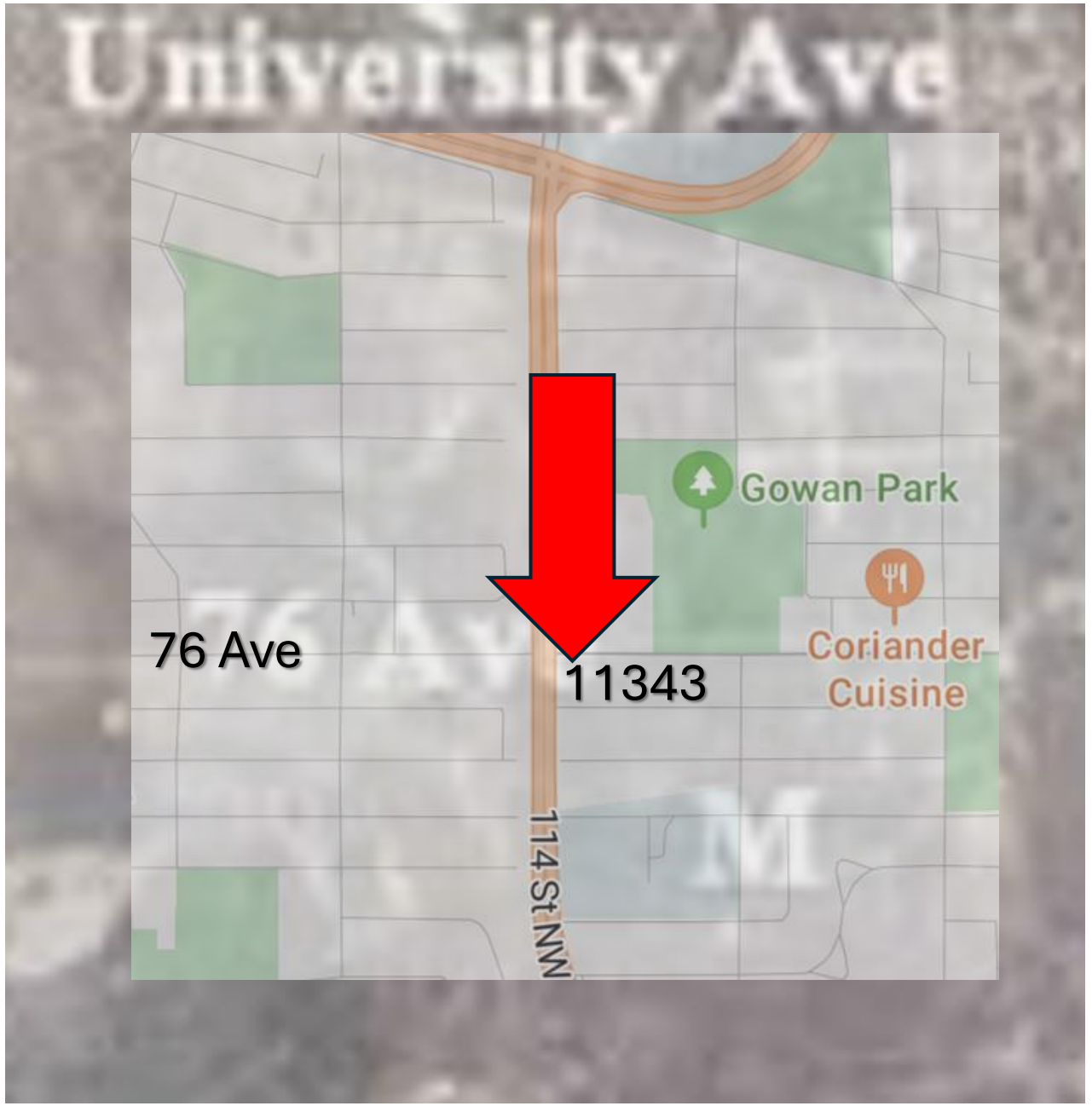
COMMENT ON:

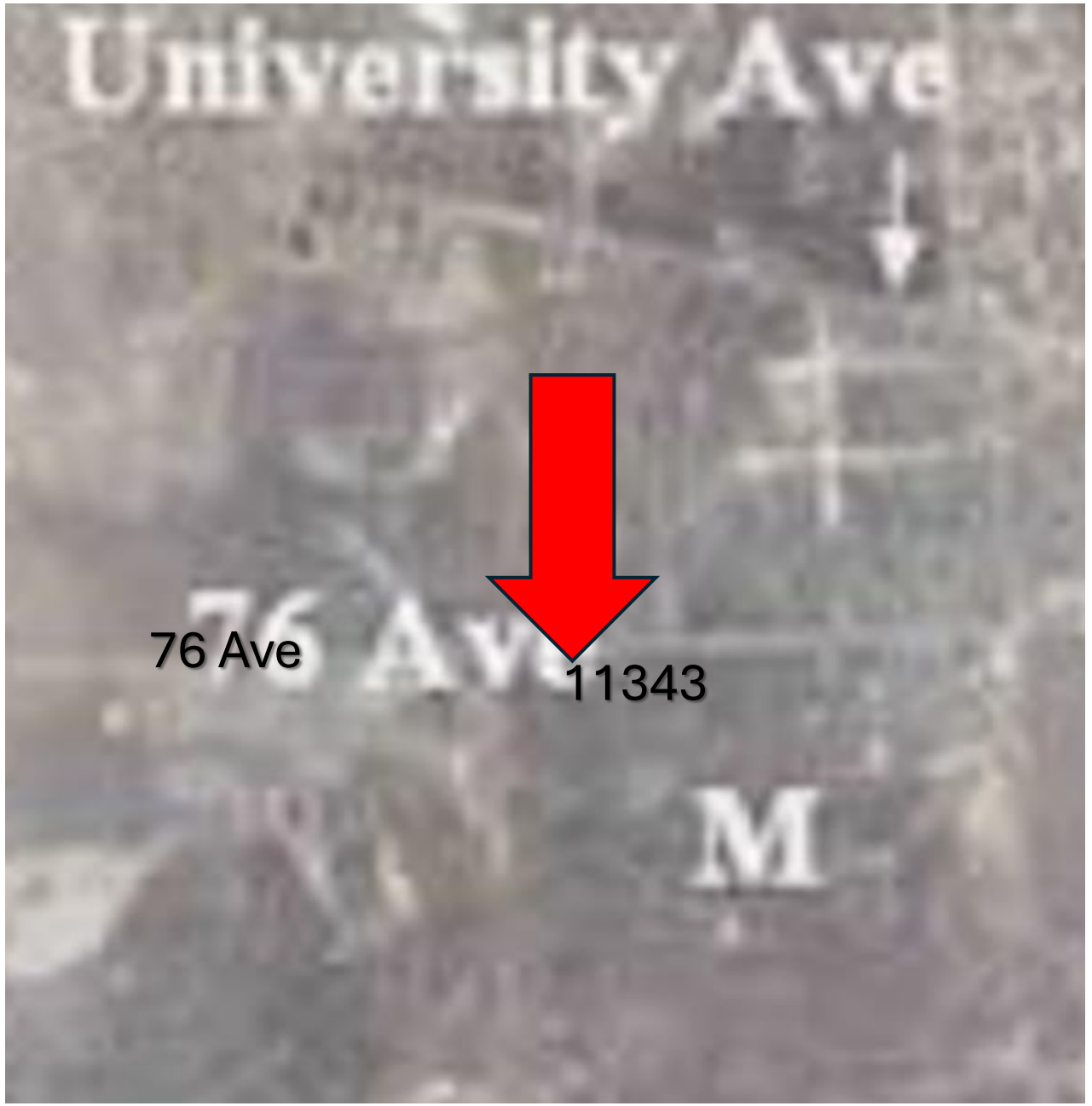
CHARTER BYLAW 20862

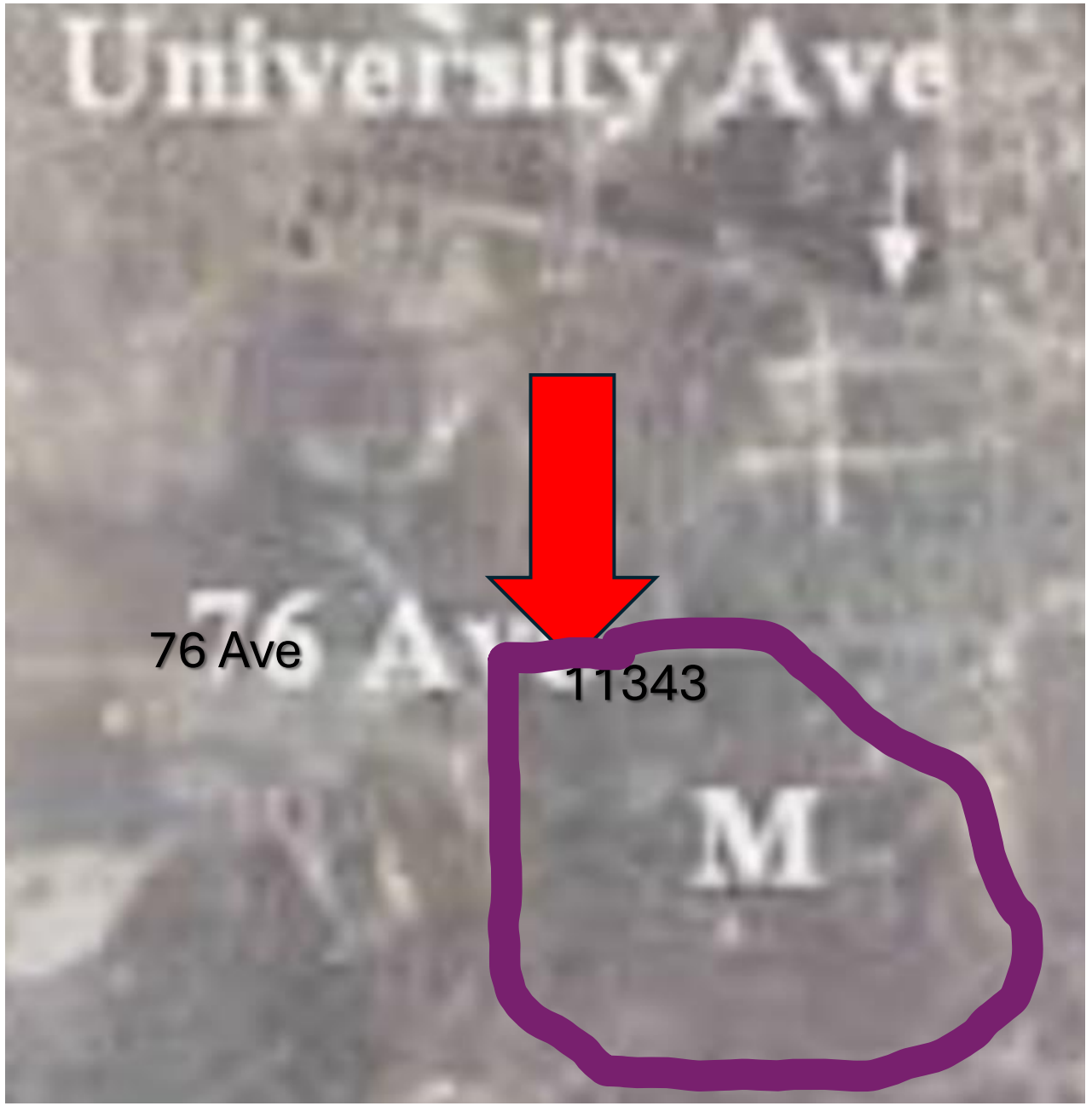
JASON TETRO

July 2, 2024


76 Ave
11343
Gowan Park
Coriander
Cuisine
114 St NW


University Ave
Gowan Park
Coriander Cuisine
76 Ave
11343
114 St NW


University Ave
76 Ave
76 Ave
11343
M


University Ave
76 Ave
11343
M

McKERNAN'S LAKE

110 -114 Streets
76 -72 Avenues

McKernan’s Lost Lake

Author Katherine Koller | October 25, 2016

McKernan’s Lake was completely drained to make way for 150 new homes.

Today, a drop in elevation south of 76 Avenue is a reminder of the edge of the lakeshore.

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Bearing pressures are the pressures that the footing exerts on the supporting soil.

SOIL BEARING CAPACITY CHART

		Ultimate Ground Bearing Capacity			Allowable Ground Bearing Capacity		
Ground Type	Density of State	Tons s/f	PSF	PSI	Tons s/f	PSF	PSI
Rock (not shale unless hard)	Bedrock	60	120,000	833	30	60,000	417
Rock (not shale unless hard)	Layers	15	30,000	208	7.5	15,000	104
Rock (not shale unless hard)	Soft	8	16,000	111	4	8,000	56
Hardpan, cemented sand or gravel	All	10	20,000	139	5	10,000	69
Gravel or Sand	Compact	8	16,000	111	4	8,000	56
Gravel or Sand	Firm	6	12,000	83	3	6,000	42
Gravel or Sand	Loose	4	8,000	56	2	4,000	28
Sand, course to medium	Compact	6	12,000	83	3	6,000	42
Sand, course to medium	Firm	4.5	9,000	63	2.25	4,500	31
Sand, course to medium	Loose	3	6,000	42	1.5	3,000	21
Sand, fine, silty or with trace of clay	Compact	4	8,000	56	2	4,000	28
Sand, fine, silty or with trace of clay	Firm	3	6,000	42	1.5	3,000	21
Sand, fine, silty or with trace of clay	Loose	1	2,000	14	0.5	1,000	7
Silt	Compact	3	6,000	42	1.5	3,000	21
Silt	Firm	2.5	5,000	35	1.25	2,500	17
Silt	Loose	2	4,000	28	1	2,000	14
Clay	Compact	4	8,000	56	2	4,000	28
Clay	Firm	2.5	5,000	35	1.25	2,500	17
Clay	Loose	1	2,000	14	0.5	1,000	7

Clay	Compact	4	8,000	56	2	4,000	28
Clay	Firm	2.5	5,000	35	1.25	2,500	17
Clay	Loose	1	2,000	14	0.5	1,000	7

Shallow footings bear directly on the supporting soil. This type of foundation is used when the shallow soils can safely support the foundation loads.

A deep foundation may be selected if the shallow soils cannot economically support the foundation loads. Deep foundations consist of a footing that bears on piers or piles. The footing above the piers or piles is typically referred to as a pile cap.

The piers or piles are supported by deeper competent soils, or are supported on bedrock. It is commonly assumed that the soil immediately below the pile caps provides no direct support to the pile cap.

UNKNOWNS:

- **SOIL: TYPE OF CLAY**
- **SOIL: UNDER-CONSOLIDATED?**
- **SOIL: WATER TABLE DEPTH**
- **SOIL: BEDROCK DEPTH**
- **PILES: NUMBER FOR PARKADE/STRUCTURE**
- **PILES: SHEAR/ELASTICITY**
- **PILES: AFFECT ON ADJACENT STRUCTURES**

CAN THIS SITE SUPPORT A SIX STOREY STRUCTURE?

STEP	EVALUATE	DESCRIPTION
1	Soil profile of selected site	Develop depth profiles of water content, liquid and plastic limits, unit weight and overburden pressure, site and unconsolidated-undrained shear strength to a depth of a least twice the width of a pile group or five times the tip diameter of drilled shafts. Estimate shear strength and elastic soil modulus from results of in situ and laboratory triaxial tests. Determine water table depth and extent of perched water. Perform consolidation/swell tests if soil is potentially expansive or collapsible and plot compression and swell indices and swell pressure with depth. Evaluate lateral modulus of subgrade reaction profile. Compare soil profile at different locations on the site.
2	Group similar soils	Group similar soils and assign average parameters to each group or strata.
3	Depth of base	Select a potentially suitable stratum that should support the structural loads such as a firm, nonswelling, and noncollapsing soil of low compressibility.
4	Select type of deep foundation	Select the type of deep foundation such as driven piles or drilled shafts depending on requirements that the foundation includes vertical and lateral load resistance, economy, availability of pertinent construction equipment, and experience. Environmental considerations include allowable noise level, vibrations, overhead clearance, and accessibility of equipment to the construction site. Soil conditions such as potential ground rise (heave) or loss and expansion/collapse also influence type of foundation.
5	Check *Qa* with structural capacity	Allowable pile or shaft load *Qa* shall be within the structural capacity of the deep foundation
6	Design	The design procedure will be similar for most types of deep foundations and requires evaluation of the ultimate pile capacity *Qu* = *Qsu* + *Qbu* where *Qsu* = ultimate skin friction resistance and *Qbu* = ultimate end bearing capacity. Reasonable estimates of vertical and lateral displacements under the probable design load *Qd* are also required. *Qd* should be within levels that can be tolerated by the structure over its projected life and should optimize operations. *Qa* = allowable pile capacity. *Qa* = *Qu/FS* = factor of safety. A typical *FS* = 3 if load tests are not performed or if the deep foundation consists of a group of driven piles. *FS* = 2 if load tests are performed or 2.5 if wave equation analyses of the driven piles are calibrated with results of pile driving analyzer tests.
7	Verify the design	The capability of the deep foundation to support the structure shall be verified by static load and dynamic tests. These tests are usually nondestructive and allow the tested piles or drilled shafts to be used as part of the foundation.
8	Addition to existing structure	Calculate displacements of existing deep or shallow foundations to determine the ability to carry existing and additional loads and to accommodate new construction.
9	Effect on adjacent structure	Evaluate changes in bearing capacity and groundwater elevation and effect of any action which can result in settlement or heave of adjacent structures.

LDA23-0010 McKernan Rezoning

Has a study been conducted to determine the structural impact on both the adjacent structure as well as the alley facing structures?

- At the building Permit stage, which comes after rezoning, a Footing and Foundation Permit is reviewed prior to the digging of the parkade foundation, which includes a review of geotechnical information (soil stability) and shoring/bracing.

WE DON'T KNOW

NRC · CNRC

Construction Technology Update No. 39

Traffic Vibrations in Buildings

*Table 1. Comparison of vibration levels (mm/sec^2, rms) induced by a bus and a truck, to demonstrate the effect of different suspension systems at different speeds**

Location	25 km/h		50 km/h	
	Bus	Truck	Bus	Truck
Ground in front of house	20.5	19.9	64.5	33.2
External foundation wall	11.2	10.1	30.9	15.7
Mid-point of floor in 1st storey	20.3	20.8	62.9	30.1
Mid-point of floor in 2nd storey	35.0	37.3	96.2	46.7

* Bus had air-bag suspension system; truck had multi-leaf steel spring suspension system.

Effects of Traffic Vibrations on Residents

- Vibrations may be unacceptable to occupants because of
  - physical sensations produced in the human body
  - interference with activities such as sleep
  - rattling of windowpanes and loose objects

- Experience has shown that people living in houses are likely to complain if vibration levels are only slightly above the perception threshold

Standards for evaluating human response to vibration levels

- ISO 2631/2 (1989), International Organization for Standardization
- ISO 8041 (1990), International Organization for Standardization
- BS 6472 (1984), British Standards Institution
- ANSI S3.29 (1983), American National Standards Institute

LDA23-0010 McKernan Rezoning

COMMENT: The vibrations from the traffic on 114 are enough to shake many of the foundations in the area.

- At the building Permit stage, which comes after rezoning, a Footing and Foundation Permit is reviewed prior to the digging of the parkade foundation, which includes a review of geotechnical information (soil stability) and shoring/bracing.

WE DON'T KNOW

SUMMARY

- **LOCATION IS OLD LAKE BED**
  - Different from the structures on University Ave at 114/115 St
- **SOIL UNCERTAINTIES REQUIRE MORE STUDIES**
  - Studies have not yet been performed as per rezoning Q&A
- **VIBRATION LEVELS REQUIRE MORE STUDIES**
  - Already known they exist yet not addressed

MORE STUDIES NEEDED