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RESULTS OF A 24-HOUR NOISE LEVEL SURVEY

CARRIED OUT AT

BARRIE HOUSE, No. 29 St EDMUNDS TERRACE, LONDON, NW8

AND A REPORT ON THE NOISE CONTROL MEASURES

REQUIRED TO MINIMISE THE NOISE IMPACT

OF THE PROPOSED NEW EXTERNAL PLANT

Test Engineer : C Harlow

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Release by : I Marchant

Client	:	Marek Wojciechowski Architects Ltd
Project	:	Barrie House, No. 29 St Edmunds Terrace, London, NW8
Emtec Ref.	:	QF9194/PF6117/RP1_00
Issue Date	:	18th December 2017

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1.0. INTRODUCTION

This report details the results of a 24-hour noise level survey carried out in the grounds of Barrie House, No. 29 St Edmunds Terrace, London NW8.

The objectives of this survey were as follows:

- To assess the proposal to install new external plant.
- To identify the nearest properties that might be affected by noise from the new plant.
- To establish the existing background noise level outside the nearest affected properties.
- To recommend noise limits and any necessary measures to ensure that the operation of the new plant does not disturb the occupants of the nearest affected properties.

This report has been divided into the following sections for ease of analysis:

2.0. SITE DESCRIPTION

Barrie House, No. 29 St Edmunds Terrace is an eight storey residential block of flats located on the corner of Broxwood Way and St Edmunds Terrace in the Primrose Hill area of central London. Within the grounds of Barrie House is a small derelict building, a small garden area and car park for off street parking. The surrounding properties are all residential.

3.0. TEST INSTRUMENTATION

All measurement equipment used during the survey complied with the requirements of BS4142:2014 "Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas". Details of the equipment are as follows:

Integrating Sound Level Meter:	Rion type NL-52 class 1 Sound Level Meter fitted with a Rion type UC-59 ½ inch condenser microphone. Serial no.: 01121378
Statistical Analysis Modules:	Built in module capable of computing the percentile levels L1, L10, L50, L90 and L99 and also the Leq level.
Acoustic Calibrator:	Bruel & Kjaer type 4231 electronic calibrator. Serial No.: 1934160

Calibration was performed before and after the surveys and found to be, in all cases, +/- 0.1 dB from the reference source.

3.1. Existing Noise Climate

Road traffic travelling on nearby roads could be heard during the manned periods at the start and the end of the survey, so the noise levels measured will include contributions from road vehicles.

Commercial jet aircraft were observed at medium and high altitude during the manned periods at the start and the end of the survey, so it is possible that the noise levels measured could include contributions from medium altitude jet aircraft.

It was judged that road traffic noise would be the dominant source affecting the measured ambient noise levels.

4.0. TEST PROCEDURE

The survey was conducted during a continuous 24-hour period from 8.05am on Wednesday 13th December 2017 to 8.05am on Thursday 14th December 2017.

Data was continuously acquired throughout the measurement period with the individual averaging time for statistical noise data set to 15 minutes. The following 'A' weighted statistical measurements were recorded concurrently: -

LA_1 - The Sound Pressure Level exceeded for 1% of the measurement period.

LA_{10} - The Sound Pressure Level exceeded for 10% of the measurement period.

LA_{50} - The Sound Pressure Level exceeded for 50% of the measurement period.

LA_{90} - The Sound Pressure Level exceeded for 90% of the measurement period. LA90 is considered to represent the "background noise level" during the measurement period and is used for the assessment of noise to determine the likelihood of complaints (See BS 4142:2014).

LA_{99} - The Sound Pressure Level exceeded for 99% of the measurement period.

LA_{eq} - The continuous steady state Sound Pressure Level that has the same acoustic energy as the real fluctuating level.

4.1. Measurement Positions

Noise levels were measured on the first floor flat roof of the derelict building in the grounds of Barrie House, at a position considered equivalent to the closest receptor properties in order to enable noise predictions from the proposed plant to be compared and assessed against.

The microphone was fixed to a tripod and was approximately 1.2 metres above roof level. Photo A in Appendix 'B' of this report shows the location of the microphone.

The rest of the measurement equipment was located inside a weatherproof enclosure with low impedance cables running from the microphones to the instrumentation.

4.2. Weather Conditions

The weather conditions prevailing during the measurement period were generally in line with those recommended in BS 4142:2014: -

Weather daytime: -	Light Precipitation	Weather night time: -	Dry
Wind daytime: -	Moderate Breeze	Wind night time: -	Moderate Breeze

The microphone was protected throughout the tests by acoustically transparent wind balloon.

5.0. RESULTS AND EVALUATION OF NOISE CRITERIA

The raw test data, gathered during the noise survey, is given in Appendix 'A 'of this report.

The 'A' Weighted Leq levels measured over each 15 minute interval throughout the 24-hour period (denoted by LA_{eq}, (15 mins)) are displayed as bar graph on the attached Sketch No QF/9194/T1 at the back of this report.

The 'A' Weighted percentile levels measured over each 15 minute interval denoted by LA_{10} (15 mins), LA_{50} (15 mins) and LA_{90} (15 mins) are displayed as line graphs on the attached Sketch No QF/9194/T2 at the back of this report.

5.1. Summary of Results

The tables QF/9194/D1 below summarise the noise levels taken over the 24-hour period in terms of the maximum and minimum Sound Pressure Levels recorded.

Table QF/9194/D1 – Summary of Maximum and Minimum Noise Levels

	LA_{eq}	LA_{1}	LA_{10}	LA_{50}	LA_{90}	LA_{99}
Minimum	44dBA	50dBA	46dBA	43dBA	41dBA	40dBA
Maximum	61dBA	67dBA	64dBA	61dBA	57dBA	54dBA

5.2. Summary of the Local Authority's planning requirements regarding noise for noise sensitive properties

The local planning authority is the London Borough of Camden.

The Camden Local Plan sets out the Council's planning policies and replaces the Core Strategy and Development Policy planning documents (adopted in 2010). It ensures that Camden continues to have robust, effective and up-to-date planning policies that respond to changing circumstances and the borough's unique characteristics and contribute to delivering the Camden Plan and other local priorities.

The Local Plan will cover the period from 2016-2031. Policy A4 of The Local Plan is entitled Noise and Vibration and states:

The Council will seek to ensure that noise and vibration is controlled and managed. Development should have regard to Camden's Noise and Vibration thresholds (Appendix 3). We will not grant planning permission for a) a development likely to generate unacceptable noise and vibration impacts or b) a development sensitive to noise in locations which experience high levels of noise, unless appropriate attenuation measures can be provided and will not harm the continued operation of existing uses. We will only grant permission for noise generating development, including any plant and machinery, if it can be operated without causing harm to

amenity. We will also seek to minimise the impact on local amenity from deliveries and from the demolition and construction phases of development.

The parts of Appendix 3 that we have identified as relevant to this application are as follows:

Appendix 3: Noise thresholds

The significance of noise impact varies dependent on the different noise sources, receptors and times of operation presented for consideration within a planning application. Therefore, Camden's thresholds for noise and vibration evaluate noise impact in terms of various 'effect levels' described in the National Planning Policy Framework and Planning Practice Guidance:

- *NOEL – No Observed Effect Level*
- *LOAEL – Lowest Observed Adverse Effect Level*
- *SOAEL – Significant Observed Adverse Effect Level*

Three basic design criteria have been set for proposed developments, these being aimed at guiding applicants as to the degree of detailed consideration needed to be given to noise in any planning application. The design criteria outlined below are defined in the corresponding noise tables. The values will vary depending on the context, type of noise and sensitivity of the receptor:

- *Green – where noise is considered to be at an acceptable level.*
- *Amber – where noise is observed to have an adverse effect level, but which may be considered acceptable when assessed in the context of other merits of the development.*
- *Red – where noise is observed to have a significant adverse effect.*

Table C: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)

Existing Noise sensitive receptor	*Assessment Location*	*Design Period*	*NOEL (Green)*	*LOAEL to SOAEL (Amber)*	*SOAL (Red)*
*Dwellings***	*Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)*	*Day*	*'Rating level' 10dB* below background*	*'Rating level' between 9dB below and 5dB above background*	*'Rating level' greater than 5dB above background*
*Dwellings***	*Outside bedroom window (façade)*	*Night*	*'Rating level' 10dB* below background and no events exceeding 57dBL_{Amax}*	*'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB L_{Amax}*	*'Rating level' greater than 5dB above background and/or events exceeding 88dBL_{Amax}*

**10dB should be increased to 15dB if the noise contains audible tonal elements (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.*

***levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.*

The periods in Table C correspond to 0700 hours to 2300 hours for the day and 2300 hours to 0700 hours for the night. The Council will take into account the likely times of occupation for types of development and will be amended according to the times of operation of the establishment under consideration.

There are certain smaller pieces of equipment on commercial premises, such as extract ventilation, air conditioning units and condensers, where achievement of the rating levels (ordinarily determined by a BS:4142 assessment) may not afford the necessary protection. In these cases, the Council will generally also require an NR curve specification of NR35 or below, dependant on the room (based upon measured or predicted Leq (5mins) noise levels in octave bands, 1 metre from the façade of affected premises, where the noise sensitive premise is located in a quiet background area.

5.3. Determination of noise sensitive property design criteria

The new plant shall be selected so that it is not be intermittent or contain tones. Based on the local authority's planning requirements outlined above, the new plant shall be designed to be 10dB below the minimum existing LA_{90} background noise level during the relevant operational period in order to achieve 'NOEL' criteria

The lowest recorded LA_{90} level measured during the 24-hour period was 41dBA. This occurred during two different time periods 03.20am and 04.05am.

Any plant located outside the rear of the property shall therefore need to be designed to achieve a rating level of 31dBA at 1 metre from the windows of the nearest noise sensitive residential properties.

5.4. Summary of external noise criteria

Based upon the results of the survey and the above design criteria we summarise the actual design rating levels to be adopted for this project in table QF/9194/D2: -

Table QF/9194/D2 – recommended design rating levels $L_{Ar,T}$

Type of premises	$L_{Ar,T}$ (24-hour)
Noise sensitive	31 dBA

6.0. DISCUSSION OF RESULTS

It is proposed to install external air cooled condensing units on each of the terraces to the front and rear of the proposed development.

Marked up drawing P_43 in Appendix 'B' of this report shows possible locations for the plant.

The nearest noise sensitive windows to either location will belong to the neighbouring properties in Broxwood Way. Depending on the location of the plant, the distance between the plant and the nearest affected window will be between approximately 5 metres and 8 metres.

When details of the external plant have been finalised we can undertake further analysis and recommend any specific noise control measures that may be required.

On the basis that commonly available air cooled condensers have a sound pressure level at 1 metre in free-field conditions typically ranging between 50 dBA and 65 dBA, it is our belief that the external plant will require some form of noise control measures.

The design of any noise control measures shall ensure that the exhaust air path is separated from the fresh air inlet air path. Consideration must be given to maintenance access, and the transmission of structure borne noise must be minimised by isolating the machines from the supporting structure via neoprene-in-shear anti-vibration mounts having a minimum static deflection of 6mm.

7.0. SUMMARY

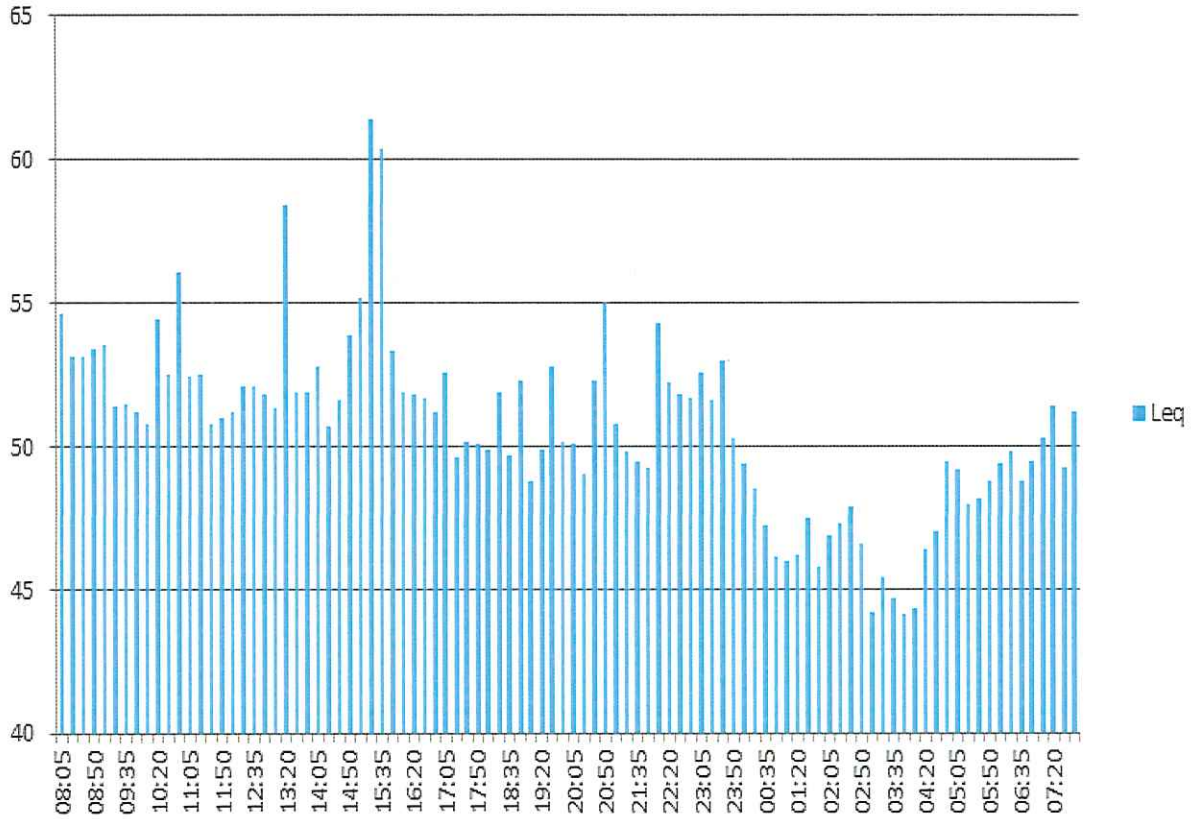
A 24-hour noise level survey has been undertaken at Barrie House, No. 29 St Edmunds Terrace, London NW8.

Recommended design rating noise levels have been established for the proposed external plant, based upon the results of the survey and the local authority's planning guideline requirements.

When details of the plant have been finalised then analysis can be undertaken that will predict plant noise levels at the nearest affected noise sensitive locations. After this, specific noise control measures can be described.

If the external plant is designed to achieve the recommended design rating level, then noise emitted by external building services plant and equipment will not increase the existing measured lowest LA90 (15min) background noise level. As such it should not attract any justifiable complaints under the guidelines of BS4142, and should therefore meet the conditions set out in the London Borough of Camden planning policies.

EMTEC PRODUCTS LTD
19th December 2017



TITLE: *LAeq Levels*	*ISSUE DATE:* 14/12/2017				*DRAWN BY:* *CH*	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*
CLIENT: Marek Wojciechowski Architects Limited	*PF No: 6117*				*APPROVED BY:* *CH*	*REVISION*							
PROJECT: Barrie House 28 St Edmunds Terrace, NW8	*Q*	*A*	*M*	*I*	*DESIGN AUTH:* *CH*	*SKETCH No. QF/9194/T1*							

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TITLE: *LA10; LA50 & LA90 Levels*	*ISSUE DATE:* 14/12/2017				*DRAWN BY:* *CH*	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*
CLIENT: Marek Wojciechowski Architects Limited	*PF No:6117*				*APPROVED BY:* *CH*	*REVISION*							
PROJECT: Barrie House 28 St Edmunds Terrace, NW8	*Q*	*A*	*M*	*I*	*DESIGN AUTH:* *CH*	*SKETCH No. QF/9194/T2*							

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APPENDIX 'A'

Raw Data – Noise Survey

13th to 14th December 2017

RAW NOISE DATA - Barrie House 28 St Edmunds Terrace, NW8

Ref: QF9194/PF6117/RP1
Client: Marek Wojciechowski Architects Limited
Date 13th to 14th December 2017

Address	Start Time	Leq	LE	Lmax	Lmin	LA1	LA10	LA50	LA90	LA99
1	08:05	54.6	84.2	82.3	46.2	60.4	54.5	52.2	49.6	47.4
2	08:20	53.1	82.7	83.4	45.5	61.7	54.2	49.4	47.5	46.6
3	08:35	53.1	82.7	77.5	46.1	62.2	54.1	49.9	47.8	47
4	08:50	53.4	83	72.8	46.1	60.5	55	53.4	47.6	46.7
5	09:05	53.5	83.1	74.5	46.1	62.4	55.4	51.4	48.1	47
6	09:20	51.4	81	66.6	45.9	57.8	54.2	49.8	47.8	47
7	09:35	51.5	81.1	73	46.5	59.1	53.8	49.6	48	47.4
8	09:50	51.2	80.8	76.6	46.3	58.3	53	49.1	47.6	46.9
9	10:05	50.8	80.4	74.1	45.9	57.9	52.9	49	47.4	46.5
10	10:20	54.4	84	78.4	46.4	62.9	57.2	50.8	48.4	47.6
11	10:35	52.5	82.1	66.8	46.8	61.1	54.9	50.5	48.5	47.6
12	10:50	56.1	85.7	71.9	46.9	64.5	58.8	54.8	49.1	47.8
13	11:05	52.4	82	75.8	45.9	59.7	54.5	50.6	48.2	47
14	11:20	52.5	82.1	73.2	46	60.9	54.4	50	47.9	47.1
15	11:35	50.8	80.4	66.9	46	57.9	52.9	49.3	47.8	46.9
16	11:50	51	80.6	62	46.4	56.7	53.6	50	47.9	47.1
17	12:05	51.2	80.8	62.6	45.7	57.8	53.5	50.2	47.9	46.9
18	12:20	52.1	81.7	66	46.9	58.6	54.6	51	48.6	47.7
19	12:35	52.1	81.7	70.9	46.3	59	54.7	50.6	48.6	47.2
20	12:50	51.8	81.4	65.6	46.1	59	54.7	49.7	47.6	46.9
21	13:05	51.3	80.9	65.8	45.8	59.9	53.9	49.2	47.4	46.6
22	13:20	58.4	88	93.5	45.7	62.3	55.1	49.6	47.5	46.5
23	13:35	51.9	81.5	64.8	46.1	60.1	54.7	50	47.9	47.1
24	13:50	51.9	81.5	74.3	45.9	58.6	54	50.1	47.9	46.8
25	14:05	52.8	82.4	69	46.4	62.6	55	49.9	48.3	47.3
26	14:20	50.7	80.3	63.8	46.1	57.3	52.7	49.4	47.9	47.2
27	14:35	51.6	81.2	67.6	45.9	59.4	54	49.5	47.8	46.7
28	14:50	53.9	83.5	77.3	45.7	61.7	54.1	49.6	47.8	46.9
29	15:05	55.2	84.8	66.8	46.8	59.8	58.1	54.5	49.5	47.8
30	15:20	61.4	91	74.7	52.3	66.6	64	60.8	57.4	53.9
31	15:35	60.4	90	78.6	50.6	67.2	62.2	59.4	56.2	53.1
32	15:50	53.3	82.9	72.6	46.5	60	56.3	51.5	48.8	47.6
33	16:05	51.9	81.5	64.5	45.7	58.4	54.5	50.7	48.2	46.9
34	16:20	51.8	81.4	66.3	45.7	58.6	54.5	50.3	47.9	46.7
35	16:35	51.7	81.3	66.8	45.7	59.6	54.2	49.9	47.7	46.7
36	16:50	51.2	80.8	66.1	44.5	59.6	53.8	49	47	46
37	17:05	52.6	82.2	79.8	44.9	60.6	54.3	50.1	47.4	46
38	17:20	49.6	79.2	61.4	45	56	51.7	48.6	47	46.1
39	17:35	50.2	79.8	67	45.7	56.5	52.5	48.8	47.3	46.4
40	17:50	50.1	79.7	68.5	45.5	56.9	52.6	48.6	46.8	46.2
41	18:05	49.9	79.5	63.2	45.3	56.7	52.1	48.7	47	46.2
42	18:20	51.9	81.5	76.4	45.2	58.7	54.5	49.4	46.8	46
43	18:35	49.7	79.3	61.2	45.2	57	52	48.3	46.8	46
44	18:50	52.3	81.9	82.3	44.7	61.4	52.4	47.9	46.3	45.5
45	19:05	48.8	78.4	65.2	45.4	55	51	47.6	46.5	46
46	19:20	49.9	79.5	73.2	45.5	57.1	51.8	48	46.8	46.1
47	19:35	52.8	82.4	76.7	45.6	63.2	54.3	48.5	47	46.3
48	19:50	50.2	79.8	67.7	44.7	60.4	51.8	47.6	46.3	45.5
49	20:05	50.1	79.7	74.5	44.4	58.4	50.5	47.1	46	45.4
50	20:20	49.1	78.7	65.3	44.3	56.9	51.4	47.6	46	45.1
51	20:35	52.3	81.9	83.8	44.9	58.6	52.4	48.9	46.9	45.7

52	20:50	55	84.6	66	45.4	60.4	58.3	53.9	48.4	46.8
53	21:05	50.8	80.4	69.4	46.1	57.9	52.8	49.5	47.9	47.1
54	21:20	49.8	79.4	64.4	44.7	56	52.2	48.7	46.9	45.9
55	21:35	49.5	79.1	63.7	44.2	56.5	51.5	48.5	46.8	45.5
56	21:50	49.3	78.9	62.3	45.2	55.4	51	48.4	46.9	46.1
57	22:05	54.3	83.9	74.3	46.9	62.3	56.3	52.4	49.6	48.2
58	22:20	52.2	81.8	68.2	46.2	61.9	54.8	49.8	48	47.2
59	22:35	51.8	81.4	70.4	46.1	58.5	54.1	50.4	48.3	47.1
60	22:50	51.7	81.3	63.2	46.8	57.6	54.2	50.6	48.4	47.6
61	23:05	52.6	82.2	65.7	45.7	60.7	55.2	51.2	47.6	46.4
62	23:20	51.6	81.2	61.1	45.5	57.6	54.6	50	47.6	46.6
63	23:35	53	82.6	65.8	44.9	61.4	56.3	50.3	47.3	45.8
64	23:50	50.3	79.9	64.3	44.2	57.6	52.7	49.1	46.7	45.5
65	00:05	49.4	79	71.8	43.1	57.9	50.9	47	45.2	44.2
66	00:20	48.5	78.1	64.8	43.5	57.9	50.2	46.7	44.8	44
67	00:35	47.2	76.8	62.2	42.3	54.8	48.9	46.2	44.3	43.2
68	00:50	46.1	75.7	54.9	41.9	51.6	48.1	45.2	43.8	43
69	01:05	46	75.6	62.7	41.5	53	48	44.7	43.3	42.4
70	01:20	46.2	75.8	67.5	41.4	54	47.1	44.5	42.8	42.1
71	01:35	47.5	77.1	62.6	41.2	55.9	49.9	45.8	43.6	42.4
72	01:50	45.8	75.4	57.1	40.7	54.3	47.9	44.2	42.7	41.7
73	02:05	46.9	76.5	62	40.3	56.5	48.9	44.5	42.5	41.3
74	02:20	47.3	76.9	62.5	40.3	56.6	49.4	45.1	42.5	41.1
75	02:35	47.9	77.5	62.9	40.5	57.4	50.4	44.9	42.8	41.7
76	02:50	46.6	76.2	61.8	39.4	55.6	48.8	44.5	42	40.6
77	03:05	44.2	73.8	58.5	39.8	50.2	46.1	43.3	41.9	40.8
78	03:20	45.4	75	61.2	39.8	53.5	48.1	42.9	41.2	40.5
79	03:35	44.7	74.3	56	39.7	51.9	47	43.5	41.6	40.7
80	03:50	44.1	73.7	52.4	39.4	50.5	46.1	43.2	41.5	40.4
81	04:05	44.3	73.9	55.5	39.1	52	46.7	42.8	41.2	40
82	04:20	46.4	76	57.7	40.5	53.9	49.2	44.8	42.2	41.2
83	04:35	47	76.6	60.4	40.8	55.2	50.3	44.6	42.6	41.7
84	04:50	49.5	79.1	65.9	41.3	60.4	51.9	45.4	43	42
85	05:05	49.2	78.8	63.9	42	58.2	52.2	46.6	43.6	42.8
86	05:20	48	77.6	61.5	41.3	56	51.3	45.7	43.6	42.5
87	05:35	48.2	77.8	62.4	41.2	57.4	50.7	46.2	43.5	42.1
88	05:50	48.8	78.4	65.7	42.6	55.8	51.8	47	45	43.7
89	06:05	49.4	79	63.6	43.8	56	52.5	47.8	45.8	44.6
90	06:20	49.8	79.4	62.1	43.8	57.2	52.3	48.2	46	45
91	06:35	48.8	78.4	58.2	44.2	54.3	51.4	47.7	45.9	45
92	06:50	49.5	79.1	60.8	44.2	55.8	52	48.2	46.4	45.3
93	07:05	50.3	79.9	71.8	45.1	60.1	51.9	48	46.7	45.9
94	07:20	51.4	81	73.5	44.6	59.2	53.5	49	46.6	45.5
95	07:35	49.3	78.9	63.7	44.6	55.8	51.4	47.9	46.4	45.5
96	07:50	51.2	80.8	78.3	44.5	58.8	53.2	48.9	46.8	45.6

APPENDIX 'B'

Photos and sketches

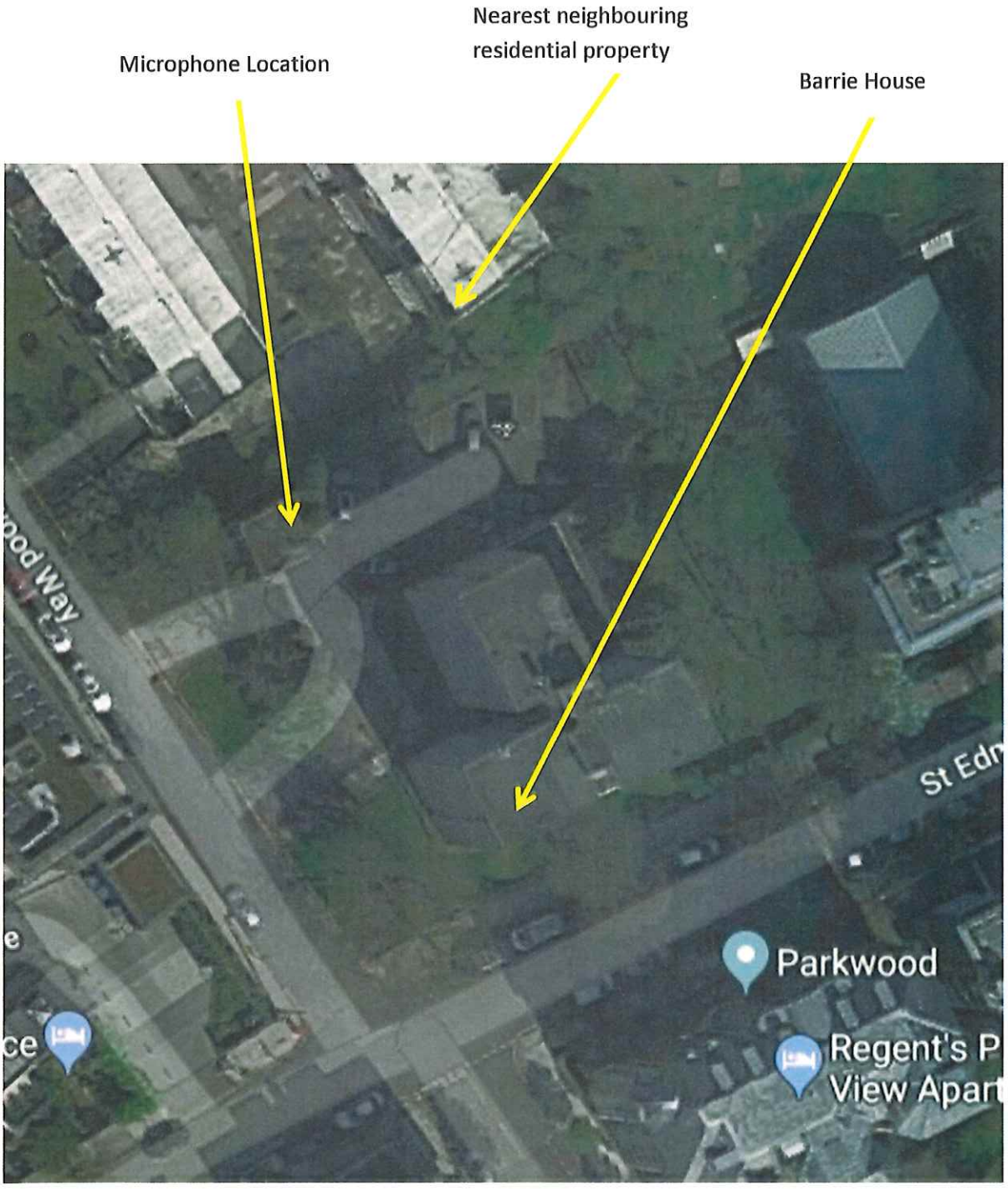
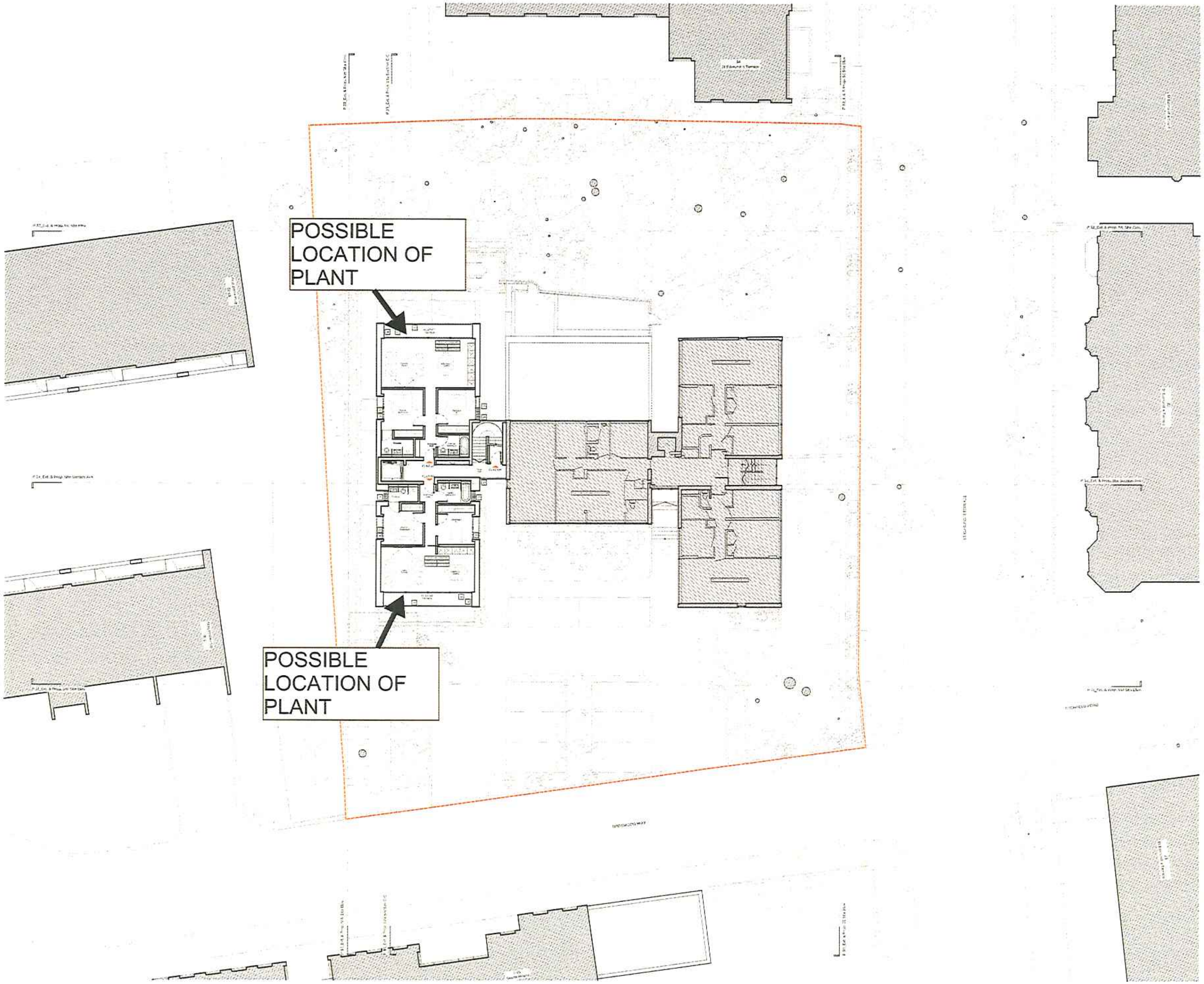


PHOTO A: Barrie House and its surroundings



PLANNING

Project No.	16033
Client	Kalemister Ltd.
Date	November 2017
Scale	1:200 @ A2/ 1:400 @ A4
Project	Barrie House, 29 St. Edmunds Terrace
Drawing Title	Proposed Second Floor Plan
Drawing No.	P_43
Approved	AA

Marek Wojciechowski Architects