

J.R. Paine & Associates Ltd.

CONSULTING AND TESTING ENGINEERS

EDMONTON — GRANDE PRAIRIE — PEACE RIVER — WHITEHORSE

17505-106 Avenue
Edmonton, Alberta
T5S 1E7

October 31, 2008
File No. 2692-11

CITY OF EDMONTON
c/o SCHEFFER ANDREW LTD.
12204 – 145 Street
Edmonton, Alberta
T5L 24V7

ATTENTION: Tammy Carignan, P. Eng.

Dear Sir:

**Re: Geotechnical Review Letter
 Proposed Hollick Kenyon Stage 10D
 157 Avenue & 53 Street
 Edmonton, Alberta**

As requested, J. R. PAINE & ASSOCIATES LTD. has reviewed the geotechnical report that resulted out of our geotechnical investigation of this subdivision dated May 1997 in order to provide the moisture content criteria for trench backfill, as set out in the City of Edmonton specifications, and pavement design. The report reviewed was as follows:

- Geotechnical Investigation, Proposed Hollick Kenyon Stages 11 Residential Subdivision, Hollick Kenyon Way and 54 Street, May 1997, Prepared by JRP, File No. 2431-76.

Trench Backfill and Moisture Content Criteria

The attached chart compares the native moisture content of the materials encountered at the time of investigation, with different moisture content criteria for trench backfill at this site. Testholes located within or near proposed Stage were utilized. It should be noted that more Atterberg Limit testing will be required at the time of construction to confirm these results. Please refer to the complete site recommendations and the testhole logs. The logs show considerably more moisture data than the chart below.

Table A
Trench Backfill Maximum Moisture Content Criteria
Proposed Hollick Kenyon Stage 10D

Testhole Number	Sample Depth	Liquid Limit	Plastic Limit	Field Moisture Content	Plasticity Index (PI)	Maximum Moisture Content Criteria							
						Uniform Backfill			Conventional Backfill			PL+10 Criteria	
						PI/2	PL+PI/2	+/- Criteria	PI/3	PL+PI/3	+/- Criteria	PL+10	+/- Criteria
97-1	6.1 m	36.0	19.0	23.5	17.0	8.5	27.5	-4.0	5.7	24.7	-1.2	29.0	-5.5
97-3	0.6 m	48.0	16.5	24.0	31.5	15.8	32.3	-8.3	10.5	27.0	-3.0	26.5	-2.5
97-4	1.5 m	41.0	15.0	22.0	26.0	13.0	28.0	-6.0	8.7	23.7	-1.7	25.0	-3.0

- Notes:
- City specifications state that when the plasticity index criteria for maximum moisture content exceeds 10 percent over the plastic limit, the plastic limit plus 10 percent shall govern. Also, the top 1.5 meters in conventional trenching has a maximum moisture content of PI + 8 or the formula, whichever is less.
 - All values are percentages.
 - Bold values of PL+10 are governing criteria.
 - Chart shows only the samples, which were tested for Atterberg Limits. See testhole logs for all moisture content data.

It is recommended that the maximum lift thickness in the top 1.5 metres of the trench backfill be a maximum 150 millimetres. The clay materials should be wetted to above optimum moisture content.

The clay shale materials found at this site have a potential to be very high plastic and feature very high swelling, and therefore should not be used for the top 1.5 metres of trench backfill. Although bentonite was not encountered in the testholes, these soils are known to be in the region. Any bentonite soils encountered during trenching should be completely removed from the trenches. The bentonite soils can be placed in back of lot borrow areas only or removed from the site.

Topsoil and other deleterious material are not considered suitable as trench backfill. Significant coal seams were encountered in the testholes, coal is generally not considered suitable as trench backfill. The coal should be separated during underground utility installation. Minor coal seams may be utilized as trench backfill if mixed with the clay soils. A geotechnical engineer should be consulted to approve the trench backfill during construction.

Free water and slough materials were noted in the testholes at completion of drilling. Also, wet coal and sand lenses were encountered in the testholes. Dewatering will likely be required during underground utility installation. Dewatering efforts may consist of a simple sump and pump system. Exact dewatering methods should be determined in the field during construction.

Recommended Pavement Design

The pavement designs are based on the City of Edmonton typical lane cross-section and an estimated CBR of 3.0 for a prepared and approved clay subgrade.

Recommended Staged Roadway Structures Proposed Hollick Kenyon Stage 10D

STAGE 1

Structure Options	Local Residential (3.6x10⁴ ESALs)	Minor Collector (1.8x10⁵ ESALs)	Major Collector (1 bus route) (3.6x10⁵ ESALs)
Granular Base			
Asphaltic Concrete	65 mm (ACR)	75 mm (ACR)	75 (ACO)
Crushed Gravel (20 mm)	200 mm	250 mm	325 mm

STAGE 2

All Options:

35 mm of Asphaltic Concrete Overlay (ACO)

ACR = City of Edmonton Designation Asphaltic Concrete Residential

ACO = City of Edmonton Designation Asphaltic Concrete Overlay

Cement stabilization is the recommended minimum subgrade preparation method for this site. The addition of 20 kilograms of cement per square metre of subgrade mixed to a depth of 300 millimetres is the minimum recommended for this site, with care taken to adequately hydrate the clay during stabilization.

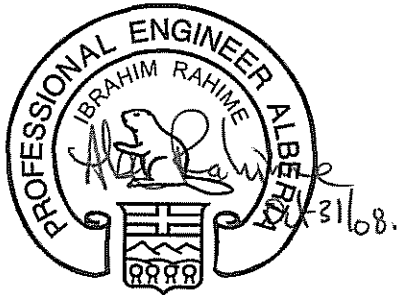
Foundation Drain Services

Foundation drain services are mandatory as per City of Edmonton standards.

We trust this information is satisfactory. If you should have any questions or comments, please contact our office.

Yours truly,

J.R. PAINE & ASSOCIATES LTD.

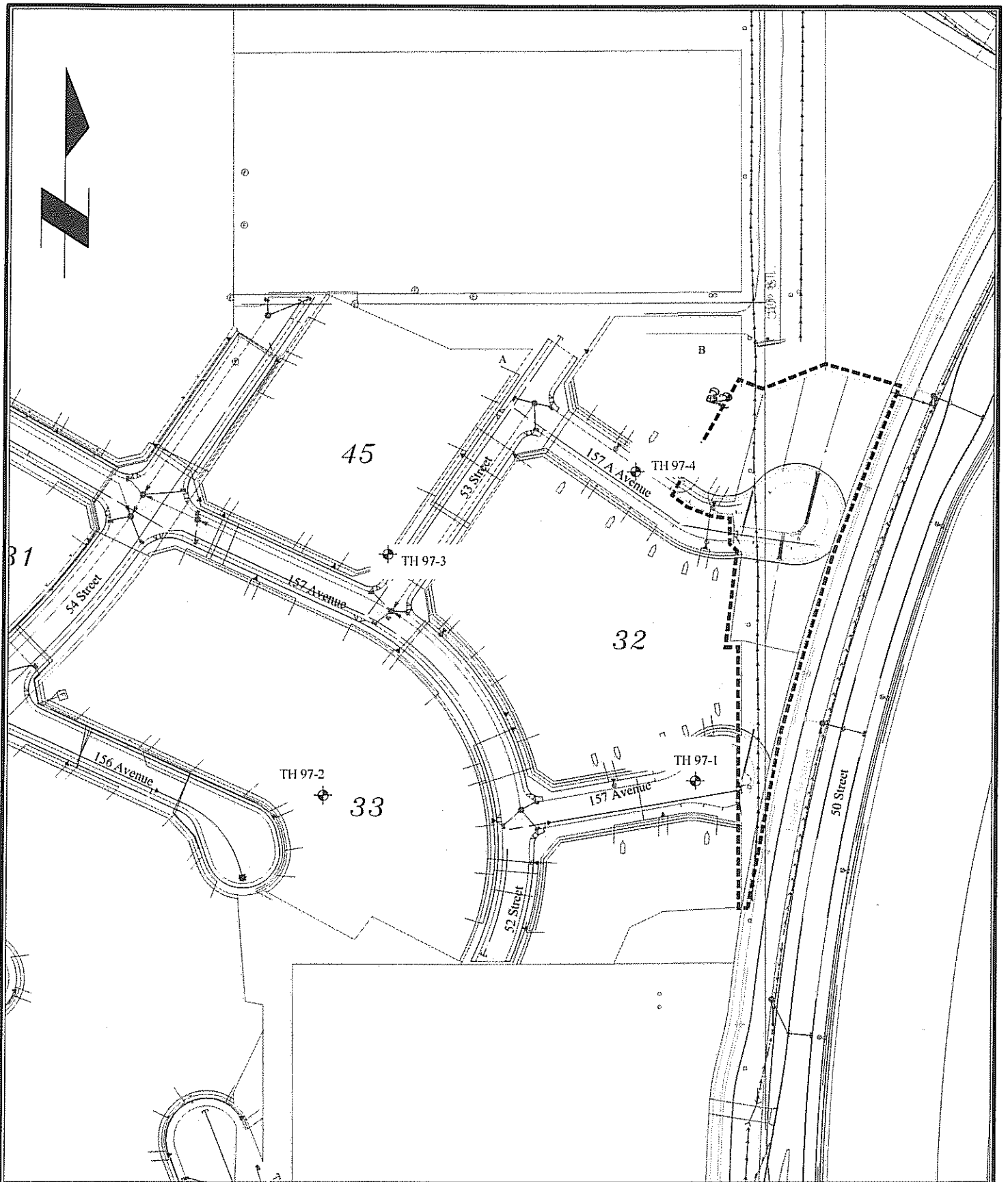


Abe Rahime, P. Eng

APEGGA Permit to Practice Number: P401

Attachments:

- Site Plan
- Testhole Logs



J.R. Paine & Associates Ltd.
CONSULTING AND TESTING ENGINEERS

**Approximate Testhole Location
Proposed Hollick Kenyos 10D
157 and 53 Street
Edmonton, Alberta**

SCALE: NTS

DATE: October 31, 2008

DRAWN BY: AR

File #: 2692-11

