0	30.2	-	33.2	49.0	0.0	38.7	10.2	-	49.0	62.2	0.1	11.5	6.2	-	17.8	-
Lights	0	34	335	-	369	555	0	437	118	-	555	1127	0	132	71	-	203	1127
% Lights	-	97.1	96.3	-	96.3	98.4	-	98.0	100.0	-	98.4	97.8	-	99.2	100.0	-	99.0	97.8
Buses	0	0	0	-	0	0	0	0	0	-	0	1	0	1	0	-	1	1
% Buses	-	0.0	0.0	-	0.0	0.0	-	0.0	0.0	-	0.0	0.1	-	0.8	0.0	-	0.5	0.1
Single-Unit Trucks	0	0	5	-	5	6	0	6	0	-	6	11	0	0	0	-	0	11
% Single-Unit Trucks	-	0.0	1.4	-	1.3	1.1	-	1.3	0.0	-	1.1	1.0	-	0.0	0.0	-	0.0	1.0
Articulated Trucks	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	-	0.0	0.0	-	0.0	0.0	-	0.0	0.0	-	0.0	0.0	-	0.0	0.0	-	0.0	0.0
Bicycles on Road	0	1	8	-	9	3	0	3	0	-	3	13	1	0	0	-	1	13
% Bicycles on Road	-	2.9	2.3	-	2.3	0.5	-	0.7	0.0	-	0.5	1.1	-	0.0	0.0	-	0.5	1.1
Pedestrians	-	-	-	7	-	0	-	-	-	0	-	66	-	-	-	-	-	66
% Pedestrians	-	-	-	100.0	-	-	-	-	-	0	-	100.0	-	-	-	-	-	100.0



Kenig Lindgren O'Hara Aboona, Inc.
9575 W. Higgins Rd., Suite 400

Rosemont, Illinois, United States 60018
(847)518-9990

Count Name: Old Rand Road with Pine Tree
Row Code:
Site Code:
Start Date: 04/05/2021
Page No. 2

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Old Rand Road Eastbound				Old Rand Road Westbound				Pine Tree Row Southbound							
	U-Turn	Left	Thru	Peds	App. Total	U-Turn	Thru	Right	Peds	App. Total	U-Turn	Left	Right	Peds	App. Total	Int. Total
4:45 PM	0	1	20	1	21	0	26	5	0	31	0	12	4	4	16	68
5:00 PM	0	5	28	1	33	0	45	9	0	54	0	7	2	2	9	96
5:15 PM	0	3	33	3	36	0	44	20	0	64	0	15	4	10	19	119
5:30 PM	0	3	25	0	28	0	41	4	0	45	0	9	3	9	12	85
Total	0	12	106	5	118	0	156	38	0	194	0	43	13	25	56	368
Approach %	0.0	10.2	89.8	-	32.1	0.0	80.4	19.6	-	52.7	0.0	76.8	23.2	-	15.2	-
Total %	0.0	3.3	28.8	-	0.819	0.0	42.4	10.3	-	0.758	0.000	0.717	0.813	-	0.737	0.773
PHF	0.000	0.600	0.803	-	0.819	0.000	0.867	0.475	-	0.758	0.000	0.717	0.813	-	0.737	0.773
Lights	0	11	101	-	112	0	156	38	-	194	0	43	13	-	56	362
% Lights	-	97.7	95.3	-	94.9	-	100.0	100.0	-	100.0	-	100.0	100.0	-	100.0	98.4
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
Single-Unit Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Single-Unit Trucks	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
Bicycles on Road	0	1	5	-	6	0	0	0	-	0	0	0	0	-	0	6
% Bicycles on Road	-	8.3	4.7	-	5.1	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	1.6
Pedestrians	-	-	-	5	-	-	-	-	0	-	-	-	-	25	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	0	-	-	-	-	100.0	-	-



Kenig Lindgren O'Hara Aboona, Inc.
9575 W. Higgins Rd., Suite 400

Rosemont, Illinois, United States 60018
(847)518-9990

Count Name: Old Rand Road with Pine Tree
Row Code:
Site Code:
Start Date: 04/05/2021
Page No: 3

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Old Rand Road Eastbound					Old Rand Road Westbound					Pine Tree Row Southbound						
	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Thru	Right	Peds	App. Total	U-Turn	Left	Right	Peds	App. Total	Int. Total
7:15 AM	0	1	13	0	0	14	0	16	3	0	19	0	9	5	0	14	47
7:30 AM	0	0	16	0	0	16	0	12	3	0	15	0	8	7	1	15	46
7:45 AM	0	0	19	0	0	19	0	17	7	0	24	0	10	8	1	18	61
8:00 AM	0	4	22	0	0	26	0	20	3	0	23	0	6	3	1	9	58
Total	0	5	70	0	0	75	0	65	16	0	81	0	33	23	3	56	212
Approach %	0.0	6.7	93.3	-	-	35.4	0.0	80.2	19.8	-	38.2	0.0	58.9	41.1	-	26.4	-
Total %	0.0	2.4	33.0	-	-	0.721	0.0	30.7	7.5	-	0.844	0.000	0.825	0.719	-	0.778	0.869
PHF	0.000	0.313	0.795	-	-	0.721	0.000	0.813	0.571	-	0.844	0.000	0.825	0.719	-	0.778	0.869
Lights	0	5	68	-	-	73	0	62	16	-	78	0	32	23	-	55	206
% Lights	-	100.0	97.1	-	-	97.3	-	95.4	100.0	-	96.3	-	97.0	100.0	-	96.2	97.2
Buses	0	0	0	-	-	0	0	0	0	-	0	0	0	0	-	0	1
% Buses	-	0.0	0.0	-	-	0.0	-	0.0	0.0	-	0.0	-	3.0	0.0	-	1.8	0.5
Single-Unit Trucks	0	0	1	-	-	1	0	3	0	-	3	0	0	0	-	0	4
% Single-Unit Trucks	-	0.0	1.4	-	-	1.3	-	4.6	0.0	-	3.7	-	0.0	0.0	-	0.0	1.9
Articulated Trucks	0	0	0	-	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	-	0.0	0.0	-	-	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
Bicycles on Road	0	0	1	-	-	1	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	-	0.0	1.4	-	-	1.3	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.5
Pedestrians	-	-	0	-	-	0	-	-	0	-	0	-	-	-	-	3	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-

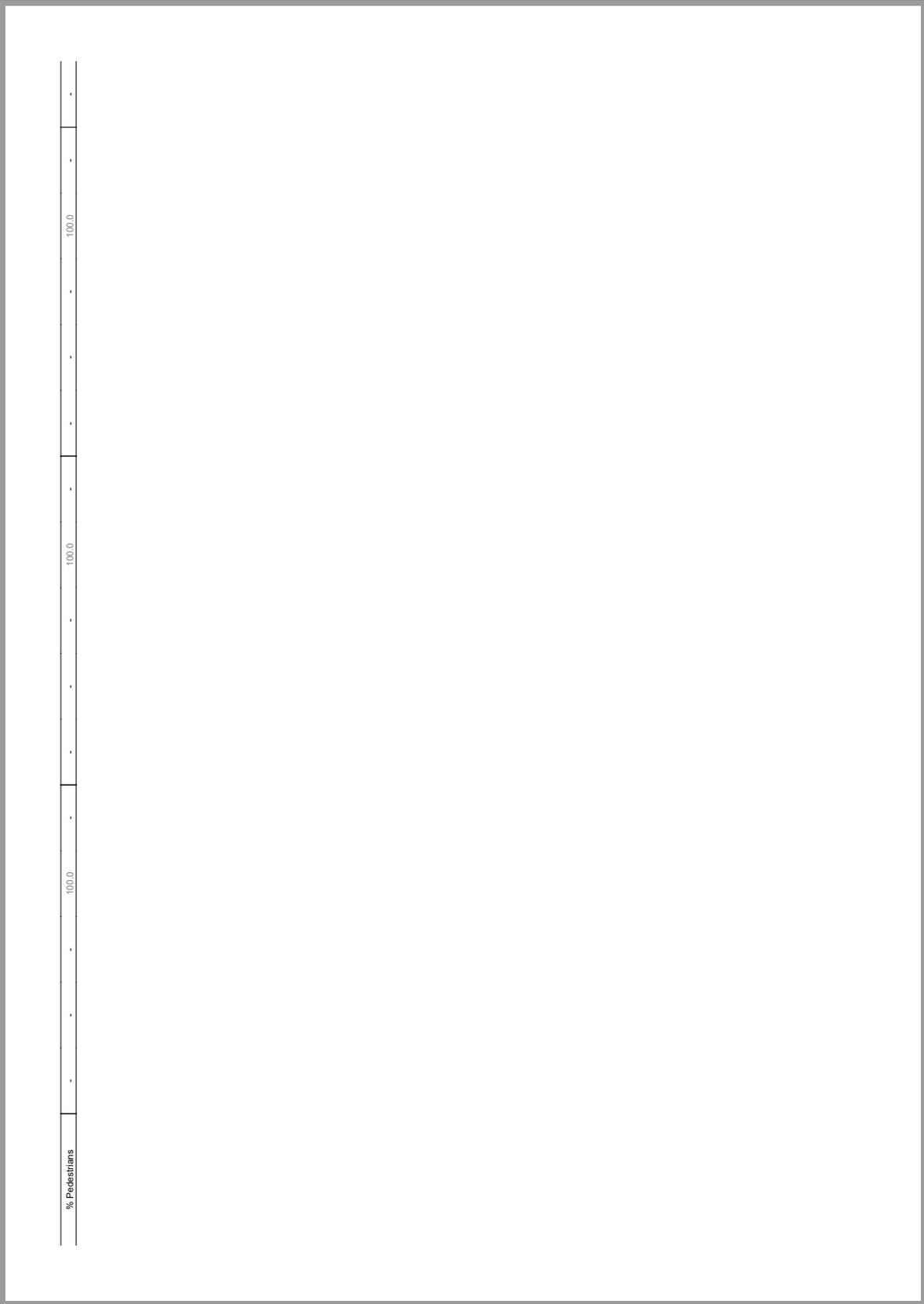


KLOA
Kenig Lindgren O'Hara Aboona, Inc.
9575 W. Higgins Rd., Suite 400
Rosemont, Illinois, United States 60018
(847)518-9990

Count Name: Old Rand Road with Access Drive
Site Code:
Start Date: 04/05/2021
Page No: 1

Turning Movement Data

Start Time	Old Rand Road Eastbound						Old Rand Road Westbound						Access Drive Northbound						
	U-Turn	Thru	Right	Peds	App. Total	Int. Total	U-Turn	Left	Thru	Peds	App. Total	Int. Total	U-Turn	Left	Right	Peds	App. Total	Int. Total	
																			U-Turn
4:00 PM	0	22	0	0	22	0	1	53	0	54	0	0	0	1	0	0	0	1	77
4:15 PM	0	20	0	2	20	0	0	38	1	38	0	0	0	0	0	2	0	0	58
4:30 PM	0	27	1	5	28	0	0	37	3	37	0	0	0	0	0	7	0	0	65
4:45 PM	0	21	0	1	21	0	0	27	1	27	0	0	0	0	0	2	0	0	48
Hourly Total	0	90	1	8	91	0	1	155	5	156	0	1	0	0	11	1	0	1	248
5:00 PM	0	35	0	2	35	0	0	43	0	43	0	0	0	0	0	0	0	0	78
5:15 PM	0	30	1	5	31	0	2	54	1	55	0	0	0	0	1	1	1	1	88
5:30 PM	0	26	0	4	26	0	0	36	1	36	0	0	0	0	0	0	0	0	62
5:45 PM	0	30	0	5	30	0	2	37	0	39	0	0	0	0	1	1	1	1	70
Hourly Total	0	121	1	16	122	0	4	170	2	174	0	0	0	0	2	3	2	2	298
BREAK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	0	10	0	2	10	0	0	13	2	13	0	0	0	0	0	2	0	0	23
7:15 AM	0	12	0	0	12	0	0	20	0	20	0	0	2	0	0	0	0	0	34
7:30 AM	0	16	0	2	16	0	0	18	0	18	0	0	0	0	0	0	0	0	34
7:45 AM	0	19	0	0	19	0	0	27	0	27	0	0	0	0	1	0	0	1	47
Hourly Total	0	57	0	4	57	0	0	78	2	78	0	2	1	2	2	3	3	3	138
8:00 AM	0	20	0	2	20	0	0	19	0	19	0	0	0	0	1	1	1	1	40
8:15 AM	0	23	0	0	23	0	1	24	0	25	0	0	0	0	1	1	1	1	49
8:30 AM	0	30	0	2	30	0	0	20	0	20	0	0	0	0	0	0	0	0	50
8:45 AM	0	21	0	1	21	0	0	18	2	18	0	0	0	0	0	2	0	0	39
Hourly Total	0	94	0	5	94	0	1	81	2	82	0	0	0	0	2	4	2	2	178
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	362	2	33	364	0	6	484	11	490	0	0	3	5	20	8	8	8	862
Approach %	0.0	98.5	0.5	-	-	0.0	1.2	98.8	-	-	0.0	0.0	37.5	62.5	-	-	-	-	-
Total %	0.0	42.0	0.2	-	42.2	0.0	0.7	56.1	-	56.8	0.0	0.3	0.6	-	-	0.9	-	-	-
Lights	0	348	2	-	351	0	2	475	-	477	0	3	2	-	-	5	-	-	833
% Lights	-	96.4	100.0	-	96.4	-	33.3	96.1	-	97.3	-	100.0	40.0	-	-	62.5	-	-	96.6
Buses	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
% Buses	-	0.0	0.0	-	0.0	-	0.0	0.2	-	0.2	-	0.0	0.0	-	-	0.0	-	-	0.1
Single-Unit Trucks	0	4	0	0	4	0	0	5	-	5	0	0	0	0	0	0	0	0	9
% Single-Unit Trucks	-	1.1	0.0	-	1.1	-	0.0	1.0	-	1.0	-	0.0	0.0	-	-	0.0	-	-	1.0
Articulated Trucks	0	1	0	0	1	0	0	2	-	2	0	0	0	0	0	0	0	0	3
% Articulated Trucks	-	0.3	0.0	-	0.3	-	0.0	0.4	-	0.4	-	0.0	0.0	-	-	0.0	-	-	0.3
Bicycles on Road	0	8	0	0	8	0	4	1	-	5	0	0	3	-	-	3	-	-	16
% Bicycles on Road	-	2.2	0.0	-	2.2	-	66.7	0.2	-	1.0	-	0.0	60.0	-	-	37.5	-	-	1.9
Pedestrians	-	-	-	33	-	-	-	-	11	-	-	-	-	-	-	20	-	-	-





Kenig Lindgren O'Hara Aboona, Inc.
9575 W. Higgins Rd., Suite 400

Count Name: Old Rand Road with Access Drive
Site Code:
Start Date: 04/05/2021
Page No: 3

Rosemont, Illinois, United States 60018
(847)518-9990

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Old Rand Road Eastbound					Old Rand Road Westbound					Access Drive Northbound					
	U-Turn	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Peds	App. Total	U-Turn	Left	Right	Peds	App. Total	Int. Total
4:45 PM	0	21	0	1	21	0	0	27	1	27	0	0	0	2	0	48
5:00 PM	0	35	0	2	35	0	0	43	0	43	0	0	0	0	0	78
5:15 PM	0	30	1	5	31	0	2	54	1	55	0	0	1	1	1	88
5:30 PM	0	26	0	4	26	0	0	36	1	36	0	0	0	1	0	62
Total	0	112	1	12	113	0	2	160	3	162	0	0	1	4	1	276
Approach %	0.0	99.1	0.9	-	-	0.0	1.2	98.8	-	-	0.0	0.0	100.0	-	-	-
Total %	0.0	40.6	0.4	-	40.9	0.0	0.7	58.0	-	58.7	0.0	0.0	0.4	-	0.4	-
PHF	0.000	0.800	0.250	-	0.807	0.000	0.250	0.741	-	0.723	0.000	0.000	0.250	-	0.250	0.784
Lights	0	107	1	-	108	0	0	156	-	156	0	0	0	-	0	264
% Lights	-	95.5	100.0	-	95.6	-	0.0	97.5	-	96.3	-	-	0.0	-	0.0	95.7
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
Single-Unit Trucks	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	2
% Single-Unit Trucks	-	0.0	0.0	-	0.0	-	0.0	1.3	-	1.2	-	-	0.0	-	0.0	0.7
Articulated Trucks	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1
% Articulated Trucks	-	0.0	0.0	-	0.0	-	0.0	0.6	-	0.6	-	-	0.0	-	0.0	0.4
Bicycles on Road	0	5	0	0	5	0	2	1	0	3	0	0	1	0	1	9
% Bicycles on Road	-	4.5	0.0	-	4.4	-	100.0	0.6	-	1.9	-	-	100.0	-	100.0	3.3
Pedestrians	-	-	-	12	-	-	-	-	3	-	-	-	-	4	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-



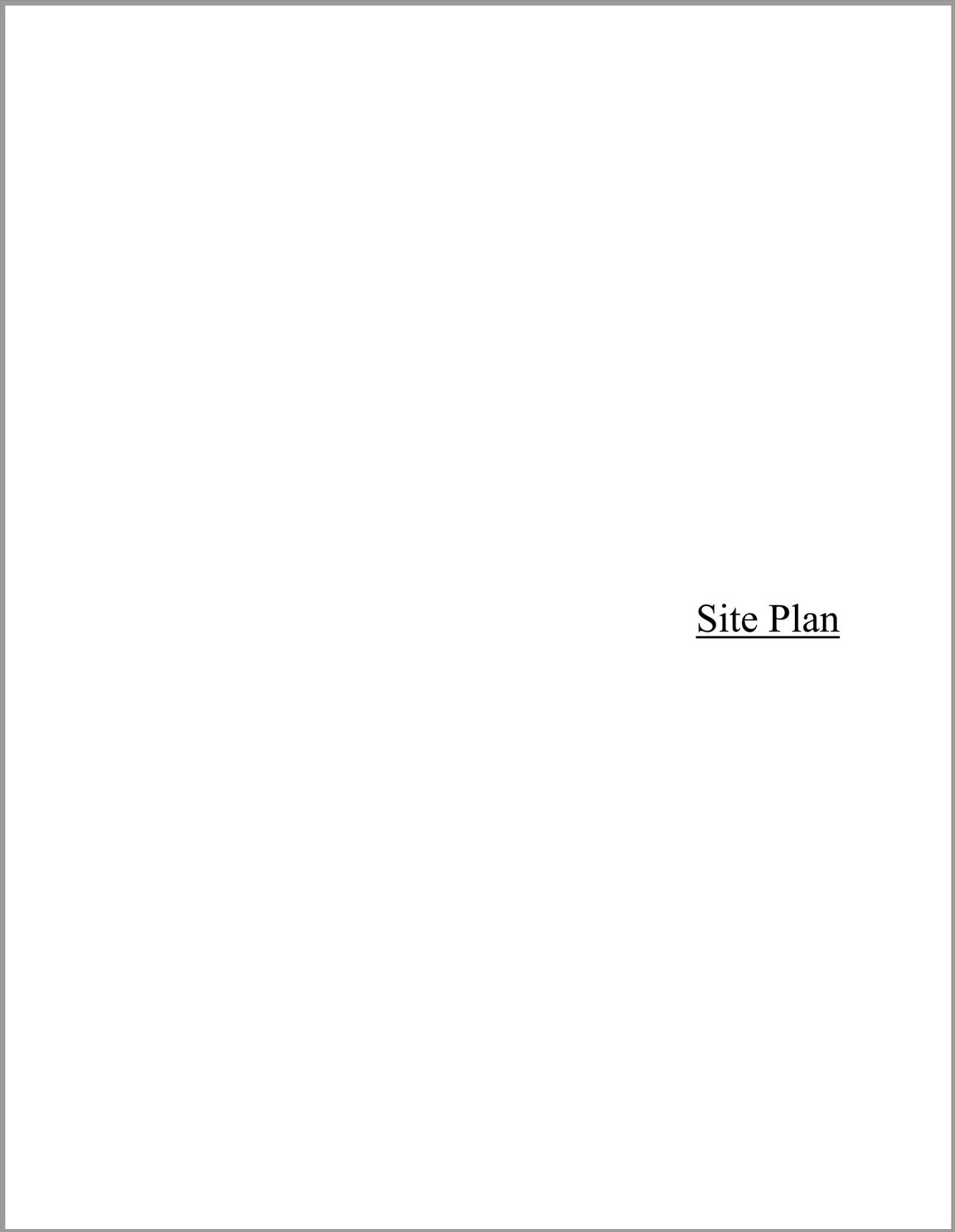
Kenig Lindgren O'Hara Aboona, Inc.
9575 W. Higgins Rd., Suite 400

Count Name: Old Rand Road with Access Drive
Site Code:
Start Date: 04/05/2021
Page No: 4

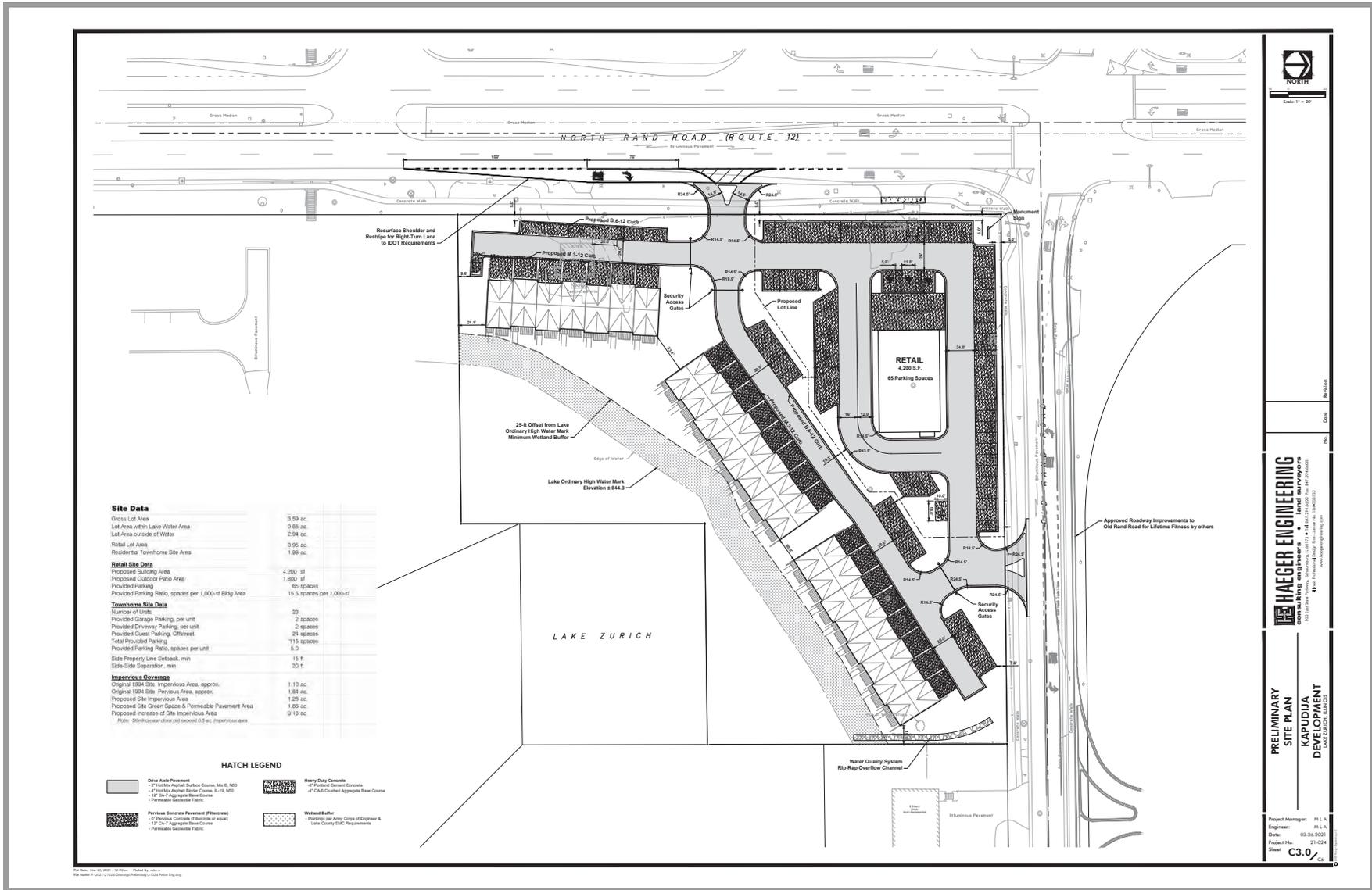
Rosemont, Illinois, United States 60018
(847)518-9990

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Old Rand Road Eastbound				Old Rand Road Westbound				Access Drive Northbound							
	U-Turn	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Peds	App. Total	U-Turn	Left	Right	Peds	App. Total	Int. Total
7:15 AM	0	12	0	0	12	0	0	20	0	20	0	2	0	0	2	34
7:30 AM	0	16	0	2	18	0	18	0	18	18	0	0	0	0	0	34
7:45 AM	0	19	0	0	19	0	27	0	27	27	0	0	1	0	1	47
8:00 AM	0	20	0	2	22	0	19	0	19	19	0	2	1	1	4	40
Total	0	67	0	4	71	0	84	0	84	84	0	2	2	1	4	155
Approach %	0.0	100.0	0.0	-	100.0	0.0	100.0	-	-	-	0.0	50.0	50.0	-	-	-
Total %	0.0	43.2	0.0	-	43.2	0.0	54.2	-	-	54.2	0.0	1.3	1.3	-	2.6	-
PHF	0.000	0.638	0.000	-	0.638	0.000	0.778	-	-	0.778	0.000	0.250	0.500	-	0.500	0.824
Lights	0	66	0	-	66	0	82	-	-	82	0	2	1	-	3	151
% Lights	-	98.5	-	-	98.5	-	97.6	-	-	97.6	-	100.0	50.0	-	75.0	97.4
Buses	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	1
% Buses	-	0.0	-	-	0.0	-	1.2	-	-	1.2	-	0.0	0.0	-	0.0	0.6
Single-Unit Trucks	0	1	0	-	1	0	0	0	0	0	0	0	0	0	0	1
% Single-Unit Trucks	-	1.5	-	-	1.5	-	0.0	-	-	0.0	-	0.0	0.0	-	0.0	0.6
Articulated Trucks	0	0	0	-	0	0	1	0	1	1	0	0	0	0	0	1
% Articulated Trucks	-	0.0	-	-	0.0	-	1.2	-	-	1.2	-	0.0	0.0	-	0.0	0.6
Bicycles on Road	0	0	0	-	0	0	0	0	0	0	0	0	1	1	1	1
% Bicycles on Road	-	0.0	-	-	0.0	-	0.0	-	-	0.0	-	0.0	50.0	-	25.0	0.6
Pedestrians	-	-	-	4	4	-	-	0	0	0	-	-	-	1	-	-
% Pedestrians	-	-	-	100.0	100.0	-	-	-	-	-	-	-	-	100.0	-	-



Site Plan



Scale: 1" = 20'

HAEGER ENGINEERING
1001 Lake Mary Parkway, Suite 200, Lake Mary, FL 32746
Phone: 407.329.4400 Fax: 407.329.4405
www.haegerengineering.com License: 150000333

PRELIMINARY SITE PLAN
KAPU'UAIA DEVELOPMENT
LAKE ZURICH, FLORIDA

Project Manager: M.L.A.
Engineer: M.L.A.
Date: 03.24.2021
Project No.: 21-024
Sheet: **C3.0**

CMAP 2050 Projections Letter



Chicago Metropolitan
Agency for Planning

433 West Van Buren Street
Suite 450
Chicago, IL 60607
312-454-0400
cmep.illinois.gov

April 6, 2021

Brendan S. May
Senior Consultant
Kenig, Lindgren, O'Hara and Aboona, Inc.
9575 West Higgins Road
Suite 400
Rosemont, IL 60018

Subject: *Rand Road (US 12) @ Old Rand Road*
IDOT

Dear Mr. May:

In response to a request made on your behalf and dated April 6, 2021, we have developed year 2050 average daily traffic (ADT) projections for the subject location.

ROAD SEGMENT	Current AADT	Year 2050 AADT
Rand Road (US 12), @ Old Rand/ Ravinia Terr	40,100	45,500
Old Rand Rd east of Rand Rd	4,200	5,600

Traffic projections are developed using existing ADT data provided in the request letter and the results from the December 2020 CMAP Travel Demand Analysis. The regional travel model uses CMAP 2050 socioeconomic projections and assumes the implementation of the ON TO 2050 Comprehensive Regional Plan for the Northeastern Illinois area. The provision of this data in support of your request does not constitute a CMAP endorsement of the proposed development or any subsequent developments.

If you have any questions, please call me at (312) 386-8806.

Sincerely,

Jose Rodriguez, PTP, AICP
Senior Planner, Research & Analysis

cc: Quigley (IDOT)
2021_CY_TrafficForecast\LakeZurich\la-06-21\la-06-21.docx

Level of Service Criteria

LEVEL OF SERVICE CRITERIA

Signalized Intersections		
Level of Service	Interpretation	Average Control Delay (seconds per vehicle)
A	Favorable progression. Most vehicles arrive during the green indication and travel through the intersection without stopping.	≤10
B	Good progression, with more vehicles stopping than for Level of Service A.	>10 - 20
C	Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear. Number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	>20 - 35
D	The volume-to-capacity ratio is high and either progression is ineffective or the cycle length is too long. Many vehicles stop and individual cycle failures are noticeable.	>35 - 55
E	Progression is unfavorable. The volume-to-capacity ratio is high and the cycle length is long. Individual cycle failures are frequent.	>55 - 80
F	The volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.	>80.0
Unsignalized Intersections		
Level of Service	Average Total Delay (SEC/VEH)	
A	0 - 10	
B	> 10 - 15	
C	> 15 - 25	
D	> 25 - 35	
E	> 35 - 50	
F	> 50	

Source: *Highway Capacity Manual*, 2010.

Capacity Analysis Summary Reports
Weekday Morning Peak Hour – Existing Conditions

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	2	4	47	4	54	0	1033	35	43	2004	1
Future Volume (vph)	14	2	4	47	4	54	0	1033	35	43	2004	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		0	60		0	135		130	250		260
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	120			90			225			160		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.900			0.860				0.850			0.850
Flt Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1671	1710	0	1805	1575	0	1900	3304	1553	1805	3654	1615
Flt Permitted				0.635						0.950		
Satd. Flow (perm)	1759	1710	0	1206	1575	0	1900	3304	1553	1805	3654	1615
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			25			45			45	
Link Distance (ft)		468			581			785			655	
Travel Time (s)		16.0			15.8			11.9			9.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	0%	0%	0%	0%	4%	0%	15%	4%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	15	6	0	51	63	0	0	1123	38	47	2178	1
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	3.0	8.0		3.0	8.0		3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	6.5	14.0		6.5	14.0		7.5	21.0	21.0	7.5	21.0	21.0
Total Split (s)	14.0	24.0		14.0	24.0		15.0	82.0	82.0	20.0	87.0	87.0
Total Split (%)	10.0%	17.1%		10.0%	17.1%		10.7%	58.6%	58.6%	14.3%	62.1%	62.1%
Yellow Time (s)	3.5	4.5		3.5	4.5		3.5	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	0.0	1.5		0.0	1.5		1.0	1.5	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0		3.5	6.0		4.5	6.0	6.0	4.5	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effect Green (s)	10.1	9.2		17.9	12.0			103.9	103.9	9.0	115.4	115.4
Actuated g/C Ratio	0.07	0.07		0.13	0.09			0.74	0.74	0.06	0.82	0.82

21-093 - Mixed-Use Development - Lake Zurich
Existing Weekday Morning Peak Hour

Synchro 10 Report

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.12	0.05		0.24	0.47			0.46	0.03	0.41	0.72	0.00
Control Delay	56.4	60.7		53.0	71.4			11.2	9.3	72.3	10.1	5.0
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	60.7		53.0	71.4			11.2	9.3	72.3	10.1	5.0
LOS	E	E		D	E			B	A	E	B	A
Approach Delay		57.6			63.1			11.1			11.5	
Approach LOS		E			E			B			B	
Queue Length 50th (ft)	13	5		44	56			195	9	42	353	0
Queue Length 95th (ft)	31	19		76	102			382	30	84	785	2
Internal Link Dist (ft)		388			501			705			575	
Turn Bay Length (ft)	125			60					130	250		260
Base Capacity (vph)	167	219		226	202			2452	1152	199	3012	1331
Starvation Cap Reductn	0	0		0	0			0	0	0	0	0
Spillback Cap Reductn	0	0		0	0			0	0	0	0	0
Storage Cap Reductn	0	0		0	0			0	0	0	0	0
Reduced v/c Ratio	0.09	0.03		0.23	0.31			0.46	0.03	0.24	0.72	0.00

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	108 (77%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.72
Intersection Signal Delay:	13.3
Intersection LOS:	B
Intersection Capacity Utilization	71.9%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

Ø1	Ø2 (R)	Ø3	Ø4
20 s	82 s	14 s	24 s
Ø5	Ø6 (R)	Ø7	Ø8
15 s	87 s	14 s	24 s

HCM 6th TWSC 2: Old Rand Road & Pine Tree Row

04/08/2021

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	6	84	78	19	40	28
Future Vol, veh/h	6	84	78	19	40	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	1	4	0	3	0
Mvmt Flow	7	97	90	22	46	32
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	112	0	-	0	212	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	111	-
Critical Hdwy	4.1	-	-	-	6.43	6.2
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.3
Pot Cap-1 Maneuver	1490	-	-	-	774	960
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	911	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1490	-	-	-	770	960
Mov Cap-2 Maneuver	-	-	-	-	770	-
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	911	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.5	0		9.7		
HCM LOS				A		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1490	-	-	-	-	838
HCM Lane V/C Ratio	0.005	-	-	-	-	0.093
HCM Control Delay (s)	7.4	0	-	-	-	9.7
HCM Lane LOS	A	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-	0.3

21-093 - Mixed-Use Development - Lake Zurich
Existing Weekday Morning Peak Hour

Synchro 10 Report

HCM 6th TWSC 3: Bayshore Village West Access Drive & Old Rand Road

04/08/2021

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	80	0	0	103	2	2
Future Vol, veh/h	80	0	0	103	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	98	0	0	126	2	2
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	98	0	224	98
Stage 1	-	-	-	-	98	-
Stage 2	-	-	-	-	126	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1508	-	769	963
Stage 1	-	-	-	-	931	-
Stage 2	-	-	-	-	905	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1508	-	769	963
Mov Cap-2 Maneuver	-	-	-	-	769	-
Stage 1	-	-	-	-	931	-
Stage 2	-	-	-	-	905	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	9.2			
HCM LOS						A
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	855	-	-	1508	-	
HCM Lane V/C Ratio	0.006	-	-	-	-	
HCM Control Delay (s)	9.2	-	-	0	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0	-	-	0	-	

21-093 - Mixed-Use Development - Lake Zurich
Existing Weekday Morning Peak Hour

Synchro 10 Report

Capacity Analysis Summary Reports
Weekday Evening Peak Hour – Existing Conditions

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	22	17	13	68	19	106	2	2	2220	54	4	64
Future Volume (vph)	22	17	13	68	19	106	2	2	2220	54	4	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%				0%			
Storage Length (ft)	125		0	60		0		135		130		250
Storage Lanes	1		0	1		0		1		1		1
Taper Length (ft)	120			90				225				160
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frts		0.936			0.873					0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	1805	1778	0	1770	1659	0	0	1444	3725	1615	0	1805
Flt Permitted	0.669			0.568				0.950				0.950
Satd. Flow (perm)	1271	1778	0	1058	1659	0	0	1444	3725	1615	0	1805
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		20			25				45			
Link Distance (ft)		468			581				789			
Travel Time (s)		16.0			15.8				12.0			
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	50%	0%	2%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%				0%			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	33	0	75	137	0	0	4	2440	59	0	74
Turn Type	pm+pt	NA		pm+pt	NA			Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	8			5	5	2		1
Permitted Phases	4			8						2		1
Detector Phase	7	4		3	8			5	5	2	2	1
Switch Phase												
Minimum Initial (s)	3.0	8.0		3.0	8.0			3.0	3.0	15.0	15.0	3.0
Minimum Split (s)	6.5	14.0		6.5	14.0			7.5	7.5	21.0	21.0	7.5
Total Split (s)	13.0	23.0		13.0	23.0			15.0	15.0	99.0	99.0	15.0
Total Split (%)	8.7%	15.3%		8.7%	15.3%			10.0%	10.0%	66.0%	66.0%	10.0%
Yellow Time (s)	3.5	4.5		3.5	4.5			3.5	3.5	4.5	4.5	3.5
All-Red Time (s)	0.0	1.5		0.0	1.5			1.0	1.0	1.5	1.5	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0		3.5	6.0			4.5	6.0	6.0	6.0	4.5
Lead/Lag	Lead	Lag		Lead	Lag			Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None			None	None	C-Min	C-Min	None
Act Effect Green (s)	21.0	13.3		25.8	17.6			6.1	99.1	99.1	99.1	9.7
Actuated g/C Ratio	0.14	0.09		0.17	0.12			0.04	0.66	0.66	0.66	0.06

21-093 - Mixed-Use Development - Lake Zurich
Existing Weekday Evening Peak Hour

Synchro 10 Report

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021

Lane Group	SBT	SBR
Lane Configurations	↑↑	↑
Traffic Volume (vph)	1333	8
Future Volume (vph)	1333	8
Ideal Flow (vphpl)	2000	1900
Lane Width (ft)	12	12
Grade (%)	0%	
Storage Length (ft)		260
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3689	1615
Flt Permitted		
Satd. Flow (perm)	3689	1615
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	655	
Travel Time (s)	9.9	
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor	0.91	0.91
Growth Factor	100%	100%
Heavy Vehicles (%)	3%	0%
Bus Blockages (#/hr)	0	0
Parking (#/hr)		
Mid-Block Traffic (%)	0%	
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1465	9
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	15.0	15.0
Minimum Split (s)	21.0	21.0
Total Split (s)	99.0	99.0
Total Split (%)	66.0%	66.0%
Yellow Time (s)	4.5	4.5
All-Red Time (s)	1.5	1.5
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.0	6.0
Lead/Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes
Recall Mode	C-Min	C-Min
Act Effect Green (s)	111.0	111.0
Actuated g/C Ratio	0.74	0.74

21-093 - Mixed-Use Development - Lake Zurich
Existing Weekday Evening Peak Hour

Synchro 10 Report

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
v/c Ratio	0.12	0.21		0.32	0.70			0.07	0.99	0.06		0.63
Control Delay	49.0	64.6		54.2	82.9			71.2	41.9	10.8		91.8
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Delay	49.0	64.6		54.2	82.9			71.2	41.9	10.8		91.8
LOS	D	E		D	F			E	D	B		F
Approach Delay		58.1			72.7				41.3			
Approach LOS		E			E				D			
Queue Length 50th (ft)	19	30		61	130			4	-1372	22		71
Queue Length 95th (ft)	46	65		110	#229			17	#1493	41		#134
Internal Link Dist (ft)		388			501				709			
Turn Bay Length (ft)	125			60				135		130		250
Base Capacity (vph)	230	201		232	205			101	2461	1067		127
Starvation Cap Reductn	0	0		0	0			0	0	0		0
Spillback Cap Reductn	0	0		0	0			0	0	0		0
Storage Cap Reductn	0	0		0	0			0	0	0		0
Reduced v/c Ratio	0.10	0.16		0.32	0.67			0.04	0.99	0.06		0.58

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 32 (21%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 100
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.99
 Intersection Signal Delay: 33.4 Intersection LOS: C
 Intersection Capacity Utilization 82.5% ICU Level of Service E
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

Ø1	Ø2 (R)	Ø3	Ø4
15 s	99 s	13 s	23 s
Ø5	Ø6 (R)	Ø7	Ø8
15 s	99 s	13 s	23 s

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021



Lane Group	SBT	SBR
v/c Ratio	0.54	0.01
Control Delay	10.6	7.9
Queue Delay	0.0	0.0
Total Delay	10.6	7.9
LOS	B	A
Approach Delay	14.5	
Approach LOS	B	
Queue Length 50th (ft)	316	2
Queue Length 95th (ft)	490	10
Internal Link Dist (ft)	575	
Turn Bay Length (ft)		260
Base Capacity (vph)	2730	1195
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.54	0.01
Intersection Summary		

21-093 - Mixed-Use Development - Lake Zurich
Existing Weekday Evening Peak Hour

Synchro 10 Report

HCM 6th TWSC 2: Old Rand Road & Pine Tree Row

04/08/2021

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	14	127	187	46	52	16
Future Vol, veh/h	14	127	187	46	52	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	18	165	243	60	68	21
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	303	0	-	0	474	273
Stage 1	-	-	-	-	273	-
Stage 2	-	-	-	-	201	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1269	-	-	-	553	771
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	838	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1269	-	-	-	544	771
Mov Cap-2 Maneuver	-	-	-	-	544	-
Stage 1	-	-	-	-	766	-
Stage 2	-	-	-	-	838	-
Approach	EB	WB	SB			
HCM Control Delay, s	0.8	0	12.3			
HCM LOS						B
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1269	-	-	-	584	
HCM Lane V/C Ratio	0.014	-	-	-	0.151	
HCM Control Delay (s)	7.9	0	-	-	12.3	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.5	

21-093 - Mixed-Use Development - Lake Zurich
Existing Weekday Evening Peak Hour

Synchro 10 Report

HCM 6th TWSC 3: Bayshore Village West Access Drive & Old Rand Road

04/08/2021

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	134	1	2	193	0	1
Future Vol, veh/h	134	1	2	193	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	0	0	0	2	0	0
Mvmt Flow	172	1	3	247	0	1
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	173	0	426	173
Stage 1	-	-	-	-	173	-
Stage 2	-	-	-	-	253	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1416	-	589	876
Stage 1	-	-	-	-	862	-
Stage 2	-	-	-	-	794	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1416	-	588	876
Mov Cap-2 Maneuver	-	-	-	-	588	-
Stage 1	-	-	-	-	862	-
Stage 2	-	-	-	-	792	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.1	9.1			
HCM LOS						A
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	876	-	-	1416	-	
HCM Lane V/C Ratio	0.001	-	-	0.002	-	
HCM Control Delay (s)	9.1	-	-	7.5	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

21-093 - Mixed-Use Development - Lake Zurich
Existing Weekday Evening Peak Hour

Synchro 10 Report

Capacity Analysis Summary Reports
Weekday Morning Peak Hour
Year 2027 No-Build Conditions

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	4	4	83	5	56	0	1143	48	112	2088	1
Future Volume (vph)	15	4	4	83	5	56	0	1143	48	112	2088	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	125		0	215		0	135		130	275		250
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	120			135			225			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.925			0.861				0.850			0.850
Fit Protected	0.950			0.950						0.950		
Satd. Flow (prot)	1671	1758	0	1805	1578	0	1900	3304	1553	1805	3654	1615
Fit Permitted				0.625						0.950		
Satd. Flow (perm)	1759	1758	0	1188	1578	0	1900	3304	1553	1805	3654	1615
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		20			25			45			45	
Link Distance (ft)		468			581			800			655	
Travel Time (s)		16.0			15.8			12.1			9.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	0%	0%	0%	0%	4%	0%	15%	4%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	8	0	90	66	0	0	1242	52	122	2270	1
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8					2			6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	3.0	8.0		3.0	8.0		3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	6.5	14.0		6.5	14.0		7.5	21.0	21.0	7.5	21.0	21.0
Total Split (s)	14.0	24.0		14.0	24.0		15.0	82.0	82.0	20.0	87.0	87.0
Total Split (%)	10.0%	17.1%		10.0%	17.1%		10.7%	58.6%	58.6%	14.3%	62.1%	62.1%
Yellow Time (s)	3.5	4.5		3.5	4.5		3.5	4.5	4.5	3.5	4.5	4.5
All-Red Time (s)	0.0	1.5		0.0	1.5		1.0	1.5	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0		3.5	6.0		4.5	6.0	6.0	4.5	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effect Green (s)	10.3	9.3		19.1	12.3			92.2	92.2	14.5	111.1	111.1
Actuated g/C Ratio	0.07	0.07		0.14	0.09			0.66	0.66	0.10	0.79	0.79

21-093 - Mixed-Use Development - Lake Zurich
 No-Build Weekday Morning Peak Hour

Synchro 10 Report

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.13	0.07		0.39	0.48			0.57	0.05	0.66	0.78	0.00
Control Delay	56.5	60.9		57.1	71.5			16.5	11.8	76.5	12.2	5.0
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	60.9		57.1	71.5			16.5	11.8	76.5	12.2	5.0
LOS	E	E		E	E			B	B	E	B	A
Approach Delay		57.9			63.2			16.3			15.5	
Approach LOS		E			E			B			B	
Queue Length 50th (ft)	14	7		78	58			272	14	108	399	0
Queue Length 95th (ft)	32	24		119	107			503	44	173	885	2
Internal Link Dist (ft)		388			501			720			575	
Turn Bay Length (ft)	125			215					130	275		250
Base Capacity (vph)	168	226		229	202			2174	1022	211	2900	1281
Starvation Cap Reductn	0	0		0	0			0	0	0	0	0
Spillback Cap Reductn	0	0		0	0			0	0	0	0	0
Storage Cap Reductn	0	0		0	0			0	0	0	0	0
Reduced v/c Ratio	0.10	0.04		0.39	0.33			0.57	0.05	0.58	0.78	0.00

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	108 (77%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	17.9
Intersection LOS:	B
Intersection Capacity Utilization:	83.2%
ICU Level of Service:	E
Analysis Period (min):	15

Splits and Phases: 1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

Ø1	Ø2 (R)	Ø3	Ø4
20 s	82 s	14 s	24 s
Ø5	Ø6 (R)	Ø7	Ø8
15 s	87 s	14 s	24 s

HCM 6th TWSC 2: Old Rand Road & Pine Tree Row

04/08/2021

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	6	87	109	20	42	30
Future Vol, veh/h	6	87	109	20	42	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	1	4	0	3	0
Mvmt Flow	7	100	125	23	48	34
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	148	0	-	0	251	137
Stage 1	-	-	-	-	137	-
Stage 2	-	-	-	-	114	-
Critical Hdwy	4.1	-	-	-	6.43	6.2
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.3
Pot Cap-1 Maneuver	1446	-	-	-	735	917
Stage 1	-	-	-	-	887	-
Stage 2	-	-	-	-	908	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1446	-	-	-	731	917
Mov Cap-2 Maneuver	-	-	-	-	731	-
Stage 1	-	-	-	-	883	-
Stage 2	-	-	-	-	908	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.5	0		10		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1446	-	-	-	-	798
HCM Lane V/C Ratio	0.005	-	-	-	-	0.104
HCM Control Delay (s)	7.5	0	-	-	-	10
HCM Lane LOS	A	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.3

21-093 - Mixed-Use Development - Lake Zurich
No-Build Weekday Morning Peak Hour

Synchro 10 Report

HCM 6th TWSC

3: Bayshore Village West Access Drive/Life Time Fitness Access Drive & Old Rand Road 10/08/2021

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↕			↕				↗
Traffic Vol, veh/h	81	83	0	0	107	29	2	0	2	0	0	35
Future Vol, veh/h	81	83	0	0	107	29	2	0	2	0	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	125	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	99	101	0	0	130	35	2	0	2	0	0	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	165	0	0	101	0	0	468	464	101	-	-	148
Stage 1	-	-	-	-	-	-	299	299	-	-	-	-
Stage 2	-	-	-	-	-	-	169	165	-	-	-	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	-	-	3.3
Pot Cap-1 Maneuver	1426	-	-	1504	-	-	509	498	960	0	0	904
Stage 1	-	-	-	-	-	-	714	670	-	0	0	-
Stage 2	-	-	-	-	-	-	838	766	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1426	-	-	1504	-	-	459	464	960	-	-	904
Mov Cap-2 Maneuver	-	-	-	-	-	-	459	464	-	-	-	-
Stage 1	-	-	-	-	-	-	665	624	-	-	-	-
Stage 2	-	-	-	-	-	-	798	766	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.8	0	10.8	9.2
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	621	1426	-	-	1504	-	-	904
HCM Lane V/C Ratio	0.008	0.069	-	-	-	-	-	0.047
HCM Control Delay (s)	10.8	7.7	-	-	0	-	-	9.2
HCM Lane LOS	B	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	0.1

21-093 - Mixed-Use Development - Lake Zurich
 No-Build Weekday Morning Peak Hour

Synchro 10 Report

Capacity Analysis Summary Reports
Weekday Evening Peak Hour
Year 2027 No-Build Conditions

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	23	20	14	144	22	110	2	2	2394	71	4	152
Future Volume (vph)	23	20	14	144	22	110	2	2	2394	71	4	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%				0%			
Storage Length (ft)	125		0	215		0		135		130		275
Storage Lanes	1		0	1		0		1		1		1
Taper Length (ft)	120			135				225				220
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.939			0.875					0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	1805	1784	0	1770	1662	0	0	1444	3725	1615	0	1805
Flt Permitted	0.665			0.567				0.950				0.950
Satd. Flow (perm)	1264	1784	0	1056	1662	0	0	1444	3725	1615	0	1805
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		20			25				45			
Link Distance (ft)		468			581				789			
Travel Time (s)		16.0			15.8				12.0			
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	50%	0%	2%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%				0%			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	37	0	158	145	0	0	4	2631	78	0	171
Turn Type	pm+pt	NA		pm+pt	NA			Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	8			5	5	2		1
Permitted Phases	4			8						2		1
Detector Phase	7	4		3	8			5	5	2	2	1
Switch Phase												
Minimum Initial (s)	3.0	8.0		3.0	8.0			3.0	3.0	15.0	15.0	3.0
Minimum Split (s)	6.5	14.0		6.5	14.0			7.5	7.5	21.0	21.0	7.5
Total Split (s)	13.0	23.0		13.0	23.0			15.0	15.0	99.0	99.0	15.0
Total Split (%)	8.7%	15.3%		8.7%	15.3%			10.0%	10.0%	66.0%	66.0%	10.0%
Yellow Time (s)	3.5	4.5		3.5	4.5			3.5	3.5	4.5	4.5	3.5
All-Red Time (s)	0.0	1.5		0.0	1.5			1.0	1.0	1.5	1.5	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0		3.5	6.0			4.5	6.0	6.0	6.0	4.5
Lead/Lag	Lead	Lag		Lead	Lag			Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None			None	None	C-Min	C-Min	None
Act Effect Green (s)	21.1	13.4		26.1	17.9			6.1	93.0	93.0		15.6
Actuated g/C Ratio	0.14	0.09		0.17	0.12			0.04	0.62	0.62		0.10

21-093 - Mixed-Use Development - Lake Zurich
No-Build Weekday Evening Peak Hour

Synchro 10 Report

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021

Lane Group	SBT	SBR
Lane Configurations	↑↑	↑
Traffic Volume (vph)	1394	8
Future Volume (vph)	1394	8
Ideal Flow (vphpl)	2000	1900
Lane Width (ft)	12	12
Grade (%)	0%	
Storage Length (ft)		250
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3689	1615
Flt Permitted		
Satd. Flow (perm)	3689	1615
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	655	
Travel Time (s)	9.9	
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor	0.91	0.91
Growth Factor	100%	100%
Heavy Vehicles (%)	3%	0%
Bus Blockages (#/hr)	0	0
Parking (#/hr)		
Mid-Block Traffic (%)	0%	
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1532	9
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	15.0	15.0
Minimum Split (s)	21.0	21.0
Total Split (s)	99.0	99.0
Total Split (%)	66.0%	66.0%
Yellow Time (s)	4.5	4.5
All-Red Time (s)	1.5	1.5
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.0	6.0
Lead/Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes
Recall Mode	C-Min	C-Min
Act Effect Green (s)	110.8	110.8
Actuated g/C Ratio	0.74	0.74

21-093 - Mixed-Use Development - Lake Zurich
No-Build Weekday Evening Peak Hour

Synchro 10 Report

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
v/c Ratio	0.12	0.23		0.68	0.74			0.07	1.14	0.08		0.91
Control Delay	49.0	65.1		69.6	85.1			71.2	97.0	11.7		109.9
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Delay	49.0	65.1		69.6	85.1			71.2	97.0	11.7		109.9
LOS	D	E		E	F			E	F	B		F
Approach Delay		58.6			77.0				94.5			
Approach LOS		E			E				F			
Queue Length 50th (ft)	20	33		134	138			4	-1576	29		-219
Queue Length 95th (ft)	47	71		208	#250			17	#1692	52		#375
Internal Link Dist (ft)		388			501				709			
Turn Bay Length (ft)	125			215				135		130		275
Base Capacity (vph)	230	202		234	205			101	2309	1001		187
Starvation Cap Reductn	0	0		0	0			0	0	0		0
Spillback Cap Reductn	0	0		0	0			0	0	0		0
Storage Cap Reductn	0	0		0	0			0	0	0		0
Reduced v/c Ratio	0.11	0.18		0.68	0.71			0.04	1.14	0.08		0.91

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 32 (21%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.14
 Intersection Signal Delay: 66.6
 Intersection LOS: E
 Intersection Capacity Utilization 103.2%
 ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

Ø1	Ø2 (R)	Ø3	Ø4
15 s	99 s	13 s	23 s
Ø5	Ø6 (R)	Ø7	Ø8
15 s	99 s	13 s	23 s

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021



Lane Group	SBT	SBR
v/c Ratio	0.56	0.01
Control Delay	11.1	7.9
Queue Delay	0.0	0.0
Total Delay	11.1	7.9
LOS	B	A
Approach Delay	20.9	
Approach LOS	C	
Queue Length 50th (ft)	345	2
Queue Length 95th (ft)	527	10
Internal Link Dist (ft)	575	
Turn Bay Length (ft)		250
Base Capacity (vph)	2724	1192
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.56	0.01
Intersection Summary		

HCM 6th TWSC 2: Old Rand Road & Pine Tree Row

04/08/2021

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	15	132	229	48	54	18
Future Vol, veh/h	15	132	229	48	54	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	19	171	297	62	70	23
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	359	0	-	0	537	328
Stage 1	-	-	-	-	328	-
Stage 2	-	-	-	-	209	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1211	-	-	-	508	718
Stage 1	-	-	-	-	734	-
Stage 2	-	-	-	-	831	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1211	-	-	-	499	718
Mov Cap-2 Maneuver	-	-	-	-	499	-
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	831	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.8	0		13.1		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1211	-	-	-	540	
HCM Lane V/C Ratio	0.016	-	-	-	0.173	
HCM Control Delay (s)	8	0	-	-	13.1	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.6	

21-093 - Mixed-Use Development - Lake Zurich
No-Build Weekday Evening Peak Hour

Synchro 10 Report

HCM 6th TWSC
3: Bayshore Village West Access Drive/Life Time Fitness Access Drive & Old Rand Road 10/08/2021

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷			↕			↕				↶
Traffic Vol, veh/h	102	139	1	2	201	36	0	0	1	0	0	75
Future Vol, veh/h	102	139	1	2	201	36	0	0	1	0	0	75
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	125	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	0	0	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	131	178	1	3	258	46	0	0	1	0	0	96

Major/Minor	Major1		Major2			Minor1		Minor2				
Conflicting Flow All	304	0	0	179	0	0	776	751	179	-	-	281
Stage 1	-	-	-	-	-	-	441	441	-	-	-	-
Stage 2	-	-	-	-	-	-	335	310	-	-	-	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	-	-	3.3
Pot Cap-1 Maneuver	1268	-	-	1409	-	-	317	342	869	0	0	763
Stage 1	-	-	-	-	-	-	599	580	-	0	0	-
Stage 2	-	-	-	-	-	-	683	663	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1268	-	-	1409	-	-	255	306	869	-	-	763
Mov Cap-2 Maneuver	-	-	-	-	-	-	255	306	-	-	-	-
Stage 1	-	-	-	-	-	-	537	520	-	-	-	-
Stage 2	-	-	-	-	-	-	595	661	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.4	0.1	9.1	10.4
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	869	1268	-	-	1409	-	-	763
HCM Lane V/C Ratio	0.001	0.103	-	-	0.002	-	-	0.126
HCM Control Delay (s)	9.1	8.2	-	-	7.6	0	-	10.4
HCM Lane LOS	A	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0.3	-	-	0	-	-	0.4

21-093 - Mixed-Use Development - Lake Zurich
 No-Build Weekday Evening Peak Hour

Synchro 10 Report

Capacity Analysis Summary Reports
Weekday Morning Peak Hour
Year 2027 Projected Conditions

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	15	4	4	83	5	56	6	0	1156	48	123	2088
Future Volume (vph)	15	4	4	83	5	56	6	0	1156	48	123	2088
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%				0%			0%
Storage Length (ft)	125		0	215		0		135		130	275	
Storage Lanes	1		0	1		0		1		1	1	
Taper Length (ft)	120			135				225			220	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor												
Frnt		0.925			0.861					0.850		
Flt Protected	0.950			0.950				0.950			0.950	
Satd. Flow (prot)	1671	1758	0	1805	1578	0	0	1805	3304	1553	1805	3654
Flt Permitted				0.625				0.950			0.950	
Satd. Flow (perm)	1759	1758	0	1188	1578	0	0	1805	3304	1553	1805	3654
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		20			25				45			45
Link Distance (ft)		468			370				275			655
Travel Time (s)		16.0			10.1				4.2			9.9
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	0%	0%	0%	0%	4%	0%	0%	15%	4%	0%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%				0%			0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	8	0	90	66	0	0	7	1257	52	134	2270
Turn Type	pm+pt	NA		pm+pt	NA			Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	8			5	5	2		1
Permitted Phases	4			8						2		6
Detector Phase	7	4		3	8			5	5	2	1	6
Switch Phase												
Minimum Initial (s)	3.0	8.0		3.0	8.0			3.0	3.0	15.0	15.0	3.0
Minimum Split (s)	6.5	14.0		6.5	14.0			7.5	7.5	21.0	21.0	7.5
Total Split (s)	14.0	24.0		14.0	24.0			15.0	15.0	82.0	82.0	20.0
Total Split (%)	10.0%	17.1%		10.0%	17.1%			10.7%	10.7%	58.6%	58.6%	14.3%
Yellow Time (s)	3.5	4.5		3.5	4.5			3.5	3.5	4.5	4.5	3.5
All-Red Time (s)	0.0	1.5		0.0	1.5			1.0	1.0	1.5	1.5	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0		3.5	6.0			4.5	6.0	6.0	4.5	6.0
Lead/Lag	Lead	Lag		Lead	Lag			Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None			None	None	C-Min	C-Min	None
Act Effect Green (s)	10.3	9.3		19.1	12.3			6.2	91.3	91.3	15.3	108.8
Actuated g/C Ratio	0.07	0.07		0.14	0.09			0.04	0.65	0.65	0.11	0.78

21-093 - Mixed-Use Development - Lake Zurich
 Projected Weekday Morning Peak Hour

Synchro 10 Report

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021

Lane Group	SBR
Lane Configurations	1
Traffic Volume (vph)	1
Future Volume (vph)	1
Ideal Flow (vphpl)	1900
Lane Width (ft)	12
Grade (%)	
Storage Length (ft)	250
Storage Lanes	1
Taper Length (ft)	
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	0.850
Flt Protected	
Satd. Flow (prot)	1615
Flt Permitted	
Satd. Flow (perm)	1615
Right Turn on Red	No
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	0.92
Growth Factor	100%
Heavy Vehicles (%)	0%
Bus Blockages (#/hr)	0
Parking (#/hr)	
Mid-Block Traffic (%)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	1
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	15.0
Minimum Split (s)	21.0
Total Split (s)	87.0
Total Split (%)	62.1%
Yellow Time (s)	4.5
All-Red Time (s)	1.5
Lost Time Adjust (s)	0.0
Total Lost Time (s)	6.0
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Min
Act Effect Green (s)	108.8
Actuated g/C Ratio	0.78

21-093 - Mixed-Use Development - Lake Zurich
 Projected Weekday Morning Peak Hour

Synchro 10 Report

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021



Lane Group	SBR
v/c Ratio	0.00
Control Delay	8.0
Queue Delay	0.0
Total Delay	8.0
LOS	A
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	3
Internal Link Dist (ft)	
Turn Bay Length (ft)	250
Base Capacity (vph)	1254
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.00
Intersection Summary	

HCM 6th TWSC 2: Old Rand Road & Pine Tree Row

04/08/2021

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	6	93	109	20	42	30
Future Vol, veh/h	6	93	109	20	42	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	0	1	4	0	3	0
Mvmt Flow	7	107	125	23	48	34
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	148	0	-	0	258	137
Stage 1	-	-	-	-	137	-
Stage 2	-	-	-	-	121	-
Critical Hdwy	4.1	-	-	-	6.43	6.2
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.3
Pot Cap-1 Maneuver	1446	-	-	-	729	917
Stage 1	-	-	-	-	887	-
Stage 2	-	-	-	-	902	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1446	-	-	-	725	917
Mov Cap-2 Maneuver	-	-	-	-	725	-
Stage 1	-	-	-	-	883	-
Stage 2	-	-	-	-	902	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.5	0		10.1		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1446	-	-	-	-	794
HCM Lane V/C Ratio	0.005	-	-	-	-	0.104
HCM Control Delay (s)	7.5	0	-	-	-	10.1
HCM Lane LOS	A	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.3

21-093 - Mixed-Use Development - Lake Zurich
Projected Weekday Morning Peak Hour

Synchro 10 Report

HCM 6th TWSC
3: Bayshore Village West Access Drive/Life Time Fitness Access Drive & Old Rand Road 10/08/2021

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↕			↕				↗
Traffic Vol, veh/h	81	89	0	0	107	29	2	0	2	0	0	35
Future Vol, veh/h	81	89	0	0	107	29	2	0	2	0	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	125	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	2	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	99	109	0	0	130	35	2	0	2	0	0	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	165	0	0	109	0	0	476	472	109	-	-	148
Stage 1	-	-	-	-	-	-	307	307	-	-	-	-
Stage 2	-	-	-	-	-	-	169	165	-	-	-	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	-	-	3.3
Pot Cap-1 Maneuver	1426	-	-	1494	-	-	503	493	950	0	0	904
Stage 1	-	-	-	-	-	-	707	665	-	0	0	-
Stage 2	-	-	-	-	-	-	838	766	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1426	-	-	1494	-	-	454	459	950	-	-	904
Mov Cap-2 Maneuver	-	-	-	-	-	-	454	459	-	-	-	-
Stage 1	-	-	-	-	-	-	658	619	-	-	-	-
Stage 2	-	-	-	-	-	-	798	766	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	3.7			0			10.9			9.2		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	614	1426	-	-	1494	-	-	904
HCM Lane V/C Ratio	0.008	0.069	-	-	-	-	-	0.047
HCM Control Delay (s)	10.9	7.7	-	-	0	-	-	9.2
HCM Lane LOS	B	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0.2	-	-	0	-	-	0.1

21-093 - Mixed-Use Development - Lake Zurich
 Projected Weekday Morning Peak Hour

Synchro 10 Report

HCM 6th TWSC

4: Rand Road (US Route 12) & Proposed Right-In/Right-Out Access Drive

04/08/2021

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↗	↗		↗↗
Traffic Vol, veh/h	0	32	1178	22	0	2181
Future Vol, veh/h	0	32	1178	22	0	2181
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	70	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	15	0	0	4
Mvmt Flow	0	34	1240	23	0	2296
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	-	620	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	436	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	-	436	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	13.9	0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT			
Capacity (veh/h)	-	-	436			
HCM Lane V/C Ratio	-	-	0.077			
HCM Control Delay (s)	-	-	13.9			
HCM Lane LOS	-	-	B			
HCM 95th %tile Q(veh)	-	-	0.2			

21-093 - Mixed-Use Development - Lake Zurich
 Projected Weekday Morning Peak Hour

Synchro 10 Report

HCM 6th TWSC

5: Proposed Right-In/Right-Out Access Drive & Old Rand Road

04/08/2021

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↑		↗
Traffic Vol, veh/h	162	13	0	144	0	8
Future Vol, veh/h	162	13	0	144	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	0	0	2	0	0
Mvmt Flow	171	14	0	152	0	8
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	-	-	-	178
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	870
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	870
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	9.2			
HCM LOS						A
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	870	-	-	-		
HCM Lane V/C Ratio	0.01	-	-	-		
HCM Control Delay (s)	9.2	-	-	-		
HCM Lane LOS	A	-	-	-		
HCM 95th %tile Q(veh)	0	-	-	-		

21-093 - Mixed-Use Development - Lake Zurich
 Projected Weekday Morning Peak Hour

Synchro 10 Report

Capacity Analysis Summary Reports
Weekday Evening Peak Hour
Year 2027 Projected Conditions

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	23	20	14	144	22	110	7	2	2406	71	4	166
Future Volume (vph)	23	20	14	144	22	110	7	2	2406	71	4	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%				0%			
Storage Length (ft)	125		0	215		0		135		130		275
Storage Lanes	1		0	1		0		1		1		1
Taper Length (ft)	120			135				225				220
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.939			0.875					0.850		
Flt Protected	0.950			0.950				0.950				0.950
Satd. Flow (prot)	1805	1784	0	1770	1662	0	0	1289	3725	1615	0	1805
Flt Permitted	0.665			0.567				0.950				0.950
Satd. Flow (perm)	1264	1784	0	1056	1662	0	0	1289	3725	1615	0	1805
Right Turn on Red			No			No				No		
Satd. Flow (RTOR)												
Link Speed (mph)		20			25				45			
Link Distance (ft)		468			370				275			
Travel Time (s)		16.0			10.1				4.2			
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	50%	0%	2%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%				0%			
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	37	0	158	145	0	0	10	2644	78	0	186
Turn Type	pm+pt	NA		pm+pt	NA			Prot	Prot	NA	Perm	Prot
Protected Phases	7	4		3	8			5	5	2		1
Permitted Phases	4			8						2		1
Detector Phase	7	4		3	8			5	5	2	2	1
Switch Phase												
Minimum Initial (s)	3.0	8.0		3.0	8.0			3.0	3.0	15.0	15.0	3.0
Minimum Split (s)	6.5	14.0		6.5	14.0			7.5	7.5	21.0	21.0	7.5
Total Split (s)	13.0	23.0		13.0	23.0			15.0	15.0	99.0	99.0	15.0
Total Split (%)	8.7%	15.3%		8.7%	15.3%			10.0%	10.0%	66.0%	66.0%	10.0%
Yellow Time (s)	3.5	4.5		3.5	4.5			3.5	3.5	4.5	4.5	3.5
All-Red Time (s)	0.0	1.5		0.0	1.5			1.0	1.0	1.5	1.5	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.0		3.5	6.0			4.5	6.0	6.0	6.0	4.5
Lead/Lag	Lead	Lag		Lead	Lag			Lead	Lead	Lag	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None			None	None	C-Min	C-Min	None
Act Effect Green (s)	21.1	13.4		26.1	17.9			6.8	93.0	93.0		15.6
Actuated g/C Ratio	0.14	0.09		0.17	0.12			0.05	0.62	0.62		0.10

21-093 - Mixed-Use Development - Lake Zurich
 Projected Weekday Evening Peak Hour

Synchro 10 Report

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021

Lane Group	SBT	SBR
Lane Configurations	↑↑	↑
Traffic Volume (vph)	1394	8
Future Volume (vph)	1394	8
Ideal Flow (vphpl)	2000	1900
Lane Width (ft)	12	12
Grade (%)	0%	
Storage Length (ft)		250
Storage Lanes		1
Taper Length (ft)		
Lane Util. Factor	0.95	1.00
Ped Bike Factor		
Frt		0.850
Flt Protected		
Satd. Flow (prot)	3689	1615
Flt Permitted		
Satd. Flow (perm)	3689	1615
Right Turn on Red		No
Satd. Flow (RTOR)		
Link Speed (mph)	45	
Link Distance (ft)	655	
Travel Time (s)	9.9	
Confl. Peds. (#/hr)		
Confl. Bikes (#/hr)		
Peak Hour Factor	0.91	0.91
Growth Factor	100%	100%
Heavy Vehicles (%)	3%	0%
Bus Blockages (#/hr)	0	0
Parking (#/hr)		
Mid-Block Traffic (%)	0%	
Shared Lane Traffic (%)		
Lane Group Flow (vph)	1532	9
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Detector Phase	6	6
Switch Phase		
Minimum Initial (s)	15.0	15.0
Minimum Split (s)	21.0	21.0
Total Split (s)	99.0	99.0
Total Split (%)	66.0%	66.0%
Yellow Time (s)	4.5	4.5
All-Red Time (s)	1.5	1.5
Lost Time Adjust (s)	0.0	0.0
Total Lost Time (s)	6.0	6.0
Lead/Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes
Recall Mode	C-Min	C-Min
Act Effect Green (s)	108.0	108.0
Actuated g/C Ratio	0.72	0.72

21-093 - Mixed-Use Development - Lake Zurich
 Projected Weekday Evening Peak Hour

Synchro 10 Report

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
v/c Ratio	0.12	0.23		0.68	0.74			0.17	1.15	0.08		0.99
Control Delay	49.0	65.1		69.6	85.1			74.7	99.3	11.7		127.4
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0	0.0		0.0
Total Delay	49.0	65.1		69.6	85.1			74.7	99.3	11.7		127.4
LOS	D	E		E	F			E	F	B		F
Approach Delay		58.6			77.0				96.7			
Approach LOS		E			E				F			
Queue Length 50th (ft)	20	33		134	138			10	-1590	29		-249
Queue Length 95th (ft)	47	71		208	#250			31	#1705	52		#411
Internal Link Dist (ft)		388			290				195			
Turn Bay Length (ft)	125			215				135		130		275
Base Capacity (vph)	230	202		234	205			90	2309	1001		187
Starvation Cap Reductn	0	0		0	0			0	0	0		0
Spillback Cap Reductn	0	0		0	0			0	0	0		0
Storage Cap Reductn	0	0		0	0			0	0	0		0
Reduced v/c Ratio	0.11	0.18		0.68	0.71			0.11	1.15	0.08		0.99

Intersection Summary

Area Type: Other
 Cycle Length: 150
 Actuated Cycle Length: 150
 Offset: 32 (21%), Referenced to phase 2:NBT and 6:SBT, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.15
 Intersection Signal Delay: 69.4 Intersection LOS: E
 Intersection Capacity Utilization 104.3% ICU Level of Service G
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

Ø1	Ø2 (R)	Ø3	Ø4
15 s	99 s	13 s	23 s
Ø5	Ø6 (R)	Ø7	Ø8
15 s	99 s	13 s	23 s

Lanes, Volumes, Timings

1: Rand Road (US Route 12) & Ravinia Terrace/Old Rand Road

04/08/2021



Lane Group	SBT	SBR
v/c Ratio	0.58	0.01
Control Delay	12.9	9.4
Queue Delay	0.0	0.0
Total Delay	12.9	9.4
LOS	B	A
Approach Delay	25.2	
Approach LOS	C	
Queue Length 50th (ft)	345	2
Queue Length 95th (ft)	546	10
Internal Link Dist (ft)	575	
Turn Bay Length (ft)		250
Base Capacity (vph)	2656	1162
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.58	0.01
Intersection Summary		

HCM 6th TWSC 2: Old Rand Road & Pine Tree Row

04/08/2021

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	15	138	229	48	54	18
Future Vol, veh/h	15	138	229	48	54	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	19	179	297	62	70	23
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	359	0	-	0	545	328
Stage 1	-	-	-	-	328	-
Stage 2	-	-	-	-	217	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1211	-	-	-	503	718
Stage 1	-	-	-	-	734	-
Stage 2	-	-	-	-	824	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1211	-	-	-	494	718
Mov Cap-2 Maneuver	-	-	-	-	494	-
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	824	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.8	0		13.1		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1211	-	-	-	536	
HCM Lane V/C Ratio	0.016	-	-	-	0.174	
HCM Control Delay (s)	8	0	-	-	13.1	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.6	

21-093 - Mixed-Use Development - Lake Zurich
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Synchro 10 Report

HCM 6th TWSC
3: Bayshore Village West Access Drive/Life Time Fitness Access Drive & Old Rand Road 10/08/2021

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↕			↕				↗
Traffic Vol, veh/h	102	145	1	2	201	36	0	0	1	0	0	75
Future Vol, veh/h	102	145	1	2	201	36	0	0	1	0	0	75
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	125	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	0	0	0	0	2	0	0	0	0	0	0	0
Mvmt Flow	131	186	1	3	258	46	0	0	1	0	0	96

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	304	0	0	187	0	0	784	759	187	-	-	281
Stage 1	-	-	-	-	-	-	449	449	-	-	-	-
Stage 2	-	-	-	-	-	-	335	310	-	-	-	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	-	-	3.3
Pot Cap-1 Maneuver	1268	-	-	1399	-	-	313	338	860	0	0	763
Stage 1	-	-	-	-	-	-	593	576	-	0	0	-
Stage 2	-	-	-	-	-	-	683	663	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1268	-	-	1399	-	-	251	302	860	-	-	763
Mov Cap-2 Maneuver	-	-	-	-	-	-	251	302	-	-	-	-
Stage 1	-	-	-	-	-	-	532	517	-	-	-	-
Stage 2	-	-	-	-	-	-	595	661	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	3.4			0.1			9.2			10.4		
HCM LOS							A			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	860	1268	-	-	1399	-	-	763
HCM Lane V/C Ratio	0.001	0.103	-	-	0.002	-	-	0.126
HCM Control Delay (s)	9.2	8.2	-	-	7.6	0	-	10.4
HCM Lane LOS	A	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0	0.3	-	-	0	-	-	0.4

21-093 - Mixed-Use Development - Lake Zurich
 Projected Weekday Evening Peak Hour

Synchro 10 Report

HCM 6th TWSC

4: Rand Road (US Route 12) & Proposed Right-In/Right-Out Access Drive

04/08/2021

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↗↗	↗		↗↗
Traffic Vol, veh/h	0	28	2458	25	0	1559
Future Vol, veh/h	0	28	2458	25	0	1559
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	70	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	2	0	0	3
Mvmt Flow	0	29	2587	26	0	1641
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	-	1294	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	156	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	-	156	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	33.4	0	0			
HCM LOS	D					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT			
Capacity (veh/h)	-	-	156			
HCM Lane V/C Ratio	-	-	0.189			
HCM Control Delay (s)	-	-	33.4			
HCM Lane LOS	-	-	D			
HCM 95th %tile Q(veh)	-	-	0.7			

21-093 - Mixed-Use Development - Lake Zurich
 Projected Weekday Evening Peak Hour

Synchro 10 Report

HCM 6th TWSC

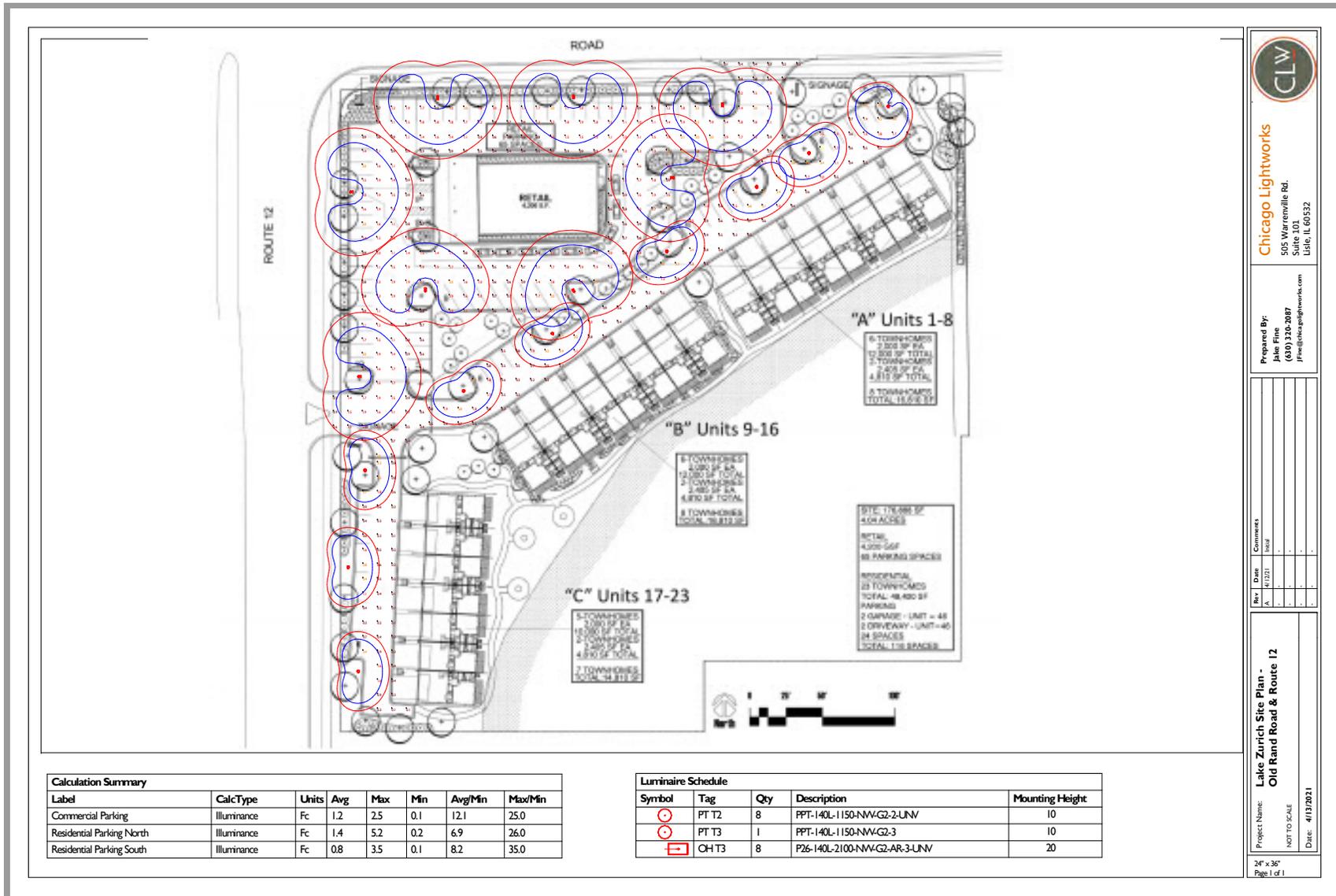
5: Proposed Right-In/Right-Out Access Drive & Old Rand Road

04/08/2021

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↑		↗
Traffic Vol, veh/h	242	15	0	276	0	7
Future Vol, veh/h	242	15	0	276	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	0	0
Mvmt Flow	255	16	0	291	0	7
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	-	-	-	263
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	781
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	781
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0	9.7			
HCM LOS						A
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT		
Capacity (veh/h)	781	-	-	-		
HCM Lane V/C Ratio	0.009	-	-	-		
HCM Control Delay (s)	9.7	-	-	-		
HCM Lane LOS	A	-	-	-		
HCM 95th %tile Q(veh)	0	-	-	-		

21-093 - Mixed-Use Development - Lake Zurich
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Synchro 10 Report



Calculation Summary						
Label	CalcType	Units	Avg	Max	Min	Max/Min
Commercial Parking	Illuminance	Fc	1.2	2.5	0.1	12.1
Residential Parking North	Illuminance	Fc	1.4	5.2	0.2	6.9
Residential Parking South	Illuminance	Fc	0.8	3.5	0.1	8.2

Luminaire Schedule					
Symbol	Tag	Qty	Description	Mounting Height	
	PT T2	8	PPT-140L-1150-NW-G2-2-UNV	10	
	PT T3	1	PPT-140L-1150-NW-G2-3	10	
	CH T3	8	PZ6-140L-2100-NW-G2-AR-3-UNV	20	

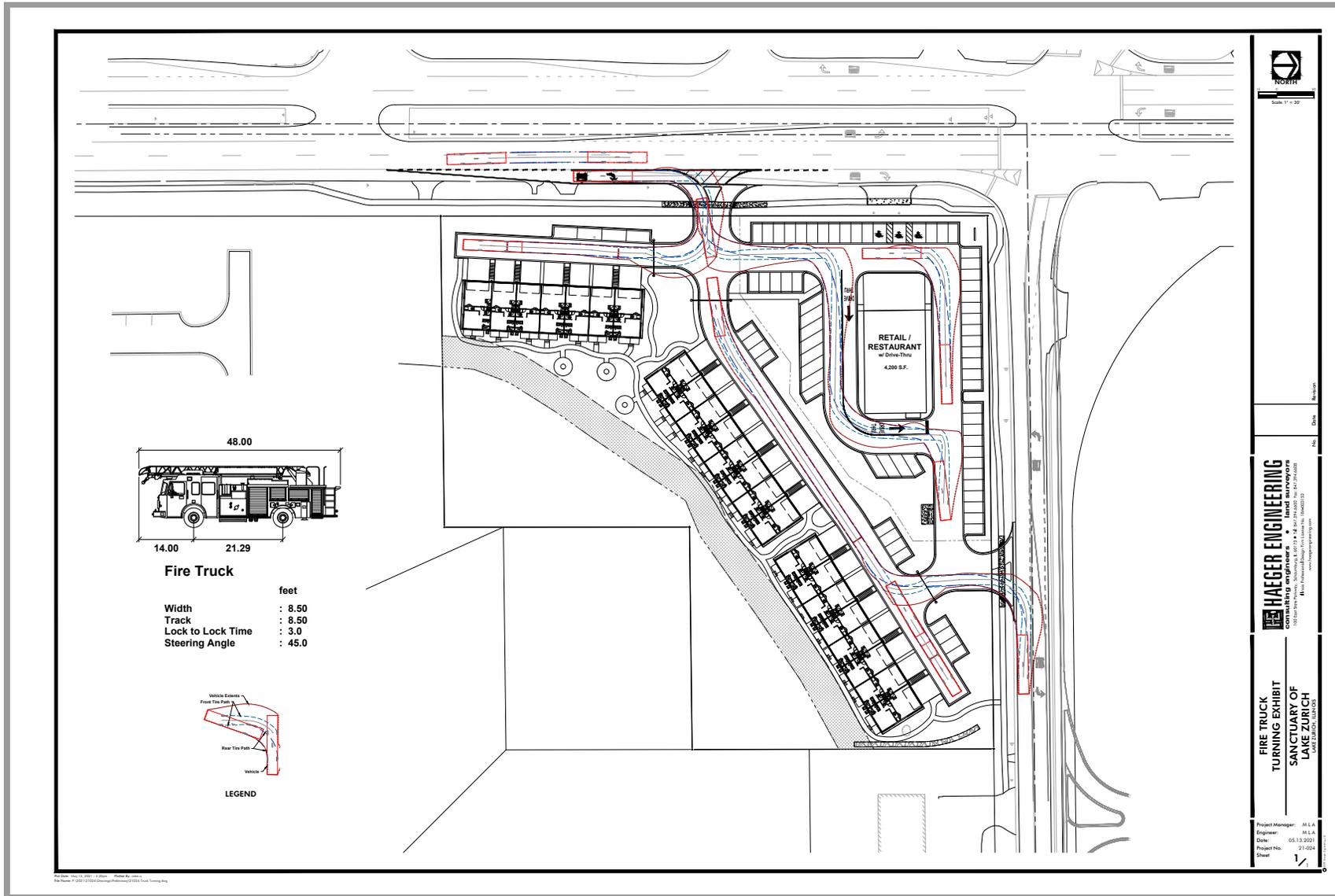


Chicago Lightworks
 505 Warrenville Rd.
 Suite 101
 Lisle, IL 60532

Prepared By:
 Name: [Redacted]
 Cell: 630.310.9087
 Email: [Redacted]

Rev	Date	Comments
A	4/13/21	Initial

Project Name: **Lake Zurich Site Plan - Old Rand Road & Route 12**
 NOT TO SCALE
 Date: 4/13/2021





100 East State Parkway
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May 13, 2021

Sarosh Saher
Village of Lake Zurich
505 Tesler Road
Lake Zurich, IL 60047

**RE: The Sanctuary of Lake Zurich
Response to Village Review
Haeger File No.: 21-024**

The attached Engineering Plans have been revised per the comments from the review letters dated 04/14/2021. A written disposition to all comments is included below. The original review comments are shown in *italics*, with our responses immediately below in **bold** text.

General

- 1) *The developer will be required to provide verification and/or submit documentation of approval or sign off letters from all agencies other than the Village of Lake Zurich that exercise jurisdiction over this development (i.e., USACOE, IEPA, etc.). Please submit a copy of all approvals received to-date and list any approvals pending in the response letter.*
Acknowledged, this will be provided during final engineering as permit approvals are applied for.
- 2) *Illinois Route 22 is the jurisdiction of the Illinois Department of Transportation. A permit will be required for all improvements and accesses associated with the development that will be constructed within the agencies' rights-of-way. The Village of Lake Zurich should be copied on project correspondences and a copy of all approvals and permits should be provided to the Village.*
Acknowledged, we have made an initial submittal to IDOT with the preliminary engineering plans and traffic impact study, and are awaiting their initial response.
- 3) *It shall be the property owner's responsibility to ensure compliance with the 2010 ADA Standards for Accessible Design and the Illinois Accessibility Code and subsequent amendments. Detailed grades must be provided with final engineering for all pedestrian crossings.*
Acknowledged, this will be provided during final engineering stage.
- 4) *A traffic study is required to evaluate the potential impacts the proposed development may have on the adjacent highways and area.*
A traffic study is submitted herewith for review.
- 5) *An Engineer's Opinion of Probable Cost (EOPC) for the proposed site improvements should be provided.*
This will be provided during final engineering stage.
- 6) *The townhome development, including all roadways, open spaces, and driveways are located in a single outlot and easement. This does not conform to the typical right-of-way dedication for these types of roads following the Village's Code. The applicant should identify any modifications from the Village's ordinance requirements.*
The preliminary plat of subdivision format has been revised to match an example plat for the Canterbury townhome project.
- 7) *An Autoturn analysis should be completed to ensure the proposed site layout will accommodate moving, delivery and fire trucks.*

A fire truck turning exhibit has been provided for review, which demonstrates the largest vehicle maneuvering.

- 8) *The submittal should include proposed shoreline improvements, dock improvements, and a detailed justification analysis pertaining to the buffer in relation to WDO and USACE requirements.*
This is included in the architectural submittal documents, and we acknowledge that permitting will be required through SMC and USACE during final project approval stage.

Boundary and Topographic Survey

- 9) *The surveyor's note 4 states that the survey was conducted during heavy snow cover. There is also some existing information missing, such as sanitary inverts. The topographic survey should be updated to reflect field conditions without snow cover.*
This was an erroneous note, the survey work was done in late March with no snow cover.
- 10) *The surveyor's note 5 states that a title commitment policy was not provided and may not reflect all existing easements on the site. This information should be provided on the survey, and document numbers for all existing easements and subdivisions should be included.*
This will be provided during final engineering stage.

Site Plan Preliminary Engineering (Sheet C3.0)

- 11) *It is recommended there be pedestrian access interconnecting the retail parcel, the townhomes and the public right-of-ways.*
Additional sidewalks have been incorporated into the plan as requested.
- 12) *The proposed sidewalks should be a minimum of 5-feet wide per the Village code and meet material standards.*
Sidewalks have been increased to 5-ft width in the public areas of the site but the private residential walks are proposed 4-ft width which we believe meets Village code and was approved on the Canterbury townhome project recently.
- 13) *The bump outs at the end of each dead-end road should be sized to support turn-arounds.*
The bump outs have been eliminated. In coordination with Village staff the two dead-end access drives match the configuration of the approved Canterbury townhome project.
- 14) *The single parking stall at the southwestern corner of the site does not provide adequate space to back out.*
This space has been eliminated as mentioned above.
- 15) *The materials specified for paving differ from the ordinance requirements. The design engineer should provide structural numbers for the pervious concrete, driveway, roadway and parking lot for consideration by the Village.*
The project proposes alternate pavement sections to accommodate pervious pavement design, although we believe they exceed Village structural design number. We will coordinate with staff on any modifications to the current proposed sections during final engineering design stage.
- 16) *Each off-street parking space shall be a minimum nine feet (9') wide by twenty feet (20') long and not less than one hundred eighty (180) square feet; provided, however, that the minimum length of a perimeter space or space perpendicular to a landscape area shall be eighteen feet (18'). There are also irregular stalls located on the retail parcel that create concern for safe maneuverability in the parking lot.*
As discussed with staff, we are requesting that the proposed parking spaces be approved as submitted. We have provided examples from other Village codes that allow this size parking space and have provided examples of site locations they are present.

Grading Plan Preliminary Engineering (Sheet C4.0)

- 17) *The proposed townhomes should include basement floor or lowest floor elevations to show appropriate flood protection. Elevations for the lowest floor should be at least 2 feet above the BFE of Lake Zurich, and the plans should include the BFE and proposed buffers.*

The elevations have been added to the plan, the lowest floors are approximately 7 feet above the BFE of Lake Zurich.

- 18) *Additional information should be provided to show the drainage patterns of the site, including but not limited to: contours in open areas, drainage arrows on pavement areas, roof drainage direction shown, 100-year overflow routes, high points, and entrance slopes.*

Additional pavement elevations have been added to the plan to demonstrate drainage design, along with contours in open areas.

Utility Plan Preliminary Engineering (Sheet C5.0)

- 19) *Indicate the approximate location of lighting on the plan.*

The proposed lighting locations have been added to the plan.

- 20) *Additional information must be provided relating to the age, condition, and material of the existing sanitary main onsite, and televising records should be provided. The developer should be required to have the pipe condition verified for use.*

This will be provided during final engineering design.

- 21) *Proposed elevations, slopes, inverts, cover, and materials should be provided for all proposed utilities.*

This will be provided during final engineering design.

- 22) *Valves shall be installed at every six hundred feet (600') or less along all water distribution mains. Additional valves shall be installed, as needed, so that no more than two (2) fire hydrants and/or twenty-five (25) dwelling units are affected by isolation of any section of water distribution main.*

Additional valves have been added to the site design.

- 23) *There is a cluster of utilities, east of the retail space at the existing sanitary manhole, that is of concern for utility conflicts and separation requirements. This area, as well as all other crossing areas, should be confirmed to meet IEPA separation requirements.*

We will provide this analysis during final engineering design.

- 24) *The frontage has overhead utilities located adjacent to the property. The developer should consider burying the overhead utilities to avoid conflicts with ingress/egress the roadways.*

The developer will not be burying utilities along the frontage due to the extreme cost of this improvement, which we understand is not required by code.

- 25) *Please refer to the Utilities Division review for additional water and sanitary sewer comments.*

Acknowledged, we have received and responded to Public Works comments.

Preliminary Engineering Report

- 26) *Flows for the water and sewer mains should be provided and verification of existing water system capacity and the downstream capacity of the sanitary sewer system should be noted in the report.*

This will be provided during final engineering design.

- 27) *A preliminary stormwater report should be provided. The final stormwater report shall be consistent with Section 400 of the Watershed Development Ordinance (WDO), including a Watershed Development Permit, and shall be submitted with final engineering.*

A preliminary engineering report is provided and a final report and permit application will be provided during final engineering design.

28) *Per Article 500.07, pursuant to state law, a property owner of a parcel being subdivided adjacent to a state or county road right-of-way shall notify the proper highway authority in writing of the proposed subdivision, and request that the proper highway authority provide, at the cost of the highway authority or otherwise provided by law, the amount of additional capacity in any stormwater detention facility to be constructed in the subdivision for the future availability of the highway authority for meeting stormwater detention requirements of any future public construction on the highway.*

Acknowledged. We will coordinate with IDOT during final design stage.

29) *As discussed during the pre-application meeting, the WDO does allow credit for existing impervious surfaces on the site, but proposed permeable pavement / concrete is not considered a fully pervious surface that can be substituted for detention. Detention will need to be provided for the proposed site improvements. The runoff to Old Rand Road is tributary to an existing 12" storm sewer line that may not have capacity.*

Acknowledged. As discussed with you we have modified the site design to provide stormwater detention for the project area not including the pre-1992 site impervious area.

30) *Water quality sampling will need to be provided in accordance with WDO section 602.03. (Lake Zurich is on the Appendix D list for TSS).*

Acknowledged, this will be provided during final project permitting.

31) *RVR and water quality standards must be met per the WDO.*

Acknowledged, this will be provided during final project permitting.

Preliminary Plat of Subdivision

32) *The plat should include a subdivision name.*

The project name has been added to the preliminary plat.

33) *The Plat should include easement and outlot descriptions, including restrictions for the public utilities, stormwater management system(s), wetland buffers, and RVR / WQ areas prohibiting any modification to these areas. If stormwater management systems are included on the commercial parcel, they must also be restricted.*

The plat has added these areas, and additional details will be provided during final plat stage.

34) *It is understood that the plat is preliminary and certificates and other items required for recordation will be submitted and reviewed in final engineering. No response is required.*

Acknowledged, this will be provided during final plat stage.

Public Works Comments

- *No portion of a structure or building can be more than two hundred fifty feet from the nearest fire hydrant.*
Additional fire hydrants have been added to the plan to comply with this requirement.
- *Water main will be C900 with a tracing wire.*
This has been noted on the plans.
- *All utility crossing must be delineated and proper spacing and/or pipe material must be employed.*
Acknowledged, this will be provided during final engineering design.
- *A ten-foot horizontal distance between the storm sewer and water main must be maintained.*
Acknowledged, this will be provided during final engineering design.
- *A dedicated easement is required for public utilities.*
Acknowledged, this will be provided during final plat design.

- *Existing sanitary sewer must be properly abandoned.*
Acknowledged.
- *An inspection manhole is required for the retail building. This cannot be the manhole on the sewer main.*
This has been added to the plan.
- *B-boxes and sanitary sewer clean outs cannot be in driveways.*
Acknowledged, the typical townhome lot detail shows proposed locations outside of the driveway areas.
- *Access to the public utilities cannot be closed off via the security gates.*
Acknowledged this will be coordinated during final design stage.
- *A Letter of Credit (LOC) is required. The LOC will be 110% of the Engineer's Estimate of Probable Cost.*
Acknowledged, this will be provided during final engineering design.
- *Residential connection fee based on 1 1/2-inch water service; \$ 3,500 water connection fee; \$ 5,000 sewer connection fee. Lake County sewer connection fee \$ 4,030. Commercial connection fee based on 2 inch water service; \$ 10,000 water connection fee; \$ 14,000 sewer connection fee. Lake County sewer connection fee based on submittal of actual retail usage.*
Acknowledged.

Fire Dept Comments

1. *Provide an aerial ladder turning template for review.*
An exhibit has been provided herewith.
2. *The interior road shall be at 24 feet in width not 20 feet as shown.*
We have increased the roadway with in the center portion of the project within the circulation areas. As discussed with Village staff and as approved on the Canterbury townhome project the two dead-end streets have remained at 20-ft.
3. *All units will be required to have a 13-D residential fire sprinkler system.*
Acknowledged.
4. *The security gate shall be equipped with a Knox opening system.*
Acknowledged, details will be provided during final design stage.
5. *The security gate shall open to the full 24 foot width.*
Acknowledged, this has been shown on the plans.
6. *The retail building shall have a sprinkler riser room. The location shall be approved by my office. The room will contain the sprinkler risers, fire alarm panel and Knox key box.*
Acknowledged, details will be provided during final design stage.
7. *If there are multiple occupants in the retail space, they shall be divided with separate flow switches per unit.*
Acknowledged, details will be provided during final design stage.
8. *Provide a fire hydrant at the retail space.*
A fire hydrant has been added within the retail space and the existing hydrant to remain within the Old Rand Road right-of-way has been called out.

The Sanctuary of Lake Zurich
Plan Review Comment Responses

May 13, 2021

9. *The drawings only indicate two fire hydrants. Provide hydrants at the end of each drive.*
Additional hydrants have been added to the plan as requested.
10. *Further comments will be provided upon final review.*
Acknowledged.

This concludes our resubmittal. Should you require further information or have any questions, please do not hesitate to give us a call.

Sincerely,

HAEGER ENGINEERING, LLC



Mike Anderson, P.E., LEED AP
Vice-President



At the Heart of Community

COMMUNITY DEVELOPMENT DEPARTMENT

505 Telsler Road
Lake Zurich, Illinois 60047

(847) 540-1696
Fax (847) 726-2182
LakeZurich.org

APPLICATION PZC 2021-05
PZC Hearing Date: May 19, 2021

AGENDA ITEM 4.B

STAFF REPORT

To: Chairperson Stratman and Members of the Planning & Zoning Commission
From: Sarosh Saher, Community Development Director
CC: Tim Verbeke, Planner
Mary Meyer, Building Services Supervisor
Date: May 19, 2021
Re: PZC 2021-05 Zoning Application for 525 Enterprise – Milieu Landscaping
Special Use Permit for Outdoor Storage associated with a Landscape Contractor

SUBJECT

Brian Frank, Milieu Landscaping, (the “Applicant”) requests a Special Use Permit to establish his landscape company with outdoor storage at the property commonly known as 525 Enterprise Parkway and legally described in Exhibit A attached hereto (the “Subject Property”).

GENERAL INFORMATION

Requested Action: Special Use Permit
Current Zoning: I Industrial District
Current Use: Vacant Building
Proposed Use: Office, Outdoor Landscape Storage Yard, and Parking Lot
Property Location: 525 Enterprise Parkway
Applicant: Brian Frank, Milieu Landscaping
Owner: DAC Realty
Staff Coordinator: Tim Verbeke, Planner

Staff Report
APPLICATION PZC 2021-05

Community Development Department
PZC Hearing Date: May 19, 2021

LIST OF EXHIBITS

- A. Legal Description
- B. Public Hearing Sign
- C. Site Photos
- D. Aerial Map
- E. Zoning Map
- F. Parcel Map
- G. Development Application and Attachments
- H. Development Review Comments

BACKGROUND

Brain Frank, Milieu Landscaping (the “Applicant”), with the consent of the owner, DAC Realty, is proposing to relocate his landscaping contractor company with associated outdoor storage, known as Milieu Landscaping, from Wheeling to Lake Zurich. The land use is proposed to be established at 525 Enterprise Parkway, and legally described in Exhibit A attached hereto (the “Subject Property”).

The Applicant desires to establish a landscape company and office in the existing industrial building, along with an outdoor storage yard for landscape materials. The outdoor storage yard requires a special use permit in the Lake Zurich I-Industrial zoning district.

The primary activity of the land use as classified by the Standard Industrial Classification (SIC) System is landscape and horticultural services, (SIC #078). The SIC code also allows for snow removal (0782), tree services (0783), and landscape counseling and planning (0781). All such activities are allowed as “permitted uses” in the I Industrial District.

However, the Lake Zurich zoning code classifies “outdoor storage” associated with a special trade contractor as a special use, requiring further review and scrutiny through the public hearing process with Village Board approval.

The Applicant has therefore filed an application with the Village of Lake Zurich received on April 26, 2021 (the “Application”) additionally seeking:

- Special Use Permit to allow “outdoor storage” associated with a permitted landscape and horticultural services contractor (S)

The Subject Property is located within the Village’s I Industrial Zoning District. The existing approximately 20,138 square-foot building on the property will be retrofitted with offices for dispatching of landscape/snow removal crews, and indoor storage for landscape materials. The only alterations to the building will be minor cosmetic changes. The remaining balance of the parcel is proposed to be paved for use as a parking lot and operate as a landscape vehicle parking and material storage area. The parking area will be completely fenced in and landscaped to screen the outdoor storage from the neighboring industrial units. The rear parking lot is not proposed to be striped due to only Milieu’s vehicles being parked in that area.

Staff Report
APPLICATION PZC 2021-05

Community Development Department
PZC Hearing Date: May 19, 2021

Landscape Services provided by Milieu Landscaping include: full service landscape design, construction, maintenance contractor, and snow plow contractor. The Applicant has stated that no vehicles will be worked on or repaired on site. The company employs over 100 employees, but not all of them will be working at this facility.

Pursuant to public notice published on May 1, 2021, in the Daily Herald, a public hearing has been scheduled with the Lake Zurich Planning & Zoning Commission for May 19, 2021, to consider the Application. On April 30, 2021 the Village posted a public hearing sign on the Subject Property (Exhibit B).

Staff offers the following additional information:

- A. **Courtesy Review.** Due to the low impact of this project, courtesy review was not recommended.
- B. **Zoning History.** The property is located within the Lake Zurich Midlothian Court Subdivision, Lot 1, being a resubdivision of Lots 3,4,5 and 6, which was recorded on March 15, 2004 in Lake County and is zoned within the I-Industrial District. The existing warehouse building was constructed in 2004, and used by Zippy Shell: Portable Storage Units & Moving Company, a moving company up until 2020.

Milieu Landscaping has been operating at 48 East Hintz Road in Wheeling since 1987. The business is expanding and looking to relocate to a larger property to allow for product storage and vehicle parking on the same site. This site is closer to a many of their western clients, although Milieu also intends to retain a presence in Wheeling to serve that customer base.

- C. **Surrounding Land Use and Zoning.** The subject property is located on Enterprise Parkway on the northern end of the Industrial Park. The land to the north, south, east, and west of the Subject Property is zoned I-Industrial and improved with a variety of Industrial uses.
- D. **Trend of Development.** The subject property is located within the thriving Lake Zurich Corporate and Industrial Park in the northeast quadrant of the Village. The accessibility to major state highways, a strong industrial park community, room for potential growth and development, all position the Subject Property in a desirable location for many industrial-oriented businesses.
- E. **Zoning District.** The I-Industrial district is intended to provide for a range of nuisance free manufacturing, warehousing, transportation, wholesaling, and industrial uses that are compatible with the suburban residential character of the village. The industrial district is also meant to accommodate certain professional offices and similar uses that may provide services to the industrial users and are compatible with the industrial character of the district. It is the goal of these regulations to provide and preserve an area within the village

Staff Report
APPLICATION PZC 2021-05

Community Development Department
PZC Hearing Date: May 19, 2021

for industrial uses that create employment and economic benefits for the village and the industrial district.

GENERAL FINDINGS

Staff of the Village's Development Review Team (DRT) has evaluated the development against the various standards and provisions of the Lake Zurich Municipal Code and offers findings on specific sections of the Code.

9-19-3: STANDARDS FOR SPECIAL USE PERMITS.

Staff has reviewed the plan and found that the development proposal will continue to remain in substantial conformance with the standards for Special Use Permits as outlined below.

A. General Standards: No special use permit shall be recommended or granted unless the applicant shall establish substantial conformance with the following:

1. Zoning Code and Plan Purposes: The proposed use and development will be in harmony with the general and specific purposes for which this zoning code was enacted and for which the regulations of the district in question were established and with the general purpose and intent of the official comprehensive plan.

Staff Response: Standard met. The development will continue to remain in substantial conformance with the purpose and intent of the I-Industrial District, and the land use designation of the adopted Comprehensive Plan.

2. No Undue Adverse Impact. The proposed use and development will not have a substantial or undue adverse effect upon adjacent property, the character of the area, or the public health, safety, and general welfare.

Staff Response: Standard met. The business is consistent with industrial-oriented development in the Industrial District. All activities will take place within property and will be effectively screened from neighboring properties. The business has demonstrated that it does not have any substantial or undue adverse effect upon any adjacent properties and does not adversely impact the public health, safety, and general welfare of the Village.

3. No Interference with Surrounding Development. The proposed use and development will be constructed, arranged, and operated so as not to dominate the immediate vicinity or to interfere with the use and development of neighboring property in accordance with the applicable district regulations.

Staff Response: Standard met. The entirety of the business and its activities will be operated on the subject property.

Staff Report
APPLICATION PZC 2021-05

Community Development Department
PZC Hearing Date: May 19, 2021

4. Adequate Public Facilities. The proposed use and development will be served adequately by essential public facilities and services such as streets, public utilities, drainage structures, police and fire protection, refuse disposal, parks, libraries, and schools, or the applicant will provide adequately for such services.

Staff Response: Standard met. The proposed development is currently served by and will continue to be served adequately by essential public facilities and services such as streets, utilities, drainage and other municipal services. No change in impact these are anticipated at this time.

5. No Traffic Congestion. The proposed use and development will not cause undue traffic congestion nor draw significant amounts of traffic through the surrounding streets.

Staff Response: Standard met. Enterprise Parkway has adequate capacity to accommodate the traffic generated by the landscape vehicles that will be attributed to Milieu Landscaping.

6. No Destruction of Significant Features. The proposed use and development will not result in the destruction, loss, or damage of any natural, scenic, or historic feature of significant importance.

Staff Response: Standard met. The proposed use will not result in the destruction or removal of any natural features. Any removal of trees will require a tree removal permit which provides for compensation through new replacement trees or a fee in lieu of.

7. Compliance with Standards. The proposed use and development complies with all additional standards imposed on it by the particular provision of this Code authorizing such use.

Staff Response: Standard met. There are no additional standards imposed on the land use by the zoning code.

8. Positive Effect. The proposed special use creating a positive effect for the zoning district, its purpose, and adjacent properties shall be placed before the benefits of the petitioner.

Staff Response: Standard met. The proposed development will continue to contribute to the established character of the Industrial Park.

- B. Special Standards for Specified Special Uses. When the district regulations authorizing any special use in a particular district impose special standards to be met by such use in such district, a permit for such use in such district shall not be recommended or granted unless the applicant shall establish compliance with such special standards.

Staff Report
APPLICATION PZC 2021-05

Community Development Department
PZC Hearing Date: May 19, 2021

Staff Response: Standard met. The applicant has agreed to and staff will ensure that the Applicant continues to comply with the conditions imposed on the landscaping company with associated outdoor storage.

C. Considerations. In determining whether the applicant's evidence establishes that the foregoing standards have been met, the Plan Commission and the Board of Trustees shall consider:

1. Benefit. Whether and to what extent the proposed use and development at the particular location requested is necessary or desirable to provide a service or a facility that is in the interest of the public convenience or that will contribute to the general welfare of the neighborhood or community.

Staff Response: Standard met. The business will continue to provide a convenient location for this service within the community.

2. Alternative Locations. Whether the purposes of the zoning code can be met by the location of the proposed use and development in some other area or zoning district that may be more appropriate than the proposed site.

Staff Response: Standard met. There is no evidence that the proposed location is inappropriate for the proposed land use, so an alternative location would not be any more appropriate than the proposed location. A landscape company with outdoor storage requires a Special Use Permit and is only provided for within the Industrial District.

3. Mitigation of Adverse Impacts. Whether all steps possible have been taken to minimize any substantial or undue adverse effects of the proposed use and development on the immediate vicinity through building design, site design, landscaping, and screening.

Staff Response: Standard met: The warehouse building has been developed and constructed to prevent any undue adverse effect on itself or on surrounding property in relation to its location, design and operation.

Staff Report
APPLICATION PZC 2021-05

Community Development Department
PZC Hearing Date: May 19, 2021

RECOMMENDATION

The recommendation of the Planning and Zoning Commission should be based on the standards included in the following Sections of the Lake Zurich Municipal Code:

- Section 9-19-3: Standards for Special Use Permits

Based on the review of staff, the standards for approval continue to be met and therefore staff recommends that the Planning and Zoning Commission make these standards a part of the official record of the Application.

Staff of the Community Development Department therefore recommends the approval of Application PZC 2021-05, subject to the following conditions:

1. Substantial conformance with the following documentation submitted as part of the application subject to revisions required by Village Staff, Village Engineer, Village Landscape Consultants and applicable governmental agencies:
 - a. Zoning Application and Cover Letter dated April 26, 2021, prepared by Mr. Brian Frank, of Milieu Landscaping
 - b. Exhibit A: Legal Description of the Subject Property
 - c. Engineering Plans dated April 26, 2021, prepared by MEI
 - d. Engineer's Estimate of Probable Cost dated April 26, 2021, prepared by MEI
 - e. Stormwater Report dated April 26, 2021, prepared by MEI
 - f. Soil Resource Report dated April 26, 2021, prepared by MEI
2. The final landscape design plan depicting the required landscape screening of the yard and outdoor storage areas from the street and neighboring properties shall be submitted for approval by village staff prior to construction of the various new improvements on the subject property. Such screening shall consist of a solid fence in compliance with Section 8-11-1 of the Lake Zurich Municipal Code, and screening plant material as approved by village staff.
3. The final lighting and photometric design plan depicting, in particular, exterior lighting within the parking yard shall be submitted for approval by village staff prior to construction of the various new improvements on the subject property.
4. The Applicant shall submit any proposals for onsite signage or branding to the village prior to final plan approval. The final proposed signage plan shall be approved by village staff.
5. The development shall be in compliance with all other applicable codes and ordinances of the Village of Lake Zurich.

Respectfully Submitted,

Tim Verbeke
 Planner

Staff Report
APPLICATION PZC 2021-05

Community Development Department
PZC Hearing Date: May 19, 2021

LAKE ZURICH PLANNING & ZONING COMMISSION
FINAL FINDINGS & RECOMMENDATIONS

FOR 525 ENTERPRISE PARKWAY
May 19, 2021

The Planning & Zoning Commission recommends approval of Application PZC 2021-05, and the Planning & Zoning Commission adopts the findings as contained within the Staff Report dated **May 19, 2021** for this Application and subject to any changes or approval conditions as listed below:

1. Substantial conformance with the following documentation submitted as part of the application subject to revisions required by Village Staff, Village Engineer, Village Landscape Consultants and applicable governmental agencies:
 - a. Zoning Application and Cover Letter dated April 26, 2021, prepared by Mr. Brian Frank, of Milieu Landscaping
 - b. Exhibit A: Legal Description of the Subject Property
 - c. Engineering Plans dated April 26, 2021, prepared by MEI
 - d. Engineer's Estimate of Probable Cost dated April 26, 2021, prepared by MEI
 - e. Stormwater Report dated April 26, 2021, prepared by MEI
 - f. Soil Resource Report dated April 26, 2021, prepared by MEI
2. The final landscape design plan depicting the required landscape screening of the yard and outdoor storage areas from the street and neighboring properties shall be submitted for approval by village staff prior to construction of the various new improvements on the subject property. Such screening shall consist of a solid fence in compliance with Section 8-11-1 of the Lake Zurich Municipal Code, and screening plant material as approved by village staff.
3. The final lighting and photometric design plan depicting, in particular, exterior lighting within the parking yard shall be submitted for approval by village staff prior to construction of the various new improvements on the subject property.
4. The Applicant shall submit any proposals for onsite signage or branding to the village prior to final plan approval. The final proposed signage plan shall be approved by village staff.
5. The development shall be in compliance with all other applicable codes and ordinances of the Village of Lake Zurich.
 - Without any further additions, changes, modifications and/or approval conditions.
 - With the following additions, changes, modifications and/or approval conditions:

Planning & Zoning Commission Chairman

Staff Report
APPLICATION PZC 2021-05

Community Development Department
PZC Hearing Date: May 19, 2021

EXHIBIT A
LEGAL DESCRIPTION OF SUBJECT PROPERTY

LOT 1 IN MIDLOTHIAN COURT FIRST RESUBDIVISION, BEING A RESUBDIVISION OF LOTS 3,4,5, AND 6 IN MIDLOTHIAN COURT SUBDIVISION OF PART OF THE NW ¼ OF SECTION 16, TOWNSHIP 43 NORTH, RANGE 10, EAST OF THE THIRD PRINCIPAL MERIDIAN, ACCORDING TO THE PLAT THEREOF RECORDED MARCH 15, 2004 AS DOCUMENT 5517234, IN LAKE COUNTY. ILLINOIS.

Staff Report
APPLICATION PZC 2021-05

Community Development Department
PZC Hearing Date: May 19, 2021

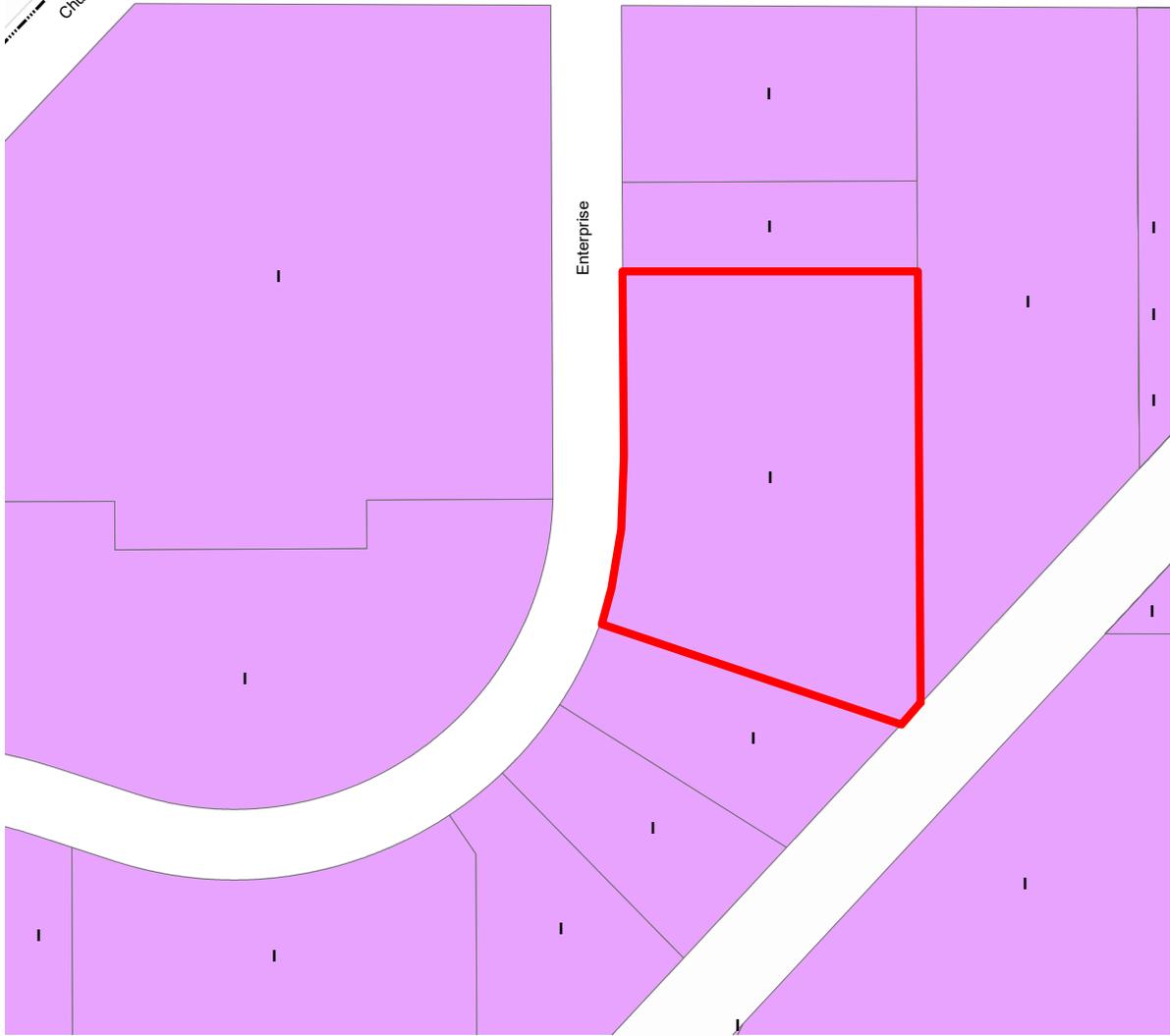
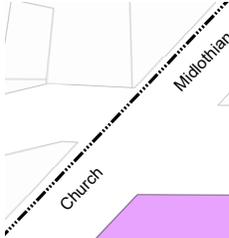
EXHIBIT B
PUBLIC HEARING SIGN PRESENT AT SUBJECT PROPERTY





Milieu Landscaping

525 Enterprise Parkway



COMMUNITY SERVICES DEPARTMENT
Building and Zoning Division
505 Telser Road, Lake Zurich, Illinois 60047

(847) 540-1696
Fax: (847) 726-2182
LakeZurich.org



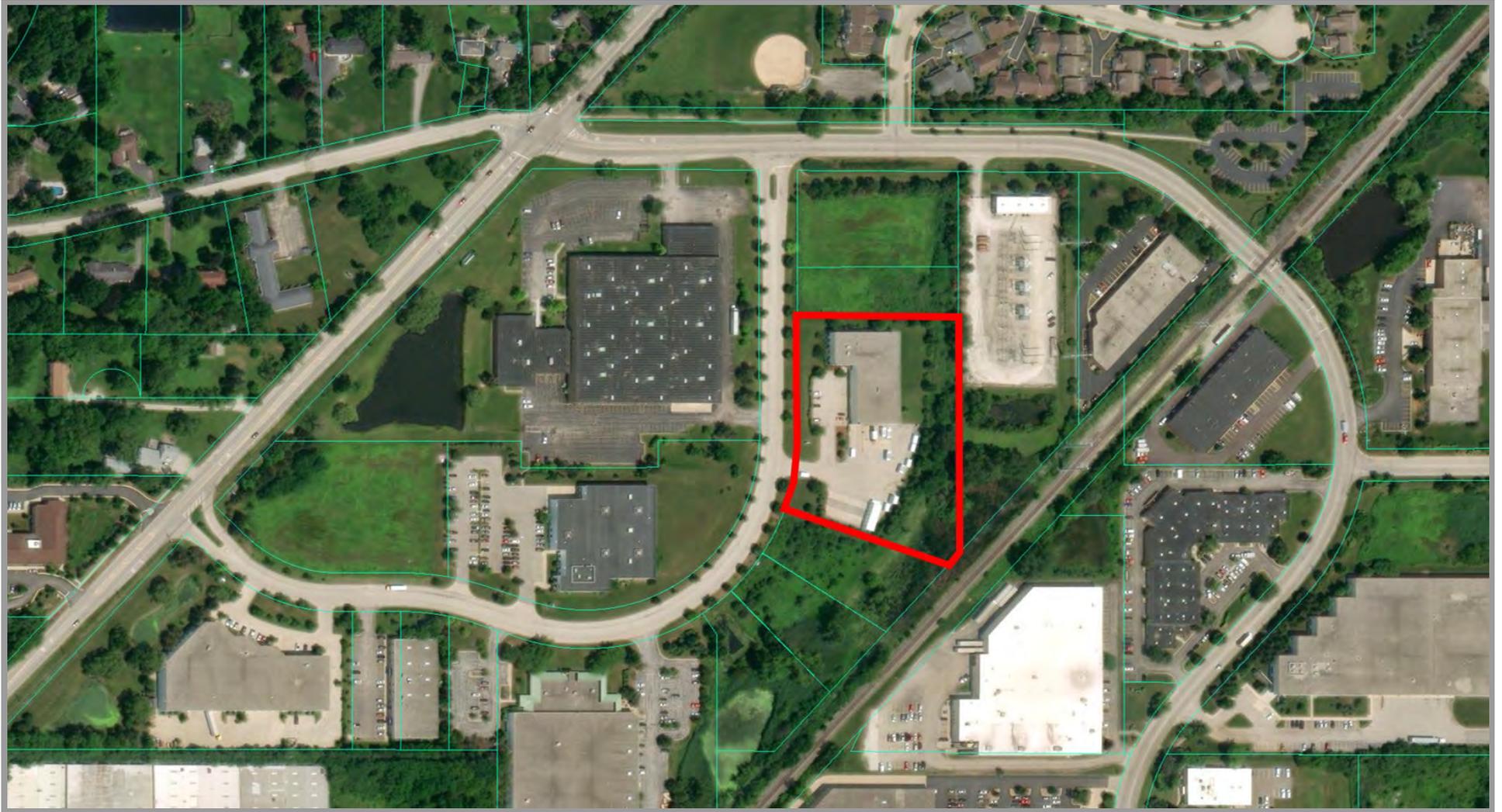
Milieu Landscaping

525 Enterprise Parkway



COMMUNITY SERVICES DEPARTMENT
Building and Zoning Division
505 Telser Road, Lake Zurich, Illinois 60047

(847) 540-1696
Fax: (847) 726-2182
LakeZurich.org





At the Heart of Community

PUBLIC WORKS DEPARTMENT

505 Telser Road
Lake Zurich, Illinois 60047

(847) 540-1696
LakeZurich.org

May 10, 2021

Tim Verbeke, Planner
Village of Lake Zurich
505 Telser Road
Lake Zurich, Illinois 60047

PRELIMINARY ENGINEERING REVIEW #1

DEVELOPMENT: **525 Enterprise Parkway – Milieu Landscaping
Lake Zurich, IL 60047**

ITEMS RECEIVED: 1) **Preliminary Engineering Plan for 525 Enterprise prepared by
Morris Engineering, Inc, dated April 26, 2021.**
2) **Milieu Landscaping 525 Enterprise Parkway Stormwater Report
prepared by Morris Engineering, Inc, dated April 26, 2021.**

On behalf of the Village of Lake Zurich, Manhard Consulting has completed a preliminary review of the above referenced material for conformance with the Village ordinances and general accepted engineering practices. We reserve the right to generate additional comments on future submittals. By copy of this letter we request that the Developer address all comments in a response letter and submit the appropriate revisions for further review.

General

- 1) Per Section 300.08 of the Watershed Development Ordinance (WDO), "Any development which hydrologically disturbs 5,000 square feet or more" requires a Watershed Development Permit (WDP) to be submitted for review of soil erosion and sediment control performance standards. The WDO Permit Application can be found and printed from <https://www.lakecountyil.gov/2363/Watershed-Development-Permit-Application>.
- 2) The following items will require coordination with the Public Works Department to confirm:
 - a. that the location of the swale is acceptable and access to the watermain / valves is still feasible,
 - b. that they approve that the rim of the valve vault being raised 4' to accommodate the proposed contours in that area, and
 - c. the fencing / gate requirements that will be required to gain access to the existing valve vault as the proposed chain link fence cuts off access from the parking lot.

Preliminary Engineering Plan

- 3) An existing conditions sheet should be included in the plan set, with all existing utilities and easements clearly labeled.
- 4) In general, it is very difficult to tell what is existing and what is proposed on the plans. It is recommended existing conditions have a slightly lighter shade when printed.
- 5) Additional information should be provided for the bioswale, including a cross section showing vegetation type, types and depths of engineered soils / stone, overflow sizing, dimensions, if any underdrains are used and where they outlet, etc.
- 6) The gas tank area should be detailed to show how the containment area will be constructed (type of materials, if pavement is to be removed, etc) and the proposed elevations of any barriers / curbing.
- 7) Per Section 504.04 of the WDO, areas with vehicle fueling must have a hydrocarbon removal technology with a 70% removal rate. Calculations / specification from the manufacturer must be provided in the stormwater report, and a detail provided in the plans.
- 8) The following comments pertain to the grading and landscaping plan sheets;
 - a. The proposed driveway grades transitioning from the existing parking lot to the proposed storage area have slopes up to 25%. This area of grading should have additional information provided with spot elevations and slopes labeled, and it should be noted if curb is to be removed between the existing lot and the new pavement area.
 - b. All proposed contours around the existing valve vault should be shown, as it appears the vault is being proposed to be elevated 4'. Additional contouring appears to be required to the east of the vault as well.
 - c. The 885 contour in the depression / swale area appears to be incorrectly labeled as an 884 elevation.
 - d. A stabilized construction entrance should be provided and a detail added to the plans.
 - e. The plans should include the Lake County SMC standard sequencing, which can be found at: <https://www.lakecountyiil.gov/DocumentCenter/View/3269/Typical-Construction-Sequence-PDF?bidId=>
 - f. The plans should include the Lake County SMC standard Soil Erosion and Sediment Control Notes which can be found at: <https://www.lakecountyiil.gov/DocumentCenter/View/3415/SESC-Construction-Notes-2013-PDF>
 - g. All areas with slopes 4:1 or greater should be stabilized with erosion control blanket.
 - h. The limits of the existing wetland / native planting along the basin should be shown on the plans. The type of vegetation and blanket should be specified for areas of disturbance, especially for those areas near the wetland plantings.

Preliminary Stormwater Management

- 9) The report should be enhanced to include an exhibit that characterizes the existing and proposed drainage patterns.
- 10) Calculations should be provided to confirm the sizing of the bioswale for the area tributary to it and an overflow discussed / provided. It should be ensured that the entire storage area is draining to an adequately sized treatment area, and additional measures may be warranted to prevent material from washing into the existing wetland basin.
- 11) A maintenance plan should be provided for the bioswale and water quality unit. The areas will also be required to be in a deed restricted easement.

If you should have any questions, please do not hesitate to contact me.

Yours truly,
MANHARD CONSULTING

A handwritten signature in black ink that reads "Jodi McCarthy". The signature is written in a cursive style with a large, sweeping flourish at the end.

Jodi McCarthy, PE, CFM, CPESC
Senior Project Manager

cc: Sarosh Saher, Community Development Director
Betty Harrison, EQC Supervisor
Nadine Gerling, Permit Coordinator
Nicholle Petroff, Office Manager
Mary Meyer, Building Services Supervisor

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At the Heart of Community

FIRE DEPARTMENT
Fire Prevention Bureau

1075 N. Old McHenry Road
Lake Zurich, Illinois 60047
Fire.bureau@lakezurich.org
(847) 540-5073
LakeZurich.org

May 3, 2021

Tim Verbeke
Village of Lake Zurich
505 Telser Road
Lake Zurich, IL 60047

**RE: PR21-103 – 525 ENTERPRISE PKWY.
MILIEU LANDSCAPE**

Tim:

Thank you for the submittal. After reviewing the drawings, I have the following comments:

1. Provide State of Illinois permits and drawings for the fuel storage.
2. Provide a Knox key box system on the gate for entry to locked areas.
3. Provide details on the warehouse layout and any possible chemical storage.

If there are any questions, please contact my office.

Sincerely,

A handwritten signature in black ink that reads "Robert Kleinheinz". The signature is written in a cursive style.

Robert Kleinheinz
Fire Prevention Specialist
Lake Zurich Fire Department

Village of Lake Zurich
Utilities Division of
Public Works

Memo

To: Tim Verbeke, Planner
From: Betty Harrison, EQC Supervisor
Date: May 4, 2021
Re: 525 Enterprise – Milieu Landscaping

1. 525 Enterprise – Milieu Landscaping
 - No changes indicated for the water and sewer service.
 - Storm water inlet protection baskets must be installed due to the outside storage of vehicles,



MILIEU
LANDSCAPING

48 E. Hintz Rd.
Wheeling, IL 60090
Office: 847-465-1160 Fax: 847-465-1159
Email: hello@milieuland.com
Website: <http://milieuland.com>

April 26, 2021

Subject: 525 Enterprise – Special Use Permit and Introduction

Sarosh Saher
Community Development Officer
505 Telser Road
Lake Zurich, IL 60047

Dear Sarosh,

Milieu Landscaping is in the process of purchasing the property at 525 Enterprise in the Village of Lake Zurich. We have a signed contract with the seller, financing is in order, and we are in the process of pursuing a special use permit with the Village of Lake Zurich.

Please review this cover letter and our submittals for the purpose of awarding a Special Use Permit for Outdoor Storage at 525 Enterprise. The building is currently vacant and was previously used by a Moving Company. Milieu Landscaping is pursuing this purchase with the intention of operating our business for the foreseeable future. The current owner is DAC Realty.

It is with great pleasure and pride that our organization pursues a deep and long-lasting relationship with the Village of Lake Zurich, Chamber of Commerce, local businesses, and residents. We envision Lake Zurich as the home for our business for decades to come.

Please allow the following history and background of Milieu Landscaping:

- Established in 1987 to service Lake and Cook Counties.
- Full service landscape design, construction, and maintenance contractor.
- Snow Plow Contractor.
- Award winning projects as recognized by the Illinois Landscape Contractors Association.
- Excellent track record as a corporate citizen and environmental stewards in our current locations of Wheeling and Wauconda
- Strong Municipal References for work performed: Village of Wheeling, Ela Township, Village of Long Grove, Village of Niles, Village of Arlington Heights, Village of Kildeer, Village of Hawthorn Woods.
- Over 100 employees in the Cook and Lake County areas.
 - Not all will be located at this facility
 - Professional staff of designers, horticulturists, and administration will make this their home office.

Milieu intends to use the property at 525 Enterprise as our primary office space, for storage of landscape materials, and for dispatching of landscape/snow removal crews. We will also maintain a presence in Wheeling to service our customer base to the east.

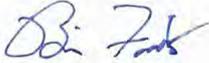
The balance of professional office space, indoor storage for landscape materials, and outdoor parking for our vehicles is a strong fit for our business model. Moreover, the proximity to our client base is quite favorable at this location.

A special use permit will allow the outdoor storage and parking of our vehicles. Our commitment is to be a strong environmental steward, cooperative neighbor, and have an exceptionally clean, beautiful presentation of the landscape to all passers-by.

We have engaged Morris Engineering of Lisle, Illinois to facilitate our investigation of wetlands and/or conservancy soils existence on the property. At this point, there are no indications of concern.

Additionally, the available public and private streets as well as the utilities on and around the property are more than adequate to serve the proposed development.

In anticipation of your warm welcome to the community, we offer our most sincere gratitude. Moreover, we pledge to go beyond Village requirements in the spirit of integrating with the community and being a positive contributor to the community.



Brian Frank
President



ZONING APPLICATION

Community Development Department
 505 Telsler Rd.
 Lake Zurich, IL 60047
 Phone: (847) 540-1696
 Fax: (847) 540-1769

(Please Type or Print)

1. Address of Subject Property: 525 Enterprise Parkway, Lake Zurich, Illinois
2. Please attach complete legal description: [Redacted]
3. Property Identification number(s): 14-16-104-20
4. Owner of record is: DAC Realty Phone: 630-513-9800 (Andrew Kolb, Attorney)
 E-Mail akolbe.viklawfirm.com Address: 200 W. Main St, St. Charles, IL
5. Applicant is (if different from owner): Milieu Design LLC Phone: 847-366-5069
 E-Mail brian@miliuland.com Address: 148 E Hinte Rd, Wheeling, IL
6. Applicant's interest in the property (owner, agent, realtor, etc.): Owner
7. All existing uses and improvements on the property are: Moving/Storage
8. The proposed uses on the property are: Landscape Contractor.
9. List any covenants, conditions, or restrictions concerning the use, type of improvements, setbacks, area, or height requirements placed on the Subject Property and now of record and the date of expiration of said restrictions: Purchaser is only
10. Describe any contract or agreement of any nature relevant to the sale or disposal of the Subject Property: AWARE OF THE FOLLOWING SETBACK LINES: BUILDING SETBACK LINE AFFECTING THE NORTH AND SOUTH 25' BUILDING SETBACK LINE AFFECTING THE WEST 40' BUILDING SETBACK LINE AFFECTING THE EAST 30'
Real Estate Sale Agreement between DAC Realty and Milieu Design LLC dated April 24th, 2021
11. For applications requiring a public hearing, please attach a list which contains the PIN, owner, and owner's mailing address of all properties located within 250 feet (excluding all Public Right-of-Ways) of the Subject Property.

THE APPLICANT'S SIGNATURE BELOW INDICATES THE INFORMATION CONTAINED IN THIS APPLICATION AND ON ANY ACCOMPANYING DOCUMENTS IS TRUE AND CORRECT. THE APPLICANT ALSO ACKNOWLEDGES IF THE CONSULTANT EXPENSES EXCEED THE INITIAL ESCROW DEPOSIT, THE APPLICANT WILL REIMBURSE THE ACCOUNT IMMEDIATELY.

Brian V. Frank
 (Name of applicant)

[Signature]
 (Signature of applicant)

Subscribed and sworn to before me this 26th day of APRIL, 2021.

[Signature]
 (Notary Public)



My Commission Expires 6/21/2023

(Name of Owner, if different)

(Signature of Owner, if different)

Subscribed and sworn to before me this _____ day of _____, 2021.

(Notary Public)

My Commission Expires _____

Please indicate what form of zoning relief your application requires. For assistance, please contact Staff:

- Zoning Code **Map** Amendment to change zoning of Subject Property from _____ to _____
- Zoning Code **Text** Amendment to amend the following section(s) of the Zoning Code _____

(See Section 18-103 of the Lake Zurich Zoning Code for specific standards. If a specific parcel is the subject of this amendment, then provide the additional information listed in Section 18-103C.)

- Special Use Permit/Amendment for LANDSCAPE CONTRACTOR BUSINESS
(See Section 19-103 of the Lake Zurich Zoning Code for specific standards.)

- Planned Unit Development/Major Adjustment/Amendment

(Planned Unit Developments are a distinct category of special use and are intended to create a more desirable environment than through strict application of the zoning and subdivision regulations. See Section 22-105 of the Lake Zurich Zoning Code for specific standards. Please list all the 'modifications' requested in the cover letter.)

- Variation for _____

(See Section 17-104 of the Lake Zurich Zoning Code for specific standards. Please indicate what your specific hardships are in the cover letter.)

- Modification to the Land Development Code (includes retaining walls more than 2 feet in height)
(See Section 10-6-18 of the Land Development Code for specific standards.)

- Preliminary Plat of Subdivision

- Final Plat of Subdivision or Amendment to Plat of Subdivision
(See Sections 10-5-2 and 10-5-9 of the Land Development Code for specific standards.)

- Site Plan Approval/Major Adjustment/Amendment
(See Section 20-103 of the Lake Zurich Zoning Code for specific standards.)

- Exterior Appearance Approval or Amendment
(See Section 21-103 of the Lake Zurich Zoning Code for specific standards.)

APPLICATION TO ANNEX CERTAIN TERRITORY

All land annexed to the Village is classified automatically after such annexation in the R-1\2 Single Family Residential District. The owner must file an application for a Zoning Map amendment if he or she desires a different zoning classification for the Subject Property.

- Petition to Annex Certain Territory (Please complete attached petition)
- Application to Annex Certain Territory

COMPREHENSIVE PLAN APPLICATION

- Comprehensive Plan **Map** Amendment for _____

- Comprehensive Plan **Text** Amendment for _____



ZONING APPLICATION

Community Development Department
505 Telser Rd.
Lake Zurich, IL 60047
Phone: (847) 540-1696
Fax: (847) 540-1769

(Please Type or Print)

1. Address of Subject Property: 525 Enterprise Parkway, Lake Zurich, Illinois
2. Please attach complete legal description
3. Property Identification number(s): 14-16-104-20
4. Owner of record is: DAC Realty Phone: 630-513-9800 (Andrew Kolb, Attorney)
E-Mail akolber@kolb-law.com Address: 200 W. Main St, St. Charles, IL
5. Applicant is (if different from owner): Milieu Design LLC Phone: 847-366-5069
E-Mail brian@milieuand.com Address: 348 E Hite Rd, Wheeling, IL
6. Applicant's interest in the property (owner, agent, realtor, etc.): Owner
7. All existing uses and improvements on the property are: Moving/Storage
8. The proposed uses on the property are: Landscape Contractor.
9. List any covenants, conditions, or restrictions concerning the use, type of improvements, setbacks, area, or height requirements placed on the Subject Property and now of record and the date of expiration of said restrictions:
10. Describe any contract or agreement of any nature relevant to the sale or disposal of the Subject Property.
11. For applications requiring a public hearing, please attach a list which contains the PIN, owner, and owner's mailing address of all properties located within 250 feet (excluding all Public Right-of-Ways) of the Subject Property.

THE APPLICANT'S SIGNATURE BELOW INDICATES THE INFORMATION CONTAINED IN THIS APPLICATION AND ON ANY ACCOMPANYING DOCUMENTS IS TRUE AND CORRECT. THE APPLICANT ALSO ACKNOWLEDGES IF THE CONSULTANT EXPENSES EXCEED THE INITIAL ESCROW DEPOSIT, THE APPLICANT WILL REIMBURSE THE ACCOUNT IMMEDIATELY.

Brian V. Frank

(Name of applicant)

(Signature of applicant)

Subscribed and sworn to before me this _____ day of _____, 2021.

(Notary Public)

My Commission Expires _____

David A. Caruso

(Name of Owner, if different)

(Signature of Owner, if different)

Subscribed and sworn to before me this 23RD day of APRIL, 2021.

(Notary Public)

My Commission Expires JUN 01 2021



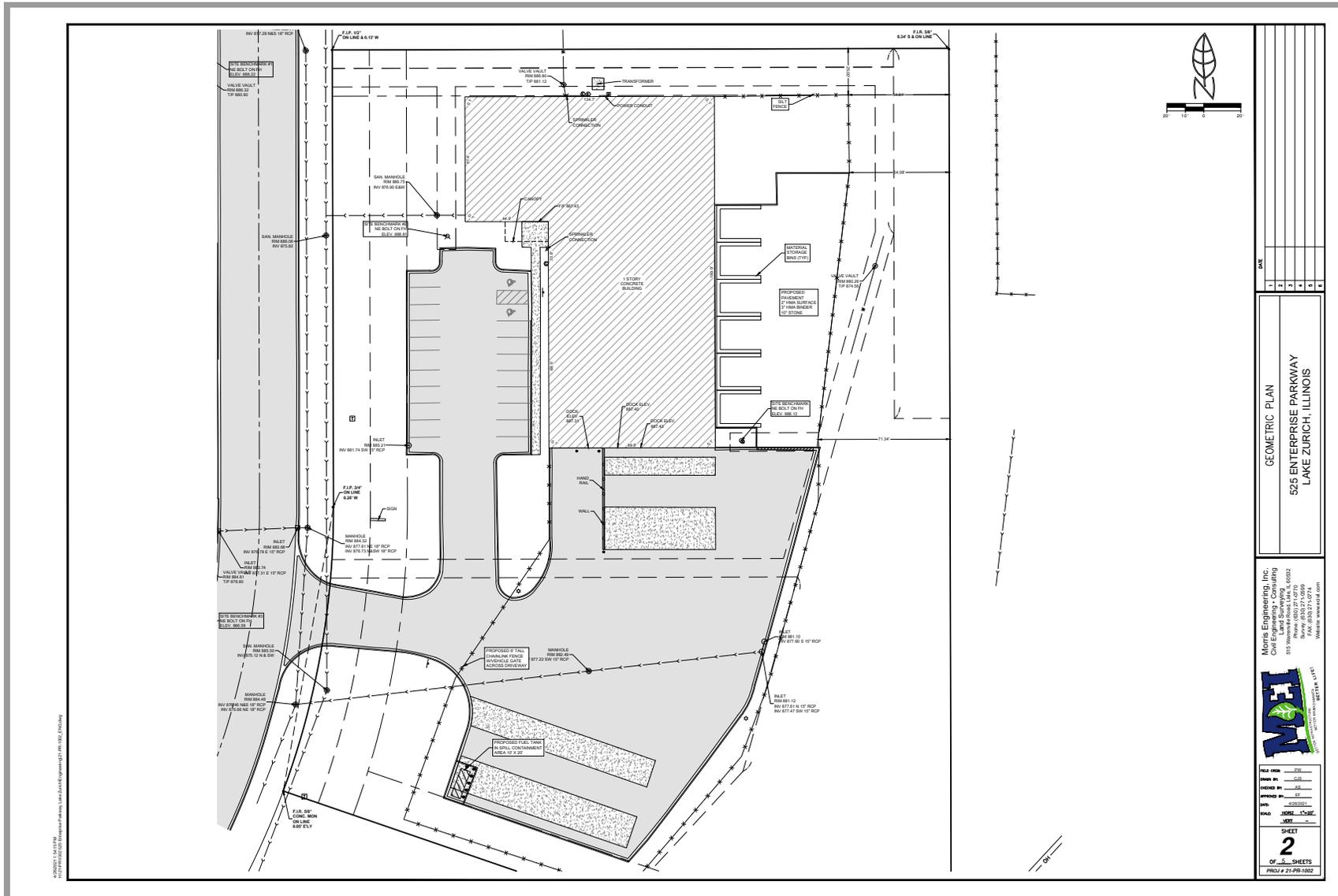
QUESTION #9
ZONING APPLICATION

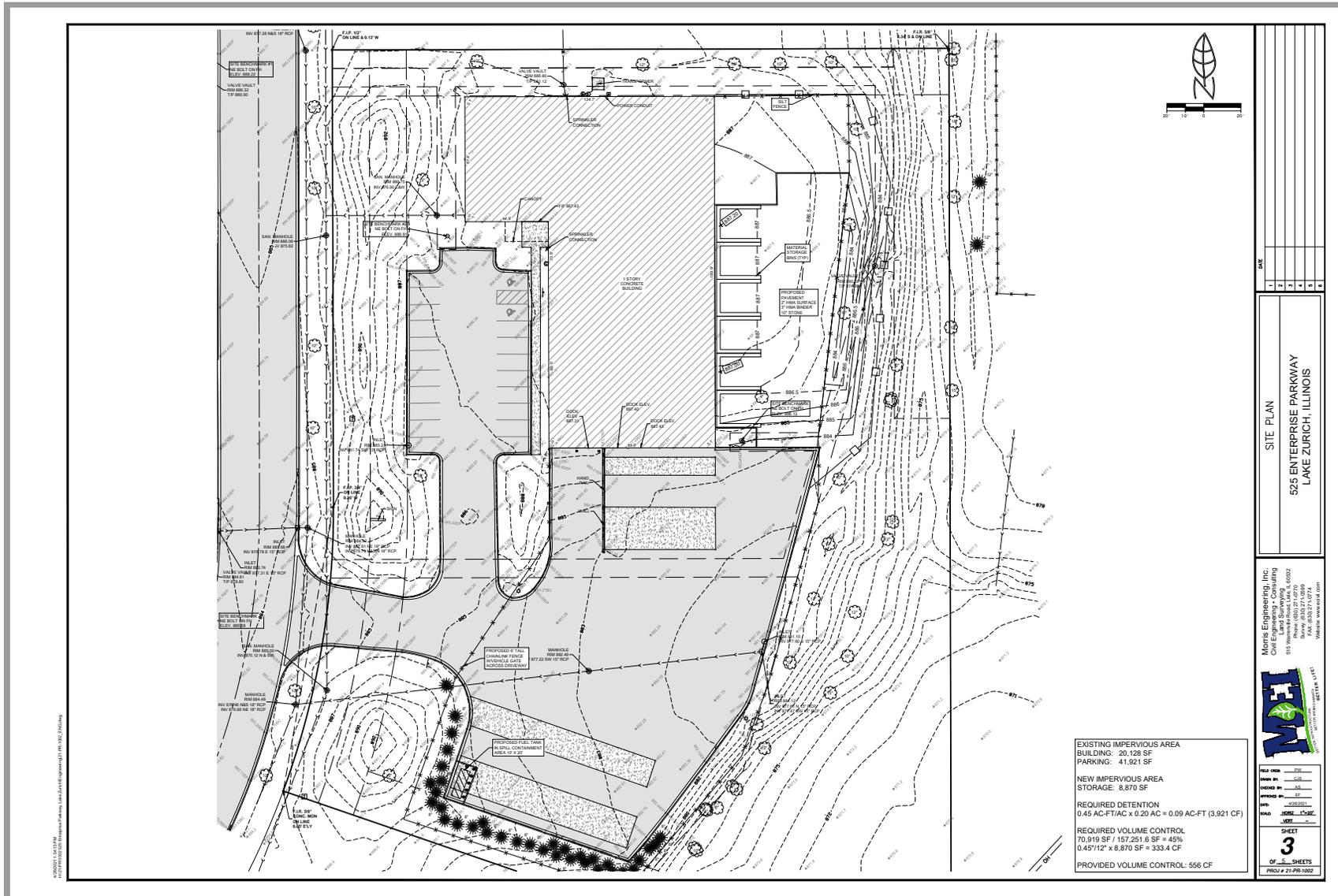
EXHIBIT A
LEGAL DESCRIPTION

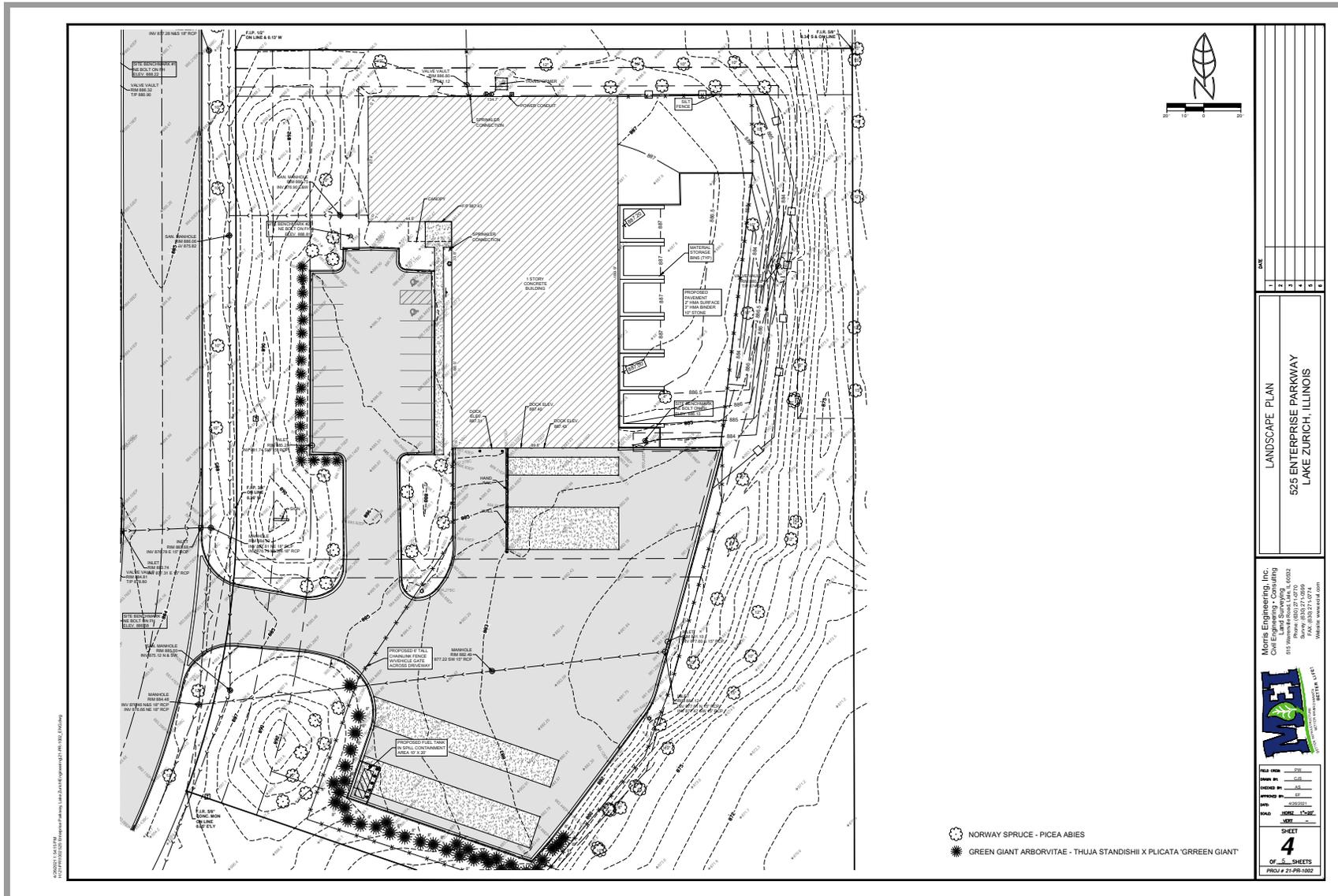
LOT 1 IN MIDLOTHIAN COURT FIRST RESUBDIVISION, BEING A RESUBDIVISION OF LOTS 3,4,5, AND 6 IN MIDLOTHIAN COURT SUBDIVISION OF PART OF THE NW ¼ OF SECTION 16, TOWNSHIP 43 NORTH, RANGE 10, EAST OF THE THIRD PRINCIPAL MERIDIAN, ACCORDING TO THE PLAT THEREOF RECORDED MARCH 15, 2004 AS DOCUMENT 5517234, IN LAKE COUNTY, ILLINOIS.

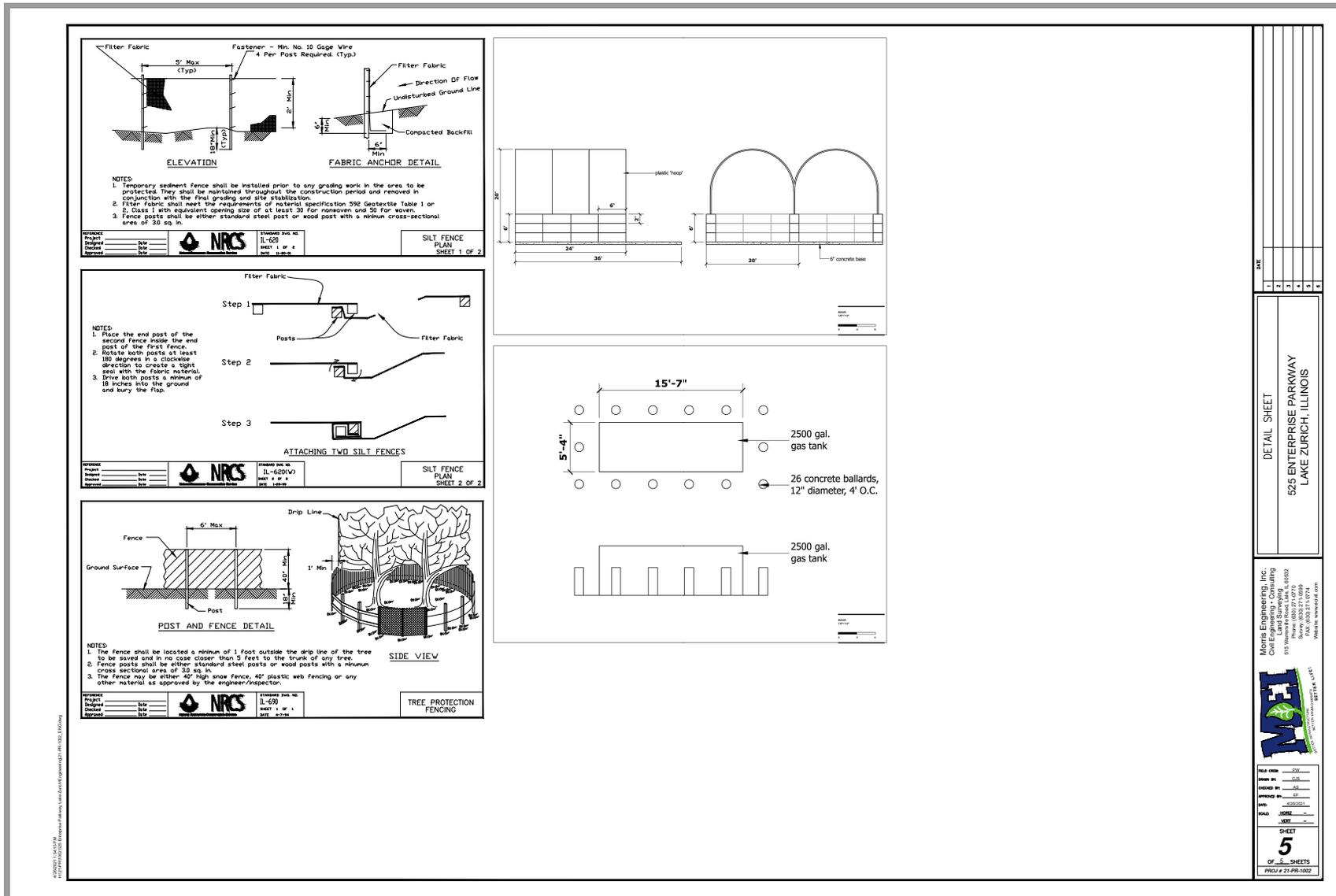
Common Address: 525 Enterprise Parkway, Lake Zurich, Illinois, 60047

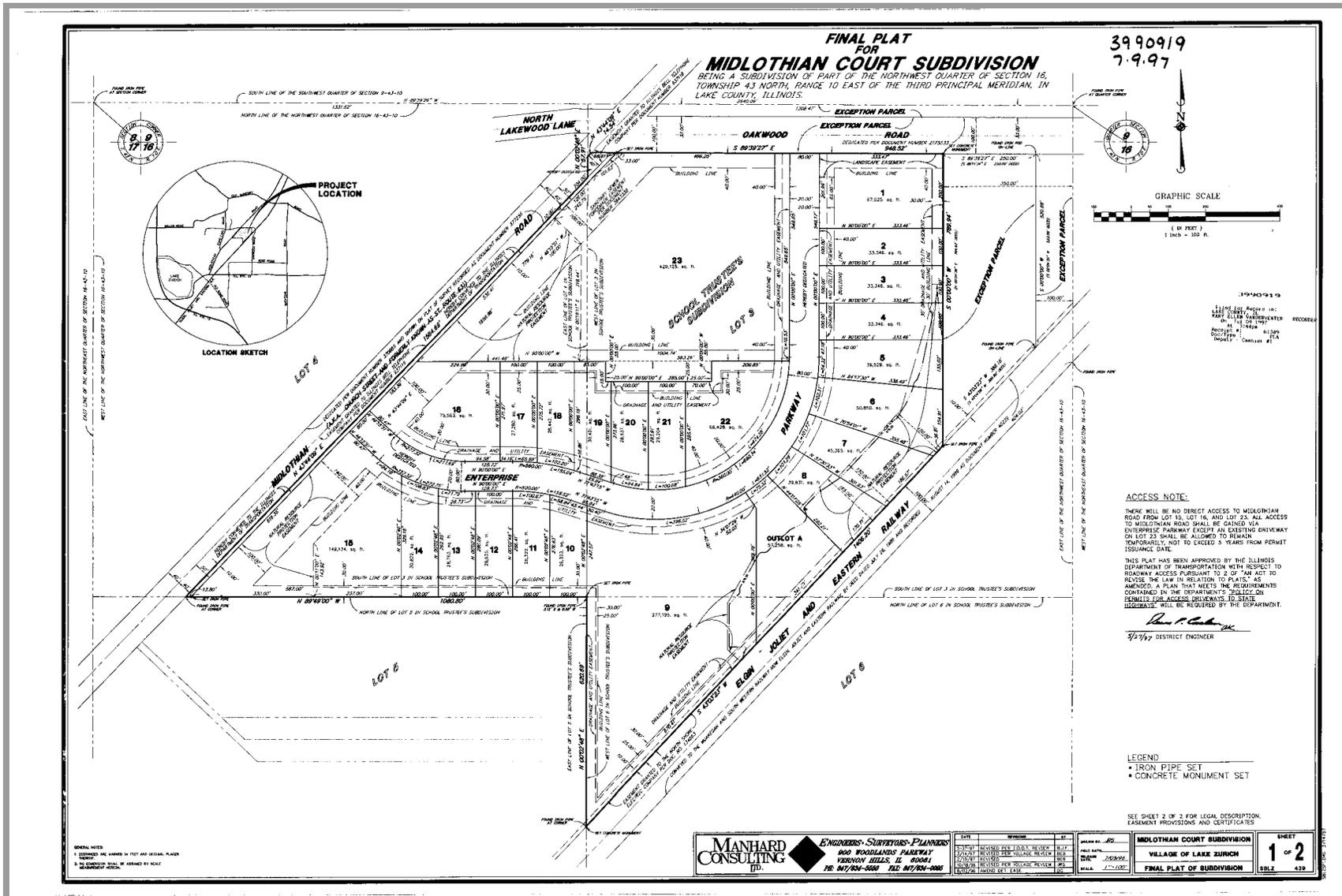
P.I.N. Numbers: 14-16-104-20











**MILIEU LANDSCAPING
525 ENTERPISE PARKWAY
LAKE ZURICH, ILLINOIS**

**STORMWATER REPORT
APRIL 26, 2021**

**MILIEU LANDSCAPING
48 E HINTZ ROAD
WHEELING, IL 60090**



**515 WARRENVILLE ROAD
LISLE, ILLINOIS 60532
(630) 271-0770**

MEI Project Number 21-PR-1002



April 26, 2021

Re: 525 Enterprise Parkway
Lake Zurich, Illinois
MEI Project No. 21-PR-1002

The Property consists of a developed parcel with an existing commercial building, car parking, and a parking area for larger vehicles.

The proposed project will include the construction of a new paved area behind the building for the purpose of bulk material storage. A bioswale is proposed along the east edge of the new paved area to satisfy the volume control requirements.

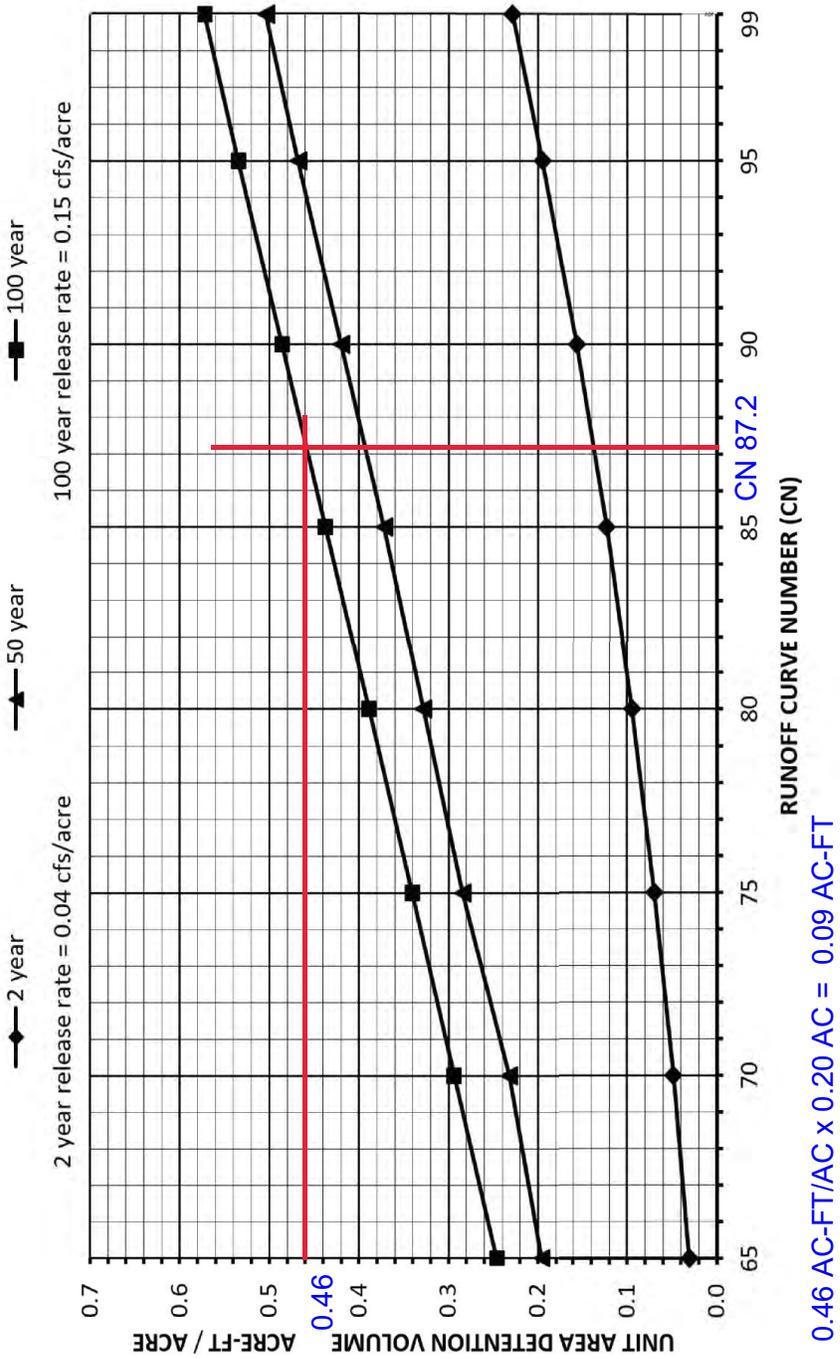
Per Midlothian Court Subdivision plat Natural Resource Protection Easement was created solely for the establishment and maintenance of wetlands and other natural resources and as drainage and stormwater detention areas as per Village of Lake Zurich requirements. Required detention volume for new impervious surface area under this report is 0.09 Acre-feet, however it is our understanding that detention volume was provided for the full development as per final engineering plans for Midlothian Court Subdivision. If additional detention is required for new impervious area, we could regrade the Natural Resource Protection Easement area to provide 0.09 Acre-foot volume, however it is our opinion that well established and working stormwater facility management area would benefit from no additional regrading.

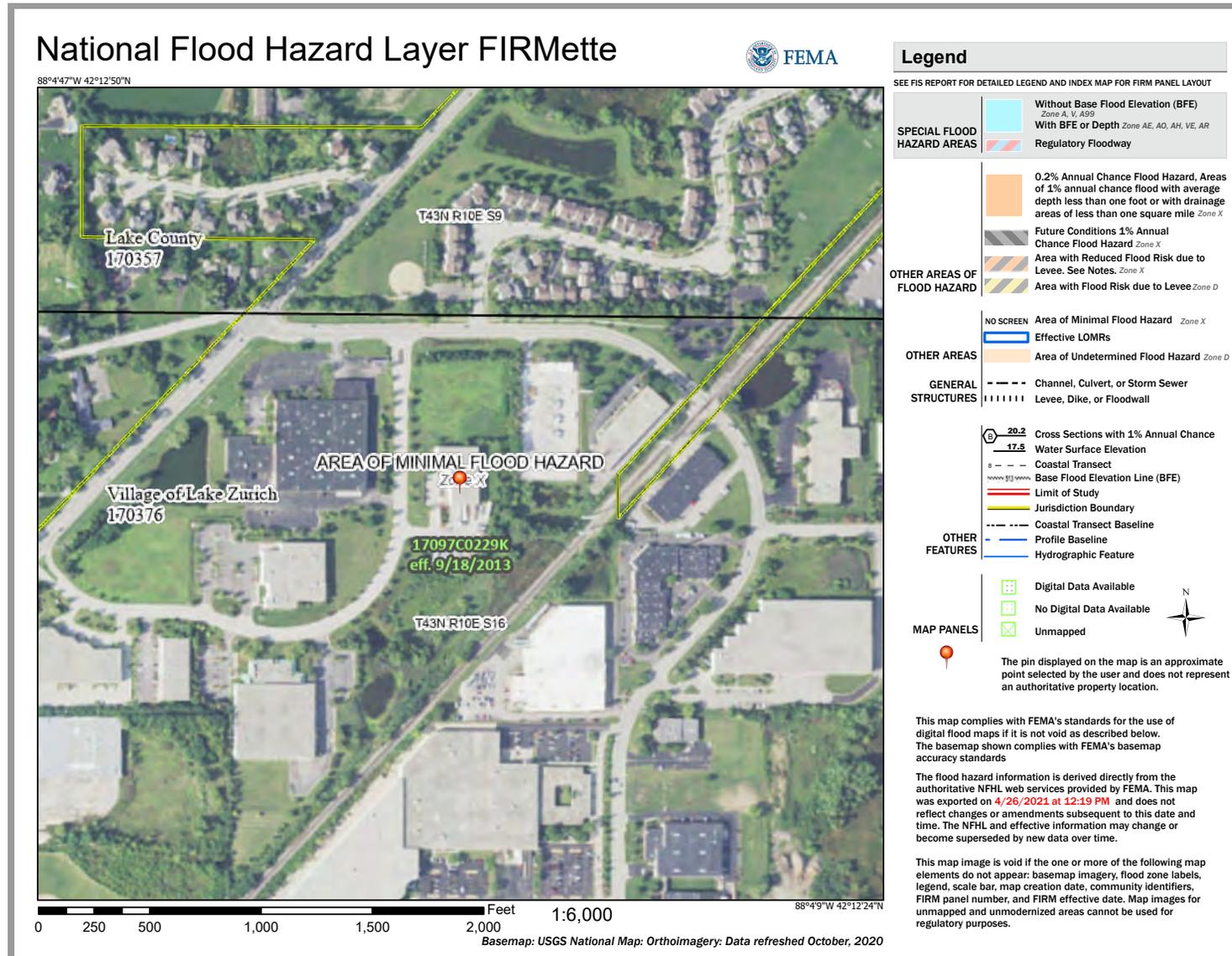
There is no known floodplain on or near the parcel. Per Lake County GIS information, there are several wetlands adjacent to the property but outside of the proposed work area.

The property owner will be responsible for the maintenance of the volume control.

During the construction process, erosion control will be provided around the site with the installation of silt fence along the property lines as required by Lake County and Village of Lake Zurich ordinance. Erosion control is to be inspected and repaired as necessary throughout the duration of construction.

Appendix K: Detention Volume Versus Curve Number





0 250 500 1,000 1,500 2,000 Feet 1:6,000

88°49'W 42°12'24"N

Basemap: USGS National Map; Orthoimagery; Data refreshed October, 2020

Lake County, Illinois



Lake County, Illinois



Map Printed on 4/26/2021

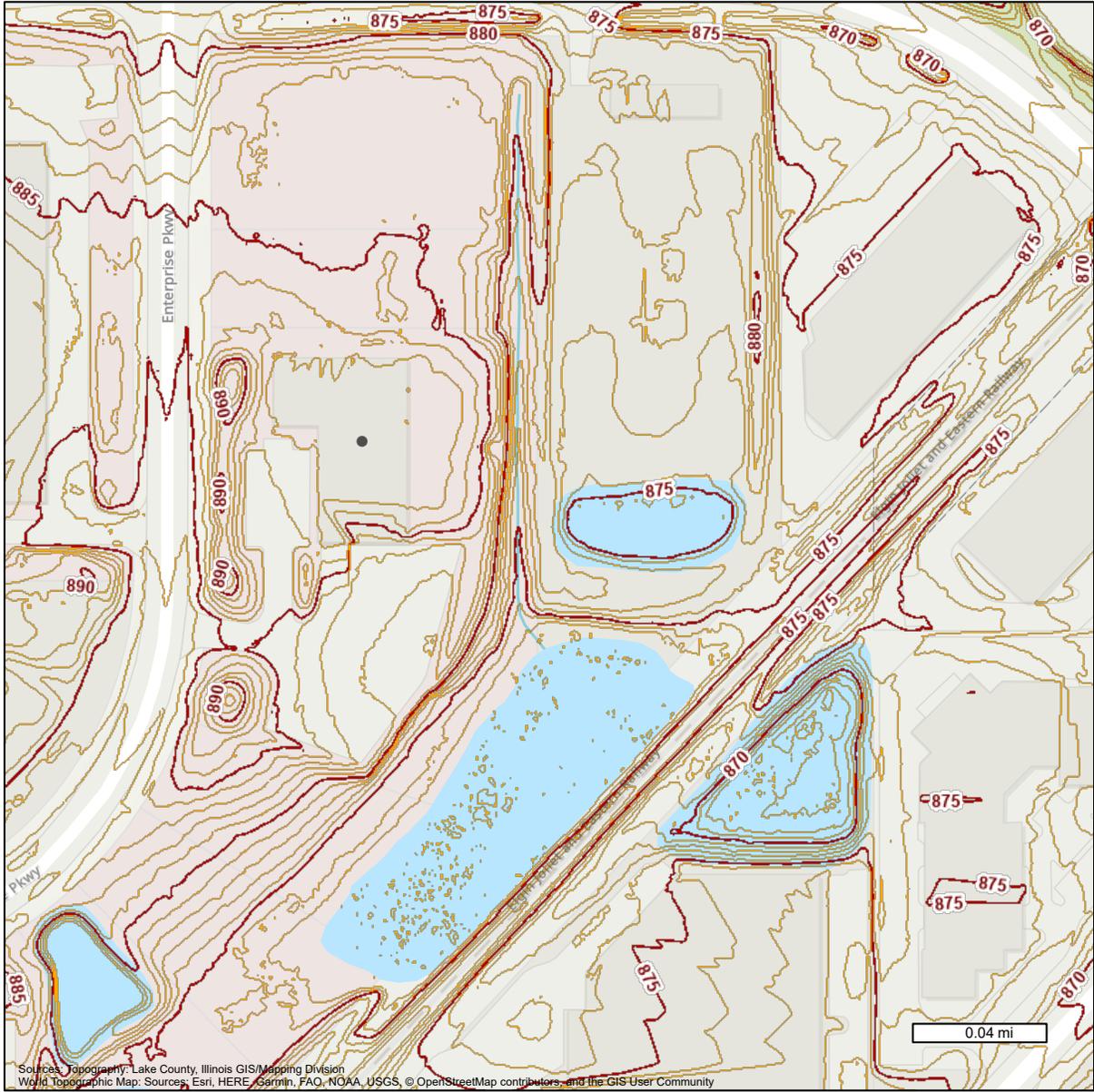


Tax Parcel
Information

Lake County
Wetland
Inventory

Disclaimer: The selected feature may not occur anywhere in the current map extent. A Registered Land Surveyor should be consulted to determine the precise location of property boundaries on the ground. This map does not constitute a regulatory determination and is not a base for engineering design. This map is intended to be viewed and printed in color.

Lake County, Illinois



Sources: Topography: Lake County, Illinois GIS/Mapping Division
 World Topographic Map: Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community



Lake County, Illinois



Map Printed on 4/26/2021



Tax Parcel Information

1ft Contours (2017)

- Index Index
- Intermediate Intermediate

Disclaimer: The selected feature may not occur anywhere in the current map extent. A Registered Land Surveyor should be consulted to determine the precise location of property boundaries on the ground. This map does not constitute a regulatory determination and is not a base for engineering design. This map is intended to be viewed and printed in color.



A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Lake County, Illinois



April 26, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

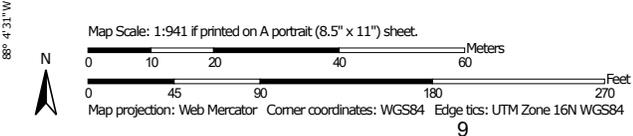
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

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Soil Map



Soil Map may not be valid at this scale.



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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
146B	Elliott silt loam, 2 to 4 percent slopes	0.2	5.1%
223C2	Varna silt loam, 4 to 6 percent slopes, eroded	2.7	76.0%
232A	Ashkum silty clay loam, 0 to 2 percent slopes	0.2	7.0%
330A	Peotone silty clay loam, 0 to 2 percent slopes	0.4	11.8%
Totals for Area of Interest		3.5	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Custom Soil Resource Report

Lake County, Illinois

146B—Elliott silt loam, 2 to 4 percent slopes

Map Unit Setting

National map unit symbol: 2sss1
Elevation: 570 to 930 feet
Mean annual precipitation: 33 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 150 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Elliott and similar soils: 94 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elliott**Setting**

Landform: Ground moraines, till plains
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Interfluvium
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Thin mantle of loess or other silty material over silty clay loam till

Typical profile

Ap - 0 to 9 inches: silt loam
A - 9 to 13 inches: silty clay loam
2Bt1 - 13 to 17 inches: silty clay
2Bt2 - 17 to 35 inches: silty clay loam
2Cd - 35 to 60 inches: silty clay loam

Properties and qualities

Slope: 2 to 4 percent
Depth to restrictive feature: 25 to 39 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: R110XY007IL - Moist Glacial Drift Upland Prairie
Hydric soil rating: No

Custom Soil Resource Report

Minor Components**Ashkum, drained**

Percent of map unit: 4 percent
Landform: Ground moraines, till plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow
Hydric soil rating: Yes

Orthents, clayey

Percent of map unit: 1 percent
Landform: Ground moraines, till plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Urban land

Percent of map unit: 1 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

223C2—Varna silt loam, 4 to 6 percent slopes, eroded**Map Unit Setting**

National map unit symbol: 2yrqw
Elevation: 520 to 950 feet
Mean annual precipitation: 34 to 42 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Varna, eroded, and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Varna, Eroded**Setting**

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Backslope, shoulder

Custom Soil Resource Report

Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess over silty clay loam or clay loam till

Typical profile

Ap - 0 to 9 inches: silt loam
2Bt1 - 9 to 30 inches: silty clay loam
2Bt2 - 30 to 48 inches: silty clay loam
2Cd - 48 to 60 inches: silty clay loam

Properties and qualities

Slope: 4 to 6 percent
Depth to restrictive feature: 24 to 55 inches to densic material
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: R110XY007IL - Moist Glacial Drift Upland Prairie, R108AY006IL - Loess Upland Prairie
Hydric soil rating: No

Minor Components

Ashkum, drained

Percent of map unit: 6 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow
Hydric soil rating: Yes

Orthents, clayey

Percent of map unit: 2 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluvium
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Urban land

Percent of map unit: 2 percent
Landform: Ground moraines

Custom Soil Resource Report

Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

232A—Ashkum silty clay loam, 0 to 2 percent slopes**Map Unit Setting**

National map unit symbol: 2ssrw
Elevation: 520 to 930 feet
Mean annual precipitation: 33 to 41 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 160 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Ashkum, drained, and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ashkum, Drained**Setting**

Landform: Ground moraines, end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Clayey colluvium over till

Typical profile

Ap - 0 to 12 inches: silty clay loam
Bg1 - 12 to 29 inches: silty clay
2Bg2 - 29 to 54 inches: silty clay loam
2Cg - 54 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 8.1 inches)

Custom Soil Resource Report

Interpretive groups*Land capability classification (irrigated):* None specified*Land capability classification (nonirrigated):* 2w*Hydrologic Soil Group:* C/D*Ecological site:* R110XY024IL - Poned Depressional Sedge Meadow*Hydric soil rating:* Yes**Minor Components****Peotone, drained***Percent of map unit:* 5 percent*Landform:* Depressions on ground moraines*Landform position (two-dimensional):* Toeslope*Landform position (three-dimensional):* Dip*Down-slope shape:* Concave*Across-slope shape:* Concave*Ecological site:* R110XY024IL - Poned Depressional Sedge Meadow*Hydric soil rating:* Yes**Orthents, clayey***Percent of map unit:* 2 percent*Landform:* Ground moraines, lake plains*Landform position (two-dimensional):* Summit*Landform position (three-dimensional):* Interfluve*Down-slope shape:* Linear*Across-slope shape:* Linear*Hydric soil rating:* No**Urban land***Percent of map unit:* 1 percent*Landform:* Ground moraines*Landform position (two-dimensional):* Summit*Landform position (three-dimensional):* Interfluve*Down-slope shape:* Linear*Across-slope shape:* Linear*Hydric soil rating:* No**330A—Peotone silty clay loam, 0 to 2 percent slopes****Map Unit Setting***National map unit symbol:* 2sn05*Elevation:* 500 to 1,020 feet*Mean annual precipitation:* 33 to 43 inches*Mean annual air temperature:* 46 to 55 degrees F*Frost-free period:* 140 to 195 days*Farmland classification:* Prime farmland if drained**Map Unit Composition***Peotone, drained, and similar soils:* 95 percent*Minor components:* 5 percent

Custom Soil Resource Report

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peotone, Drained

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty and clayey colluvium

Typical profile

Ap - 0 to 7 inches: silty clay loam
Bg1 - 7 to 27 inches: silty clay loam
Bg2 - 27 to 50 inches: silty clay
Cg - 50 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow
Hydric soil rating: Yes

Minor Components

Peotone, long duration ponding

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

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Custom Soil Resource Report

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At the Heart of Community

COMMUNITY DEVELOPMENT DEPARTMENT
Building and Zoning Division

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LakeZurich.org

APPLICATION PZC 2021-06
PZC Hearing Date: May 19, 2021

AGENDA ITEM 4.C

STAFF REPORT

To: Chairperson Stratman and Members of the Planning & Zoning Commission
From: Sarosh Saher, Community Development Director
CC: Tim Verbeke, Planner
Mary Meyer, Building Services Supervisor
Date: May 19, 2021
Re: PZC 2021-06 Zoning Application for 708 Telser Road – Journey Cremation
Text Amendment and Special Use Permit for a “Direct Cremation” Establishment

SUBJECT

Steve Cook of Journey Cremations, (the “Applicant”) requests a Text Amendment and Special Use Permit to establish a crematorium providing “direct cremation” services within the condominium space commonly known as 708 Telser Road and legally described in Exhibit A attached hereto (the “Subject Property”).

“Direct Cremation” by definition, takes place when the deceased is taken directly into the care of the crematorium without any visitation and or funeral service. Upon completion of the cremation process, the cremains are either delivered by the company or returned via USPS mailing protocol back to the source such as a funeral home or directly to the deceased’s successors.

GENERAL INFORMATION

Requested Action: Text Amendment and Special Use Permit
Current Zoning: I Industrial District
Current Use: Vacant Industrial Condominium Space
Proposed Use: Crematorium providing “direct cremation” service
Property Location: 708 Telser Road
Applicant: Steve Cook, on behalf of Journey Cremations
Owner: 708 Telser LLC
Staff Coordinator: Tim Verbeke, Planner

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LIST OF EXHIBITS

- A. Legal Description
- B. Public Hearing Sign
- C. Site Photos
- D. Aerial Map
- E. Zoning Map
- F. Parcel Map
- G. Development Application and Attachments
- H. Development Review Comments

BACKGROUND

Steve Cook, of Journey Cremations (the “Applicant”), is the applicant intending to purchase the unit within Brooke Commons Industrial Condominiums. The Applicant is proposing to open a business that will operate as a crematorium offering direct cremation services. The Subject Property is located at 708 Telser Road, and legally described in Exhibit A attached hereto (the “Subject Property”). The Applicant filed an application with the Village of Lake Zurich received on April 29, 2021 (the “Application”) seeking:

- Text Amendment to Provide for “Funeral Services and Crematories” – SIC #7261 limited to “direct cremation” only as a Special Use in the I Industrial District
- Special Use Permit to establish a Direct Crematorium (classified as “Funeral Services and Crematories” SIC #7261)

The Subject Property is an industrial condominium unit within the Brooke Commons Industrial Condominiums located within the Village’s I Industrial Zoning District. The existing multi-tenant building is approximately 25,820 square feet and has 16 units. The Applicant proposes to purchase the approximately 1,624 square-foot space located approximately in the middle of the building (Unit N). This space was formerly occupied by Rise Pest Control Illinois LLC from 2019 to 2021. Prior to that it was the location of Revtel, Inc. The proposed use will not require the unit to be retrofitted to accommodate the crematorium, as its configuration as an industrial space will suit the proposed use. The Applicant will be installing an approximately 90 square foot walk-in cooler and one cremation system (incinerator). The remaining 24,100 square feet of the building will continue to operate as an industrial condominium complex with CKE Properties LLC, Millark INC, 2M Precision Laser Specialist, LLC, EZ Kut, Total Midwest Construction INC, Fine Line Ventures LLC, Wolfe Enterprises LLC, Knocando LLC, R & K Partners LLC, and W/W Associates.

The Applicant, Mr. Steve Cook, is a licensed funeral director and is looking to open a satellite location to assist in his current business’s direct cremation process. The majority of the Applicant’s business will still be conducted at a client’s location or at their Rolling Meadows Regus facility, with only the cremations being conducted on site at the subject property. The Applicant has stated the cremations preformed at the proposed Lake Zurich location will be performed in private during normal business hours and with no knowledge or exposure to the public. The Applicant stated that

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the deceased will be stored on site for a period of 2-3 days in the provided walk-in cooler to prevent decomposition, before being cremated and returned to the point of origin.

Typical hours of operation will be Monday through Saturday (9:00 a.m. – 4:00 p.m.). The Applicant anticipates bringing an average of 2 to 4 deceased individuals to the facility per day and performing the roughly the same amount of cremations. Approximately 1-2 cremations will be conducted during business hours with the balance conducted in the evening. The business will have 1 to 2 employees at the onset and probably grow to 3 to 4 employees within a couple of years.

Crematoriums are categorized under SIC code #7261, “Funeral Services and Crematories” and specifically called out as a special use in the B-1 Local and Community Business District only. In the B-1 district crematoriums are categorized as “Funeral homes or parlors” (#726). This categorization was created under Ordinance #2014-11-014 and #2014-11-015 to allow for Davenport Funeral Home within the B-1 Local and Community Business District. It should be noted that funeral parlors alone without crematories are also allowed in the O-1 and O-3 Office districts. There are no specific conditions in the zoning code governing the location, design and operation of a these uses in the B-1, O-1 or O-3 zoning districts other than the required public hearing and final approval by the Village Board.

A text Amendment is therefore being requested to allow for the use to be established in the I Industrial district. Both Text Amendments and Special Uses are required to go through the public hearing process and require Village Board approval.

Pursuant to public notice published on May 1, 2021, in the Daily Herald, a public hearing has been scheduled with the Lake Zurich Planning & Zoning Commission for May 19, 2021, to consider the Application. On April 30, 2021, the Village posted a public hearing sign on the Subject Property (Exhibit B).

Following receipt of the notice of the public hearing, a number of letters of objection to the land use were received by the board of trustees and village staff as it related to the location and operation of the land use within the specific condominium space at 708 Telsler Road. The objections are summarized as follows:

- The use is incompatible with the uses in the adjacent condominium units and will have a detrimental effect on their operations and property value
- The condominium themselves do not provide adequate sound insulation from adjacent units
- Concerns related to noise levels, odors and emissions from the incinerators and handling of waste product as a result of the operation.
- Health concerns as a result of the operation of an incinerator
- Sensitivity to the nature of the operation – handling of the deceased on the property
- Suggestion that this type of business is better suited to a stand-alone building rather than an in-line condominium building with common demising walls.

In response to these comments, the applicant has provided the following clarification of the operation of the facility at this location:

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- The public will not be served at this location. No signage describing the operation will be posted at the property, besides the company logo.
- The deceased will be transferred to a holding cooler within the building out of view of the neighbors.
- Only one retort will be located and operated within the building. The equipment is completely regulated with safety controls.
- Noise – the decibel level is equivalent to sound emanating from an exhaust fan or window air conditioner.
- Emissions – smoke generated from the incinerator will be less than that of a fire place, but similar to a home furnace. The system is designed to monitor the incinerator to prevent fire.
- Odor - The smoke created is processed in an “afterburner” removing any odors produced during cremation.
- Waste – there is no physical waste to dispose of. The cremains are packaged and returned to the point of origin.

Staff offers the following additional information:

- A. Courtesy Review.** The project for the establishment of “Direct Cremation” services at the property at 708 Telser Road was presented to the Village Board for Courtesy Review on April 19, 2021. Discussion focused on the type of use and how the building would be occupied.

Following discussion, the Village Board suggested that if the owners were inclined to move forward, they would need to submit their proposal to the Planning and Zoning Commission for consideration. The courtesy review can be viewed at the following link:

<https://play.champds.com/lakezurichil/event/21>

- B. Zoning History.** The property is located within the Brooke Commons Industrial Condominiums Unit N, and is zoned within the I-Industrial District. The existing warehouse building was constructed in 2005, and used by Rise Pest Control Illinois LLC, a pest control company up until 2021.

The Applicant has been operating at their Rolling Meadows Regus facility since 2012. The business expanded and the Applicant would like to set up a satellite facility strictly for cremations in Lake Zurich to continue to grow more consistently.

- C. Surrounding Land Use and Zoning.** The subject property is located within the Lake Zurich Corporate and Industrial Park. The land to the north, south, east, and west of the Subject Property is zoned I-Industrial and improved with a variety of office, research and industrial (light manufacturing) uses. Brooke Commons, within which this use is proposed, contains a mix of office and light industrial uses.

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- D. Trend of Development.** The subject property is located on Telser Road on the heart of the Lake Zurich Corporate and Industrial Park containing a variety of office, research and industrial (light manufacturing) uses.
- E. Zoning District.** The I-Industrial district is intended to provide for a range of nuisance free manufacturing, warehousing, transportation, wholesaling, and industrial uses that are compatible with the suburban residential character of the village. The industrial district is also meant to accommodate certain professional offices and similar uses that may provide services to the industrial users and are compatible with the industrial character of the district. It is the goal of these regulations to provide and preserve an area within the village for industrial uses that create employment and economic benefits for the village and the industrial district.

GENERAL FINDINGS

Text Amendment. The purpose of a text amendment is to allow the text of the zoning code to be amended from time to time by ordinance duly enacted by the board of trustees in accordance with procedures set out in the code.

The amendment process established by the Chapter 18 of the Lake Zurich Zoning Code entitled “Amendments” is intended to provide a means for making changes in the text of the zoning code and in the zoning map that have more or less general significance or application. It is not intended to relieve particular hardships nor to confer special privileges or rights. Rather, it is intended as a tool to adjust the provisions of this zoning code and the zoning map in light of changing or newly discovered conditions, situations, or knowledge, or conditions, situations or knowledge with heightened significance or elevated relevance.

STANDARDS FOR TEXT AMENDMENTS:

Staff provides the following findings that the land use as proposed to be allowed within the (I) Industrial District.

1. The consistency of the proposed amendment with the purposes of this zoning code.
Staff Response: Standard met. Staff has found that the proposed text amendment is consistent with the theme and general principles of the zoning code and the current aspirations of the subject property owner and Applicant.
2. The community need for the proposed amendment and for the uses and development it would allow.
Staff Response: Standard somewhat met. Currently, the land use is limited to the B-1 Local and Community Business district. The applicant has not demonstrated a need for this business in Lake Zurich, rather is looking at this location within the I Industrial district as a means to expand their operations in Rolling Meadows.

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On its own, “Direct Cremation” is a land use generally similar to wholesale trade in that its activity does not involve consumers, visitation, consultation or sale of goods at the property. As such it is similar to a majority of uses in the Industrial Park, and therefore fits within purpose and intent of the (I) Industrial District.

3. If a specific parcel of property is the subject of the proposed amendment, then the following factors (related to the amendment of the zoning map):

Staff Response: Not Applicable. The amendment being requested is to the text of the zoning code to allow for the provision of “Funeral Services and Crematories” – SIC #7261 to be established within the I Industrial District.

No Amendment to the underlying zoning classification (I-Industrial district) of the subject property is being requested at this time.

It should be noted that inclusion of the land use (“direct cremation”) within the I-Industrial district as a special use provides the option of future applicants of this use to establish on other properties within this zoning district.

Special Use Permit. As it relates to the proposed Special Use Permit, Chapter 19 of the Lake Zurich Zoning Code entitled “Special Use Permits” provides for special uses that have some special impact or uniqueness that requires a careful review of their location, design, configuration, and special impact to determine, against fixed standards, the desirability of permitting their establishment on any given site. They are uses that may or may not be appropriate in a particular location depending on a weighing, in each case, of the public need and benefit against the local impact and effect. The standards for special uses examine the location, design and operational characteristics of a use.

Staff finds that the land use as proposed to be established will continue to comply with the location, design and operational standards associated with the subject property and offers the following findings on specific sections of the Code.

9-19-3: STANDARDS FOR SPECIAL USE PERMITS.

Staff has reviewed the plan and provides its findings in relation to the standards for Special Use Permits as outlined below.

- A. General Standards: No special use permit shall be recommended or granted unless the applicant shall establish substantial conformance with the following:
1. Zoning Code and Plan Purposes: The proposed use and development will be in harmony with the general and specific purposes for which this zoning code was enacted and for which the regulations of the district in question were established and with the general purpose and intent of the official comprehensive plan.

Staff Response: Standard met. Direct Cremation is a form of wholesale activity. The use will continue to remain in substantial conformance with the purpose and intent of the I-Industrial District, and the land use designation of the adopted Comprehensive Plan.

2. No Undue Adverse Impact. The proposed use and development will not have a substantial or undue adverse effect upon adjacent property, the character of the area, or the public health, safety, and general welfare.

Staff Response: Standard somewhat met. There has been substantial public objection to locating the proposed crematorium at the subject property, specifically by the neighboring units. The neighbors have cited a number of concerns such as noise levels, odors, emissions, and sensitivity over the type of use itself.

The Applicant has responded to each of these concerns. Staff finds that the business is consistent with wholesale and industrial-oriented activity in the Industrial District. All activities will take place within the condominium space on the property and will be effectively screened from adjacent units.

The Applicant has demonstrated that it does not have any substantial or undue adverse effect upon any adjacent properties and does not adversely impact the public health, safety, and general welfare of the Village.

3. No Interference with Surrounding Development. The proposed use and development will be constructed, arranged, and operated so as not to dominate the immediate vicinity or to interfere with the use and development of neighboring property in accordance with the applicable district regulations.

Staff Response: Standard met. The entirety of the business and its activities will be operated on the subject property and within the condominium unit.

4. Adequate Public Facilities. The proposed use and development will be served adequately by essential public facilities and services such as streets, public utilities, drainage structures, police and fire protection, refuse disposal, parks, libraries, and schools, or the applicant will provide adequately for such services.

Staff Response: Standard met. The proposed development is currently served by and will continue to be served adequately by essential public facilities and services such as streets, utilities, drainage and other municipal services. No change in impact these are anticipated at this time.

5. No Traffic Congestion. The proposed use and development will not cause undue traffic congestion nor draw significant amounts of traffic through the surrounding streets.

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Staff Response: Standard met. Journey Cremations will have minimal associated traffic attributed to this business.

Parking is in conformance with the requirements of the zoning code. The Industrial Condominium Complex was designed with adequate parking to accommodate the parking demand for the various types of uses that the spaces within the buildings could accommodate.

6. No Destruction of Significant Features. The proposed use and development will not result in the destruction, loss, or damage of any natural, scenic, or historic feature of significant importance.

Staff Response: Standard met. The proposed use will not result in the destruction or removal of any natural features. The subject property has been previously and fully developed as an Industrial Condominium Complex with parking lot.

7. Compliance with Standards. The proposed use and development complies with all additional standards imposed on it by the particular provision of this Code authorizing such use.

Staff Response: Standard met. A text amendment is concurrently being considered to allow the use in the industrial district. There are no additional standards proposed to be imposed on the land use by the zoning code.

8. Positive Effect. The proposed special use creating a positive effect for the zoning district, its purpose, and adjacent properties shall be placed before the benefits of the petitioner.

Staff Response: Standard met. The proposed development will continue to contribute to the established character of the Industrial Park.

- B. Special Standards for Specified Special Uses. When the district regulations authorizing any special use in a particular district impose special standards to be met by such use in such district, a permit for such use in such district shall not be recommended or granted unless the applicant shall establish compliance with such special standards.

Staff Response: Standard met. If the text amendment and special use permit are approved, the applicant has agreed to and staff will ensure that the Applicant continues to comply with the conditions imposed on direct crematorium business.

- C. Considerations. In determining whether the applicant's evidence establishes that the foregoing standards have been met, the Plan Commission and the Board of Trustees shall consider:

1. Benefit. Whether and to what extent the proposed use and development at the particular location requested is necessary or desirable to provide a service or a

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facility that is in the interest of the public convenience or that will contribute to the general welfare of the neighborhood or community.

Staff Response: Standard met. The property will continue to provide a convenient location for this service within the community.

2. Alternative Locations. Whether the purposes of the zoning code can be met by the location of the proposed use and development in some other area or zoning district that may be more appropriate than the proposed site.

Staff Response: Standard somewhat met. It is suggested through public comment that the operation of the subject business would be more suitable within a stand-alone building.

There is no evidence that the proposed location is inappropriate for the proposed land use, so an alternative location would not be any more appropriate than the proposed location.

3. Mitigation of Adverse Impacts. Whether all steps possible have been taken to minimize any substantial or undue adverse effects of the proposed use and development on the immediate vicinity through building design, site design, landscaping, and screening.

Staff Response: Standard met. The industrial condo center has been developed to prevent any undue adverse effect on itself or on surrounding property in relation to its location, design and operation.

It has been brought to the attention of village staff that the construction of the demising walls of the condominium units allow for noise to permeate from one unit to the next. Staff therefore believes that noise attenuating measures be implemented by the Applicant to prevent any impact of its operations on adjacent units.

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RECOMMENDATION

The recommendation of the Planning and Zoning Commission should be based on the standards included in the following Sections of the Lake Zurich Municipal Code:

- Section 9-18-3: Standards for Amendments
- Section 9-19-3: Standards for Special Use Permits

Based on the review of staff, the standards for approval continue to be met and therefore staff recommends that the Planning and Zoning Commission make these standards a part of the official record of the Application.

Staff of the Community Development Department therefore recommends the approval of Application PZC 2021-06, subject to the following conditions:

1. Substantial conformance with the following documentation submitted as part of the application subject to revisions required by Village Staff, Village Engineer, Village Landscape Consultants and applicable governmental agencies:
 - a. Zoning Application and Cover Letter dated April 29, 2021, prepared by Mr. Steve Cook, of Journey Cremation
 - b. Exhibit A: Legal Description of the Subject Property
 - c. Brooke Commons Site and Building Plans dated April 29, 2021, prepared by Mr. Steve Cook, of Journey Cremation
 - d. CANA Emissions Testing dated April 29, 2021, prepared by Mr. Steve Cook, of Journey Cremation
 - e. Db Diagram dated April 29, 2021, prepared by Mr. Steve Cook, of Journey Cremation
 - f. University of Michigan Noise Levels Report dated April 29, 2021, prepared by Mr. Steve Cook, of Journey Cremation
2. The Applicant shall meet all applicable requirements and regulations imposed upon the business related to its operation to ensure that any negative impact as a result of noise, emissions, odor and waste be removed to the greatest extent possible.
3. All activity related to the operation of the business shall be conducted within the condominium space of 708 Telser Road. This shall include the transfer of the deceased from transport vehicles to the facility as well as the removal of any cremains intended to be returned to their point of origin.
4. Noise attenuation measures shall be implemented to the satisfaction of the village staff to ensure that no extraordinary noise is allowed to permeate the adjacent units.
5. The special use constituting this direct cremation facility shall be located within the industrial condominium complex tenant space addressed at 708 Telser Road within Brooke Commons Industrial Condominiums and operated by Journey Cremations. The special use

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permit shall expire if this cremation facility ceases operating at the property, or if the current owner conveys the business to a successive owner.

6. The development shall be in compliance with all other applicable codes and ordinances of the Village of Lake Zurich.

Respectfully Submitted,

Tim Verbeke
Planner

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LAKE ZURICH PLANNING & ZONING COMMISSION
FINAL FINDINGS & RECOMMENDATIONS

708 TELSER ROAD
May 19, 2021

The Planning & Zoning Commission recommends approval of Application PZC 2021-06, and the Planning & Zoning Commission adopts the findings as contained within the Staff Report dated **May 19, 2021** for this Application and subject to any changes or approval conditions as listed below:

1. Substantial conformance with the following documentation submitted as part of the application subject to revisions required by Village Staff, Village Engineer, Village Landscape Consultants and applicable governmental agencies:
 - a. Zoning Application and Cover Letter dated April 29, 2021, prepared by Mr. Steve Cook, of Journey Cremation
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 - d. CANA Emissions Testing dated April 29, 2021, prepared by Mr. Steve Cook, of Journey Cremation
 - e. Db Diagram dated April 29, 2021, prepared by Mr. Steve Cook, of Journey Cremation
 - f. University of Michigan Noise Levels Report dated April 29, 2021, prepared by Mr. Steve Cook, of Journey Cremation
2. The Applicant shall meet all applicable local and state requirements and regulations imposed upon the business related to its operation to ensure that any negative impact as a result of noise, emissions, odor and waste be removed to the greatest extent possible.
3. All activity related to the operation of the business shall be conducted within the condominium space of 708 Telser Road. This shall include the transfer of the deceased from transport vehicles to the facility as well as the removal of any cremains intended to be returned to their point of origin.
4. Noise attenuation measures shall be implemented to the satisfaction of the village staff to ensure that no extraordinary noise is allowed to permeate the adjacent units.
5. The special use constituting this direct cremation facility shall be located within the industrial condominium complex tenant space addressed at 708 Telser Road within Brooke Commons Industrial Condominiums and operated by Journey Cremations. The special use permit shall expire if this cremation facility ceases operating at the property, or if the current owner conveys the business to a successive owner.

Staff Report
APPLICATION PZC 2021-06

Community Development Department
PZC Hearing Date: May 19, 2021

6. The development shall be in compliance with all other applicable codes and ordinances of the Village of Lake Zurich.

- Without any further additions, changes, modifications and/or approval conditions.
- With the following additions, changes, modifications and/or approval conditions:

Planning & Zoning Commission Chairman

Staff Report
APPLICATION PZC 2021-06

Community Development Department
PZC Hearing Date: May 19, 2021

EXHIBIT A
LEGAL DESCRIPTION OF SUBJECT PROPERTY

UNIT 708 IN BROOKE COMMONS INDUSTRIAL CONDOMINIUMS, AS DELINEATED ON A SURVEY ON THE FOLLOWING DESCRIBED REAL ESTATE: LOT 6 IN FLEX COURT SUBDIVISION, BEING A SUBDIVISION OF THE NORTHEAST QUARTER OF SECTION 16, TOWNSHIP 43 NORTH, RANGE 10 EAST OF THE THIRD PRINCIPAL MERIDIAN, IN LAKE COUNTY, ILLINOIS. WHICH SURVEY IS ATTACHED AS EXHIBIT "B" TO THE DECLARATION OF CONDOMINIUM RECORDED AS DOCUMENT NO. 5900242, CERTIFICATE OF CORRECTION RECORDED AS DOCUMENT NO. 5946701, TOGETHER WITH ITS UNDIVIDED PERCENTAGE INTEREST IN THE COMMON ELEMENT.

THE REAL PROPERTY OR ITS ADDRESSES IS COMMONLY KNOWN AS 708 TELSER ROAD, LAKE ZURICH, IL 60047. THE REAL PROPERTY TAX IDENTIFICATION NUMBER IS 14-16-205-039-0000.

Staff Report
APPLICATION PZC 2021-06

Community Development Department
PZC Hearing Date: May 19, 2021

EXHIBIT B
PUBLIC HEARING SIGN PRESENT AT SUBJECT PROPERTY



Village of Lake Zurich
Utilities Division of
Public Works

Memo

To: Tim Verbeke, Planner
From: Betty Harrison, EQC Supervisor
Date: May 4, 2021
Re: 708 Telser – Journey Cremation

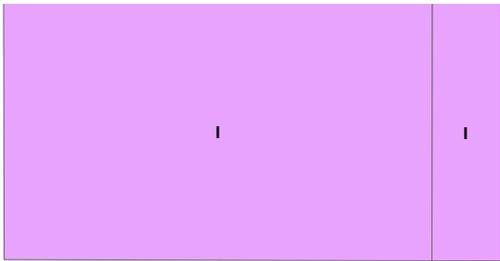
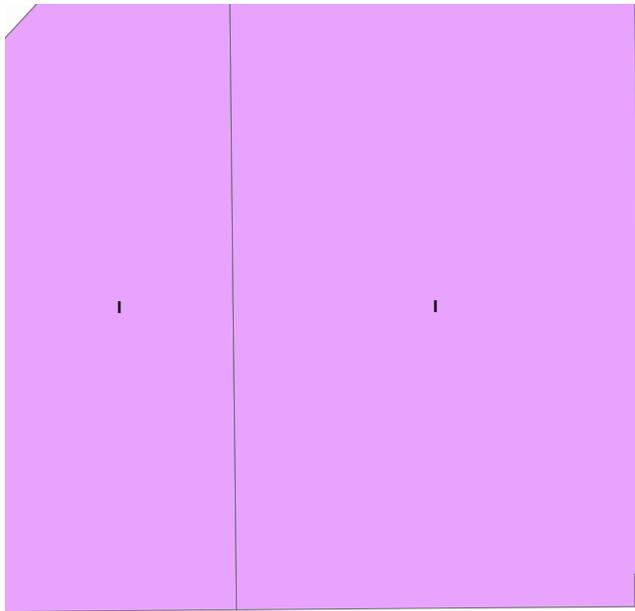
1. 708 Telser – Journey Cremation

- No changes indicated for the water and sewer service.
- Backflow protection is present on the 6-inch fire protection line and the 2-inch domestic line. Additional backflow protection for this unit will be decided by a certified backflow inspector.
- At this time, the backflow devices for this multiple tenant building are past due for annual certification.



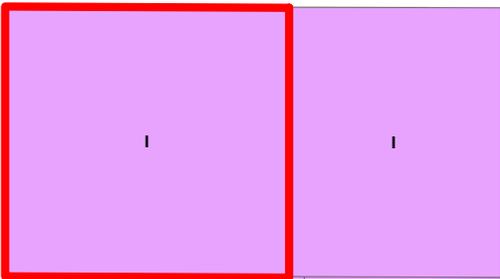
Journey Cremation

708 Telser Road

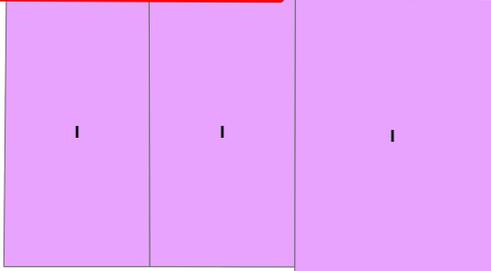
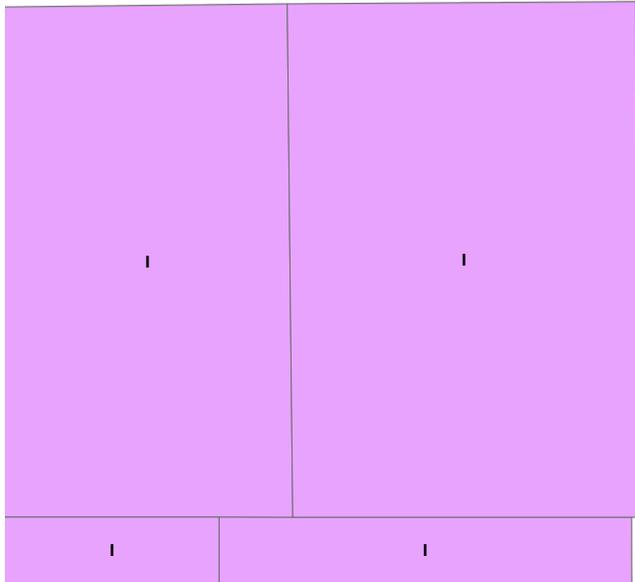


Telser

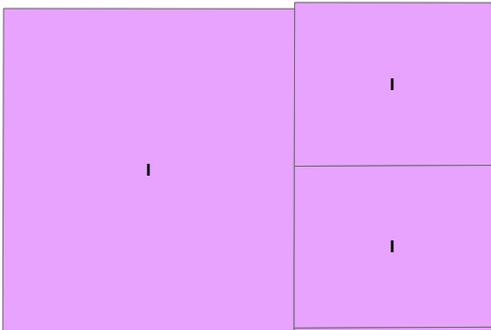
Flex



Commerce



Heather



COMMUNITY SERVICES DEPARTMENT
Building and Zoning Division
505 Telser Road, Lake Zurich, Illinois 60047

(847) 540-1696
Fax: (847) 726-2182
LakeZurich.org



Journey Cremation

708 Telser Road



COMMUNITY SERVICES DEPARTMENT
Building and Zoning Division
505 Telser Road, Lake Zurich, Illinois 60047

(847) 540-1696
Fax: (847) 726-2182
LakeZurich.org





224 283 0778
steve@journeycremations.com
www.JourneyCremations.com

April 27, 2021

Mr. Orlando Stratman
Chairperson of the Planning & Zoning Commission
Village of Lake Zurich
505 Telser Rd
Lake Zurich, Illinois 60047

Dear Stratman,

Journey Cremations is seeking a Text Amendment and Special Use permit for the property at 708 Telser Road in Lake Zurich.

We have completed the courtesy review with the Village and have attached that presentation for you. Journey Cremations has also paid the necessary fees of \$1,890.00 per transaction number 20020800.

The property at 708 Telser is currently vacant. Journey Cremations is seeking the Text Amendment and Special Use permit for the purpose of operating a Crematorium at the location. The attached presentation outlines the operation and equipment used. There will be no remodeling of the facility in order to accommodate our needs. The equipment is free standing. It will be assembled on site and then hooked up to the utilities.

Our intention is to purchase the property.

Included with this letter is the Application, Receipt of Payment, Floor Plan and Parking Plan, and Our Business plan. Please let us know if any additional information is need.

We look forward to making Lake Zurich our home

Sincerely,

Steve Cook
President
Licensed Funeral Director

1600 Golf Road Corporate Center Suite 1200 Rolling Meadows, IL



ZONING APPLICATION

Community Development Department
505 Telser Rd.
Lake Zurich, IL 60047
Phone: (847) 540-1696
Fax: (847) 540-1769

(Please Type or Print)

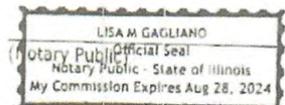
1. Address of Subject Property 708 Telser Road Lake Zurich, IL
2. Please attach complete legal description
3. Property Identification number(s) 14-16-205-039
4. Owner of record is 708 TELSER LLC, Phone: 847-438-2792
E-Mail: Variety78@gmail.com Address: 708 Telser Rd Lake Zurich, IL
5. Applicant is (if different from owner) Steve Cook Phone: 224-283-0778
E-Mail: Steve@JourneyCrematorium.com Address: 1600 Golf Rd, Suite 1200 Rolling Meadows IL 60008
6. Applicant's interest in the property (owner, agent, realtor, etc.) occupant
7. All existing uses and improvements on the property are VACANT
8. The proposed uses on the property are: Crematorium
9. List any covenants, conditions, or restrictions concerning the use, type of improvements, setbacks, area, or height requirements placed on the Subject Property and how of record and the date of expiration of said restrictions:
NONE
10. Describe any contract or agreement of any nature relevant to the sale or disposal of the Subject Property:
NONE
11. For applications requiring a public hearing, please attach a list which contains the PIN, owner, and owner's mailing address of all properties located within 250 feet (excluding all Public Right-of-Ways) of the Subject Property.

THE APPLICANT'S SIGNATURE BELOW INDICATES THE INFORMATION CONTAINED IN THIS APPLICATION AND ON ANY ACCOMPANYING DOCUMENTS IS TRUE AND CORRECT. THE APPLICANT ALSO ACKNOWLEDGES IF THE CONSULTANT EXPENSES EXCEED THE INITIAL ESCROW DEPOSIT, THE APPLICANT WILL REIMBURSE THE ACCOUNT IMMEDIATELY.

Steven D. Cook
(Name of applicant)

Steve Cook
(Signature of applicant)

Subscribed and sworn to before me this 26th day of April, 2021.



My Commission Expires 8/28/2024

CHARLES ZIMNICKI
(Name of Owner, if different)

[Signature]
(Signature of Owner, if different)

Subscribed and sworn to before me this 27 day of April, 2021.

[Signature]
(Notary Public)



My Commission Expires 12/2/2022

Please indicate what form of zoning relief your application requires. For assistance, please contact Staff:

- Zoning Code **Map** Amendment to change zoning of Subject Property from ____ to ____
- Zoning Code **Text** Amendment to amend the following section(s) of the Zoning Code Special Use List Rev
"I" INDUSTRIAL LIST

(See Section 18-103 of the Lake Zurich Zoning Code for specific standards. If a specific parcel is the subject of this amendment, then provide the additional information listed in Section 18-103C.)

- Special Use Permit/Amendment for Special use permit for direct cremation
(See Section 19-103 of the Lake Zurich Zoning Code for specific standards.)

- Planned Unit Development/Major Adjustment/Amendment

(Planned Unit Developments are a distinct category of special use and are intended to create a more desirable environment than through strict application of the zoning and subdivision regulations. See Section 22-105 of the Lake Zurich Zoning Code for specific standards. Please list all the 'modifications' requested in the cover letter.)

- Variation for _____

(See Section 17-104 of the Lake Zurich Zoning Code for specific standards. Please indicate what your specific hardships are in the cover letter.)

- Modification to the Land Development Code (includes retaining walls more than 2 feet in height)
(See Section 10-6-18 of the Land Development Code for specific standards.)

- Preliminary Plat of Subdivision

- Final Plat of Subdivision or Amendment to Plat of Subdivision
(See Sections 10-5-2 and 10-5-9 of the Land Development Code for specific standards.)

- Site Plan Approval/Major Adjustment/Amendment
(See Section 20-103 of the Lake Zurich Zoning Code for specific standards.)

- Exterior Appearance Approval or Amendment
(See Section 21-103 of the Lake Zurich Zoning Code for specific standards.)

APPLICATION TO ANNEX CERTAIN TERRITORY

All land annexed to the Village is classified automatically after such annexation in the R-1\2 Single Family Residential District. The owner must file an application for a Zoning Map amendment if he or she desires a different zoning classification for the Subject Property.

- Petition to Annex Certain Territory (Please complete attached petition)
- Application to Annex Certain Territory

COMPREHENSIVE PLAN APPLICATION

- Comprehensive Plan **Map** Amendment for _____

- Comprehensive Plan **Text** Amendment for _____

Thank You for Your Payment - Illinois: Village of Lake Zurich

4/27/2021 10:46 AM Central Standard Time

Customer Name Steven Cook

Effective Date

4/27/2021

Approved 20020800

Item	Amount
Miscellaneous Payments	\$1,890.00
Subtotal:	\$1,890.00
Transaction Fee:	\$42.53
Total Charged to:	\$1,932.53
MasterCard ***** 1054	
Total Amount Paid:	\$1,932.53

Collection Mode: Web

Payment Details

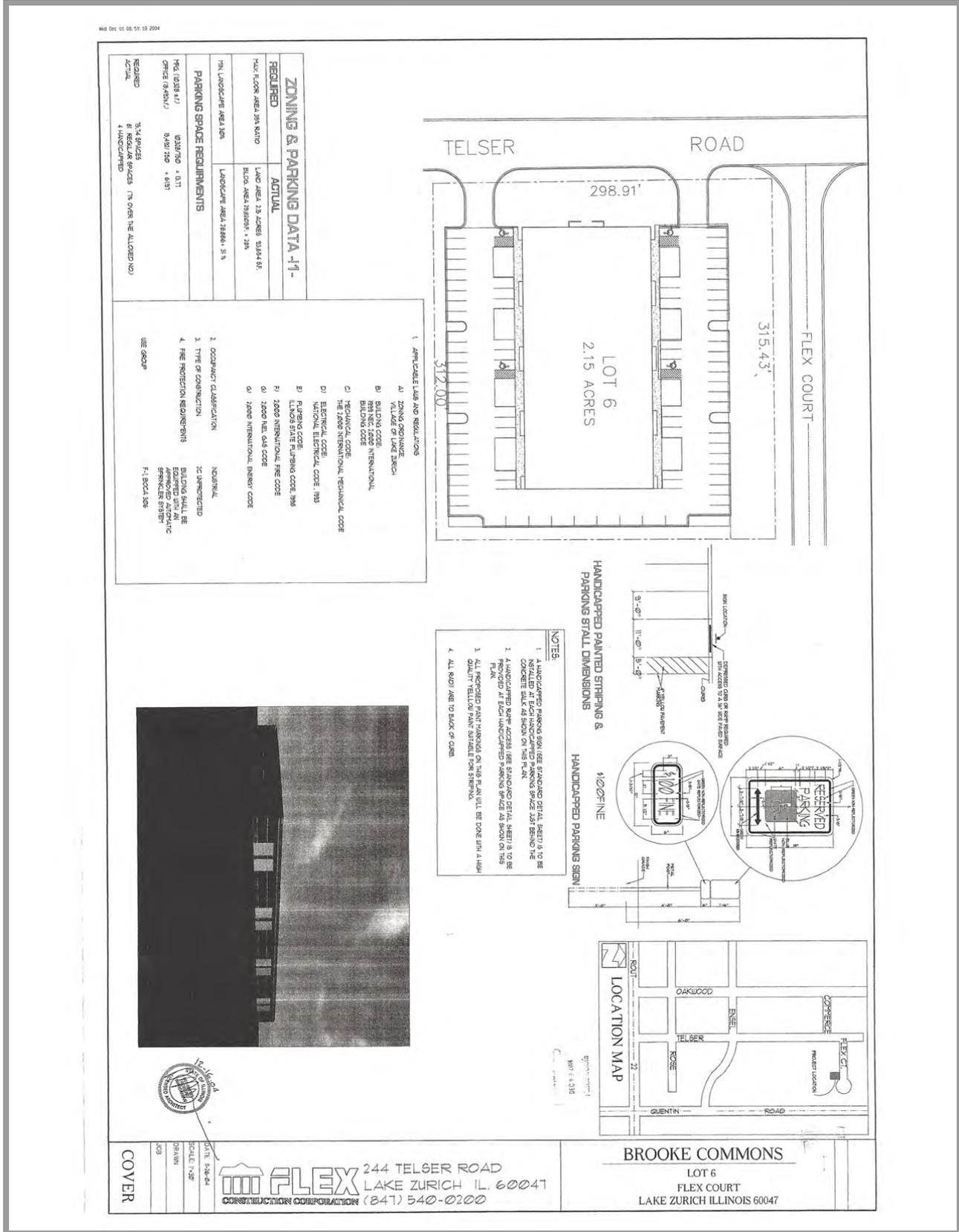
Miscellaneous Payments

Name of Contact Person: Paul Chapman - Cell or Daytime Phone Number: 8476518407 - Contact

Email: paulc1060@gmail.com - Company Name: Journey Cremations - Invoice Number: Special Use

Permit for Journey Cremations - Steven Cook - \$1,890.00

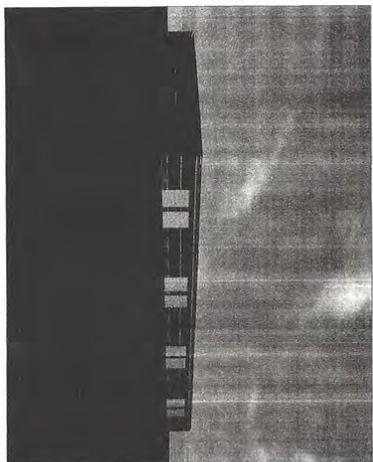
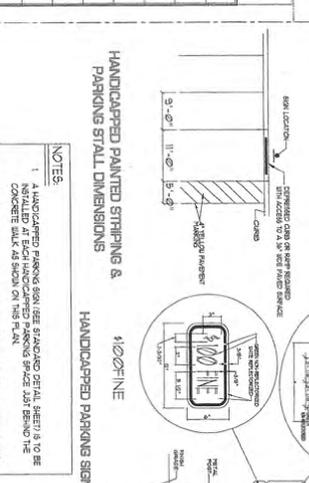
A Transaction Fee has been included in the total amount paid for this transaction.



ZONING & PARKING DATA -11-

REQUIRED	ACTUAL
MAX. FLOOR AREA PER UNIT	LAND AREA: 13.0000 30,344.45; BLOCK AREA: 13,000.00 * 100%
MIN. LANDSCAPE AREA PER UNIT	LANDSCAPE AREA: 18,000.00, 51%
PARKING SPACE REQUIREMENTS	
REQ. (0.250 A/U)	0.250 * 100 = 25.00
OFFICE (0.000 U)	0.000 * 100 = 0.00
REQUIRED	ACTUAL
25.00 SPACES	176 OVER THE ALLOWED NO.
4 HANDICAPPED	1 HANDICAPPED

1. APPLICABLE LAWS AND REGULATIONS
- A) ZONING ORDINANCE
 - B) BUILDING CODE
 - C) MECHANICAL CODE
 - D) ELECTRICAL CODE
 - E) PLUMBING CODE
 - F) FIRE PROTECTION CODE
 - G) 2000 IBC
 - H) 2000 INTERNATIONAL ENERGY CODE
2. COMPACT CLASSIFICATION: INDUSTRIAL
3. TYPE OF CONSTRUCTION: 20 UNIMPROVED
4. FIRE PROTECTION REQUIREMENTS: BUILDING SHALL BE EQUIPPED WITH AN APPROVED AUTOMATIC SPRINKLER SYSTEM
- USE GROUP: F-1, BOCAL 100

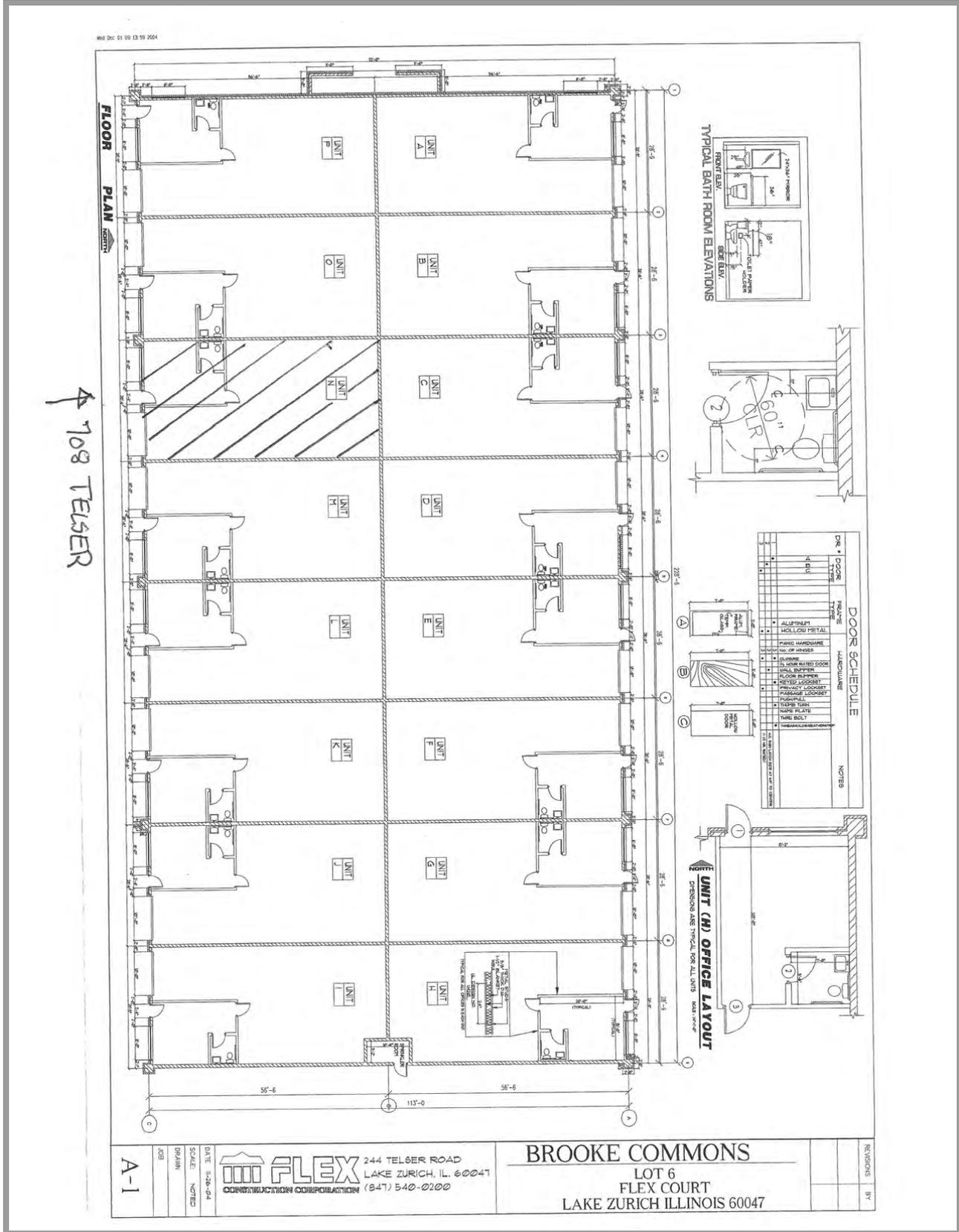


FLEX CONSTRUCTION CORPORATION 244 TELSER ROAD LAKE ZURICH, IL. 60047 (847) 540-0200

DATE: 2-14-18
SCALE: 1/8" = 1'-0"
DRAWN: [Name]
JOB: [Number]

COVER

BROOKE COMMONS
LOT 6
FLEX COURT
LAKE ZURICH ILLINOIS 60047





224 283 0778
steve@journeycremations.com
www.journeycremations.com

**Lake Zurich
Zoning Presentation
April 2, 2021**

(Confidential)

**Prepared by Steve Cook
Owner**

1600 Golf Road Corporate Center Suite 1200 Rolling Meadows, IL 60008

Thank you for this opportunity to discuss the needs of Journey Cremations and our request for a zoning variance.

Business Model

Journey Cremations provides Direct Cremation services to the public and to the funeral industry.

By definition, a Direct Cremation takes place when the deceased is taken into our care and cremated without any visitation and or religious service. Upon completion, the cremains are either delivered by us or returned via USPS mailing protocol.

- Thus, there are no arrival nor departures of individuals or families at our facility other than our employees. Our need for parking is minimal as compared to the needs of a traditional Funeral home.

Our public customers find us via advertising on the web or other marketing channels. We do not seek customers by having them visit a retail sales office. We have no public presence.

- Thus, we find an industrial location preferable as not to encourage visitors.

The greater number of our cremations go to contract without meeting with the family or facility in person. The business is concluded via phone or email. Our public customer base comes from the surrounding counties and from out of state families with loved ones who have passed in Illinois.

- Thus, when we need to meet with a family or customer, we meet at their home or facility. If they want to come to us, we use Regus Office facilities. Our current HQ office is in the Rolling Meadows Regus facility. By having a contract with Regus, we can we can meet with a family at any one of their many local offices.

Process Model

Our cremations are preformed in private with no knowledge or exposure to the public.

The first step in the cremation process is the removal of the deceased from their place of death. We do these removals from Hospitals, Hospices, Coroners Offices or Homes and bring the deceased directly into our facility.

- Thus, there is no evidence that a body is in the process of being delivered. The body is never removed from the van until it is in our facility and all doors have been closed.
- It should also be noted that all of the bodies we transport and eventually cremate are sealed in plastic and placed in their own cardboard container for cremation.
- There is no exposure to Covid-19 during our process. Any individual who passes from Covid is handled according to the CDC and OSHA safety protocols by the hospitals or Journey Cremations.

Once the deceased is in our facility, it is immediately placed inside our walk-in cooler. The holding period for this storage is generally 2-3 days while we await the final paperwork and the permit to Cremate.

- Thus, the bodies are kept at a temperature similar to those of a morgue, eliminating any odors or decomposition.

Page 2

After the cremation permit has been obtained. The deceased is placed inside the cremation chamber. The chamber is brought to a temperature whereby the deceased is cremated in less than two hours. The cremation chamber or retort is state of the art, designed not only for efficiency but designed to provide a clean environment during the process.

- Thus, this equipment runs on natural gas and emits an odorless and colorless discharge very similar to that produced by the average home furnace.

The last step of the process is to package the remains in the appropriate container or Urn and prepare them for return to their destination.

Production model

We anticipated bringing an average of 2 to 4 deceased individuals to our facility and cremating the same number each day. In general, our business hours will run from approximately 9AM to 4PM Monday through Saturday. This allows for the completion of paperwork, finalizing remains for delivery and receiving the deceased. We will probably perform 1 or 2 cremations during the working day and the balance in evening after 5 PM.

The type of equipment we will be using is detailed on the following pages.

In Conclusion

Journey Cremations should not be viewed as a holding facility or a morgue. Our role in the final disposition of loved ones is to complete the final steps in an expeditious manner with very little impact to the area.

We will maintain a low profile to the community as we provide our needed services. While we intend to grow the business, add jobs and participate locally, The Journey Cremations facility should be thought of as a hidden component of the funeral industry.

We look forward to answering any question you may have and look forward to calling Lake Zurich our Home.

Page 3

The types of equipment that will be used are as follows:

Walk-in Cooler



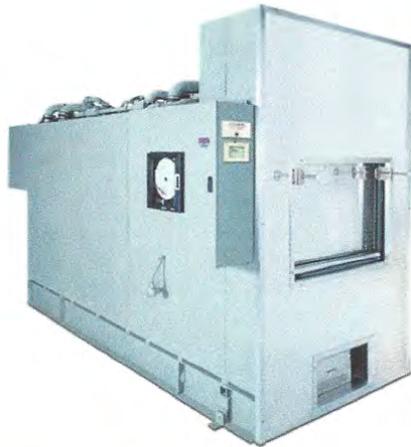
SPECIFICATIONS:

- External (O.D.): 10' 0" x 10' 0" x 7' 6 1/2" Length x Width x Height
- Internal (I.D.): 9' 5 1/4" x 9' 5 1/4" x 7' 3 1/8" Length x Width x Height
- Door Size Standard: 36" x 81" (upsized available via dropdown)
- Unit Weight: 207 lbs.
- Compressor Specs +21" of height to external dims, actual is 17.5"
- A maximum 95-degree ambient temperature allowed on included compressor.
- Medium Temperature
- R404A
- NEMA Plug 6-20R is supplied
- Includes 1 light fixture (customer installed/ wired by electrician*)
- Wall Finishes: Acrylume/Embossed – 26 Ga. – interior & exterior (silver finish)
- Ceilings: Acrylume/Embossed – 26 Ga. – interior Galvanized/Embossed – 26 Ga. – exterior
- Panel Thickness Walls: 3.375" UL Listed Class 1 Foam Ceilings: 3.375" UL Listed Class 1 Foam
- No refrigerant piping required. Pre-charged with refrigerant
- Evaporative condensate pan, no drain line needed
- U/L certified panels, certified to NSF/ANSI standard #7
- Electrical and refrigeration components are U.L. listed or registered and NSF certified
- 2007 Federal Energy Independence & Safety Act (EISA) compliant
- Made in the USA

Page 4

Human Cremation Equipment

PowerPak I



The Essential Cremation System

- Smoke-Buster™ 138 emission control
- Ideal for new or low-volume crematories
- 120 minutes or less cremation time
- Automatic operation, most fuel efficient in its class

Just Right for Your Business

The PowerPak I Cremation System is designed to meet the needs of low-volume cremation businesses. Whether you're just starting out, or you're adding cremation as a new service for the families you serve, you want reliable equipment from a manufacturer you can trust. That's why we've taken our decades of field-proven innovation and experience and engineered them into every detail of the PowerPak I.

Ready To Go

The PowerPak I arrives at your doorstep ready to go. It comes pre-wired, pre-piped, and pre-tested. All you have to do is unload it, connect it to gas and electricity, and attach the exhaust stack. As always, our team is available to help you prepare your site so installation is quick and easy.

Matthews is the acknowledged global leader in cremation equipment, with more than 5000 cremators installed worldwide. Our cremator line covers the full range of crematories, from small independent funeral homes to large crematories.



224.283.0778
steve@journeycremations.com
www.JourneyCremations.com

**Lake Zurich
Zoning Committee Presentation
May 10, 2021**

(Confidential)

**Prepared by Steve Cook
Owner
And
Paul Chapman**

1600 Golf Road Corporate Center Suite 1200 Rolling Meadows, IL 60008

Thank you for this opportunity to discuss the needs of Journey Cremations and our request for a zoning variance.

The information that follows is presented in 4 sections.

- I. Journey Cremations' Business Model and Operations information as presented at the Courtesy Review meeting to the Village Trustees.
- II. A brief overview of the Cremations Industry.
- III. Specifics about the equipment we will use and their impact on the environment and community.
- IV. Information we provided to address concerns of others in the Telser Condo Complex

Section I

Business Model

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Page 4

Human Cremation Equipment

PowerPak I



The Essential Cremation System

- Smoke-Buster™ 138 emission control
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The PowerPak I arrives at your doorstep ready to go. It comes pre-wired, pre-piped, and pre-tested. All you have to do is unload it, connect it to gas and electricity, and attach the exhaust stack. As always, our team is available to help you prepare your site so installation is quick and easy.

Matthews is the acknowledged global leader in cremation equipment, with more than 5000 cremators installed worldwide. Our cremator line covers the full range of crematories, from small independent funeral homes to large crematories.

CFS-2300 Cremation Chamber

from *Cremation Systems*

CFS-2300 Features Include:

- Automatic operation
- High efficiency refractory lining
- Recessed hot hearth design accommodates large cases, 750 lbs
- Cremation status can be sent via email
- Quick Change hearth tile system
- Emission monitoring
- Front loading and retrieval through extra-wide door
- 150 lbs per hour cremation burn rate
- Touch-screen digital controls
- PC-based data acquisition and storage
- Meets all applicable NFPA and UL standards
- Engineered for installation through an 8' door opening
- Includes Fire Marshal monitoring system
- Tek Marshal internet retort diagnostics, optional



**CFS-2300
Cremation Chamber**

Made in Illinois!

The CFS-2300 has a composite refractory lining, and extra-wide 42" door opening.

General Dimensions:

Height: 7' 7½"
 Width: 5' 3" without control panel
 6' 5½" with control panel
 Length: 15' 4"
 Hearth area: 42" wide x 89" deep
 Door opening: 42" wide x 25" high

Utility Requirements:

Natural gas: 1000 Btu/cu ft
 2350 CFH at 7" w.c. minimum
 Propane: 2500 Btu/cu ft
 940 CFH at 11" w.c. minimum
 Electrical: 208/240 VAC, 1 phase, 40 amp

Refer to General Specification HS01



Cremation Systems

is pleased to offer the CFS-2300 cremation chamber with **Fire Marshal** monitoring system.



Optional with the CFS-2300: **Tek Marshal** internet retort diagnostics.



UNDERWRITERS LABORATORIES INC.
CHICAGO - FORT WORTH, TEXAS - MILWAUKEE, WISCONSIN - SANTA CLARA, CALIFORNIA

an independent, not-for-profit organization testing for public safety



Cremation Systems™

Division of Armil CFS, Inc.

15660 South LaSalle Street
 South Holland, IL 60473

708-339-6810
 Fax: 708-339-0517
 www.cremsys.com

© 2020, Cremation Systems

CFS-2300 Cremation Chamber from **Cremation Systems**

Features and Benefits

- One-step, automatic operation:** The CFS-2300 utilizes advanced "Set Point Programming" to control temperature for a completely automatic cremation cycle.
- High efficiency refractory lining:** The CFS-2300 utilizes a combination of premium firebrick, pre-cast refractory shapes and ceramic fiber insulation for a light weight, energy efficient lining.
- Quick Change hearth tiles:** The CFS-2300 Quick Change hearth is a pre-cast refractory tile system. Quick Change tiles are in stock, minimizing cremator down time by allowing for one-day hearth repair and easy sub-hearth access.
- Automatic pollution monitoring:** The CFS-2300 opacity sensor monitors emissions, ensuring EPA requirements are met.
- Touch-screen digital controls:** Case data stored on a flash drive can be automatically sent to any PC or smart phone via email.
- Remote access via the Internet:** Remote access of cremator conditions via the internet for off-site monitoring and alarm notification.
- The CFS-2300:**
- Extra-wide door opening for easy loading and retrieval
 - Low overall height and weight for ease of installation
 - Door system features a single air-cooled viewing port, spring-loaded/self-locking door latch to ensure safety, and hydraulic cylinders for door movement.
 - Control panel may be left or right side mounted, or provided separate for remote installation.
 - Meets or exceeds all applicable NFPA and UL standards.
- Fire Marshal:** The Fire Marshal monitoring system comes standard with the CFS-2300. Refer to Fire Marshal data sheet for additional information.
- Tek Marshal:** Internet retort diagnostic product to identify blown fuses, tripped relays, and dirty smoke meters, without a service tech visit.

Cremation Systems is a division of Arnil CFS, Inc., manufacturer of high temperature process equipment since 1968. Arnil CFS utilizes the finest combustion and control components, refractory and insulating materials to provide premium, high efficiency, low maintenance cremation equipment.

Members of:



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Section 2

Cremation Industry Information

In 1975, there were over 425 crematories and nearly 150,000 cremations in the United States

In 1999, there were 1,468 crematories and 595,617 cremations, a percentage of 25.39% of all deaths in the United States. By 2019, there were over 3,000 crematories and over 1,500,000 cremations...and 54.6% of deaths in the United States were handled through cremation.

AN OVERVIEW OF CREMATION PROVIDED BY CANA

There are at a minimum four main elements of cremation.

1. **Transportation** of the deceased from place of death to the crematory.
2. Secure, cold **storage** of deceased prior to cremation
3. The **cremation process** itself
4. **Return** of cremated remains to the authorized agent

TRANSPORTATION

The deceased will be removed from the place of death and taken to a funeral home; on rare occasions they may be taken directly to the crematory. From the point of removal on, the deceased's identity is carefully confirmed at each step in the process. This ensures that a chain of identification is firmly established.

STORAGE

It takes time to finalize the paperwork and make plans, so until the services are planned and the cremation is scheduled, the deceased will be placed in secure, cold storage. The time between death and cremation can vary considerably based on many factors; cremation typically occurs at least 48 hours after death.

STEPS IN THE CREMATION PROCESS

1. The deceased will be placed in a cremation container. The minimum requirement for a cremation container is that it be completely enclosed, rigid, leak resistant, and combustible.
2. Facility staff will confirm the identity of the deceased by checking all paperwork. A cremation number or other identification (id) will be assigned. This number/id is often stamped onto a stainless steel disc, but may also be in the form of a barcode. The id/number is recorded on a cremation log. The stainless disc remains with the remains throughout their entire time at the cremation facility.
3. When it is time for the cremation of the deceased, they will be removed from the storage unit and their identification will be confirmed using paperwork and the stainless disc. The container will be taken to the cremator unit and placed on a table in front of the cremator door.

4. The door of the cremator will be opened, and the container will be placed inside the primary chamber. Usually this is performed manually with the aid of cardboard rollers or mechanically with a rolling conveyor loader. The stainless disc with number/id will be placed inside the cremator with the remains.
5. The door will be closed and the cremation monitored carefully until it is completed. The process can take anywhere from 30 minutes, as in the case of a stillborn, to two hours depending on the body size and stored heat in the chamber.
6. When the cremation process is complete, the door will be opened and identification checked again against paperwork and the stainless disc. The bone fragments that remain, now called cremated remains, will be carefully swept out of the cremator into a cooling tray, allowed to cool and taken to a processor.
7. The processor is a machine that uses blades to reduce the bone fragments until the remains are less than 1/8" in size.
8. The cremated remains are then transferred to a strong plastic bag and placed in either an urn or temporary container if the family has not selected an urn yet. Identification is checked again and the stainless disc is placed in the container with the remains. The urn and its box are labeled with identifying paperwork and checked again before being stored for the family's retrieval.

THE TECHNICAL DETAILS

The process of cremation is essentially the conversion of a solid to a gas. This is accomplished by heating the body, which contains between 65% and 85% water by weight, to a temperature high enough to facilitate the combustion process. Laws for required temperatures vary by state, but the cremation process usually occurs between 1400 and 1600 degrees F.

WHAT CAN BE CREMATED?

Personal items of the deceased, such as jewelry, watches or other items will be removed from the container and returned to the family with prior arrangement. Sometimes families request that items of significance be cremated with the deceased. In some cases this can be allowed, but in many cases it cannot. This is for safety reasons, as not everything is combustible and may cause damage to the equipment or the operator if left in the container. The funeral director will advise the family on what can or cannot be put in the container.

WHAT IS IN THE CREMATED REMAINS?

The bone fragments that remain in the primary chamber are mostly calcium phosphates, with some other minor minerals. Cremated remains are generally white to gray in color. Additionally, there may be pieces of metal in the cremated remains – this metal may come from surgical implants like hip replacements, dental fillings, casket handles, or jewelry that was not removed prior to cremation. The metal is separated from the cremated remains before they are processed. The metal is typically recycled.

The average weight of adult cremated remains is between four and six pounds; a tiny percentage of the body's original mass. The cremation chamber is either swept thoroughly or vacuumed with specially designed equipment to retrieve as much of the remains as possible.

HOW DO I KNOW I AM GETTING MY LOVED ONE'S REMAINS BACK?

Chain of custody refers to the chronological documentation of the custody, control, transfer, analysis, and disposition of remains and personal property. This is an important definition. Cremation is an irreversible, unstoppable process. Every step of the process needs to be documented, from the receiving of the human remains to the ultimate disposition of the cremated remains, including returning the cremated remains to the authorized agent.

Identification checkpoints:

1. Removal of deceased from place of death
2. Transport to crematory
3. Placement in storage
4. Placement in cremator
5. Removal from cremator
6. Processing of Cremains
7. Placement in urn
8. Return to authorized agent

It is important to note that each state/province requires different operational data to be recorded, and requires specific forms of documentation, thus each facility may have different policies and procedures which will vary slightly from the above. The funeral director can advise the family of what their facility's procedures are and what to expect.

GLOSSARY OF CREMATION TERMS

Authorizing Agent(s): the person(s) legally entitled to control the disposition of human remains.

Alternative container/Cremation container: the case in which the human body is delivered to the crematory and in which it is cremated.

Casket: A rigid container that is designed for the encasement of human remains, usually constructed of wood, metal, or like materials and ornamented and lined with fabric, which may or may not be combustible.

Cremation: the mechanical and/or thermal or other dissolution process that reduces human remains to bone fragments. Cremation includes processing and usually includes the pulverization of the bone fragments. This definition covers a variety of technologies that may be applied in order to achieve reduction to bone fragments, including traditional flame-based cremation and alkaline hydrolysis.

Direct cremation: a cremation that occurs without any formal viewing of the remains or any visitation or ceremony with the body present.

Cremated remains: All the remains of the cremated human body recovered after the completion of the cremation process, including pulverization which leaves only bone fragments reduced to consist of unidentifiable dimensions.

Cremation chamber: The enclosed space within which the cremation process takes place.

Cremation container/alternative container: the case in which the human body is delivered to the crematory and in which it is cremated.

Cremation interment container /urn vault: A rigid outer container that, subject to a cemetery's rules and regulations, is composed of concrete, steel, fiberglass, plastic, or some similar material in which an urn is placed prior to being interred in the ground, and which is designed to withstand prolonged exposure to the elements and to support the earth above the urn.

Cremator: The total mechanical unit for the cremation process. Inside it is lined—top, sides, and bottom— with a heavy refractory tile or brick, with a layer of insulation between the inside surface and the outside protective housing or casing.

Crematory/Crematorium: The building that houses the cremation chamber(s). It can be a building that serves this one function or a multi-purpose building that also contains the administrative offices, mortuary preparation rooms, or cemetery maintenance facilities.

Crematory Operator: The individual who is authorized and licensed by the board to operate the cremator and perform the cremation process.

Disposition: The shipment, interment, burial, cremation, or anatomical donation of a dead human body or parts of a dead human body. **Final disposition:** The burial or other disposition on a permanent basis of a dead human body, cremated remains, or parts of a dead human body.

Funeral Director: A funeral service professional employed as a licensed “funeral director” or “funeral director and embalmer” as defined by state law to practice funeral directing or funeral directing and embalming.

General Price List (GPL): contains identifying information, itemized prices for the various goods and services sold, and other important disclosures.

Human remains: The body of a deceased person, or part of a body or limb that has been removed from a living person, including the body, part of body, or limb in any stage of decomposition.

Interment: The act or ceremony of burying a dead human body.

Inurnment: The act or ceremony of burying an urn containing cremated remains.

Provider, Funeral or Cremation: a business that sells or offers to sell both funeral goods and funeral services to the public.

Temporary container: A receptacle for cremated remains usually made of cardboard, plastic, or similar material designed to hold the cremated remains until an urn or other permanent container is acquired.

Urn: A receptacle designed to permanently encase the cremated remains.

Urn Vault/cremation inurnment container: A rigid outer container that, subject to a cemetery's rules and regulations, is composed of concrete, steel, fiberglass, plastic, or some similar material in which an urn is placed prior to being interred in the ground, and which is designed to withstand prolonged exposure to the elements and to support the earth above the urn.

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Section 3

Environmental Specifics about our operation:

There are questions about the cremation process and the equipment used that need to be answered with facts. They usually fall into to 4 Categories: Noise Level, Smoke, Smell and Safety.

Tom Krowl of Cremation Systems, a vender we are considering for our equipment, provided the following recap. It does a wonderful job addressing some of the issues.

Please see the next page.



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May 7, 2021

Subject: Planning and Zoning Board Packet for Crematory Addition

The following information is for your upcoming meeting with the zoning authority and city council of Lake Zurich. Our air emission test results performed in the state of Illinois and approved by the state of Illinois are on file with the state. It must be noted the Federal Government considers this equipment a minor source and chooses to not regulate, because of this fact all states also consider this equipment a small source and apply a maximum emission limit of 5 tons particulate matter. If it was possible to run the cremation chamber every hour of everyday it still falls short of the allowable limit set by the states and the Federal EPA.

Our company is a 52-year-old custom industrial furnace manufacturer located in South Holland, IL. We have designed a low emission, fuel efficient, internet connected, state of the art cremation chamber which has the environment and your neighbors in mind. Unfortunately, some people still have negative visions of old technology incinerators spewing smoke and odor. Today's air quality standards do not allow for this type operation. Our CFS2300 has opacity meters on the stack which continually monitor the opacity of the emissions and automatically adjust to correct. This same group of individuals generally go to the Internet and find Pseudoscience information that fits their negative perspective of cremation.

Understanding the emotional nature of cremation emissions we contracted TRC to perform a Visible Emissions Study (EPA Method 9) on both our Human and Pet cremation chambers, no visible smoke during the test procedure on each machine.

We have installed our cremation equipment in residential and cemetery properties from Great Falls, Montana to Philadelphia, Pennsylvania; they operate in compliance with the law and the surrounding neighbors.

If I can be of any further assistance in this matter, please contact me.

Regards,

Tom Krowl
Vice President Marketing
Certified Retort Operator & Educator, Cremation Association of North America

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Section 3
Noise concerns

There are no moving parts during the cremation process except for the exhaust fan. This exhaust fan produces a sound level of 63 to 72db. This is equivalent to a room air condition, general office noise or a car traveling at 60 mph with the windows closed.

As a reference, I took a db meter to the furnace in my house and checked the db level when it was running at high speed. I stood four feet away. The results were:

Max db: 71 Min db: 59 Avg db: 63 at 5/8/2021, 7:49:33 AM

I use this reference so use have a comparison of what a retort sound like vs a home furnace.

The University of Michigan compiled a reference sheet for dangerous noise levels. Our operation falls into a safe range. Our operator does not wear ear plugs or ear muffs.

Please see the Michigan report below followed by a diagram that shows the actual db readings while a retort was running.

We will be operating a single retort in this facility.

We do not see the noise level of our operation impacting the surrounding tenants.



Harmful Noise Levels

Topic Overview

The effects of noise on hearing vary among people. Some people's ears are more sensitive to loud sounds, especially at certain frequencies. (Frequency means how low or high a tone is.) But any sound that is loud enough and lasts long enough can damage hearing and lead to [hearing loss. \(/health-library/ug2252#ug2252-sec\)](#)

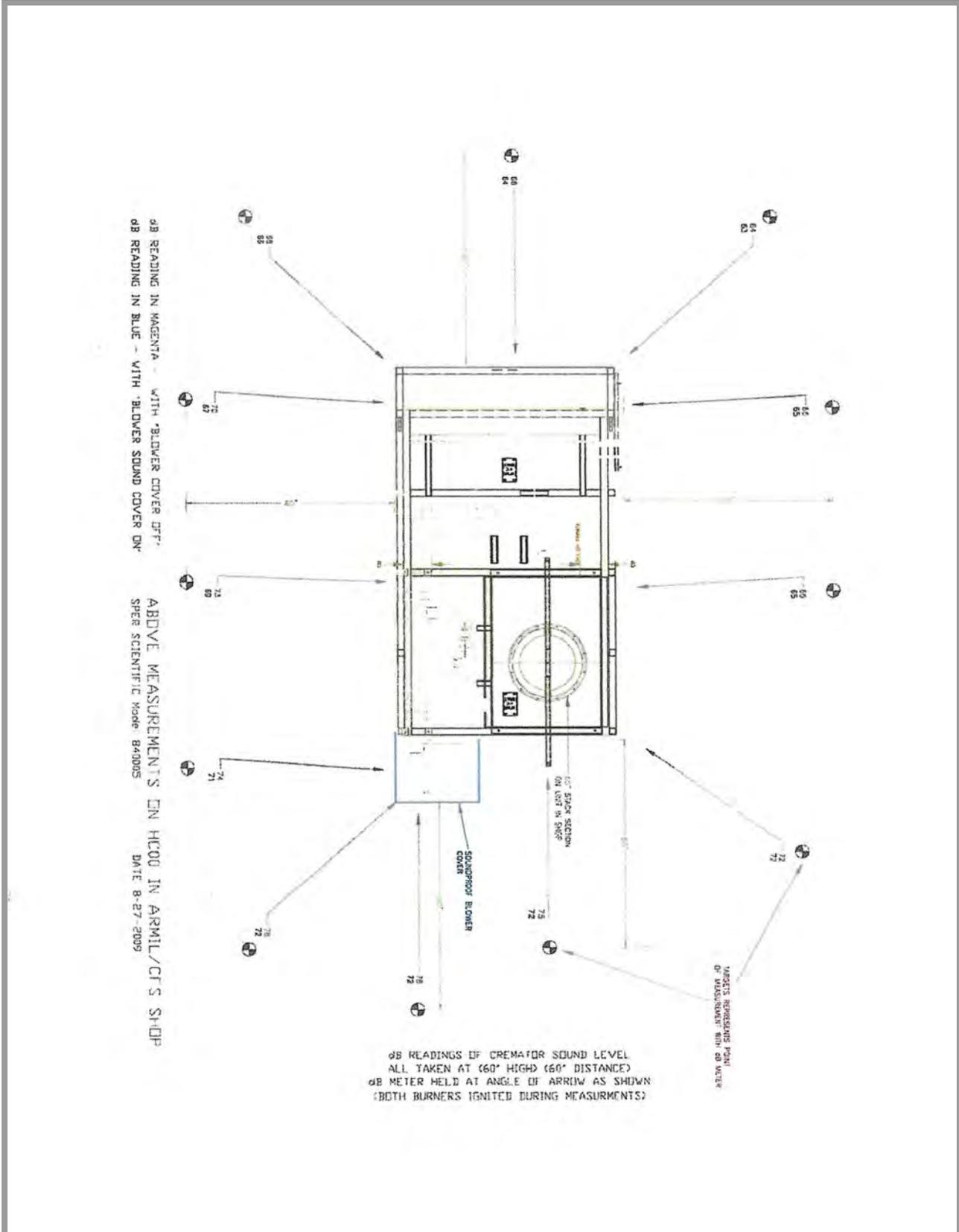
A sound's loudness is measured in decibels (dB). Normal conversation is about 60 dB, a lawn mower is about 90 dB, and a loud rock concert is about 120 dB. In general, sounds above 85 are harmful, depending on how long and how often you are exposed to them and whether you wear hearing protection, such as earplugs or earmuffs

Following is a table of the decibel level of a number of sounds.

Noise	Average decibels (dB)
Leaves rustling, soft music, whisper	30
Average home noise	40
Normal conversation, background music	60
Office noise, inside car at 60 mph	70
Vacuum cleaner, average radio	75

Info from Manufacturer

Our CFS2300 retort sounds like an air conditioner running when the blower is running, 65 decibels (65 dB is normal traffic noise).



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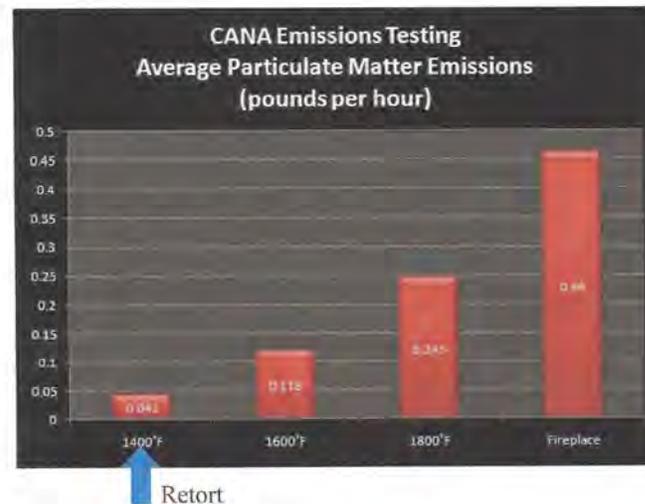
Section 3
Smoke Concerns

As Tom Krowl said,

“Unfortunately, some people still have negative visions of old technology incinerators spewing smoke and odor. Today’s air quality standards do not allow for this type operation. Our CFS2300 has opacity meters on the stack which continually monitor the opacity of the emissions and automatically adjust to correct. This same group of individuals generally go to the Internet and find Pseudoscience information that fits their negative perspective of cremation.

Understanding the emotional nature of cremation emissions, we contracted TRC to perform a Visible Emissions Study (EPA Method 9) on both our Human and Pet cremation chambers, no visible smoke during the test procedure on each machine. We have installed our cremation equipment in residential and cemetery properties.”

If there is any smoke, it has been described as white and wispy like a home furnace. In addition, it should be noted that a retort puts out 10 time LESS particulates than the average fireplace.



There is another component to this technology that prohibits most of the smoke to escape up the stack. It is referred to as a “Smoke Buster” or “After Burner”. This unit or chamber captures all the smoke that may be heading for the smoke stack and re-burns it so any remnants and can be burned off.

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Section 3
Smoke Concerns (Continued)

By the nature of using heat for a cremation the hot air does need to leave the chamber. This is done through a “Smoke” stack. This stack is a direct path from the retort to an exit port through the roof. This stack will be placed near the rear section of our unit. More than likely it will not be visible from the parking lot.

Smell /Odor Concerns

We do not use any chemicals or solvents in our process. Therefore, there are no odors in our facility. The same technology that eliminates “Smoke” also burns off all the odors.

A cremation takes place in a sealed chamber eliminating any odors during the process. The remains are odorless.

Safety Concerns

Our retort operators are trained and licensed. They know how to run a safe operation. They are backed by several fail-safe controls and processes. There are monitors in several places that assure if there is a pending problem, the system will be shut down.

Three different monitoring system are incorporated in the CFS2300.

The “Fire Marshal” and the Tech Marshal as well as the Data monitor.

Please see that next pages for a more in-depth look.

There are no other components in our processes that present any danger to anyone.

Fire Marshal

from *Cremation Systems*

Fire Marshal monitors the temperature in the retort stack area to prevent potential fire conditions.

- At 250°F, an audible alarm is sounded at the retort; an alert is sent via email to your computer.
- At 300°F, your retort is shut down, another alert is sent via email to your computer or smart phone.

Fire Marshal operates on-site or remote to safely monitor and control your retort during all operating cycles.

Annual reporting requirements made fast and easy because Fire Marshal provides complete data acquisition of all case documentation during retort operation.

Fire Marshal can be installed on **ALL** types of cremation retorts.



Fire Marshal:
The only name in crematorium monitoring technology

ATTIC TEMPERATURE	247
STACK TEMPERATURE	733
MAIN CHAMBER TEMPERATURE	1500
AFTER BURNER TEMPERATURE	1671
SET UP SCREEN	

AFTER BURNER TEMPERATURE	47
FINISHED	



Cremation Systems offers the only crematorium monitoring technology available.



Fire Marshal comes standard on all CFS-2300 cremation chambers.



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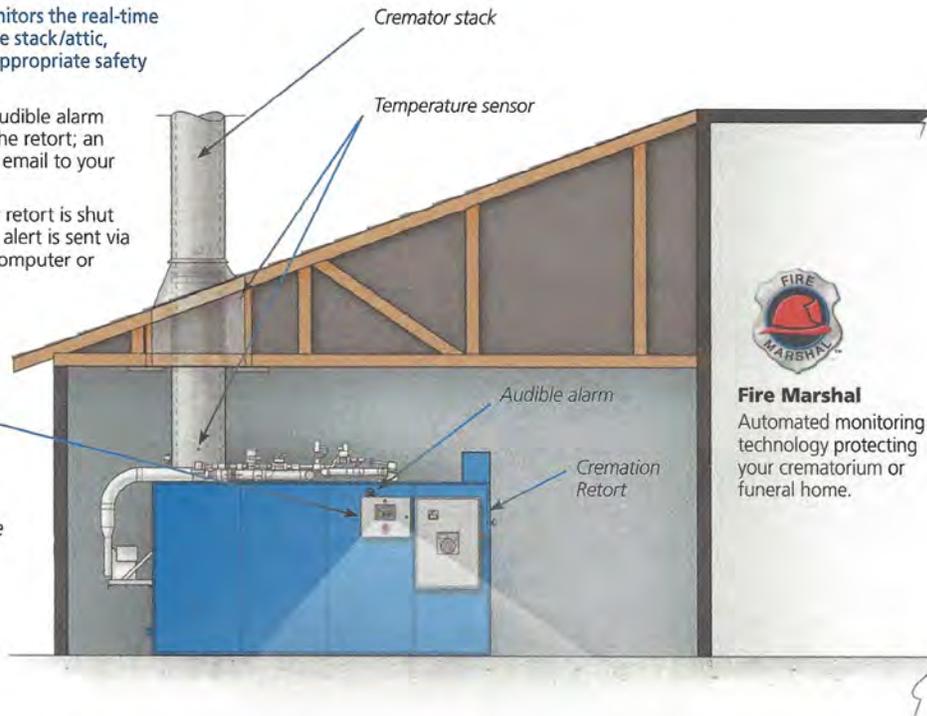
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Fire Marshal from **Cremation Systems**

Fire Marshal monitors the real-time temperature of the stack/attic, and initiates the appropriate safety procedure:

- ❗ At **250°F**, an audible alarm is sounded at the retort; an alert is sent via email to your computer.
- ❗ At **300°F**, your retort is shut down, another alert is sent via email to your computer or smart phone.

The **Fire Marshal** control panel can be installed in any convenient location on the retort or within the crematorium.



Fire Marshal
Automated monitoring technology protecting your crematorium or funeral home.



includes the most comprehensive features available, in an intuitive, user-friendly touch screen interface.



Data Marshal stores all relevant cremation cycle information, including decedent name, weight, time, afterburner temperature, alarm notification and charting data.



offers live monitoring from the crematorium to a remote viewing station via internet, PC or a smart phone.

Fire Marshal's Comprehensive Features
Include data retrieval and storage, on-site or remote video monitoring

Note:
Some Fire Marshal features require phone, internet and/or wireless connectivity.



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Section 4

Concerns of other Tenants.

The following email was sent to the Village Trustees, the Mayor and other interested parties regarding some concerns of existing tenants.

To: Matt, David and other Interested parties
From: Journey Cremations

We were hoping to get together for a cup of coffee so we could answer your questions and alleviate your concerns about our presence at 708 Telser. In lieu of a face-to-face meeting, we would like to supply you with some facts about Journey Cremations and our operation you will find helpful.

First: While we provide a service to the public, the public does not come to our location. Therefore, we do not have signage on our facility that indicates a crematory. The only signage on the building will be our logo. This is a tree and the word Journey. Thus, there is no impact to anyone of your customers coming to your offices.

All of our processes are handled inside our facility. No-one will ever see a loved one being brought in to the building. These loved ones are treated with immense respect. They are immediately covered, placed in a cardboard container and then placed in a cooler.

Second: Noise, smoke etc. The village will have all the data at the upcoming meeting that supports that this is a clean process. We wanted you to have it in advance. When a cremation takes place, the only noise that is created comes from the exhaust fan. The db level is similar to window air conditioner or a car traveling at 60mph with the windows closed. As a side note to the noise level questions being raised, we will only be operating one retort in this facility, not two or three. If the demand increases, we will either work at night or outsource the overflow. There will be no "Doubling" of db noise levels. As for hearing conversations, there will be only one or two people in the facility at a time. The chances of conversations being overheard are nil.

As for smoke, we will generate 10 time less particulates than a fireplace. The smoke output, if any, through the smoke stack is the same as the smoke from you home furnace. It is white. By the way, the smoke stack will not be anywhere near the front doors and more than likely will have an architectural detailing that makes it look more residential than industrial. You will be glad to know that that the system is enclosed in fire brick with several monitoring systems to prevent a fire. To my knowledge, there has never been a fire caused by a retort in a crematorium.

As for smells, there are none. The smoke that is created is double processed in an "afterburner" before it ever leaves the chamber and heads up the smoke stack.

If you have any other concerns, please reach out so we can address them.
I would be grateful if you would pass these facts on to any other tenants with questions.

Thanks

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Concerns of other Tenants Continued.

Pet Cremations.

A comment was made in an email referencing that a tenant was alarmed because “That Pet Crematories are only legal in 20 States for a reason.”

The fact is, I did a quick search and found that there are 36 states with pet crematories. In fact, there are over 1029 Pet crematories in the United States according to IBIS.

In recent years, pet parents have increasingly treated their pets as family members. Specifically, an estimated 67.0% of US households own a pet and they spent \$10.3 billion on pet services in 2019 (latest data available). According to the “Pet Cremation Service Offers ‘Comfort And Respect’ To Families” article on the Newtown Bee, many pet owners feel uncomfortable leaving their pets at the veterinarian, pushing up demand for pet cremation services as some families also want to have the ashes back.

We will NOT be cremating ANY PETS at this facility. I just want to be sure that the correct facts are known.

Location

Comments have been made that this type of facility is inappropriate for a crematorium. Nothing could be farther from the truth.

The city of East Dundee has zoned a crematorium in a building configuration similar to the Telser Street property where a crematorium is currently operating.

The city of Elgin had previously rezoned a building in 2019 for the purpose of allowing a crematorium to operate in a building almost identical to the Telser property. The only reason the crematorium did not move in was due to the fact that the owner could not obtain financing. The facility is no longer available.

The City of Elgin also recently rezoned an area allowing a crematorium to be placed in a funeral home that is in a residential area.

Waste Materials

A concerned and misinformed tenant stated, “Another horrifying concern is waste management effecting the sewage in addition to the monitoring of potential liquids, chemicals, gloves gauze, bandages etc. at the shared complex trash dumpster.”

I am not sure where this misperception came from but, we have NOTHING to put into the sewer system. We do not use bandages, Gauze, chemicals, gloves etc. Our waste is limited to office trash that cannot be recycled.

Fire

A tenant has found a few news clips reporting fires at funeral homes caused be a cremation unit. I believe these were all caused by a problem of cremating an obese person and not following instructions. These fires were caused by operator error. No different than starring a grease fire in a kitchen. I believe none of the buildings themselves burned down or were severally damaged. Our equipment has failsafe devices that will not let this happen.

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In Conclusion

Journey Cremations is the type of low-profile company that people will not be aware of.

We are not a high-volume crematorium.

We are a funeral service that will do 1 or 2 cremations a day. This means operating the retort for two to four hours a day. Often after 4 PM.

In this day of total transparency, we are glad to provide any information that will help people understand who we are and what we do. But in reality, we will go unnoticed while in operation.

We are a very caring company. We care about our customers, their loved ones, our neighbors the environment and the community.

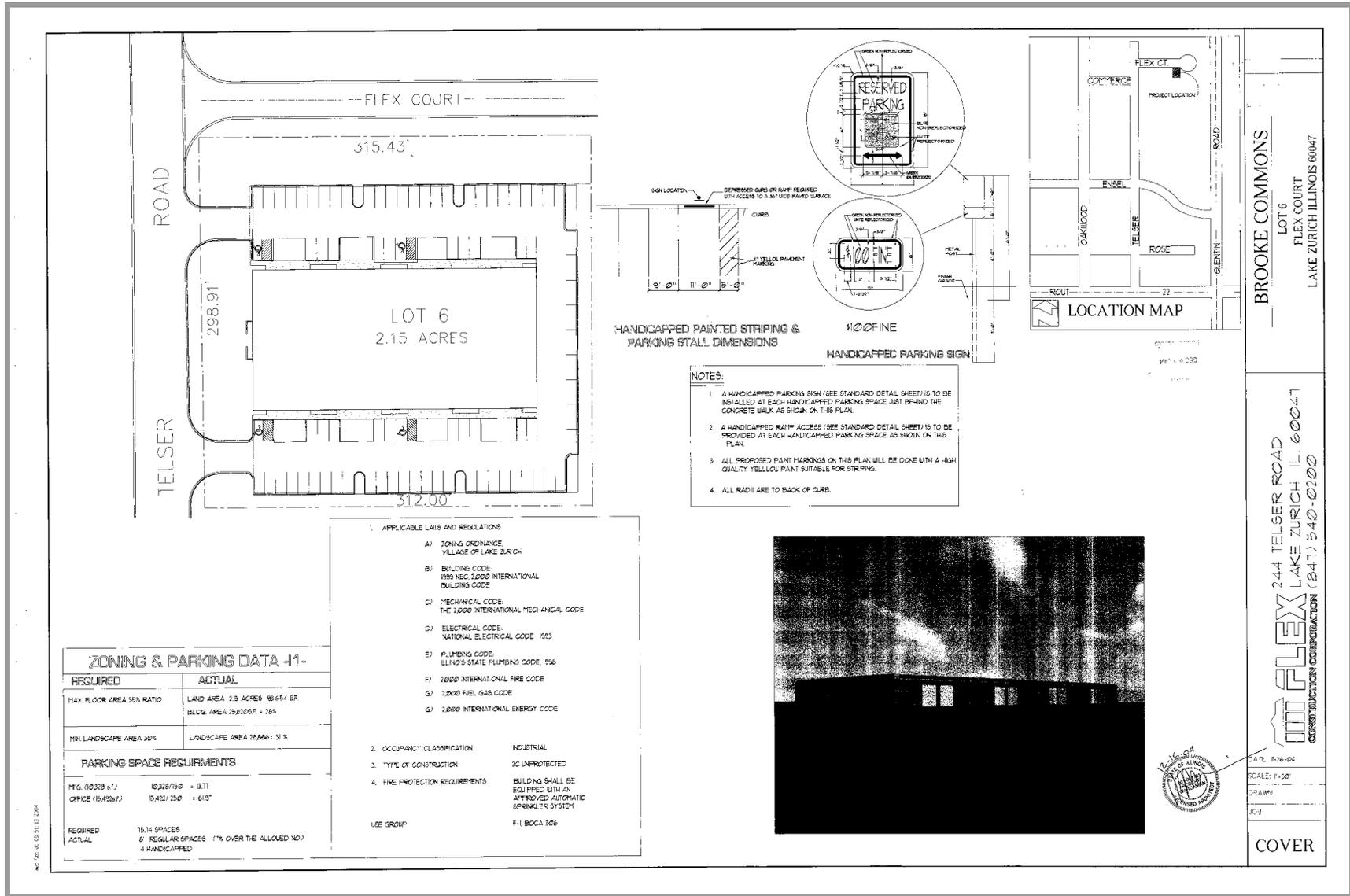
Our operation will never have a negative impact on anyone's health for any reason.

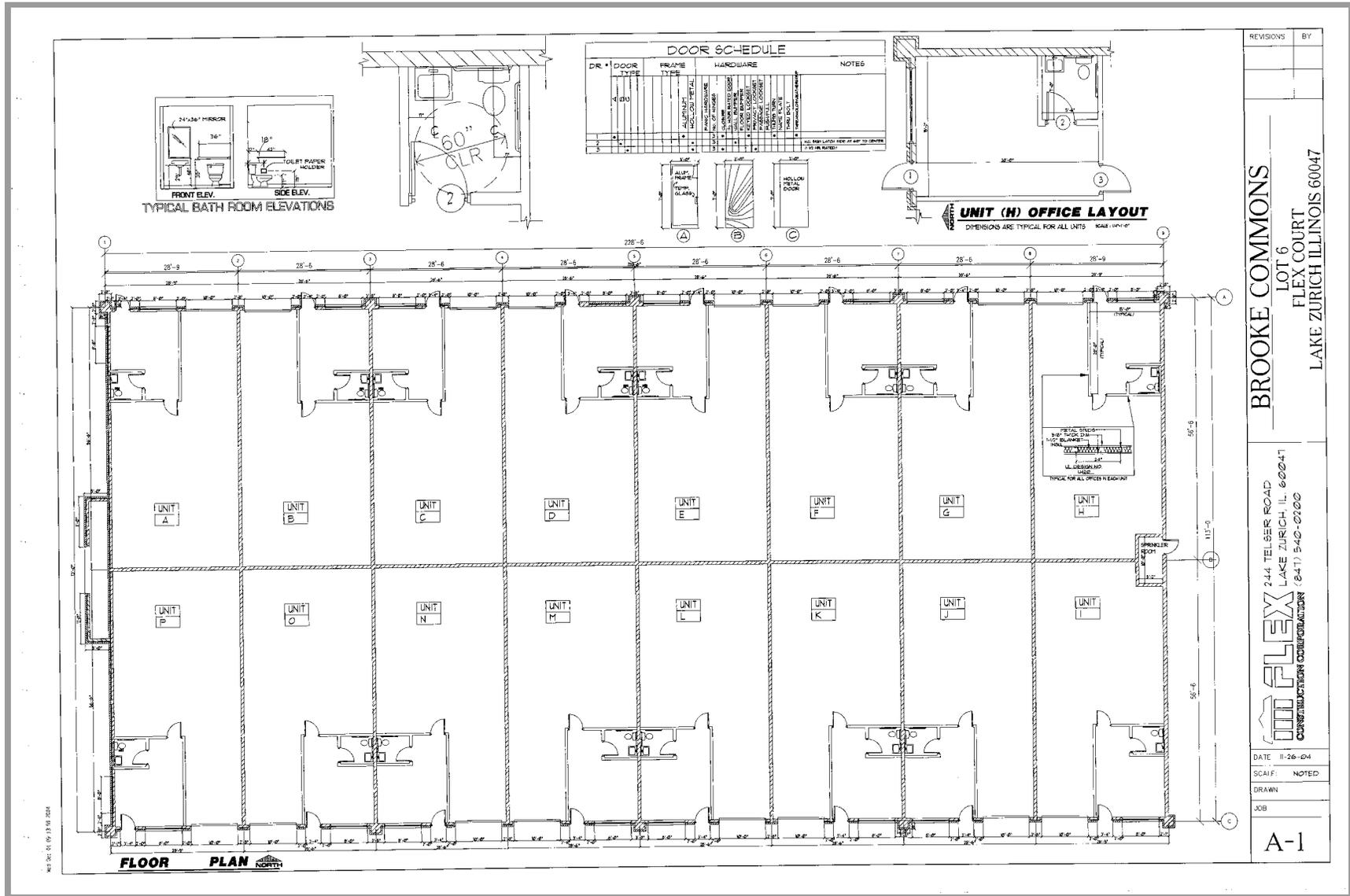
We take our responsibilities seriously.

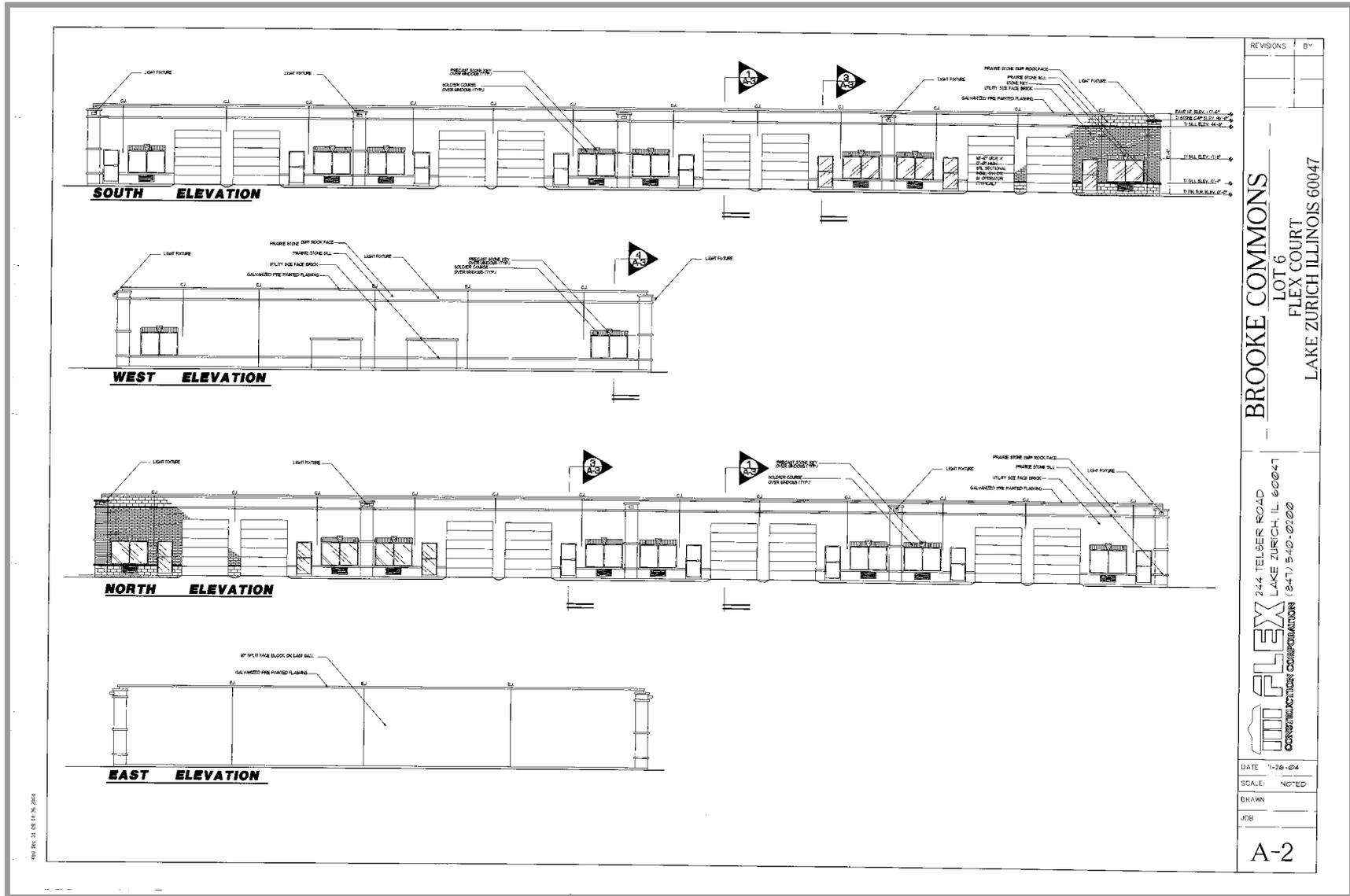
There will be No Noise, No Smell, Very little Smoke and all-out safety procedures.

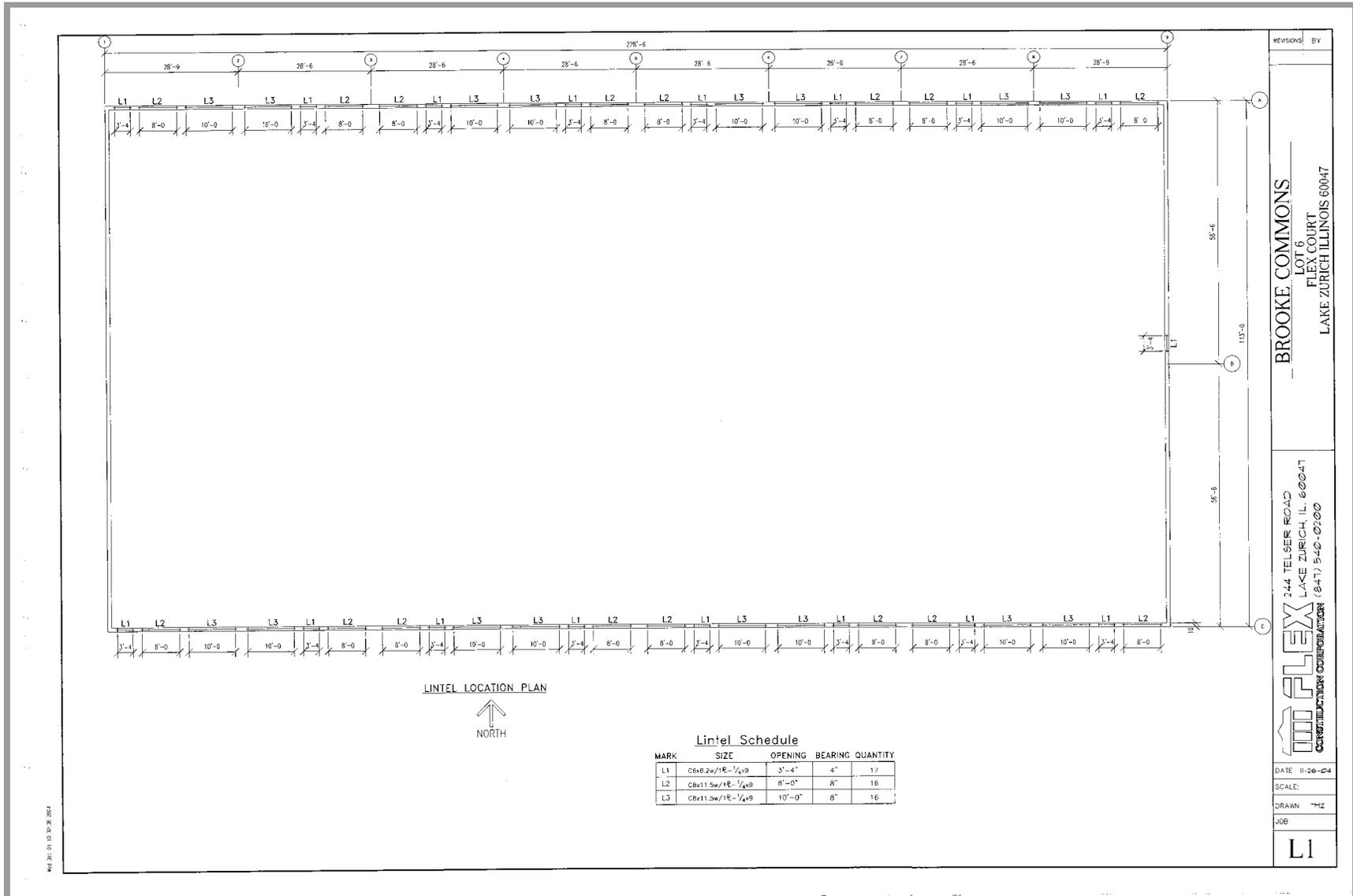
With all this in mind, we hope you have all the information you need to grant us the zoning changes we seek that will make Lake Zurich the home of Journey Cremations.

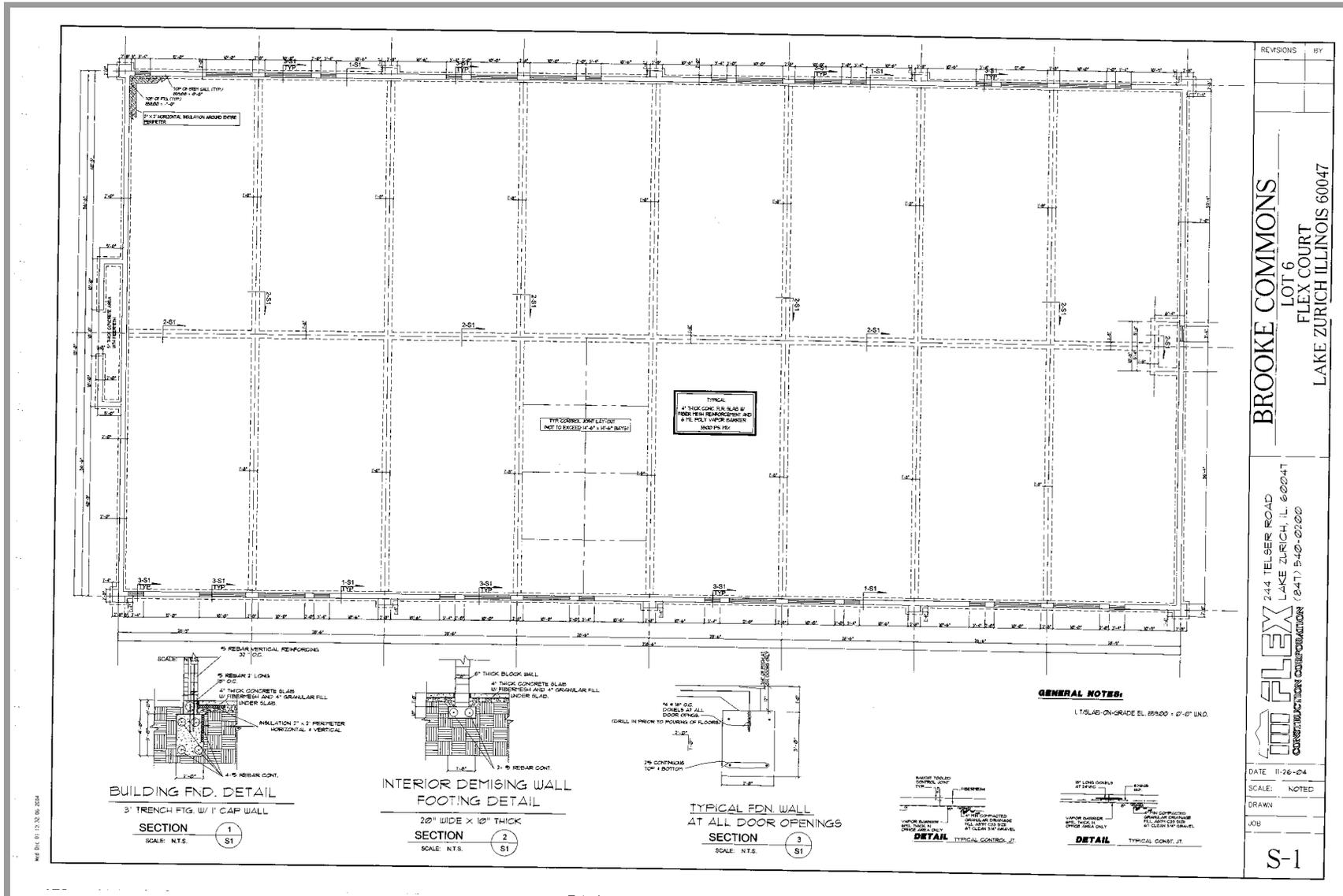
Please do not hesitate to ask for any additional information.

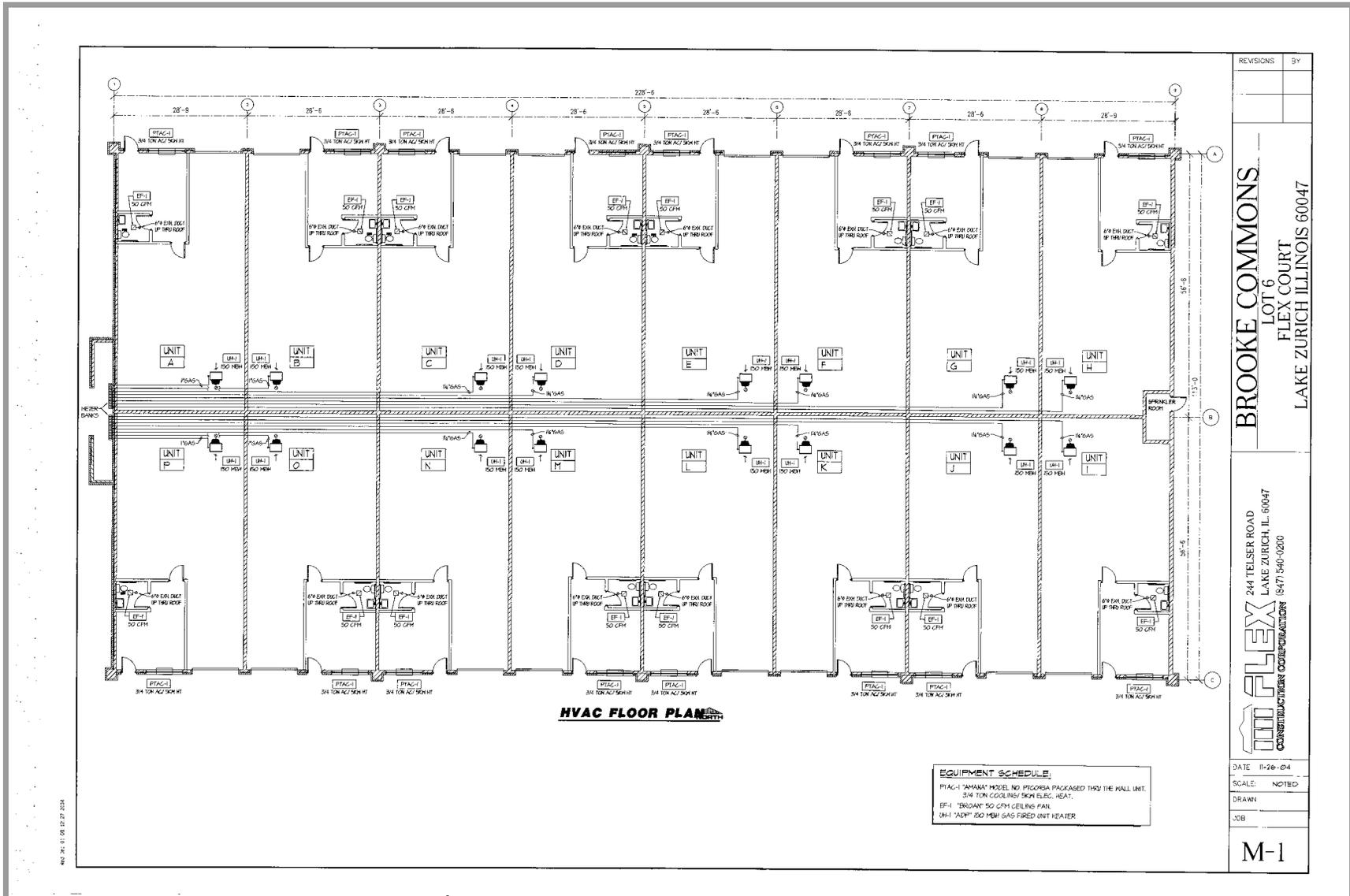












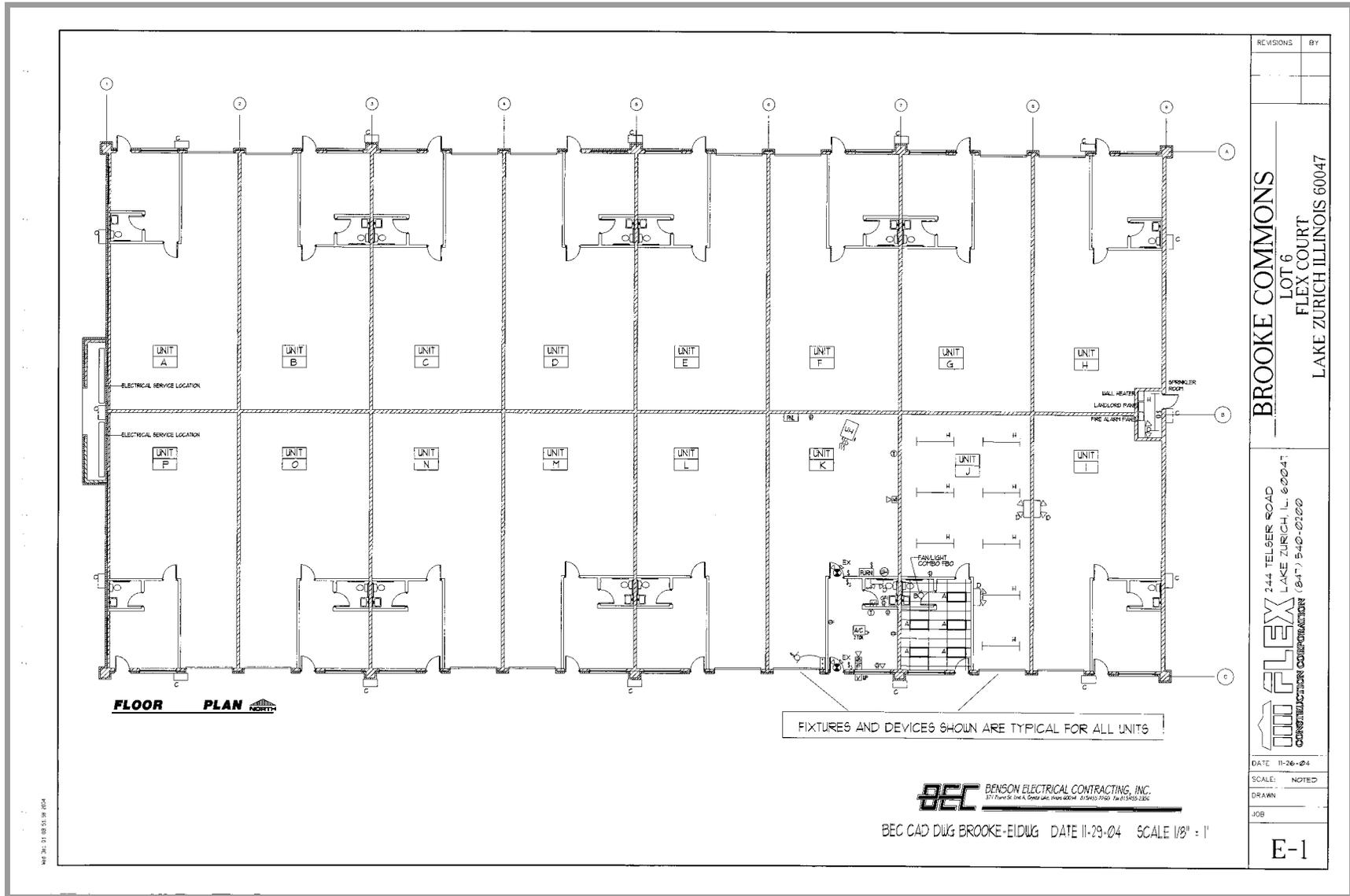
REVISIONS	BY

BROOKE COMMONS
 LOT 6
 FLEX COURT
 LAKE ZURICH ILLINOIS 60047

244 TELSER ROAD
 LAKE ZURICH, IL 60047
PLEX
 CONSTRUCTION CONSULTANTS (847) 540-0200

DATE	11-26-2014
SCALE	NOTED
DRAWN	
JOB	

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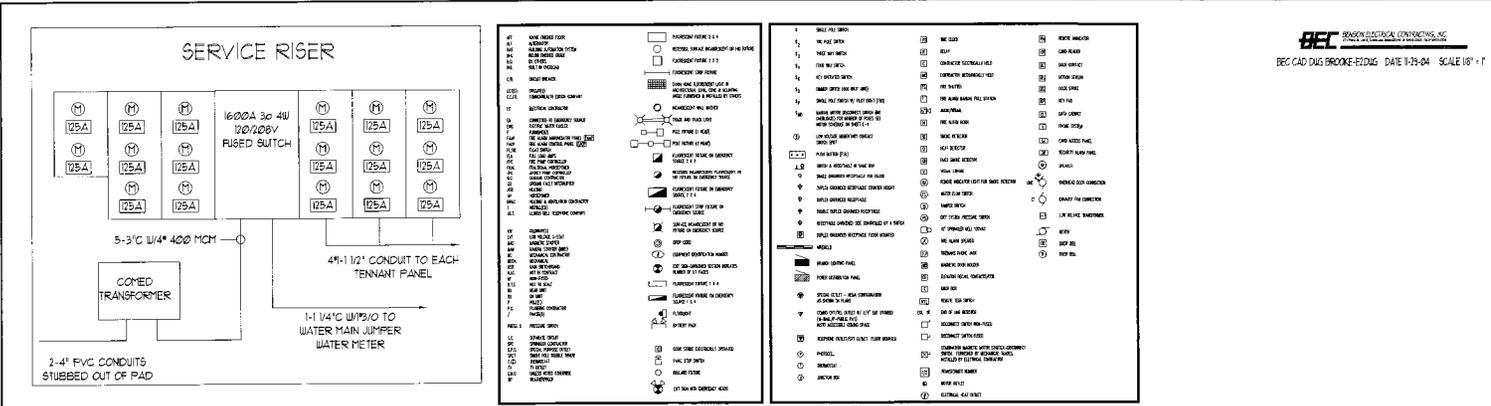
REVISIONS	BY

BROOKE COMMONS
LOT 6
FLEX COURT
LAKE ZURICH ILLINOIS 60047

244 TELSER ROAD
LAKE ZURICH, IL 60047
FLEX
CONSTRUCTION CORPORATION (847) 540-0200

DATE 11-26-04
SCALE: NOTED
DRAWN
JOB

E-1



BET BENTON ELECTRICAL CONTRACTORS, INC.
 REC DUG DUG BROOKFIELD DATE 1-29-04 SCALE 1/8" = 1'

<p>1. 1600A 30 4W 277/480V FUSED SWITCH</p> <p>2. 5-3/4" X 4" CONDUIT</p> <p>3. 4-1/2" X 1/2" CONDUIT TO EACH TENANT PANEL</p> <p>4. 2-4" PVC CONDUITS STUBBED OUT OF PAD</p> <p>5. 1-1/4" X 1/2" WATER METER</p>	<p>1. 1600A 30 4W 277/480V FUSED SWITCH</p> <p>2. 5-3/4" X 4" CONDUIT</p> <p>3. 4-1/2" X 1/2" CONDUIT TO EACH TENANT PANEL</p> <p>4. 2-4" PVC CONDUITS STUBBED OUT OF PAD</p> <p>5. 1-1/4" X 1/2" WATER METER</p>	<p>1. 1600A 30 4W 277/480V FUSED SWITCH</p> <p>2. 5-3/4" X 4" CONDUIT</p> <p>3. 4-1/2" X 1/2" CONDUIT TO EACH TENANT PANEL</p> <p>4. 2-4" PVC CONDUITS STUBBED OUT OF PAD</p> <p>5. 1-1/4" X 1/2" WATER METER</p>
---	---	---

FIXTURE SCHEDULE

WTR TYPE	LAMP	DESCRIPTION	MANUFACTURER	CATALOG NUMBER	QTY	WTR	FINISH	WATTAGE	CLG TYPE
A	4	28 WTR	LITHONIA	8078436A1	120			120	GR10
A	4	28 WTR	LITHONIA	8078436A1	120			120	GR10
B	1	100 WATT FLUO LIGHT	GE	100 WATT FLUO LIGHT	1			100	GR10
B	1	250 WATT WALL PACK	GE	250 WATT WALL PACK	1			250	GR10
B	1	BATTERY UNIT	GE	BATTERY UNIT	1			120	GR10
B	1	EXH. SIGN	LITHONIA	EXH. SIGN	1			120	GR10
F	4	32 WTR	GE	32 WTR	120			120	GR10

WTR TYPE	LAMP	DESCRIPTION	MANUFACTURER	CATALOG NUMBER	QTY	WTR	FINISH	WATTAGE	CLG TYPE
A	4	28 WTR	LITHONIA	8078436A1	120			120	GR10
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B	1	EXH. SIGN	LITHONIA	EXH. SIGN	1			120	GR10
F	4	32 WTR	GE	32 WTR	120			120	GR10

LOAD CALCULATION PANEL

BASED ON THE 1999 NEC

CONNECTED LOAD	2,000 VA
LINE L1	1,000 VA
LINE L2	1,000 VA
LINE L3	2,000 VA
LABOUR LINE LOAD X 3	6,000 VA
ADJUSTED DESIGN LOAD	3,000 VA

LOAD CALCULATION PANEL

BASED ON THE 1999 NEC

CONNECTED LOAD	2,000 VA
LINE L1	1,000 VA
LINE L2	1,000 VA
LINE L3	2,000 VA
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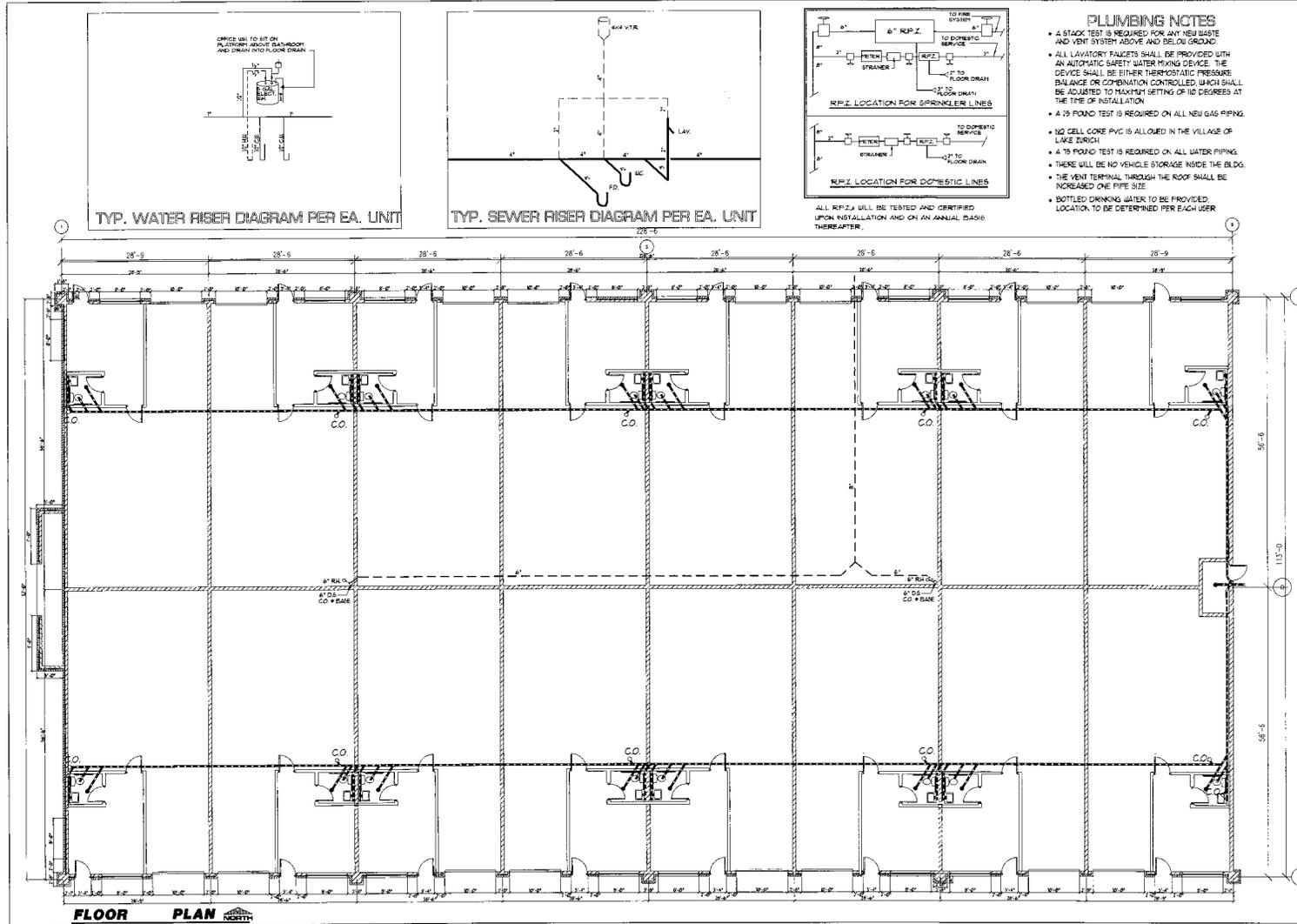
REVISIONS BY

BROOKE COMMONS
 LOT 6
 FLEX COURT
 LAKE ZURICH ILLINOIS 60047

244 TELSER ROAD
 LAKE ZURICH, IL 60047
 CONSULTING CONTRACTORS (847) 542-0200

DATE 11-26-04
 SCALE: NOTED
 DRAWN
 JOB

E-2



- PLUMBING NOTES**
- A STACK TEST IS REQUIRED FOR ANY NEW BASTE AND VENT SYSTEM ABOVE AND BELOW GROUND.
 - ALL LAVATORY FAUCETS SHALL BE PROVIDED WITH AN AUTOMATIC SAFETY WATER MIXING DEVICE. THE DEVICE SHALL BE EITHER THERMOSTATIC PRESSURE BALANCE OR COMBINATION CONTROLLED WHICH SHALL BE ADJUSTED TO MAXIMUM SETTING OF 110 DEGREES AT THE TIME OF INSTALLATION.
 - A 15 POUND TEST IS REQUIRED ON ALL NEW GAS PIPING.
 - NO CELL CORE PVC IS ALLOWED IN THE VILLAGE OF LAKE ZURICH.
 - A 15 POUND TEST IS REQUIRED ON ALL WATER PIPING.
 - THERE WILL BE NO VEHICLE STORAGE INSIDE THE BLDG.
 - THE VENT TERMINAL THROUGH THE ROOF SHALL BE INCREASED ONE PIPE SIZE.
 - BOTTLED DRINKING WATER TO BE PROVIDED. LOCATION TO BE DETERMINED PER EACH USER.

REVISIONS	BY

BROOKE COMMONS
 LOT 6
 FLEX COURT
 LAKE ZURICH ILLINOIS 60047

FLEX 244 TELSER ROAD
 LAKE ZURICH, IL 60041
 CONSTRUCTION CONSULTANTS (847) 540-0200

DATE: 11-26-04
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 DRAWN:
 JOB:

P-1

EXHIBIT C
PERCENTAGE OF OWNERSHIP

<u>Unit</u>	<u>Square footage</u>	<u>Undivided Interest</u>
Unit 700	1,629.48	6.28
Unit 704	1,620.16	6.24
Unit 708	1,617.62	6.24
Unit 712	1,618.46	6.24
Unit 716	1,619.59	6.24
Unit 720	1,620.45	6.24
Unit 724	1,620.45	6.24
Unit 728	1,632.32	6.29
Unit 732	1,629.78	6.28
Unit 736	1,620.17	6.24
Unit 740	1,617.34	6.23
Unit 744	1,618.46	6.24
Unit 748	1,620.44	6.24
Unit 752	1,619.60	6.24
Unit 756	1,619.31	6.24
Unit 760	1,630.61	6.28
Total	25,954.24	100.00

-37-

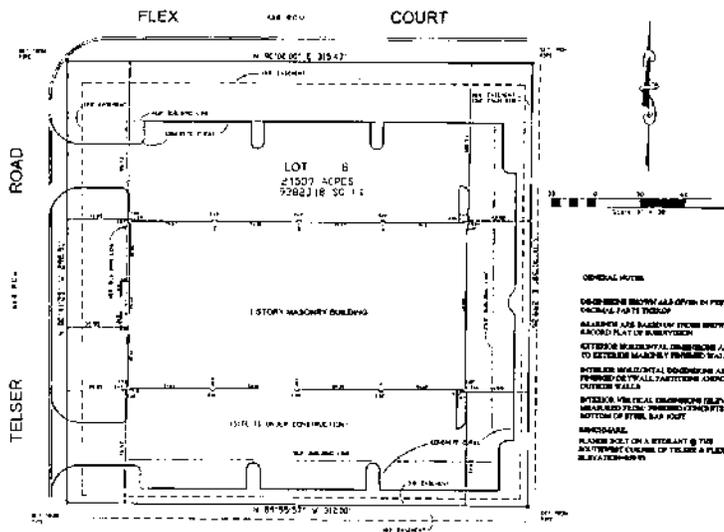
38

Alan J. Coulson, P.C.
PROFESSIONAL LAND SURVEYORS
PLAT OF SURVEY

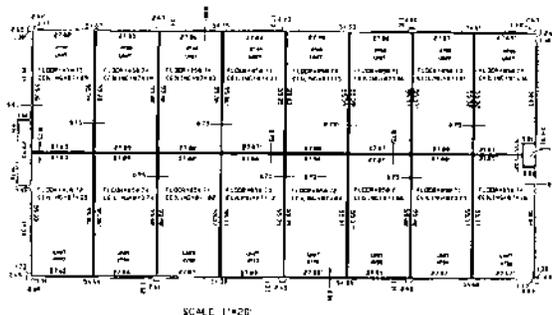
5900242
 11-21-05

BROOKE COMMONS INDUSTRIAL CONDOMINIUM

OF PROPERTY DESCRIBED AS:
 LOT 8 IN FLEX SUBDIVISION, SARDIS A SUBDIVISION OF THE NORTHEAST QUARTER
 OF THE NORTHWEST QUARTER OF SECTION 16, TOWNSHIP 43 NORTH, RANGE 10 EAST
 OF THE THIRD PRINCIPAL MERIDIAN, IN LAKE COUNTY, ILLINOIS



GENERAL NOTES
 1. DIMENSIONS SHOWN ARE GIVEN IN FEET AND DECIMAL PARTS THEREOF.
 2. ALL DIMENSIONS ARE BASED ON THE SURVEYED DATA.
 3. EXISTING MASONRY BUILDINGS ARE REQUIRED TO EXCEED MASONRY FINISHED WALLS.
 4. EXISTING MASONRY BUILDINGS ARE REQUIRED TO EXCEED MASONRY FINISHED WALLS.
 5. EXISTING MASONRY BUILDINGS ARE REQUIRED TO EXCEED MASONRY FINISHED WALLS.
 6. EXISTING MASONRY BUILDINGS ARE REQUIRED TO EXCEED MASONRY FINISHED WALLS.
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 8. EXISTING MASONRY BUILDINGS ARE REQUIRED TO EXCEED MASONRY FINISHED WALLS.
 9. EXISTING MASONRY BUILDINGS ARE REQUIRED TO EXCEED MASONRY FINISHED WALLS.
 10. EXISTING MASONRY BUILDINGS ARE REQUIRED TO EXCEED MASONRY FINISHED WALLS.



THIS PLAN IS DRAWN IN COMPLIANCE WITH THE ILLINOIS SURVEYING ACT AND THE ILLINOIS CONDOMINIUM ACT.
 CHARLES J. HILL, SURVEYOR
 ILLINOIS SURVEYOR #123456

FIELD WORK COMPLETED BY: [Signature]
 DATE: [Date]

PREPARED FOR: [Client Name]
 PROJECT: [Project Name]

Alan J. Coulson, P.C.
 Professional Land Surveyors
 100 N. Main St.
 Moline, IL 61704
 Phone: 309-241-1111

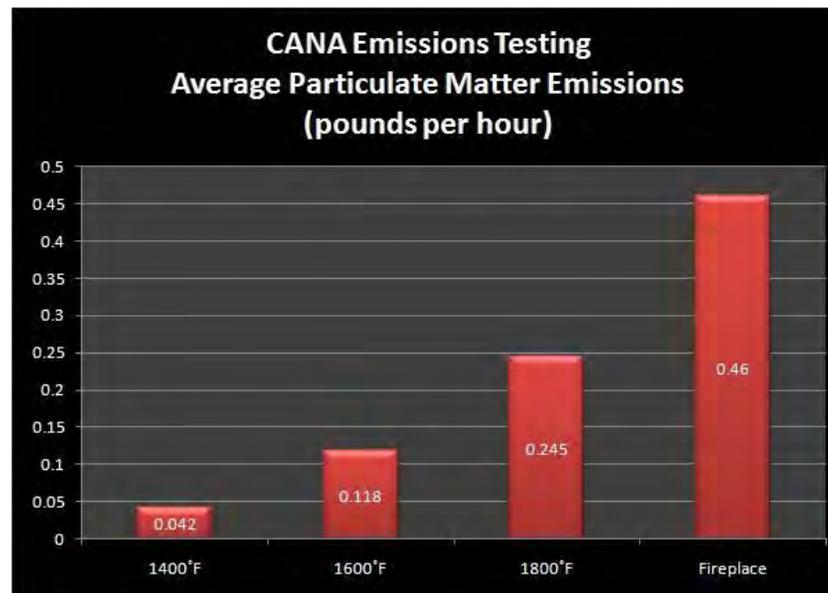
Direct Cremation Survey

May 2021

Municipality	1. Does your community allow direct cremation?	2. If yes, in what zoning district is this land use allowed?	3. If yes, is it allowed as a Permitted Use or a Special (Conditional) use?	4. If yes, does your code have any special conditions attached to the establishment of a direct cremation facility – such as operation within a stand-alone building?	5. If yes, please provide the pertinent code sections.
Arlington Heights	Crematories are classified as fall under the classification of "Cemetery/Mausoleum", which are a special use in certain zoning districts.	Residential Districts R-E, R-1, R-2, & R-3 (as a special use).	Special Use only.	During special use approval process Staff notes that to be a harmonious use no odors can be detectable from the operation.	
Barrington	No.	N/A.	N/A.	N/A.	
Glencoe	Our code is silent on this topic.				
Grayslake	Yes.	General Business, Shopping.	Permitted Use.	N/A.	
Lake Zurich	No.	N/A.	N/A.	N/A.	Lake Zurich currently allows cremation but only as a component use accompanying regular funeral services, visitation, etc. within a funeral parlor.
Lincolnshire	No, our code doesn't address it but allows funeral homes in certain districts.				
Lincolnwood	No, it is not currently defined or listed as a use in the Zoning Ordinance.				

Direct Cremation Survey					May 2021
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Morton Grove	No - 12-4-4:B.5: Specifically Excluded Uses: Only uses listed in this section as permitted uses or special uses shall be allowed in the manufacturing districts. All other uses including, but not limited to, the uses listed below are specifically excluded. - Manufacturing processes which emanate noxious odors, such as crematories, creosote treatment or manufacture, fertilizer manufacture, dumping, reduction or other processing of garbage, ore reduction, natural or synthetic rubber, caoutchouc or gutta percha manufacture, salt work, sauerkraut manufacture, soap manufacture, tar distillation or manufacture, or cement concrete or asphaltic concrete mixing plants.	N/A.	N/A.	N/A.	
Niles	Cremation is included in the definition of Funeral Home in the Zoning Ordinance.	Funeral Homes are permitted in the C-1 through C-4 districts with special use approval and by right in the Manufacturing district.	See previous answer.	N/A.	Funeral Home: An establishment that prepares the dead for burial display and for rituals before burial or cremation, including chapels for the display of the deceased and the conducting of rituals before burial or cremation. This definition of funeral home includes crematoriums and body disposal services.
Northbrook	Not permitted.				

Direct Cremation Survey					May 2021
Municipality	1. Does your community allow direct cremation?	2. If yes, in what zoning district is this land use allowed?	3. If yes, is it allowed as a Permitted Use or a Special (Conditional) use?	4. If yes, does your code have any special conditions attached to the establishment of a direct cremation facility – such as operation within a stand-alone building?	5. If yes, please provide the pertinent code sections.
Park Ridge	No.	N/A.	N/A.	N/A.	Direct cremation does not meet the definition of current permitted uses. (The City of Park Ridge does not have industrial zoning districts).
Schaumburg	Schaumburg allows cremation with special use approval (not necessarily direct cremation as defined by Lake Zurich). Schaumburg's definitions are in comments below.	M1 (Industrial). B2 & B4 as accessory use (Commercial).	Special Use in M1 as a primary use. Special Use in B2 and B4 as an accessory use to a funeral home.	Not for a "direct cremation facility" as you define it. For the accessory use to a funeral home, we do require that it be located in the principal structure.	CREMATION SERVICES: A portion of a funeral home (as an accessory use) used for the act of performing human cremation in compliance with state and federal regulations. The act of cremation must take place within the principal structure. CREMATORY: An establishment whose primary use is performing the act of cremation in compliance with the state and federal regulations.
Skokie	Cremation services is a special use in the M1, M2, M3 districts.	Cremation services is not permitted by right in any district.	Cremation services is a special use in the M1, M2, M3 districts.	No - conditions are determined through the special use process.	https://library.municode.com/il/skokie/codes/zoning Appendix A.





Harmful Noise Levels

Topic Overview

The effects of noise on hearing vary among people. Some people's ears are more sensitive to loud sounds, especially at certain frequencies. (Frequency means how low or high a tone is.) But any sound that is loud enough and lasts long enough can damage hearing and lead to [hearing loss](#). ([/health-library/ug2252#ug2252-sec](#)).

A sound's loudness is measured in decibels (dB). Normal conversation is about 60 dB, a lawn mower is about 90 dB, and a loud rock concert is about 120 dB. In general, sounds above 85 are harmful, depending on how long and how often you are exposed to them and whether you wear hearing protection, such as earplugs or earmuffs.

Following is a table of the decibel level of a number of sounds.

Hi! I can help answer COVID-19 and COVID-19 vaccine questions for you.

Noise levels

Noise	Average decibels (dB)
Leaves rustling, soft music, whisper	30
Average home noise	40
Normal conversation, background music	60
Office noise, inside car at 60 mph	70
Vacuum cleaner, average radio	75
Heavy traffic, window air conditioner, noisy restaurant, power lawn mower	80–89 (sounds above 85 dB are harmful)
Subway, shouted conversation	90–95
Boom box, ATV, motorcycle	96–100
School dance	101–105
Chainsaw, leaf blower, snowmobile	106–115
Sports crowd, rock concert, loud symphony	120–129
Stock car races	130
Gun shot, siren at 100 feet	140

As loudness increases, the amount of time you can hear the sound before damage occurs decreases. Hearing protectors reduce the loudness of sound reaching the ears, making it possible to listen to louder sounds for a longer time.

Preventing damage to your hearing

An easy way to become aware of potentially harmful noise is to pay attention to warning signs that a sound might be damaging to your hearing. A sound may be harmful if:

- You have difficulty talking or hearing others talk over the sound.
- The sound makes your ears hurt.
- Your ears are ringing after hearing the sound.
- Other sounds seem muffled after you leave an area where there is loud sound.

From: [Lisa Gagliano](#)
To: [Roy Witherow](#)
Cc: [Sarosh Saher](#)
Subject: Re: Crematorium
Date: Tuesday, January 19, 2021 1:29:12 PM

Thank you for getting back to me so quickly. As of right now we do not have a location in mind. I am looking to find out what areas this use would be acceptable in. Then we can look at locations that may work.

Lisa Gagliano
Broker
Coldwell Banker
Cell: 773.818.1888
Fax 847.908.7518

On Jan 19, 2021, at 1:24 PM, Roy Witherow <Roy.Witherow@lakezurich.org> wrote:

Hello Lisa,

Good to hear from you. I am including our community development director, Sarosh Saher, in this email, as this department oversees items coming before the Planning and Zoning Commission. I have asked Sarosh for clarification on your inquiry, for which he has responded below.

Is there a particular site you have in mind?

Best regards,

Roy T. Witherow, ICMA-CM
Assistant Village Manager
Village of Lake Zurich, Illinois
847-540-1758

From: Sarosh Saher <Sarosh.Saher@lakezurich.org>
Sent: Tuesday, January 19, 2021 12:06 PM
To: Roy Witherow <Roy.Witherow@lakezurich.org>
Subject: RE: Crematorium

Roy – thanks for sharing the message. Locations for a funeral home with crematorium, or a crematorium on its own are very limited and only allowed in the B-1 Local and

Community Business District as a Special Use. Davenport funeral home is located on property zoned within the B-1 district.

Special use permits are required to go through the public hearing process with the PZC with final approval granted by the Village Board.

Please let me know if you have any further questions.

Thanks.

Sarosh

From: Roy Witherow
Sent: Tuesday, January 19, 2021 10:56 AM
To: Sarosh Saher <Sarosh.Saher@lakezurich.org>
Subject: FW: Crematorium

From: Lisa Gagliano <lisagaglianosells@gmail.com>
Sent: Tuesday, January 19, 2021 9:57 AM
To: Roy Witherow <Roy.Witherow@lakezurich.org>
Subject: Crematorium

Hi Roy,

I have a client looking to possible look at opening a crematorium in Lake Zurich. Can you let me know where this permitted use would be allowed and what steps need to be done for this to happen.

Thank you in advance,

Lisa Gagliano

Broker
Coldwell Banker Commercial NRT
530 N. Hough St.
Suite 180
Barrington, IL 60010
Cell: 773.818.1888
Fax: 847.908.7518

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From: [Roy Witherow](#)
To: [Lisa Gagliano](#)
Cc: [Sarosh Saher](#)
Subject: RE: Crematorium
Date: Wednesday, January 27, 2021 1:36:43 PM

Hello Lisa,

The crematorium in the B-1 District is part of the Davenport Funeral Home and is not an industrial crematoria and thus allowed. I believe the type of facility you mention is an industrial crematoria typically located in an industrial zoned district and, as such, would require a text amendment.

Regards,

Roy T. Witherow, ICMA-CM
Assistant Village Manager
Village of Lake Zurich, Illinois
847-540-1758

From: Lisa Gagliano <lisagaglianosells@gmail.com>
Sent: Thursday, January 21, 2021 11:38 AM
To: Roy Witherow <Roy.Witherow@lakezurich.org>
Cc: Sarosh Saher <Sarosh.Saher@lakezurich.org>
Subject: Re: Crematorium

Roy and Sarosh,

I could see a funeral home being in a B-1 district but a crematorium would most likely be in a M-1 zoning or Industrial.
They need a warehouse space and a DID.

Are you sure this would be considered in an B-1?
From the research I have come up with none are located in a B-1 in any municipality.
Can you please look into this further.
He is leaning towards LZ.
Thank you,

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From: [Roy Witherow](#)
To: [Lisa Gagliano](#)
Cc: [Paul Chapman](#); [Sarosh Saher](#)
Subject: RE: Crematorium
Date: Friday, March 19, 2021 8:30:19 AM

Good Morning Lisa,

I had an initial discussion with our Community Development Director, Sarosh Saher, on this subject Wednesday. On the face of it, it looks like it would be a simple warehouse/storage issue, as long as the only function would be to temporarily store bodies in the appropriate environment until they are transported to another facility. Are you free in the next few days to discuss with Sarosh and me by phone?

Best regards,

Roy T. Witherow, ICMA-CM
Assistant Village Manager
Village of Lake Zurich, Illinois
847-540-1758

From: Lisa Gagliano <lisagaglianosells@gmail.com>
Sent: Thursday, March 18, 2021 11:32 AM
To: Roy Witherow <Roy.Witherow@lakezurich.org>
Cc: Paul Chapman <paulc1060@gmail.com>
Subject: Re: Crematorium

Hi Roy,
I wanted to follow up from our call last week regarding the space on Rose for the cremation tenant.
Can you please let me know what if anything you have found out?
Thank you in advance,
Lisa Gagliano

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Barrington, IL 60010
Cell: 773.818.1888
Fax: 847.908.7518

On Wed, Jan 27, 2021 at 1:36 PM Roy Witherow <Roy.Witherow@lakezurich.org> wrote:

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Barrington, IL 60010
Cell: 773.818.1888
Fax: 847.908.7518

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From: [Sarosh Saher](#)
To: [Lisa Gagliano](#)
Cc: [Roy Witherow](#)
Subject: RE: Crematorium
Date: Monday, March 29, 2021 8:27:00 AM

Hi Lisa – my response below was related to the property you had asked about – 708 Telser. My apologies, I assumed that you were aware that 708 was located in the industrial zoning district and regulated similar to the Rose Road property.

In terms of zoning – both properties are in the LZ Corporate Industrial Park, zoned within the I-Industrial district. The I-district does not allow for cremation.

But Roy and I available today to discuss more. How about 1:00pm today or any time after. I can send out a virtual meeting invite if that works for you. We use Microsoft Teams for virtual meetings.

Thanks.
Sarosh

From: Lisa Gagliano <lisagaglianosells@gmail.com>
Sent: Monday, March 29, 2021 7:47 AM
To: Sarosh Saher <Sarosh.Saher@lakezurich.org>
Cc: Roy Witherow <Roy.Witherow@lakezurich.org>
Subject: Re: Crematorium

Hi Sarosh,

This is a different location.
Maybe for all of us to get on the same page we can do a quick call.
Do you and Roy have time today?

Lisa Gagliano
Broker
Coldwell Banker Commercial NRT
Cell: 773.818.1888

On Mar 29, 2021, at 7:35 AM, Sarosh Saher <Sarosh.Saher@lakezurich.org> wrote:

Good morning Lisa – to clarify – we would only consider the space for storage, not cremation. As Roy stated in his earlier email - warehouse/storage use, as long as the only function would be to temporarily store bodies in the appropriate environment until they are transported to another facility for cremation.

If warehousing and storage is the only function/land use proposed we would be happy to discuss further with you.

Please let us know if you have any further questions.

Thanks.

Sarosh

Sarosh B. Saher, AICP

Community Development Director | Village of Lake Zurich | 505 Telser Road, Lake Zurich, IL 60047

sarosh.saher@lakezurich.org | Direct: 847-540-1754

Engage with Lake Zurich at LakeZurich.org/Connect

From: Lisa Gagliano <lisagaglianosells@gmail.com>

Sent: Friday, March 26, 2021 4:45 PM

To: Roy Witherow <Roy.Witherow@lakezurich.org>

Cc: Sarosh Saher <Sarosh.Saher@lakezurich.org>

Subject: Re: Crematorium

Hi Roy and Sarosh,

We saw a space that would work for both the storage and cremation at: 708 Telser.

Can you confirm that this would be okay with the zoning?

Thank you,

Lisa Gagliano

Broker

Coldwell Banker Commercial NRT

530 N. Hough St.

Suite 180

Barrington, IL 60010

Cell: 773.818.1888

Fax: 847.908.7518

On Fri, Mar 19, 2021 at 8:30 AM Roy Witherow <Roy.Witherow@lakezurich.org> wrote:

Good Morning Lisa,

I had an initial discussion with our Community Development Director, Sarosh Saher, on this subject Wednesday. On the face of it, it looks like it would be a simple

warehouse/storage issue, as long as the only function would be to temporarily store bodies in the appropriate environment until they are transported to another facility. Are you free in the next few days to discuss with Sarosh and me by phone?

Best regards,

Roy T. Witherow, ICMA-CM
Assistant Village Manager
Village of Lake Zurich, Illinois
847-540-1758

From: Lisa Gagliano <lisagaglianosells@gmail.com>
Sent: Thursday, March 18, 2021 11:32 AM
To: Roy Witherow <Roy.Witherow@lakezurich.org>
Cc: Paul Chapman <paulc1060@gmail.com>
Subject: Re: Crematorium

Hi Roy,
I wanted to follow up from our call last week regarding the space on Rose for the cremation tenant.
Can you please let me know what if anything you have found out?
Thank you in advance,

Lisa Gagliano

Broker
Coldwell Banker Commercial NRT
530 N. Hough St.
Suite 180
Barrington, IL 60010
Cell: 773.818.1888
Fax: 847.908.7518

On Wed, Jan 27, 2021 at 1:36 PM Roy Witherow <Roy.Witherow@lakezurich.org> wrote:

Hello Lisa,

The crematorium in the B-1 District is part of the Davenport Funeral Home and is not an industrial crematoria and thus allowed. I believe the type of facility you mention is an industrial crematoria typically located in an industrial zoned district and, as such, would require a text amendment.

Regards,

Roy T. Witherow, ICMA-CM
Assistant Village Manager
Village of Lake Zurich, Illinois
847-540-1758

From: Lisa Gagliano <lisagaglianosells@gmail.com>
Sent: Thursday, January 21, 2021 11:38 AM
To: Roy Witherow <Roy.Witherow@lakezurich.org>
Cc: Sarosh Saher <Sarosh.Saher@lakezurich.org>
Subject: Re: Crematorium

Roy and Sarosh,

I could see a funeral home being in a B-1 district but a crematorium would most likely be in a M-1 zoning or Industrial.
They need a warehouse space and a DID.

Are you sure this would be considered in an B-1?
From the research I have come up with none are located in a B-1 in any municipality.
Can you please look into this further.
He is leaning towards LZ.
Thank you,

Lisa Gagliano

Broker
Coldwell Banker Commercial NRT
530 N. Hough St.
Suite 180
Barrington, IL 60010
Cell: 773.818.1888
Fax: 847.908.7518

On Tue, Jan 19, 2021 at 1:29 PM Lisa Gagliano <lisagaglianosells@gmail.com> wrote:

Thank you for getting back to me so quickly. As of right now we do not have a location in mind. I am looking to find out what areas this use would be acceptable in. Then we can look at locations that may work.

Lisa Gagliano
Broker
Coldwell Banker
Cell: 773.818.1888
Fax 847.908.7518

On Jan 19, 2021, at 1:24 PM, Roy Witherow
<Roy.Witherow@lakezurich.org> wrote:

Hello Lisa,

Good to hear from you. I am including our community development director, Sarosh Saher, in this email, as this department oversees items coming before the Planning and Zoning Commission. I have asked Sarosh for clarification on your inquiry, for which he has responded below.

Is there a particular site you have in mind?

Best regards,

Roy T. Witherow, ICMA-CM
Assistant Village Manager
Village of Lake Zurich, Illinois
847-540-1758

From: Sarosh Saher <Sarosh.Saher@lakezurich.org>
Sent: Tuesday, January 19, 2021 12:06 PM
To: Roy Witherow <Roy.Witherow@lakezurich.org>
Subject: RE: Crematorium

Roy – thanks for sharing the message. Locations for a funeral home with crematorium, or a crematorium on its own are very limited and only allowed in the B-1 Local and Community Business District as a Special Use. Davenport funeral home is located on property zoned within the B-1 district.

Special use permits are required to go through the public hearing process with the PZC with final approval granted by the Village Board.

Please let me know if you have any further questions.
Thanks.
Sarosh

From: Roy Witherow
Sent: Tuesday, January 19, 2021 10:56 AM
To: Sarosh Saher <Sarosh.Saher@lakezurich.org>
Subject: FW: Crematorium

From: Lisa Gagliano <lisagaglianosells@gmail.com>
Sent: Tuesday, January 19, 2021 9:57 AM
To: Roy Witherow <Roy.Witherow@lakezurich.org>
Subject: Crematorium

Hi Roy,

I have a client looking to possible look at opening a crematorium in Lake Zurich.
Can you let me know where this permitted use would be allowed and what steps need to be done for this to happen.
Thank you in advance,

Lisa Gagliano

Broker
Coldwell Banker Commercial NRT
530 N. Hough St.
Suite 180
Barrington, IL 60010
Cell: 773.818.1888
Fax: 847.908.7518

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From: [Lisa Gagliano](#)
To: [Sarosh Saher](#); [Roy Witherow](#)
Cc: [Paul Chapman](#)
Subject: Fwd: Lake Zurich Presentation
Date: Wednesday, March 31, 2021 6:18:08 PM
Attachments: [Lake Zurich Presentation 3-31-21.pdf](#)

Hi Sarosh and Roy,

Thank you so much for the call with Paul about the Crematorium.
Please see the attached document and let us know if you have any questions.
We look forward to hearing about us being confirmed for the 19th of April meeting.
Thank you,

Lisa Gagliano

Broker
Coldwell Banker Commercial NRT
530 N. Hough St.
Suite 180
Barrington, IL 60010
Cell: 773.818.1888
Fax: 847.908.7518

Friday Update 210402**Potential new Crematory in the Industrial Park**

Over the past few months, the village has received a number of inquiries about establishing crematories within Lake Zurich's corporate and industrial park. However, because the land use is not provided for in the I-Industrial District, these inquiries have not resulted in any formal application for consideration. However, earlier this week, Assistant Village Manager Roy Witherow and Community Development Director Saher were approached by commercial broker Lisa Gagliano of Coldwell Banker Commercial NRT on behalf of her client Paul Chapman who is associated with Journey Cremation, a company that provides "direct cremation" services to the public and the funeral industry. In this business model, there is no provision for funerals or visitation by the public. Their preference is an industrial location with the deliberate intention not to encourage visitors. Establishment of such a use in the industrial district will require an amendment to the text of the zoning code to allow such a use. Staff has therefore recommended that Mr. Chapman present this idea to the Village Board at a Courtesy Review to obtain feedback on the likelihood of this use being allowed in the I-Industrial district.



cancer.org | 1.800.227.2345

Benzene and Cancer Risk

What is benzene?

Benzene is a colorless, flammable liquid with a sweet odor. It evaporates quickly when exposed to air. Benzene is formed from natural processes, such as volcanoes and forest fires, but most exposure to benzene results from human activities.

Benzene is among the 20 most widely used chemicals in the United States. It is used mainly as a starting material in making other chemicals, including plastics, lubricants, rubbers, dyes, detergents, drugs, and pesticides. In the past it was also commonly used as an industrial solvent (a substance that can dissolve or extract other substances) and as a gasoline additive, but these uses have been greatly reduced in recent decades.

Benzene is also a natural part of crude oil and gasoline (and therefore motor vehicle exhaust), as well as [cigarette smoke](#)¹.

How are people exposed to benzene?

The main way people are exposed is by breathing in air containing benzene. Benzene can also be absorbed through the skin during contact with a source such as gasoline, but because liquid benzene evaporates quickly, this is less common.

People can be exposed to benzene:

- At work
- In the general environment
- Through the use of some consumer products

The highest exposures have typically been in the workplace, although these have

decreased greatly over the last several decades due to federal and state regulations. Some other exposures have also gone down over time, such as the amount of benzene allowed in gasoline.

Workplace exposures

Workers in industries that make or use benzene may be exposed to this chemical. These include the rubber industry, oil refineries, chemical plants, shoe manufacturers, and gasoline-related industries. Benzene is also used to make some types of lubricants, dyes, detergents, drugs, and pesticides. Other people who may be exposed to benzene at work include steel workers, printers, lab technicians, gas station employees, and firefighters. Federal regulations limit exposure to benzene in the workplace (see below).

Community exposures

People can be exposed to benzene in the environment from gasoline fumes, automobile exhaust, emissions from some factories, and waste water from certain industries. Benzene is commonly found in air in both urban and rural areas, but the levels are usually very low. Exposures can be higher for people in enclosed spaces with unventilated fumes from gasoline, glues, solvents, paints, and art supplies. Areas of heavy traffic, gas stations, and areas near industrial sources may also have higher air levels.

[Cigarette smoking](#)² and [secondhand smoke](#)³ are important sources of exposure to benzene. Cigarette smoke accounts for about half of the exposure to benzene in the United States. Benzene levels in rooms containing tobacco smoke can be many times higher than normal.

People can also be exposed to benzene in contaminated drinking water and some foods (although the levels are usually very low).

Does benzene cause cancer?

Benzene is known to cause cancer, based on evidence from studies in both people and lab animals. The link between benzene and cancer has largely focused on [leukemia](#)⁴ and other cancers of blood cells.

What do studies show?

Researchers use 2 main types of studies to try to determine if a substance causes

cancer.

- **Studies in people:** One type of study looks at cancer rates in different groups of people. Such a study might compare the cancer rate in a group exposed to a substance to the cancer rate in a group not exposed to it, or compare it to the cancer rate in the general population. But sometimes it can be hard to know what the results of these studies mean, because many other factors might affect the results.
- **Lab studies:** In studies done in the lab, animals are exposed to a substance (often in very large doses) to see if it causes tumors or other health problems. Researchers might also expose normal human cells in a lab dish to the substance to see if it causes the types of changes that are seen in cancer cells. It's not always clear if the results from these types of studies will apply to humans, but lab studies are a good way to find out if a substance might possibly cause cancer.

Often neither type of study provides conclusive evidence on its own, so researchers usually look at both human and lab-based studies when trying to figure out if something causes cancer.

Studies in people

Rates of [leukemia](#)⁵, particularly [acute myeloid leukemia \(AML\)](#)⁶, have been found to be higher in studies of workers exposed to high levels of benzene, such as those in the chemical, shoemaking, and oil refining industries.

Some studies have also suggested links to [childhood leukemia](#)⁷ (particularly AML) as well as [acute lymphocytic leukemia \(ALL\)](#)⁸, [chronic lymphocytic leukemia \(CLL\)](#)⁹, and other blood-related cancers (such as [multiple myeloma](#)¹⁰ and [non-Hodgkin lymphoma](#)¹¹) in adults. However, the evidence is not as strong for these cancers.

There is much less evidence linking benzene to any other type of cancer.

Studies done in the lab

When inhaled or swallowed, benzene has been found to cause different types of tumors in lab animals such as rats and mice. These results support the finding of an excess risk of leukemia in humans. However, most studies in humans have not found an increased risk of cancers other than leukemia among people with higher exposures.

Benzene has been shown to cause chromosome changes in bone marrow cells in the

lab. (The bone marrow is where new blood cells are made.) Such changes are commonly found in human leukemia cells.

What expert agencies say

Several national and international agencies study substances in the environment to determine if they can cause cancer. (A substance that causes cancer or helps cancer grow is called a *carcinogen*.) The American Cancer Society looks to these organizations to evaluate the risks based on evidence from laboratory, animal, and human research studies.

Based on animal and human evidence, several expert agencies have evaluated the cancer-causing potential of benzene.

The **International Agency for Research on Cancer (IARC)** is part of the World Health Organization (WHO). One of its goals is to identify causes of cancer. IARC classifies benzene as “carcinogenic to humans,” based on sufficient evidence that benzene causes acute myeloid leukemia (AML). IARC also notes that benzene exposure has been linked with acute lymphocytic leukemia (ALL), chronic lymphocytic leukemia (CLL), multiple myeloma, and non-Hodgkin lymphoma.

The **National Toxicology Program (NTP)** is formed from parts of several different US government agencies, including the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), and the Food and Drug Administration (FDA). The NTP has classified benzene as “known to be a human carcinogen.”

The US **Environmental Protection Agency (EPA)** maintains the Integrated Risk Information System (IRIS), an electronic database that contains information on human health effects from exposure to various substances in the environment. The EPA classifies benzene as a known human carcinogen.

(For more information on the classification systems used by these agencies, see [Known and Probable Human Carcinogens](#)¹².)

Does benzene cause any other health problems?

Benzene is a potentially dangerous chemical. High levels of exposure can cause both short-term and long-term health effects.

Short-term effects

Breathing in high doses of benzene can affect the nervous system, which can lead to drowsiness, dizziness, headaches, tremors, confusion, and/or unconsciousness. Consuming foods or fluids contaminated with high levels of benzene can cause vomiting, stomach irritation, dizziness, sleepiness, convulsions, and rapid heart rate. In extreme cases, inhaling or swallowing very high levels of benzene can be deadly.

Exposure to benzene liquid or vapor can irritate the skin, eyes, and throat. Skin exposure to benzene can result in redness and blisters.

Long-term effects

Long-term exposure to benzene mainly harms the bone marrow, the soft, inner parts of bones where new blood cells are made. This can result in:

- Anemia (a low red blood cell count), which can cause a person to feel weak and tired.
- A low white blood cell count, which can lower the body's ability to fight infections and might even be life-threatening.
- A low blood platelet count, which can lead to excess bruising and bleeding.

There is also some evidence that long-term exposure to benzene might harm reproductive organs. Some women who have breathed in high levels of benzene for many months have had irregular menstrual periods and ovary shrinkage, but it is not known for sure if benzene caused these effects. It is not known if benzene exposure affects the fetus in pregnant women or fertility in men.

Are benzene levels regulated?

Several government agencies regulate benzene levels and exposures.

The Occupational Safety & Health Administration (OSHA) is the federal agency responsible for health and safety regulations in most workplaces. OSHA limits exposure to benzene in the air in most workplaces to 1 ppm (part per million) during an average workday and a maximum of 5 ppm over any 15-minute period. When working at potentially higher exposure levels, OSHA requires employers to provide personal protective equipment such as respirators.

The EPA limits the percentage of benzene allowed in gasoline to an average of 0.62% by volume (with a maximum of 1.3%).

The EPA limits concentrations of benzene in drinking water to 5 ppb (parts per billion). Some states may have lower limits. Likewise, the US Food and Drug Administration (FDA) sets a limit of 5 ppb in bottled water.

The Consumer Product Safety Commission (CPSC) considers any product containing 5% or more by weight of benzene to be hazardous, requiring special labeling.

Can I limit my exposure to benzene?

If you are concerned about benzene, there are several ways you can limit your exposure.

Stay away from cigarette smoke. If you are a smoker, [try to quit](#)¹³. Cigarette smoke is a major source of benzene exposure.

Try to limit gasoline fumes by pumping gas carefully and using gas stations with vapor recovery systems that capture the fumes. Avoid skin contact with gasoline.

When possible, limiting the time you spend near idling car engines can help lower your exposure to exhaust fumes, which contain benzene (as well as other potentially harmful chemicals).

Use common sense around any chemicals that might contain benzene. Limit or avoid exposure to fumes from solvents, paints, and art supplies, especially in unventilated spaces.

If you are exposed at your workplace, talk to your employer about limiting your exposure through process changes (such as replacing the benzene with another solvent or enclosing the benzene source) or by using personal protective equipment. If needed, the Occupational Safety & Health Administration (OSHA) can provide more information or make an inspection.

What should I do if I've been exposed to benzene?

For short-term exposure to high levels of benzene, the Centers for Disease Control and Prevention (CDC) recommends getting away from the source of benzene, removing any clothing that may have benzene on it, washing exposed areas with soap and water, and getting medical care as soon as possible.

If you think you may have been exposed to benzene over a long period of time, speak to a doctor. Benzene can be measured in the blood or breath, and breakdown products

of benzene can be measured in the urine. These tests can only detect recent exposures to benzene. They cannot predict possible health effects.

Hyperlinks

1. www.cancer.org/cancer/cancer-causes/tobacco-and-cancer.html
2. www.cancer.org/cancer/cancer-causes/tobacco-and-cancer.html
3. www.cancer.org/cancer/cancer-causes/tobacco-and-cancer/secondhand-smoke.html
4. www.cancer.org/cancer/leukemia.html
5. www.cancer.org/cancer/leukemia.html
6. www.cancer.org/cancer/acute-myeloid-leukemia.html
7. www.cancer.org/cancer/leukemia-in-children.html
8. www.cancer.org/cancer/acute-lymphocytic-leukemia.html
9. www.cancer.org/cancer/chronic-lymphocytic-leukemia.html
10. www.cancer.org/cancer/multiple-myeloma.html
11. www.cancer.org/cancer/non-hodgkin-lymphoma.html
12. www.cancer.org/cancer/cancer-causes/general-info/known-and-probable-human-carcinogens.html
13. www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html
14. <http://www.atsdr.cdc.gov/>
15. <http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=38&tid=14>
16. <https://www.epa.gov/>
17. <https://water.epa.gov/drink/contaminants/basicinformation/benzene.cfm>
18. <http://www.cdc.gov/niosh/>
19. <http://www.cdc.gov/niosh/topics/benzene/>
20. <https://www.osha.gov/>
21. <https://www.osha.gov/SLTC/benzene/>

Additional resources

Along with the American Cancer Society, other sources of information and support include:

Agency for Toxic Substances and Disease Registry (ATSDR) Toll-free number: 1-888-422-8737 (1-888-42-ATSDR) Website: www.atsdr.cdc.gov
(<http://www.atsdr.cdc.gov/>)¹⁴ ToxFAQs for benzene: www.atsdr.cdc.gov/toxfaqs/tf.asp?id=38&tid=14

(<http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=38&tid=14>)¹⁵

Environmental Protection Agency (EPA) Toll-free number (Safe Drinking Water Hotline): 1-800-426-4791 Website: www.epa.gov (www.epa.gov)¹⁶ Benzene in drinking water: <http://water.epa.gov/drink/contaminants/basicinformation/benzene.cfm> (<http://water.epa.gov/drink/contaminants/basicinformation/benzene.cfm>)¹⁷

National Institute for Occupational Safety and Health (NIOSH)

Toll-free number: 1-800-232-4636 (1-800-CDC-INFO) Website: www.cdc.gov/niosh (<http://www.cdc.gov/niosh>)¹⁸ Benzene page: www.cdc.gov/niosh/topics/benzene (<http://www.cdc.gov/niosh/topics/benzene/>)¹⁹

Occupational Safety & Health Administration (OSHA) Toll-free number: 1-800-321-6742 (1-800-321-OSHA) Website: www.osha.gov (www.osha.gov)²⁰ Benzene page: www.osha.gov/SLTC/benzene/ (www.osha.gov/SLTC/benzene/)²¹

**Inclusion on this list does not imply endorsement by the American Cancer Society.*

No matter who you are, we can help. Contact us anytime, day or night, for information and support. Call us at 1-800-227-2345 or visit [www.cancer.org \(#/cancer/cancer-causes/benzene\)](http://www.cancer.org/#/cancer/cancer-causes/benzene).

References

Agency for Toxic Substances and Disease Registry. ToxFAQs for Benzene. 2013. Accessed at www.atsdr.cdc.gov/toxfaqs/tf.asp?id=38&tid=14 on October 15, 2015.

Centers for Disease Control and Prevention. Facts About Benzene. 2013. Accessed at www.bt.cdc.gov/agent/benzene/basics/facts.asp on October 15, 2015.

International Agency for Research on Cancer. *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Volume 100F: A Review of Human Carcinogens: Chemical Agents and Related Occupations*. 2012. Accessed at <http://monographs.iarc.fr/ENG/Monographs/vol100F/mono100F-24.pdf> on October 15, 2015.

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US Environmental Protection Agency. Integrated Risk Information System: Benzene (CASRN 71-43-2). 2003. Accessed at http://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0276_summary.pdf on October 15, 2015.

US National Library of Medicine. Tox Town: Benzene. 2015. Accessed at http://toxtown.nlm.nih.gov/text_version/chemicals.php?id=5 October 15, 2015.

Last Medical Review: January 5, 2016 Last Revised: January 5, 2016

Written by

The American Cancer Society medical and editorial content team
(www.cancer.org/cancer/acs-medical-content-and-news-staff.html)

Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as journalists, editors, and translators with extensive experience in medical writing.

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CREMATORY & INCINERATOR OPERATIONS

Date Initiated:

May 6, 1993

Dates Modified / Updated:

March 24, 1994

December 24, 1997

July 15, 2013

PROCESS DESCRIPTION:

Natural gas fired crematories and incinerators that combust human remains, animal remains, refuse, agricultural products, or medical waste are sources of carbon monoxide, nitrogen oxides, particulate matter, organic compounds, sulfur oxides and trace toxic substances. Incinerators used for cremation purposes are called "retorts" and the remains are referred to as "charges". Emissions of trace toxic substances may include hydrogen chloride, formaldehyde, benzene, toluene, mercury, hexavalent chromium, PAH's, and other heavy metals.

Incinerators in San Diego County typically have a primary burner in the main chamber and a secondary burner / afterburner in the flue stack. Most permits include lb/hour charge rate limitations and periodic particulate matter source testing requirements. Emissions from these processes are highly dependent upon equipment type, control devices, operating conditions, fuel type, process time, and waste stream composition. While default emission factors have been pieced together from a variety of EPA reference sources for each type of operation, site specific test results should be used to estimate emissions whenever available.

References used to develop default emission factor estimates are;

- Sections 1.4, 2.1, and 2.3 of AP-42 (10/96) from EPA,
- VOC Speciation Profile #1167 (1/90) from EPA,
- PM Speciation Profile #42320 (1/90) from EPA,
- AB2588 crematory stack testing results from UCSD (1990) and
- California Air Toxics Emission Factors from ARB (2000).

Emission factors for NO_x, CO, SO_x, TOG, and ROG have been converted into units of lbs pollutant / million scf fuel burned since these emissions are assumed to be most directly

associated with fuel usage. Emission factors for TSP, PM10, and trace toxic substances have been converted into units of lbs pollutant / ton charged since these emissions are assumed to be most directly associated with the combusted materials.

District emission estimation techniques for crematory operations are as follows;

$$Ea = Ua \times EF$$

$$Eh = Uh \times EF$$

Where:

Ea = Annual emissions of each listed substance, (lbs/yr)

Eh = Maximum hourly emissions of each listed substance, (lbs/hr)

Ua = Annual charge weight or annual fuel usage, (tons charged/yr, # of charges/yr or mmscf gas/yr)

Uh = Max. hourly charge rate or max. hourly fuel usage, (lbs charged/hr, # of charges/hr or mmscf/hr)

EF = Emission factors for each listed substance, (lbs /ton charged, lb/charge or lbs/mmscf gas)

EMISSIONS INFORMATION:

Default emission factors for crematories and incinerators have been assembled from a combination of sources including AP-42 information, District AB2588 source testing, ARB and EPA speciation profiles. The District emission standard for crematories is 0.3 grains/dscf @ 12% CO₂, which equates to ~6.5 lbs PM/ton charged. Source tests of newly designed / installed multiple chamber incinerators indicate emissions of ~1/2 the maximum allowable rate. Test results from older equipment in use throughout San Diego County are usually much closer to the limit. A default value of 6.5 lbs PM/ton charged will be used to estimate particulate emissions where site specific emission rates are not provided.

CO, NO_x, SO_x, TOG, and ROG emissions are believed to be most accurately estimated with fuel usage data and AP-42 small boiler emission factors. These emissions are assumed to be most closely associated with the fuel usage even though EPA factors provided in AP-42 are reported by charge weight. Since charges have highly variable compositions and process times, the AP-42 values were discarded and the small boiler (external combustion) factors were used as defaults until more accurate information becomes available.

Extensive AB2588 source testing was performed by ARB in Sacramento during 1990 to identify toxic air contaminant emission rates from crematories. These test results are

supported by local AB2588 results from the UCSD Medical Center and Bonner Hall incinerators / crematories. Trace amounts of several listed substances were detected in the exhaust stack including benzene, toluene, xylenes, formaldehyde, hydrogen chloride, hydrogen fluoride, arsenic, chromium, and lead. Default values for criteria and toxic emission estimates from the UCSD testing are provided below. Default values for mercury from ARB's CATEF is provided below.

Particulate Matter (PM10)	6.0 lbs/ton charged
Nitrogen Oxides	100.0 lbs/mmscf
Sulfur Oxides	0.6 lbs/mmscf
Carbon Monoxide	21.0 lbs/mmscf
TOG	5.8 lbs/mmscf
ROG	2.8 lbs/mmscf
Acetaldehyde	1.5E-3 lbs/ton charged
Arsenic	5.8E-4 lbs/ton charged
Benzene	7.2E-4 lbs/ton charged
Beryllium	2.0E-5 lbs/ton charged
Cadmium	1.6E-4 lbs/ton charged
Chromium (total)	5.1E-4 lbs/ton charged
Chromium (hexavalent)	1.9E-4 lbs/ton charged
Copper	4.0E-4 lbs/ton charged
Formaldehyde	4.0E-4 lbs/ton charged
Hydrogen Chloride	8.6E-1 lbs/ton charged
Hydrogen Fluoride	7.8E-3 lbs/ton charged
Lead	9.8E-4 lbs/ton charged
Mercury	4.88E-3 lbs/body charged
Nickel	5.7E-4 lbs/ton charged
PAH's (excluding naphthalene)	5.2E-5 lbs/ton charged
Selenium	6.5E-4 lbs/ton charged
Toluene	9.9E-3 lbs/ton charged
Xylenes	2.8E-3 lbs/ton charged
Zinc	5.2E-4 lbs/ton charged
Dioxins	Negligible
Furans	Negligible

ASSUMPTIONS / LIMITATIONS:

- Emission factors are questionable for the formaldehyde and acetaldehyde values since one of the samples in the source test gave a negative reading. The value for mercury is higher than expected even allowing for a reasonable amount of material present in dental fillings. Additional testing to determine better emissions for mercury is warranted.

- Most crematories do not weigh their charges and may only be able to provide the number of charges burned. It is customary to assume an average charge weight of 150 pounds.
- Source test sampling began a few minutes after burning began to allow the cardboard box container to be burned through and the body mass to begin burning. This may have slightly underestimated emissions attributable to charge shrouding.
- Cardboard shrouds were used during the tests at Camellia Memorial Lawn crematorium. The chemical composition of other shrouding materials should be considered when applying these emission factors to individual facilities. The use of plastic and wood containers could result in different emission factors.
- Emission factors based on crematorium source testing should not be used for incinerators charged with refuse, medical waste, plastics, trash, contraband, hazardous waste, or other materials not consistent with human / animal remains. Emission factors for specialized incinerators are best developed from site specific testing.

FORMS:

A separate set of emission factors should be developed for each type of multiple chamber incinerator and waste stream to be quantified. Existing default factor estimates are generic and / or ballpark estimates at best.

RESEARCH ARTICLE

Emission characteristics of harmful air pollutants from cremators in Beijing, China

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Abstract

The process of corpse cremation generates numerous harmful air pollutants, including particulate matter (PM), sulfur dioxide (SO₂), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and heavy metals. These pollutants could have severe effects on the surrounding environment and human health. Currently, the awareness of the emission levels of harmful air pollutants from cremators and their emission characteristics is insufficient. In this study, we obtained the emission characteristics of flue gas from cremators in Beijing and determined the localized emission factors and emission levels of harmful air pollutants based on actual monitoring data from nine typical cremators. The results show that the emissions of air pollutants from the cremators that directly discharge flue gas exceed the emission standards of China and Beijing. The installation of a flue gas post-treatment system could effectively reduce gaseous pollutants and the emission levels of PM. After being equipped with a flue gas post-treatment system, the emission concentrations of PM₁₀, PM_{2.5}, CO, SO₂ and VOCs from the cremators are reduced by 97.6, 99.2, 19.6, 85.2 and 70.7%, respectively. Moreover, the emission factors of TSP, PM₁₀, PM_{2.5}, CO, SO₂ and VOCs are also reduced to 12.5, 9.3, 3.0, 164.1, 8.8 and 19.8 g/body. Although the emission concentration of VOCs from the cremators is not high, they are one of major sources of "odor" in the crematories and demand more attention. Benzene, a chemical that can seriously harm human health, constitutes the largest proportion (~50%) of the chemical components of VOCs in the flue gas from the cremators.

Introduction

China has the highest annual number of deaths in the world. According to the "China Civil Affairs Statistical Yearbook 2015", China's national death toll was 9.77 million, and its corpse cremation rate was 47% in 2014. The process of corpse cremation generates numerous harmful

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air pollutants [1±3], including particulate matter (PM), SO₂, NO_x, CO, HCl, HF, NH₃, VOCs, heavy metals, polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/Fs) [4±8]. Due to the characteristics of the funeral sector, the chimney heights are usually low, and the air pollutants disperse close to the ground, thus severely affecting the surrounding air quality and human health [9±17]. The problem of the emissions of harmful air pollutants from cremators is causing increasing social concern.

To strengthen the control and management of pollutant emissions from cremators and incinerators, China and Beijing have issued emission standards of air pollutants for crematories (GB13801-2015 and DB1203-2015). These standards have enhanced the emission limits of air pollutants from cremators and incinerators and clarified relevant requirements on pollution control, which are promoting the implementation of prevention and control measures in the crematories to reduce pollutant emission levels. However, the standards have not specified the emission limits of PM₁₀, PM_{2.5} and VOCs from cremators. Previous studies on air pollutants from cremators have typically focused on the problem of emissions of PCDD/Fs and other persistent pollutants in China and other countries [5,18±20]. The emission characteristics of PM₁₀, PM_{2.5} and VOCs in flue gas from cremators have seldom been reported. These pollutants have provoked increasing attention for their severe impacts on air quality, visibility and human health. The EU EMEP/EEA guidebook (2016) [21] provided the emission factors of pollutants such as PM₁₀, PM_{2.5} and VOCs from cremators, but this guidance did not distinguish the cremators with and without flue gas purification systems, and the collected data were not timely enough to accurately represent the current emission levels from cremators. In China, relevant studies have primarily focused on quantifying conventional pollutants such as total suspended particulates (TSP), SO₂, NO_x, CO and persistent organic pollutants from cremators [10,11,22]. Research into the emission concentrations and emission factors of fine particulate matter and VOCs from cremators is relatively scant.

To better understand the emissions of flue gas from cremators after the implementation of the standards in China, we examined the emission levels and emission characteristics of PM (TSP, PM₁₀ and PM_{2.5}) and air pollutants (SO₂, NO_x, CO and VOCs) from different types of cremators with and without flue gas post-treatment systems by practical monitoring of nine crematories in Beijing. We determined the localized emission factors and analyzed the chemical components of VOCs in the flue gas from these crematories. This study was the first in China to monitor and analyze PM₁₀, PM_{2.5}, VOCs and their chemical components as well as quantify the pollutant emission levels from the cremators. The result could provide a reference for the subsequent assessment and revision of national or local standards and serve as a reference providing support for the current civil administration and environmental management.

Materials and methods

Study objects

Beijing, the capital of China, is located in the northern part of the North China Plain, covering an area of 16,410.54 km². It is characterized by high residential density, with a resident population of 21.516 million. Limited in land resources, cremation is implemented as a fundamental national policy. Beijing has achieved a cremation rate of nearly 100% for many years. There are currently 12 funeral parlors in Beijing; two of them are located in the urban area, i.e., Babaoshan funeral parlor and Dongjiao funeral parlor, and the others are located in the suburbs. Each funeral parlor is for corpse cremation.

Based on the site survey and data collection at 12 funeral parlors in Beijing, we present the following findings. Regarding fuel type, the cremators in Beijing were mainly oil-fired, and the fuel conversion from oil to gas was performed for only 15 cremators in the Babaoshan funeral

Table 1. Configuration of nine cremators.

Facility No.	A	B	C	D	E	F	G	H	I
Furnace type	Car-bottom	Car-bottom	Car-bottom	Flat plate	Flat plate	Car-bottom	Car-bottom	Car-bottom	Car-bottom
Dust collector	Bag filter	Bag filter	Bag filter	Bag filter	×	×	×	×	×
Secondary chamber	○	○	○	○	×	○	○	○	○
Flue gas cooling device	Air cooling	Air cooling	Air cooling	Air cooling	×	×	×	×	×
Deacidification device	○	○	○	○	×	×	×	×	×
Fuel	Natural gas	oil	oil	oil	oil	oil	oil	oil	oil

Note: ○ contains the device, × does not contain the device.

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parlor. In terms of furnace structure, Beijing's cremators were predominantly car-bottom type with a percentage of ~70%. Considering end-of-pipe control, 59.8% of the cremators in Beijing were equipped with a flue gas purification system, which mainly included flue gas cooling, deacidification, deodorization and dedusting devices. The flue gas containing various harmful air pollutants emitted from combustion has a high temperature. To prevent the re-synthesis of dioxins, the flue gas is rapidly cooled to avoid recombination. Moreover, to remove the acid gases such as SO₂ and H₂S in the flue gas, alkali liquor is used to neutralize the acid gas, and the activated carbon is used to adsorb VOCs and odor components. Finally, the particulate matter in the flue gas is removed by a dust collector, thereby reducing the concentration of harmful air pollutants in the flue gas. Based on the control measure equipment for pollutants emitted from the cremators, the furnace type and fuel type, one typical cremator was selected from each of nine selected funeral parlors (geographical coordinates information in [S1 Table](#)) for monitoring the actual flue gas emissions. The emission concentrations of air pollutants were sampled, and the emission factors were determined. The configuration of the nine cremators is depicted in [Table 1](#). Four cremators post-processed the flue gas, and five discharged the flue gas directly. There was one gas-fired cremator and eight oil-fired cremators.

Sample collection

The sampling and monitoring of PM and air pollutants were conducted from the nine selected cremators during the winter from November 2016 to January 2017. The sampling location was on the exhaust stack, which can be seen in [Fig 1](#). Dust samples (TSP, PM₁₀ and PM_{2.5}) were

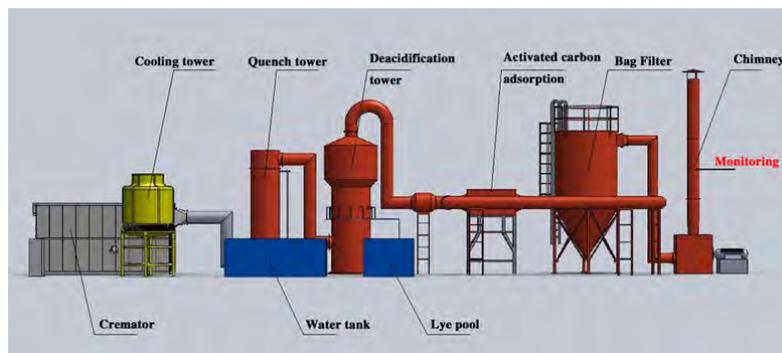


Fig 1. Typical flue gas post-treatment system of a cremator.

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collected using a two-stage PM₁₀ and PM_{2.5} virtual impactor (Model IV501, China) according to the method of ISO 13271:2012. Before sampling, we measured the temperature, water content, oxygen content, pressure, flow rate and other parameters at the sampling point to calculate the flow rate and the PM_{2.5} main flow, PM_{2.5} secondary flow and PM₁₀ secondary flow required for estimating the sample nozzle diameter. The sampling period started from the beginning of corpse incineration in the main combustion chamber and ended when ashes were emptied from the main combustion chamber after the completion of the cremation process. Each cremator was sampled three times; unfortunately, due to pump failure during the sampling, 22 groups of available PM samples were obtained. Before sampling, a Teflon membrane was placed in a constant temperature and humidity chamber for 24 h of equilibration and then weighed with a precision electronic balance (0.00001 g resolution). After sampling, the Teflon membrane was held at constant temperature and humidity for 24 h and then weighed and stored. VOCs were sampled in air bags (10 L) from the flue gas of the cremators via a vacuum box and suction pump (set at 0.2 L/min) following the standard for emissions from stationary sources of volatile organic compounds using the Bags method (HJ 732±2014); the sampling time covered the time to cremate an entire body, which was approximately 45 minutes. Every cremator was sampled three times. In total, 27 groups of VOC samples were obtained from the cremators. The samples were stored in the dark and analyzed as soon as possible. Simultaneously, a microcomputer dust parallel sampler (TH880F, Tianhong, Wuhan) was applied to monitor the concentrations of CO, SO₂ and NO_x and record the information of other parameters including flue gas temperature, humidity, oxygen content and flow rate. The trace gases (e.g., CO, SO₂ and NO_x) were determined by the fixed potential electrolysis method (HJ 693±2014 and HJ/T 57±2010).

Concentration and chemical composition analysis of VOCs

The VOC samples were subjected to non-methane hydrocarbon (NMHC) analysis using a gas chromatograph (Beifen SP-3420A, China). The composition of the collected VOC samples was analyzed by a pre-concentrator (Entech 7100A, USA) and a gas chromatograph-mass spectrometer (Agilent 7890A-5975C, USA). The GC-MS enables qualitative and quantitative analysis of more than 100 types of VOCs according to the standard of stationary source emission determination of VOCs based on the sorbent adsorption and thermal desorption gas chromatography-mass spectrometry method (HJ 734±2014).

VOCs were identified based on their retention times and mass spectra and quantified by external calibration. The calibration standards were prepared by dynamically diluting the 100 ppbv Photochemical Assessment Monitoring Station (PAMS) standard mixture (57 NMHCs) and TO-15 standard mixture (65 compounds, from Spectra Gases Inc., NJ, USA) to 2.5, 5, 10, and 20 ppbv, with pure nitrogen as the mixing medium in a chamber after passing mass flow controllers. The calibration curves were obtained by running the four diluted standards plus humidified zero air in the same way as the field samples [23].

Quality assurance and quality control (QA/QC)

The collected filter samples of particulate matter were collected on aluminum foil paper as soon as possible after sampling and stored in a refrigerator before analysis. The storage temperature was approximately -18°C. Weighing, extraction and analysis of the sample filter were performed in a closed and clean laboratory, which avoids errors introduced by the dust falling into the sample film during the experiment.

As for VOCs, before sampling, all canisters were cleaned at least five times by repeatedly filling and evacuating with humidified zero air. To check if there was any contamination in the

canisters, after the cleaning procedure, all vacuumed canisters were re-filled with humidified zero air and stored in the laboratory for at least 24 h. They were analyzed using the same method as the field samples to ensure that none of the target VOC compounds were present in detectable amounts.

The precision of the VOCs measurements was compound-specific and within 3% for NMHCs and 6% for VOCs. The measurement accuracy was determined by treating the system with the dynamically diluted authentic standards and calculating the differences between the measured and true values. When running the samples, the system was challenged with a standard each day. If the reported values were beyond $\pm 10\%$ of the standard values, recalibration of the system was performed [23].

Calculation of emission factors

The emission factors of harmful air pollutants from the cremators were calculated based on their emission concentrations, flue gas amount and cremation time. The formulae are as follows:

$$E = \frac{C \times T \times V \times S \times 60}{1000} \quad (1)$$

$$S = \frac{\pi D^2}{4} \quad (2)$$

where E is the pollutant emission factor, g/body; C is the pollutant emission concentration, mg/m^3 ; T is the cremation time, min; V is the flue gas flow speed, m/s; S is the cross-sectional area of the flue, m^2 ; and D is the stack diameter, m.

Results and discussion

Emission concentrations of flue gas from cremators

The emission concentrations of harmful air pollutants from cremators are affected by various factors, such as fuel type, cremator type, flue gas post-treatment system and operational maintenance. In this study, monitoring was conducted for the concentrations of PM (TSP, PM_{10} and $\text{PM}_{2.5}$) and gaseous pollutants (SO_2 , NO_x , CO and VOCs) emitted from nine typical cremators (four with flue gas post-treatment devices) in Beijing as well as the related parameters (flue gas oxygen content, temperature, humidity and flow rate). The results (data in S2 Table) are presented in Fig 2.

PM from cremators is predominantly generated as a result of the incomplete combustion of the fuel or corpse. At the initial stage of combustion, the furnace temperature is relatively low and there is no guarantee for the retention time of the flue gas in the secondary combustion chamber, thus resulting in a relatively high concentration of dust discharged directly from the cremator without a dust removal treatment system. The emission concentration of TSP from those cremators without flue gas post-treatment systems ranged from 104.8 to 1,323.5 mg Nm^{-3} (@ 11% O_2 ; the same as below), with an average concentration of 393.7 mg Nm^{-3} , which greatly exceeded the emission limit for PM specified by local standards (30 mg Nm^{-3}). Remarkably, the emission concentrations of TSP from the cremators with a flue gas post-treatment system ranged from 0.5 to 70.3 mg Nm^{-3} , with an average concentration of 11.0 mg Nm^{-3} . The emission concentrations of PM_{10} and $\text{PM}_{2.5}$ from the cremators without a flue gas post-treatment system ranged from 76.6 to 1,084.6 and 47.5 to 1,069.9 mg Nm^{-3} , with average concentrations of 350.6 and 300.9 mg Nm^{-3} , respectively. After being processed with a flue gas post-treatment system, these concentrations were efficiently reduced, ranging from 0.2 to 54.8

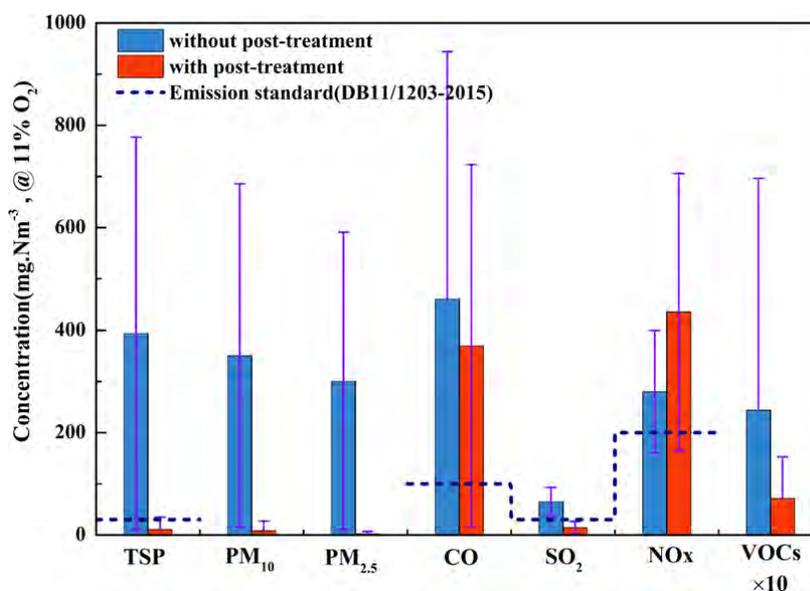


Fig 2. Emission concentration of harmful air pollutants from cremators.

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and 0.1 to 13.0 mg Nm⁻³, with average concentrations of 8.4 and 2.4 mg Nm⁻³, respectively. The removal rates of TSP, PM₁₀ and PM_{2.5} were 97.2, 97.6 and 99.2%, respectively. These results demonstrate that dust concentrations were markedly reduced for the cremators with a flue gas post-treatment system. The reduction in PM is an effective measure to coordinate controlling the emission of PCDD/Fs [18].

CO is a product of incomplete combustion in the cremators. At furnace start-up or the initial cremation stage, a low furnace temperature can easily result in incomplete combustion. The emission concentrations of CO in the flue gas from the cremators with and without flue gas purification systems were 0.4 ± 750.8 and $42.3 \pm 1,378.6$ mg Nm⁻³, with average concentrations of 369.8 and 460.2 mg Nm⁻³, respectively. The emission concentrations of CO from the cremators with and without flue gas purification devices were 3.7 and 4.6 times the emission limits of the local standards. Because CO is predominantly regulated by the furnace temperature and the retention time of the flue gas, at the beginning of cremation, the temperature was low, incomplete combustion occurred, and the CO concentration was high. As combustion continued, the furnace temperature increased, combustion became increasingly complete, and the concentration of CO emissions decreased. Cremators with a secondary combustion chamber have a relatively low CO emission concentration. Compared to oil-fired cremators, gas-fired cremators have lower CO emissions.

SO₂ principally originates from the combustion of sulfur in the fuel source. A CO interference experiment was performed prior to the determination of SO₂, which was performed at the highest SO₂ concentration and highest CO concentration. For flue gas purification systems, the deacidification device with an alkaline solution can neutralize and remove SO₂. In this study, the emission concentrations of SO₂ from the cremators without flue gas purification devices ranged from 3.8 to 350.2 mg Nm⁻³, with an average of 65.0 mg Nm⁻³. This level

exceeded the standard limit by 116.7%, and it was also higher than the emission concentration of SO₂ from the cremators with flue gas purification devices.

NO_x consists primarily of fuel-type and thermal-type gases, particularly the latter; the production of thermal-type NO_x increases with furnace temperature. The combustion temperature in the cremators can be up to 900–1100°C, and about 700°C in secondary chamber. In the present study, the average NO_x concentrations from the cremators with and without post-treatment systems were 435.5 and 280.2 mg Nm⁻³, respectively. The former value is 55% higher than the latter, which is mainly because cremators with a post-treatment system were set to a higher temperature for more complete burning and to further reduce the emission of PM and dioxins, although the side effect is more NO_x emissions.

Under high-temperature conditions, the strong oxidation process of combustible materials such as fuel and corpses is associated with decomposition and combination reactions of the materials. This process produces VOCs, leading to environmental pollution. The emission concentrations of VOCs from the cremators with and without flue gas post-treatment systems were in the ranges of 0.1±23.9 and 0.1±162.7 mg Nm⁻³, with average concentrations of 7.1 and 24.4 mg Nm⁻³, respectively. The former value is 70.7% less than the latter, suggesting that flue gas post-treatment systems have a particular effect on the removal of VOCs emitted by cremators.

According to the Beijing emission standard of air pollutants from crematories (DB11/1203-2015), the compliance rates of TSP, CO, SO₂ and NO_x of flue gas in the monitoring samples with a post-treatment system are 87.5%, 33.3%, 87.5% and 25%, respectively, and they are 0%, 28.6%, 55.6% and 33.3% without a post-treatment system. Additionally, as shown in Fig 2, the compliance rates of the average emission concentrations for these four pollutants are higher for the cremators with a post-processing device than those without a post-treatment system.

Chemical composition analysis of VOCs

The chemical components of VOC samples from the cremators were analyzed by GC-MS. Totals of 32 and 42 components were detected in the VOCs emitted from the cremators with and without flue gas purification systems, respectively. Fig 3 displays the percentages of every chemical component in the VOCs. The top 10 components in the flue gas from the cremators without post-treatment were benzene, acrolein, acetone, ethanol, toluene, methyl chloride, propylene, 1,2-dichloroethane, 2-butanone and naphthalene, accounting for 45.1%, 13.6%, 10.3%, 8.1%, 5.5%, 3.3%, 3.2%, 1.7%, 1.6% and 1.6% of the detected VOCs samples, respectively. The top 10 components in the flue gas from the cremators with post-treatment were benzene, propylene, acetone, acrolein, toluene, 1-butene, acetonitrile, *n*-dodecane, *n*-undecane

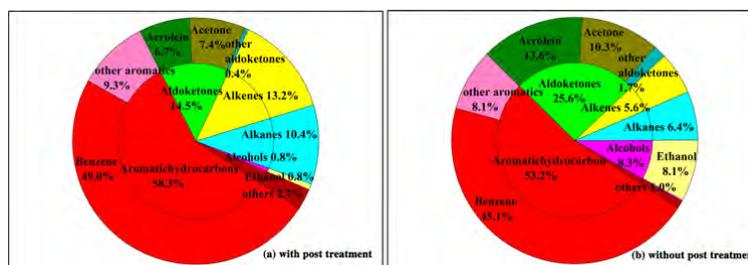


Fig 3. Percentage of compounds in VOCs from cremators.

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and *n*-hexane, which accounted for 49.0%, 8.1%, 7.4%, 6.7%, 5.7%, 2.9%, 2.6%, 1.6%, 1.2% and 1.1% of the detected concentrations, respectively. Based on the percentage distribution of the chemical components with and without flue gas post-treatment systems, aromatics accounted for more than 50% of the two VOC samples, and benzene, presenting high photochemical activities and severe effects on human health, accounted for approximately half of the aromatics. As shown in Fig 3, flue gas post-treatment systems are particularly effective at reducing the levels of aldehydes, ketones and alcohols in VOCs. The percentages of acrolein, acetone and ethanol in the VOCs of flue gas were lower for the cremators with a post-treatment system, indicating an observable removal effect of post-treatment systems for these components.

Emission factors of flue gas from cremators

The EFs of harmful air pollutants for the studied cremators were calculated based on practical monitoring data (data in S3 Table). Fig 4 exhibits the characteristics of pollutant emission factors for the cremators with and without post-treatment systems based on the obtained emission factors of PM₁₀, PM_{2.5} and VOCs. For the cremators with a flue gas post-treatment system, the emission factors of TSP, PM₁₀, PM_{2.5}, CO, SO₂, NO_x and VOCs were 12.5, 9.3, 3.0, 164.1, 26.4, 627.8 and 19.8 g/body, respectively. For comparison, the emission factors of the aforementioned pollutants without a flue gas post-treatment system were 545.8, 498.7, 440.1, 909.5, 70.6, 501.6 and 41.6 g/body, respectively. Except for NO_x, the remaining six pollutants in the post-processed flue gas were characterized by significantly lower emission factors than those in the untreated flue gas. The emission factors of TSP, PM₁₀, PM_{2.5}, CO, SO₂ and VOCs were reduced by 97.7, 98.1, 99.3, 82.4, 62.6 and 52.4%, respectively. The dust removal device in the flue gas post-treatment system had a significant impact on limiting PM, and SO₂ levels were also reduced by the deodorization spray tower with alkaline solution. The cremators with a flue gas post-treatment system were characterized by better operation management, with lower emission levels of CO than those without a flue gas post-treatment system.

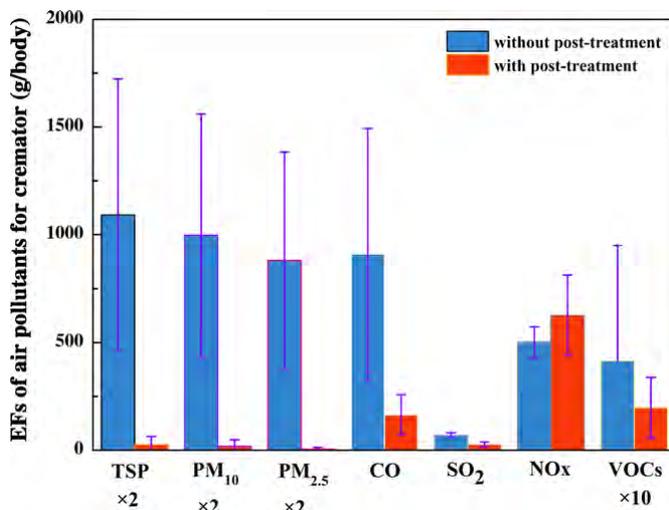


Fig 4. EFs of harmful air pollutants for the studied cremators.

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According to the survey result, no activated carbon spray or adsorption occurred in the crematories. The decrease in the emission factors of VOCs may be related to the filtration-adsorption or condensation of VOCs. A combination of existing control techniques for VOC pollution, such as activated carbon adsorption and catalytic combustion measures [24], may further reduce the emissions of VOCs. However, the drawback to a flue gas post-treatment system is that the NO_x emission levels of cremators increased by 25.1% relative to the levels from cremators without a flue gas post-treatment system, which is likely due to the influence of temperature regulation and other factors.

The emission factors for different fuel types were compared among cremators with and without post-treatment systems (Fig 5). During the initial discharge of air pollutants, the emission levels of various pollutants of the oil-fired cremators are higher than those of the gas-fired cremators. Regardless of the type of fuel used in the cremator, the air pollutant emission levels for those using a flue gas purification system were lower; however, due to the effect of temperature, NO_x emission levels were higher. The emission factors were considerably reduced for the oil-fired cremators with flue gas purification systems than those without, and the removal rates of TSP, PM_{10} , $\text{PM}_{2.5}$, CO, SO_2 and VOCs were 97.2, 97.7, 99.2, 75.9, 56.3 and 43.4%, respectively. Similarly, the emission factors of TSP, CO and SO_2 were considerably reduced for the gas-fired cremators equipped with a purification device. For the cremators fitted with a flue gas purification system, the emission factors were much lower for gas-fired cremators than oil-fired cremators, and the emission factors of TSP, PM_{10} , $\text{PM}_{2.5}$, CO, SO_2 and VOCs were reduced by 68.8, 81.4, 80.1, 99.7, 58.7 and 63.4%, respectively. Therefore, a clean energy conversion of cremators from oil-fired to gas-fired could improve the combustion efficiency and reduce the incomplete combustion of corpses and fuel, effectively lowering the emission levels of pollutants such as PM, SO_2 and CO.

Comparison of pollutant emission characteristics with other studies

In previous investigations [9,25], the analysis results of the EFs of harmful air pollutants from cremators were 12.5 ± 18.6 and $9.8 \sim 4.6 \text{ mg Nm}^{-3}$, with average concentrations of 15.6 and

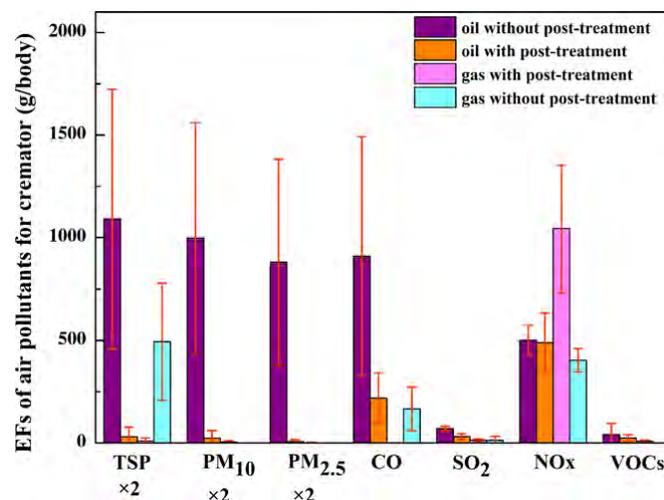


Fig 5. Comparison of EFs of harmful air pollutants between gas-fired and oil-fired cremators.

<https://doi.org/10.1371/journal.pone.0194226.g005>

17.2 mg Nm⁻³, respectively. These values are similar to the emission concentration of TSP in our study (11.0 mg Nm⁻³). However, previous studies did not report PM₁₀ and PM_{2.5} levels. This is the first study in China to obtain the emission levels of PM₁₀ and PM_{2.5}. According to the analysis results, the percentages of PM₁₀ and PM_{2.5} in the TSP of the flue gas from the studied cremators with a post-treatment system were 0.76 and 0.22, respectively, and the values for cremators without a post-treatment system were 0.89 and 0.76, respectively. This finding indicates that a PM removal device can effectively reduce the emission of inhalable particle and fine particulate matter and reduce the impact on human health and the surrounding environment.

The pollutant emission factors of the cremators obtained in this study were compared with the research results within and outside China (Table 2). Compared with the results mentioned in the EU EMEP/EEA guidebook (2016), the emission factors of PM, SO₂ and NO_x were relatively low in the present study, which is perhaps related to the different contents of hazardous components present in the fuel source. The relatively high emission level of CO may be associated with the different control levels of combustion due to the differences among cremator device types in China and other countries as well as the operational differences in the fuel supply quantity and the fuel- and oxygen-supplying air time. Influenced by traditional customs, corpse cremation in China may also include the incineration of burial objects. Moreover, differences in flue gas treatment facilities and the standardization of their operational management may result in higher emission levels of VOCs [26].

Compared with previous research results [22], the present monitoring results show that the pollutant emission levels of cremators without a flue gas post-treatment system became markedly higher, with TSP and CO increases of 288% and 60%, respectively. This is due in part to the long-term use of cremators in addition to insufficient operational maintenance, poor implementation of combustion controls and the incomplete combustion of fuel and corpses. Additionally, previous studies have primarily been based on the supervisory monitoring of cremators. To better represent the emission levels of flue gas directly discharged from the cremators, our evaluation was conducted based on the implementation of emission standards. For the cremators with a flue gas post-treatment system, the present monitoring results were much lower than those of previous data except for NO_x. This result also reflects that adhering to stringent standardized limits and the oversight departments have strengthened the operation and maintenance of flue gas post-treatment systems and enhanced the control of combustion conditions in the cremators. By improving the combustion efficiency and reducing incomplete combustion, the pollutant emission levels of cremators can be efficiently reduced. Because of strengthened controls on combustion operating conditions, furnace temperatures and thermal-type NO_x generation have increased.

Table 2. Comparison of harmful air pollutants in China and abroad (g/body).

Pollutants	Average emission factor				EU (2016)
	Without a post-treatment system		With a post-treatment system		
	Xue et al., 2016	This study	Xue et al., 2016	This study	
TSP	140.6	545.8	15.8	12.5	38.6
PM ₁₀		498.7		9.3	34.7
PM _{2.5}		440.1		3	34.7
CO	567.8	909.5	281.4	164.1	140
SO ₂	92.7	70.6	73	26.4	113
NO _x	189.6	501.6	134.5	627.8	825
VOCs		42		20	13

<https://doi.org/10.1371/journal.pone.0194226.t002>

Conclusions

In this study, we examined the emission characteristics of flue gas and determined the local emission factors of pollutants from cremators in Beijing, China, based on the monitoring and analysis of major air pollutants (TSP, PM₁₀, PM_{2.5}, SO₂, CO, NO_x, VOCs and their chemical components) from nine cremators.

According to the monitoring results, the pollutant emission concentrations were significantly lower for cremators with flue gas post-treatment system than those without. The pollutant emission factors of TSP, PM₁₀, PM_{2.5}, CO, SO₂ and VOCs were reduced in cremators with flue gas post-treatment systems by 97.7, 98.1, 99.3, 82.4, 62.6 and 52.4, respectively. Dust removal units can effectively remove PM. Additionally, deacidification spray towers are available to remove a quantity of acidic gases and reduce SO₂ emissions. Moreover, the operating conditions of combustion were generally optimized and adjusted in the cremators with a flue gas post-treatment system, which improved the combustion efficiency and reduced the incomplete combustion of corpses and fuel, thereby reducing pollutant emission levels.

The emissions of VOCs from cremators have been a neglected issue in previous studies, and no corresponding control requirements have been proposed for VOCs in emission standards. Based on the monitoring of the parameters in this study, we found that the process of corpse cremation produced certain emissions of VOCs, a significant source of odors emitted from crematories. Benzene is the most significant VOC, with a percentage of ~50%, and it may cause serious risks to human health. Moreover, benzene has high photochemical activity and tends to cause the secondary transformation of PM_{2.5} and ozone, which may impact air quality, meriting serious attention and concern.

Apart from the ability of flue gas post-treatment systems to reduce the emission of pollutants, clean energy conversion of the fuel types used by cremators, such as the use of natural gas in place of oil, can also effectively reduce the emissions of air pollutants such as PM, CO and SO₂ from cremators. Among various pollution prevention measures, control over the content of hazardous components in burial objects, the use of clean fuel and combustion optimization should be implemented in crematories to match the current requirements of stringent emission limits. Combining these measures with an efficient flue gas post-treatment system (including dust removal, deacidification and odor removal) can further reduce the emission levels of air pollutants from cremators.

Supporting information

S1 Table. Geographical coordinates for the funeral parlours sampled.
(DOCX)

S2 Table. Emission concentration of harmful air pollutants from cremators (mg/m³).
(DOCX)

S3 Table. Emission factors of harmful air pollutants from cremators (g/body).
(DOCX)

Acknowledgments

This work was funded by the National Science and Technology Support Program of the Ministry of Science and Technology of China (2014BAC23B02), the National Key Research and Development Program of China (2016YFC0201106), the Science Foundation of Beijing Municipal Research Institute of Environmental Protection (2017B01), and the Beijing

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Author Contributions

Data curation: Xi Chen, Xiaoman Zhai, Lei Nie, Shihao Zhang.

Investigation: Linglong Cheng, Yan Bai, Tong Wei.

Methodology: Wenjie Zhang.

Validation: Lei Nie.

Writing ± original draft: Yifeng Xue.

Writing ± review & editing: Wei Wang, Hezhong Tian.

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From: [Tim Verbeke](#)
To: [Sarosh Saher](#)
Subject: FW: Zoning permit for 708 Telser Rd.
Date: Wednesday, May 5, 2021 1:54:27 PM

Wanted to make sure you saw this email

From: dohland@pls.email <dohland@pls.email>
Sent: Wednesday, May 5, 2021 1:28 PM
To: Mary Beth Euker <marybeth.euker@lakezurich.org>; Greg Weider <greg.weider@lakezurich.org>; Jonathan Sprawka <jonathan.sprawka@lakezurich.org>; Marc Spacone <marc.spacone@lakezurich.org>; Janice Gannon <Janice.Gannon@lakezurich.org>; Dan Bobrowski <dan.bobrowski@lakezurich.org>; Tom Poynton <tom.poynton@lakezurich.org>; Tim Verbeke <Tim.Verbeke@lakezurich.org>
Cc: 'Matt Clark' <mattc@wnwinc.com>
Subject: Zoning permit for 708 Telser Rd.

Lake Zurich Board of Trustees,

I own the condo unit at 712 Telser Rd. I have occupied this unit since it was originally built, and have paid my property tax each year since without question.

I was alarmed to learn of a Pet Crematorium request for a special permit to conduct business from Tim at the Lake Zurich Zoning Department. That practice is only legal in 20 states for a reason. Tim then called me to clarify this would be a Human Crematorium. Both of these businesses would have a huge impact on my business specifically because they are both within feet of my front door. Such an allowance will have a detrimental impact on my business, disturbing potential customers, and ultimately reduce the value of my property and the value of the other 15 units located within this condo association. Are you and the planning board of Lake Zurich prepared to have 16 condo owners request a downward adjustment to the tax bills next year which **will** occur as a result of this permit?

Noise levels

- Due to the nature of the concrete walls and aluminum roof, I can hear every conversation in all 3 units that surround me. A human crematorium would introduce conversation into my work place that should not be allowed.

Ordors, furnace emissions

- The current owner of 708 Telser Rd., an Arizona resident, rented his unit to a pest control business last year. My office was under a constant chemical smell as a result of the air flow between units inside this construction. The tenant was confronted many times, but could never end the chemical smells until they moved out a few months back.
- The idea of a furnace with smoke stack next to our front door will be a daily reminder of the emissions I would be forced to work by. What if my valued employees decide to no longer work here as a result?

I will be attending the virtual TEAM conference on May 19th where this special use permit is on the agenda for the Village of Lake Zurich to approve. I ask you to carefully consider the impact this decision will have.

Please feel free to contact me if you have questions.

Sincerely,

David Ohland

2M Precision Laser Specialist, LLC

712 Telser Rd.

Lake Zurich, IL. 60047

dohland@PLS.email

847-726-9845 office

847-726-9846 fax

www.precisionlaserspecialist.com

[Watch Us in Action](#)

From: [Kyle Kordell](#)
To: [David Wolfe](#)
Cc: [Michael Duebner](#); [Sarosh Saher](#); [Tim Verbeke](#)
Subject: RE: Zoning hearing for 708 Telser Road
Date: Friday, May 7, 2021 11:21:44 AM

Mr. Wolfe,

Thank you for this – you’re public comment for the May PZC meeting has been received and will be shared with the Commission.

Regards,

Kyle Kordell
Assistant to the Village Manager / Deputy Village Clerk
Village of Lake Zurich

From: David Wolfe <dwolfe@wolfe-llc.com>
Sent: Friday, May 7, 2021 11:19 AM
To: Net.Inbound General <info@lakezurich.org>
Cc: dwolfe@wolfe-llc.com
Subject: RE: Zoning hearing for 708 Telser Road

RE:
Notice of Public Hear – 708 Telser Road

To:
Orlando Stratman
Chairperson
Planning & Zoning Commission:

Respectfully,

My name is David Wolfe and I am the owner of 736 Telser Road, Lake Zurich.

I would like to state my staunch opposition to granting a zoning variance to permit a crematorium at 708 Telser Road, Lake Zurich.

There are several reasons I oppose the proposed crematorium; health concerns, emission concerns, property value concerns, and concern that this type of business does not fit with the scope and culture of the Lake Zurich business and commerce center.

I am opposed to having a crematorium in the business park, but this specific proposed crematorium is literally in the same building as my property. I have not received any communication or information previous to the Village Notice, thus I was shocked to learn of what is being proposed.

When I invested in my commercial condominium unit, the requirements and exclusions for both the condo association and the Village were very clear as to what business activities were approved – I made my purchase / investment decision based on that information. I would not have invested in the Lake Zurich property if there was at the time or were to be in the future a crematorium in the same building or nearby.

The proposed crematorium will cause my property values to drop and will create real and perceived health concerns for owners, employees, and visitors to the Brook Commons Condominium building.

Again, I urge you and the Village of Lake Zurich Planning and Zoning Commission not to grant the variance regarding 708 Telser Road.

Thank you,
David Wolfe
736 Telser Road
Lake Zurich, IL 60047

David Wolfe
Wolfe Enterprises, LLC
847-778-9833 – P
847-307-8320 – F



From: [Tim Verbeke](#)
To: [Sarosh Saher](#)
Subject: FW: Zoning Change Request at 708 Telser Rd
Date: Friday, May 7, 2021 9:20:01 AM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)

Another comment from a neighbor.

From: Janice Laudani <JaniceL@wnwinc.com>
Sent: Friday, May 7, 2021 9:19 AM
To: Tom Poynton <tom.poynton@lakezurich.org>
Cc: Mary Beth Euker <marybeth.euker@lakezurich.org>; Greg Weider <greg.weider@lakezurich.org>; Jonathan Sprawka <jonathan.sprawka@lakezurich.org>; Marc Spacone <marc.spacone@lakezurich.org>; Janice Gannon <Janice.Gannon@lakezurich.org>; Dan Bobrowski <dan.bobrowski@lakezurich.org>; Tim Verbeke <Tim.Verbeke@lakezurich.org>; Matt Clark <mattc@wnwinc.com>
Subject: Zoning Change Request at 708 Telser Rd

Dear Mayor and Village Officials,

I work for W & W associates at 704 Telser Rd. This building is a condo with shared walls. The tenant next door to us at 708 Telser Rd is seeking to change the village zoning laws to include crematoriums in an industrial zoning area.

I strongly oppose this special use permit and potential zoning change at 708 Telser Rd. A crematorium should have its own separate building. We share the same walls and can hear and smell anything right next door to us. We would not be able to work in the office with the loud noise from the machines.

We are also concerned about our safety with potential pollutants and toxins. We have clients meet with us in this office and if there are dead humans or pets being brought in the door next door that would surely harm our business.

This is a sensitive matter and I ask that you please reject the zoning change.

Sincerely,

From: [Tim Verbeke](#)
To: [Sarosh Saher](#)
Subject: FW: Proposed Zoning Variance at 708 Telser Road
Date: Monday, May 10, 2021 10:44:11 AM
Attachments: [image005.png](#)
[image006.png](#)
[image007.png](#)
[image008.png](#)

FYI

From: Mary Lou Tracy <MaryLouT@wnwinc.com>
Sent: Monday, May 10, 2021 10:23 AM
To: Mary Beth Euker <marybeth.euker@lakezurich.org>; Greg Weider <greg.weider@lakezurich.org>; Jonathan Sprawka <jonathan.sprawka@lakezurich.org>; Marc Spacone <marc.spacone@lakezurich.org>; Janice Gannon <Janice.Gannon@lakezurich.org>; Dan Bobrowski <dan.bobrowski@lakezurich.org>; Tom Poynton <tom.poynton@lakezurich.org>; Tim Verbeke <Tim.Verbeke@lakezurich.org>
Cc: Matt Clark <mattc@wnwinc.com>; Nicole Marek <NicoleM@wnwinc.com>; Janice Laudani <JaniceL@wnwinc.com>
Subject: Proposed Zoning Variance at 708 Telser Road

Dear Mayor and Village Officials,

I am writing regarding the proposed zoning variance for the property at 708 Telser Road.

I understand that the potential buyer is planning on operating a crematorium at this location and I am strongly opposed to this type of business operating within arms distance to our location.

There are no words to describe the horror of this business and the health and safety risks to myself and other employees. I am aware that burning anything emits toxins into the air but am especially concerned about the constant contact and close proximity of our office to this cremation process. Studies have been conducted that indicate living near a crematory or incinerator leads to chronic health problems, with the most vulnerable population groups being the unborn fetus, small children, the elderly, and anyone with a compromised immune system or other underlying health issues. You will find these studies on the website under "crematory emissions data" – there you will also find information regarding the EPA (and their knowledge of the impact on health of crematories, the fact that the official numbers for the emissions are off – significantly off. The actual emissions are likely to be 11 times higher.

Another horrifying concern is waste management effecting the sewage in addition to the regulation and monitoring of potential disposals of liquids, chemicals, gloves, gauze, bandages etc at the shared complex trash dumpsters. What type of waste management plan will they have to keep our customers and employees safe and to prevent the release of hazardous

materials to the environment. In particular, who will pay attention to their internal collection systems and how waste is stored and disposed of?

I understand that this is a very sensitive issue to all parties involved, however, I would like you all to ask yourselves if you personally would welcome a crematorium in arm's length next to you or have your daughter, son, or parent work in an environment that may be not only hazardous to their health but also be subjected to seeing or hearing any type or form of a cremation process on a daily basis.

Best Regards,



Mary Lou Tracy

Accounting

704 Telser Rd | Lake Zurich IL, 60047

847.719.1760

Check us out on the web!



From: [Tom Poynton](#)
To: [Matt Clark](#)
Cc: [Sarosh Saher](#); [Tim Verbeke](#); [Ray Keller](#); [OU - Village Elected Officials](#)
Subject: Re: Special Use Permit 708 Telser Road
Date: Tuesday, May 4, 2021 2:36:40 PM
Attachments: [image001.png](#)
[image002.png](#)
[image003.png](#)
[image004.png](#)

Thank you for your email Mr. Clark. I look forward to your public comment at the May 19th Village Board meeting.

Tom Poynton
Mayor, Village of Lake Zurich, IL

From: Matt Clark <mattc@wnwinc.com>
Sent: Tuesday, May 4, 2021 12:33 PM
To: Tom Poynton <tom.poynton@lakezurich.org>
Subject: Special Use Permit 708 Telser Road

Mayor Poynton,

I am the owner of the industrial condo at 704 Telser Road. I am opposed to the special use permit for the human crematorium proposed at 708 Telser Road. This type of business will have a detrimental impact my day-to-day operations and property values based upon the nature of the of the business proposing this change in zoning. This type of business needs to be in a stand-alone building and not in a shared industrial condominium with owners on either side. The construction of these units does not offer sound insulation nor the appropriate venting ability for a crematorium for human remains.

I will be attendance for the village board meeting on May 19th where this special use permit is on the agenda for the Village of Lake Zurich to approve. I would hope you would deny the special use permit based upon the inappropriate location for this proposed site.

I would be happy to discuss this matter further; please reach out to me anytime.

Thanks,



Matt Clark
President

704 Telser Rd | Lake Zurich IL, 60047
847.719.1760

Check us out on the web!



From: [Tim Verbeke](#)
To: [Sarosh Saher](#)
Subject: FW: proposed zoning variance at 708 Telser Road
Date: Friday, May 7, 2021 9:09:51 AM
Attachments: [image002.png](#)

See another neighbor comment below

From: Nicole Marek <NicoleM@wnwinc.com>
Sent: Thursday, May 6, 2021 4:35 PM
To: Mary Beth Euker <marybeth.euker@lakezurich.org>; Greg Weider <greg.weider@lakezurich.org>; Jonathan Sprawka <jonathan.sprawka@lakezurich.org>; Marc Spacone <marc.spacone@lakezurich.org>; Janice Gannon <Janice.Gannon@lakezurich.org>; Dan Bobrowski <dan.bobrowski@lakezurich.org>; Tom Poynton <tom.poynton@lakezurich.org>; Tim Verbeke <Tim.Verbeke@lakezurich.org>
Cc: Matt Clark <mattc@wnwinc.com>
Subject: proposed zoning variance at 708 Telser Road

Good afternoon,

I am writing in regard to the proposed zoning variance for the property at 708 Telser Road. I understand that the potential buyer is planning on operating a crematorium at this location, and I am strongly opposed to this type of business operating next door. Because this building is composed of several individually owned "condos," our unit shares a wall with 708 Telser. I have several concerns:

1. Health and safety risks to myself and other employees- I am well aware that burning anything emits toxins into the air but am especially concerned about the constant contact and close proximity of our office to this cremation process. Not only would we be exposed to this during work hours, but these toxic particles would also accumulate on our vehicles parked in the lot, (less than 75 feet from the building) and then brought to our homes where we would have continued exposure. The unit to on the other side is a commercial kitchen. We can smell the food when employees are cooking, and smelled the gas coming from that suite when there was a leak. I mention this because it clearly indicates that odors and toxins from the proposed crematorium would also penetrate our unit, making an unsuitable work environment. In addition, it is my understanding that a fresh air intake to our office space is located on the roof of the building and would likely be less than 25 feet from where the crematory ovens would vent. This is entirely too close for comfort. In other parts of the country and across the world, there are minimum "setback" areas of at least 450 feet from other structures/ residences etc. If this crematory business were looking to purchase a free-standing building that has more space between structures, I would be completely supportive.
2. Noise. I have been present for the cremation of 4 of my pets, and I know from watching in another room separated by a thick glass partition, that these cremation ovens are loud, especially when the door is open. Because the shared walls of this building are concrete block and the ceiling is metal, we can hear when our neighbors speak loudly or play music, so we would likely hear the noise of these ovens all day/every day when they are running. This will negatively affect our ability to conduct business on the phone and be a general nuisance to our daily operations.
3. The nature of the proposed business is very sensitive, and as such, will likely be off putting to our employees, our clients, and the clients of the other businesses in this building. Especially for the shared food kitchen next door. Would you feel comfortable picking up your meals as you watch bodies being wheeled in 20 feet away? I believe this would also have a negative effect on our business, keeping customers away. The employee who sits at the front of our office near the window is mortified about the possibility of having to see bodies being brought in next door.
4. Lack of regulation. I read through the Illinois Crematory Regulation Act. I have pasted the link to this below. From what I understand, there are very little specific or strict State regulations of crematoriums currently. So, there would be no oversights on whether they are disposing of biohazardous waste materials properly or just tossing it in the common use dumpsters. Also, there would be no checks or regulations to ensure they would be operating the ovens at the proper temperatures or storing bodies properly prior to cremation (aside from the annual "providing (i)an affidavit signed by the owner of the crematory authority that **at the time of the report** the cremation device was in proper operating condition.") All things that would negatively affect the businesses that surround this location.

https://www.icfha.org/uploads/3/4/1/4/34142200/410%C2%A0ilcs%C2%A018_%C2%A0%C2%A0crematory_regulation_act.pdf

I sincerely hope each one of you will take my concerns, and the concerns of the other occupants of this building seriously and reject the zoning variance. I would be happy to discuss my concerns via email or over the phone. My contact information is below.
Thank you for your time.

From: [Tim Verbeke](#)
To: [Sarosh Saher](#)
Subject: FW: Zoning permit for 708 Telser Rd.
Date: Thursday, May 6, 2021 11:08:06 AM

Communication between neighboring units and Trustee Bobrowski

From: dohland@pls.email <dohland@pls.email>
Sent: Thursday, May 6, 2021 10:52 AM
To: Mary Beth Euker <marybeth.euker@lakezurich.org>; Greg Weider <greg.weider@lakezurich.org>; Jonathan Sprawka <jonathan.sprawka@lakezurich.org>; Marc Spacone <marc.spacone@lakezurich.org>; Janice Gannon <Janice.Gannon@lakezurich.org>; Dan Bobrowski <dan.bobrowski@lakezurich.org>; Tom Poynton <tom.poynton@lakezurich.org>; Tim Verbeke <Tim.Verbeke@lakezurich.org>
Cc: 'Matt Clark' <mattc@wnwinc.com>; Fine Line Productions <fineline4@mac.com>; JimO@totalmidwest.com; Kara@totalmidwest.com; Tom@totalmidwest.com; 'Wayne & Darlene Grant' <grantzci@aol.com>
Subject: RE: Zoning permit for 708 Telser Rd.

Dan,

Thank you for your prompt response.

I spoke with the owners of 720 Telser Rd. They are trying to sell that condo as we speak. I am sure they did not sleep well last night as this proposed business will certainly ruin interest from prospective buyers.

Because our building houses 16 tightly connected units, Both a pet crematorium and human crematorium would impact all of us. Are there no zoning laws that require such businesses to occupy a standalone building? Why would this type of business owner try to squeeze into a tight space and face such discourse?

I would like to invite everyone to use this thread for access to the concerns being shared.

Sincerely,

David Ohland

2M Precision Laser Specialist, LLC
 712 Telser Rd.
 Lake Zurich, IL. 60047
dohland@PLS.email
 847-726-9845 office
 847-726-9846 fax
www.precisionlaserspecialist.com

[Watch Us in Action](#)

From: Dan Bobrowski <dan.bobrowski@lakezurich.org>
Sent: Wednesday, May 5, 2021 4:59 PM
To: dohland@pls.email
Subject: RE: Zoning permit for 708 Telser Rd.

David,

Thank you for your input. I will look into this type of business application, and its appropriateness for the proposed location.

If you run into any additional information regarding this type of business and potential impacts, please feel free to send them to me.

Thanks!

Sent from [Mail](#) for Windows 10

From: dohland@pls.email
Sent: Wednesday, May 5, 2021 1:28 PM
To:
Cc: 'Matt Clark'
Subject: Zoning permit for 708 Telser Rd.

Lake Zurich Board of Trustees,

I own the condo unit at 712 Telser Rd. I have occupied this unit since it was originally built, and have paid my property tax each year since without question.

I was alarmed to learn of a Pet Crematorium request for a special permit to conduct business from Tim at the Lake Zurich Zoning Department. That practice is only legal in 20 states for a reason. Tim then called me to clarify this would be a Human Crematorium. Both of these businesses would have a huge impact on my business specifically because they are both within feet of my front door. Such an allowance will have a detrimental impact on my business, disturbing potential customers, and ultimately reduce the value of my property and the value of the other 15 units located within this condo association. Are you and the planning board of Lake Zurich prepared to have 16 condo owners request a downward adjustment to the tax bills next year which ***will*** occur as a result of this permit?

Noise levels

- Due to the nature of the concrete walls and aluminum roof, I can hear every conversation in all 3 units that surround me. A human crematorium would introduce conversation into my work place that should not be allowed.

Ordors, furnace emissions

- The current owner of 708 Telser Rd., an Arizona resident, rented his unit to a pest control business last year. My office was under a constant chemical smell as a result of the air flow between units inside this construction. The tenant was confronted many times, but could never end the chemical smells until they moved out a few months back.
- The idea of a furnace with smoke stack next to our front door will be a daily reminder of the emissions I would be forced to work by. What if my valued employees decide to no longer work here as a result?

I will be attending the virtual TEAM conference on May 19th where this special use permit is on the agenda for the Village of Lake Zurich to approve. I ask you to carefully consider the impact this decision will have.

Please feel free to contact me if you have questions.

Sincerely,

David Ohland

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From: [Paul Chapman](#)
To: mattc@wnwinc.com; dohland@pls.email
Cc: [Sarosh Saher](#); [Tim Verbeke](#); [Mary Beth Fuker](#); [Greg Weider](#); [Jonathan Sprawka](#); [Marc Spacone](#); [Janice Gannon](#); [Dan Bobrowski](#); Tom.poyton@lakezurich.org; [Lisa Gagliano](#); [Steve Cook](#); [Jackie Cook](#)
Subject: Information about Journey Cremations Zoning Permit
Date: Friday, May 7, 2021 12:21:52 PM

To: Matt , David and other Interested parties

From Journey Cremations

Re: Facts about Journey Cremations you need to know

We were hoping to get together for a cup of coffee so we could answer your questions and alleviate your concerns about our presence at 708 Telsler before the zoning meeting. In lieu of a face-to-face meeting, we would like to supply you with some facts about Journey Cremations and our operation you will find helpful.

First: While we provide a service to the public, the public does not come to our location. Therefore, we do not have signage on our facility that indicates a crematory. The only signage on the building will be our logo. This is a tree and the word Journey. Thus, there is no impact to any one of your customers coming to your offices.

All of our processes are handled in our facility. No-one will ever see a loved one being brought into the building. These loved ones are treated with immense respect. They are immediately covered, placed in a cardboard container and then placed in a cooler until.

Second: Noise, smoke etc. The village will have all the data at the upcoming meeting that supports that this is a clean process. We wanted you to have it in advance. When a cremation takes place, the only noise that is created comes from the exhaust fan. The db level is similar to window air conditioner or a car traveling at 60mph with the windows closed. As a side note to the noise level questions being raised, we will only be operating one retort in this facility, not two or three. If the demand increases, we will either work at night or outsource the overflow. There will be no "Doubling" of db noise levels. As for hearing conversations, there will be only one or two people in the facility at a time. The chances of conversations being overheard are nil.

As for smoke, we will generate 10 times less particulates than a fireplace. The smoke output through the smoke stack is the same as the smoke from your home furnace. It is white. By the way, the smoke stack will not be anywhere near the front doors and more than likely will have an architectural detailing that makes it look more residential than industrial. You will be glad to know that the system is enclosed in fire brick with several monitoring systems to prevent a fire. If the temperature ever becomes a question, the unit shuts down. To my knowledge, there has never been a fire caused by a retort in a crematorium.

As for smells, there are none. The smoke that is created is double processed in an "afterburner". This burns off any possible remaining scents before the smoke ever leaves the chamber and heads up the smoke stack. There are no other smells in the process.

If you have any other concerns, please reach out so we can address them.

I would be grateful if you would pass these facts on to any other tenants with questions.

Thanks

Paul Chapman
Business Manager

From: [Tom Poynton](#)
To: [dohland@pls.email](#); [Mary Beth Euker](#); [Greg Weider](#); [Jonathan Sprawka](#); [Marc Spacone](#); [Janice Gannon](#); [Dan Bobrowski](#); [Tim Verbeke](#)
Cc: ["Matt Clark"; Fine Line Productions](#); [JimO@totalmidwest.com](#); [Kara@totalmidwest.com](#); [Tom@totalmidwest.com](#); ["Wayne & Darlene Grant"](#); [Ray Keller](#); [Sarosh Saher](#)
Subject: Re: Zoning permit for 708 Telser Rd.
Date: Thursday, May 6, 2021 3:45:39 PM

IN COMPLIANCE WITH THE OPEN MEETINGS ACT PLEASE DO NOT REPLY ALL

Good afternoon Mr. Ohland ...

Thank you for your email and the voicing of your concerns. I'm copying the Board, Village Manage and Community Services Director on this email.

I'm going to try and answer a couple of your questions as best I can.
Please, don't take my answers as being the best and totally correct.

Your Question #1: Are there no zoning laws that require such businesses to occupy a standalone building?

My Answer: I don't know. But ... the answer to that will come out during the consideration process via the Planning and Zoning Commission vetting and recommendation meetings.

Your Question #2: Why would this type of business owner try to squeeze into a tight space and face such discourse?

My Answer: I don't know that as I/we were not privy to the conversations between the business owner and the property owner. But ... the business owner wouldn't be there asking if the property owner didn't solicit for a new tenant and possibly encourage the business owner to bring forward his proposal. When that happens, then the Village has to allow the proposal to go through the process ... if the parties want to. The item doesn't get voted on by the Board until the process gets to an end.

Regards,

Tom Poynton
Mayor, Village of Lake Zurich, IL
Cell: 847-207-1745

From: dohland@pls.email <dohland@pls.email>
Sent: Thursday, May 6, 2021 10:51 AM
To: Mary Beth Euker <marybeth.euker@lakezurich.org>; Greg Weider <greg.weider@lakezurich.org>; Jonathan Sprawka <jonathan.sprawka@lakezurich.org>; Marc Spacone <marc.spacone@lakezurich.org>; Janice Gannon <Janice.Gannon@lakezurich.org>; Dan Bobrowski <dan.bobrowski@lakezurich.org>; Tom Poynton <tom.poynton@lakezurich.org>; Tim

Verbeke <Tim.Verbeke@lakezurich.org>

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