

Kitchen Odour Risk Assessment

Proposed Bar and Restaurant,
Northern Quarter, Manchester
December 2025

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Want Hospitality Ltd.

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1. Introduction

- 1.1 Phlorum Limited has been commissioned by Want Hospitality Ltd. to undertake a Kitchen Odour Risk Assessment (KORA) to support a planning application for a proposed bar and restaurant (the 'Premises') located in the Northern Quarter, Manchester, M1 2EY. The Premises is located within the administrative boundary of Manchester City Council (MCC). The National Grid Reference for the centre of the Premises is 384598, 398527. A site location plan has been included in Figure 1.
- 1.2 It is understood that the proposals comprise the installation of a bar and restaurant, with an associated kitchen, on the ground floor of an extant building located adjacent to Spear Street in Manchester.
- 1.3 Due to the potentially odorous nature of the commercial kitchen and the proximity of existing residences to the Premises, a Kitchen Odour Risk Assessment (KORA) has been undertaken in accordance with relevant guidance. This KORA also aims to address comments made by MCC in relation to the proposal which are as follows:

"Given the nature of the proposal, the planning application will need to be supported by an appropriate odour impact assessment together with suitable mitigation measures, in order to satisfactorily control any odours and fumes that would be emitted from the development."
- 1.4 This KORA identifies whether odour emissions from the proposed commercial kitchen will likely have the potential to cause significant odour nuisance to nearby sensitive receptors, and whether such risks can be sufficiently reduced using appropriate kitchen odour mitigation technology. This assessment also provides guidance on what an appropriate level of odour mitigation might comprise, based on the identified level of odour risk.

2. Methodology

Guidance

- 2.1 The Department for Environment, Food and Rural Affairs (Defra) provides guidance¹ on the determination of the odour impact risk from commercial kitchens. The guidance also outlines the level of mitigation that might be required to reduce the risk to an acceptable level. Whilst this guidance has been withdrawn (due to the onus for the provision of guidance being shifted from government to industry), it still provides a framework from which the likely odour risk can be determined. As such, EMAQ+ has updated and reissued much of the Defra guidance within their own *Control of Odour and Noise from Commercial Kitchen Exhaust Systems*² document, which has been referred to in this KORA.
- 2.2 In both guidance documents, the odour impact risk is determined as a function of:
-  The dispersion characteristics;
 -  The proximity of sensitive receptors;
 -  The size of kitchen; and
 -  The cooking type.
- 2.3 The odour risk assessment scoring matrix is set out in Table 2.1, below.

Table 2.1: Odour Risk Assessment Scoring Matrix

Criteria	Score	Score	Details
Dispersion	Very Poor	20	Low level discharge, discharge into courtyard or restriction on stack.
	Poor	15	Not low level but below eaves, or discharge at below 10 m.s ⁻¹ .
	Moderate	10	Discharging 1 m above eaves at 10-15 m.s ⁻¹ .
	Good	5	Discharging 1 m above ridge at 15 m.s ⁻¹ .
Proximity of Receptors	Close	10	Closest sensitive receptor less than 20m from kitchen discharge.
	Medium	5	Closest sensitive receptor between 20 and 100m from kitchen discharge.
	Far	1	Closest sensitive receptor more than 100m from kitchen discharge.

¹ Department for Environment, Food & Rural Affairs. (2005). *Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems*.

² EMAQ+. (2022). *Control of Odour and Noise from Commercial Kitchen Exhaust Systems*.

Criteria	Score	Score	Details
<i>Size of Kitchen</i>	Large	5	More than 100 covers or large sized kitchens.
	Medium	3	Between 30 and 100 covers or medium sized kitchens.
	Small	1	Less than 30 covers or small kitchens.
<i>Cooking Type (Odour and Grease Loading)</i>	Very High	10	Pubs (high level of fried food), fried chicken, burgers, or fish & chips, Middle Eastern or any Premises cooking with solid fuel.
	High	7	Vietnamese, Thai, Indian, Japanese, Chinese, steakhouse.
	Medium	4	Cantonese, Italian, French, pizza (gas fired)
	Low	1	Most pubs (no fried food, mainly reheating and sandwiches etc), tea rooms.

- 2.4 Once the total odour significance score across the four risk elements has been determined (i.e. the sum of four scores), the odour impact risk, and the level of odour control required to mitigate that risk, can be identified from the matrix outlined in Table 2.2.

Table 2.2: Odour Impact Risk and Odour Control Requirement Level

Impact Risk	Odour Control Requirement	Significance Score
Low to Medium	Low Level Odour Control	Less than 20
High	High Level Odour Control	20 to 35
Very high	Very High Level Odour Control	More than 35

3. Kitchen Odour Risk Assessment

Current Proposals

- 3.1 The proposed kitchen will be situated at ground floor level, with the kitchen extract expected to extract horizontally via an exhaust louvre with a panel cover, flush with the surrounding wall, at the building's eastern façade adjacent to Faraday Street. Extract air will discharge at approximately 3m above ground level. Office space is located on the floors above the Premises, with commercial buildings located approximately 5m to the east on the opposite side of Farraday Street.
- 3.2 The kitchen is expected to prepare Mexican-inspired open-fire grill cuisine, although it is understood that this aspect will only make up around 30% of the menu. Meats and vegetables will be cooked on a Robata grill. It is understood that they will generally be lean meats, cooked at a relatively low temperature. Cold dishes will make up part of the menu which would not require cooking. A small wood-fired clay oven will be used for baking bread, and an electric combi oven will be used for roasting vegetables and meats. There is expected to be a single fryer for cooking tostadas and other products.
- 3.3 It is currently understood that the kitchen is expected to be in operation from 16:00 on weekdays and from 12:00 on weekends. The evening peak period is expected to be between 19:00 and 21:00, with the weekend lunchtime peak expected between 12:00 and 14:00.
- 3.4 Cooking equipment expected to be used within the kitchen includes the following:
- 🌿 RETIGO O1011 Combi oven;
 - 🌿 Big Green Egg solid fuel grill;
 - 🌿 Valentine EVO600 single pan large 2 basket fryer;
 - 🌿 Linda Lewis Kitchens ANDIAMO-W refractory wood and gas pizza oven;
 - 🌿 Wood-fired clay oven; and
 - 🌿 Robata flame grill on mobile stand.
- 3.5 Both the Big Green Egg and the Robata grill will be fuelled by charcoal, with the Robata grill expected to be fuelled by binchotan charcoal known for its clean-burning properties. The pizza oven and clay oven will be wood fired. Therefore, solid fuel will be used within the kitchen.

Site Location

- 3.6 The Premises is located in the Norther Quarter of Manchester which is a central urban location where numerous other restaurants, cafes, and other sources of odour are located in the vicinity of the Premises.

Odour Risk

- 3.7 Using information provided by Want Hospitality LTD, the odour impact risk for the proposed kitchen is set out in Table 3.1 below.

Table 3.1: Odour Impact Risk for the Commercial Kitchen

Criteria	Score	Score	This Development
<i>Dispersion</i>	Very Poor	20	<p>Extract air from the kitchen will discharge at an approximate height of 3m above ground-level horizontally via an exhaust louvre with a panel cover, flush with the surrounding wall, at the building's eastern façade adjacent to Faraday Street. The extract air will extract below the eaves of the buildings surrounding the Premises at a rate of 4-5m/s.</p> <p>As such, it is considered reasonable that the level of dispersion would be <i>Very poor</i>.</p>
<i>Proximity of Receptors</i>	Close	10	<p>The closest residential receptors to the Premises are located at first floor level within a block of flats on Spear Street located approximately 10m north of the façade of the Premises where extract air will exit the building.</p> <p>As such, the proximity of receptors is considered to be <i>Close</i>.</p>
<i>Size of Kitchen</i>	Medium	3	<p>It is anticipated that the maximum number of daily covers at peak times will be 150.</p> <p>It is anticipated that during the normal operation of the Premises there will be between 30 and 100 covers at any one time.</p> <p>As such, the size of the kitchen can reasonably be considered to be <i>Medium</i>.</p>
<i>Cooking Type (Odour and Grease Loading)</i>	Very High	10	<p>It is understood that the cuisine to be prepared will largely consist of Mexican-inspired open-fire grill cuisine including meats and vegetables. Pizzas will also be prepared.</p> <p>Binchotan charcoal will be used within the Robata grill, which is known for its clean-burning properties. The Big Green Egg will be fuelled by charcoal, and the pizza oven and clay oven will be wood fired.</p> <p>Therefore, solid fuel will be used within the kitchen, which has the potential to produce elevated levels of smoke.</p> <p>Therefore, the Premises has the potential for a <i>Very high</i> level of odour and grease loading according to appropriate guidance².</p>

Criteria	Score	Score	This Development
Overall Odour Impact Risk Score			43

3.8 Following the EMAQ+ guidance², Table 3.1 shows the overall odour impact risk score is 43, falling within the EMAQ+ *Very High* impact risk category. Therefore, a *Very High* level of odour mitigation is recommended.

3.9 Considering the overall odour impact risk score determined above, *Very High* level odour mitigation options have been outlined below, with reference to the EMAQ+ guidance².

Very High Overall Odour Risk Mitigation

3.10 EMAQ+² provides guidance on what a *Very High* level of odour mitigation might comprise. This includes the following:

"1. Fine filtration or ESP, followed by carbon filtration (carbon filters rated with a 0.4 – 0.8 second residence time).

2. Fine filtration or ESP followed by carbon filtration and by a counteractant/neutralising system to achieve the same level of control as 1.

3. Fine filtration or ESP followed by UV ozone system to achieve the same level of control as 1."

Note: ESP = Electrostatic Precipitation; used to separate solid or liquid particles from the ventilation air.

Proposed Extract System

3.11 Want Hospitality Ltd has provided information on the proposed kitchen odour abatement technology expected to be installed at the Premises, which is as follows:

 Baffle filters; and

 UV-O 1000 unit that uses Ultraviolet (UV-C) technology.

3.12 A UV ozone system is currently proposed in line with the requirements of scenario 3 for a *Very High* level of odour abatement technology, with reference to the EMAQ+² guidance:

"3. Fine filtration or ESP followed by UV ozone system to achieve the same level of control as 1)."

3.13 Based on the currently proposed equipment, in line with the identified level of odour risk for the kitchen, further odour abatement technology may be required to be installed to meet the requirements of scenario 3, to sufficiently mitigate the assessed *Very High* level of potential odour risk.

- 3.14 The currently proposed baffle filters will act as the primary measure to trap grease particles from cooking processes. Baffle filters are typically located in kitchen extract canopies and are the first inline filtration system in most commercial kitchen processes. They work by intercepting large grease, oil and water droplets on metal baffles via inertial impaction mechanisms caused by the baffles diverting airflows at sharp angles through the system. However, they are less effective in removing finer particles from kitchen extract, such as smoke from solid fuels and oil mists from grilling and frying.
- 3.15 The proposed UV-O 1000 unit is a typical UV technology used in many commercial kitchens. It works by generating ultraviolet light from powerful lamps which chemically breaks apart oxygen molecules in the extracted air, converting them into highly reactive ozone. It is this ozone that then works as an oxidising agent to break down odorous gases and some fine particles. Being a gas, ozone reacts with the surfaces of the particles it touches, which means that UV treatment is less effective in treating larger smoke particles and oily, greasy or moist aerosols. This is why UV odour control systems in commercial kitchens usually require the upstream inclusion of fine particle and aerosol filters, such as ESPs (Electrostatic Precipitators).
- 3.16 Solid fuel cooking produces smoky particles that typically require very high levels of mitigation to reduce odours to acceptable levels.
- 3.17 Although there are office and residential uses close to the proposed extract louvre at the Premises, which would emit into a relatively enclosed streetscape, the Northern Quarter is well known for its vibrant, café culture and entertainment scene. As such, commercial cooking odours are not out of context for the area, and it might be that nearby sensitive uses would be less sensitive to any potential cooking odours emitted from the Premises than they might otherwise be in a more suburban, residential location.

Recommendations

- 3.18 The EMAQ⁺'s guidance, which updates the earlier Defra guidance, recommends that the Premises would likely require a *Very High* level of odour mitigation. As such, any proposed kitchen ventilation system should meet the recommendations in the guidance. As such, it is recommended that the installed system should comprise elements of fine filtration and/or ESPs, both of which are discussed below.
- 3.19 Alternative technologies to treat odorous commercial kitchen extract air are available, and new products are constantly being developed. Such systems may well provide similar or better levels of odour control than the established systems quoted in the EMAQ⁺ guidance. The effectiveness and suitability of any installed equipment would ultimately need to be confirmed by a suitably qualified and experienced commercial kitchen ventilation engineer.

Fine Filtration

- 3.20 Some fine filtration technologies such as bag filters and panel filters are not efficient at removing smoke particles or very fine aerosols, whereas technology such as HEPA filters have the potential to filter smoke particles (depending on their grade). The efficiencies of most types of fine particle and fabric filters are significantly reduced by oily, greasy or moist extract air, which can rapidly clog the filter elements.

Electrostatic Precipitators

- 3.21 Electrostatic precipitator (ESP) technology is a high efficiency filter system that uses electrical charge to attract and separate solid particles and liquid aerosols from ventilation air. The EMAQ+ guidance states:

“ESPs can be designed to eliminate extensive quantities of smoke, giving collection efficiencies of up to 98% between $1\ \mu\text{m}^3$ and $0.01\ \mu\text{m}^3$. The effectiveness of an ESP is limited to removing the grease that adheres to smoke and should not be considered to be a primary source of odour control.”

- 3.22 As the charged particles are not impacted onto physical filtration elements (they are instead attracted onto them by an opposing electrical charge), ESPs do not clog in the same way as fabric filters, and thus they can work well in removing particles and aerosols in oily/greasy and moist kitchen extract air.

Maintenance

- 3.23 The Purified Air Ltd *Technical & Operational Manual*³ for a UV-O 1000 unit outlines an appropriate maintenance schedule for the unit, which includes cleaning and replacement of UV lamps, replacement of filters, cleaning the inside of the unit and removal of dust and grease. Maintenance of the unit should be carried out by a suitably qualified engineer.

- 3.24 According to the EMAQ+ guidance², it is recommended that for systems employing fine filtration:

👁️ Fine filters should be changed every two weeks.

- 3.25 For system employing ESP and other in-line abatement systems, it is recommended that:

👁️ ESP systems should be cleaned every 1 to 3 months; and

👁️ ESP sumps should be emptied on a monthly basis.

- 3.26 It is also recommended that baffle type self-draining filters and collection drawers should be cleaned weekly as a minimum.

3 Purified Air Ltd. (no date). *UV-O 1000 Technical & Operation Manual*.

- 3.27 These time frames may increase or reduce for extreme or very light applications.
- 3.28 The EMAQ+ guidance² also recommends a general maintenance regime/frequency for kitchen exhaust and odour mitigation equipment. It is recommended that the cleaning frequency for ductwork is dependent on the level of use/grease loading:
- 🌿 for *Heavy Use* (daily usage of 12-16 hours, cleaning should be every 3 months;
 - 🌿 for *Moderate Use* (daily usage of 6-12 hours), cleaning should be every 6 months; and
 - 🌿 for *Light Use* (daily usage of less than 6 hours), cleaning should be every 12 months.
- 3.29 The kitchen at the Premises is expected to operate under *Moderate Use* (6-12 hours a day). Therefore, it is recommended that ductwork should be cleaned every 6 months.
- 3.30 It should be noted that while the above guidance has come from the EMAQ+ guidance², manufacturers of suitable commercial kitchen ventilation systems might be able to offer alternative technologies that operate differently, and which require different levels of cleaning and maintenance.

4. Summary and Conclusions

- 4.1 Phlorum Limited has been commissioned by Want Hospitality Ltd., to undertake a Kitchen Odour Risk Assessment for a proposed bar and restaurant, with associated kitchen, located in the Northern Quarter, Manchester, M1 2EY.
- 4.2 A Kitchen Odour Risk Assessment has been undertaken in line with EMAQ+ Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems² and has identified that the proposed kitchen will likely require a *Very High* level of odour abatement technology. This is principally due to the proposed extract louvre's current dispersion potential, the proximity of local sensitive receptors and the potential for smoke release due to the proposed use of solid cooking fuels.
- 4.3 It is understood that the currently proposed odour abatement technology comprises baffle filters and a UV-O 1000 unit that uses Ultraviolet (UV-C) technology.
- 4.4 The EMAQ+ guidance² recommends that odour mitigation comprising fine filtration or electrostatic precipitation, followed by an ultra-violet ozone system, would provide a *Very High* level of odour mitigation.
- 4.5 Therefore, further odour mitigation technology is recommended to be installed, in line with relevant guidance, to provide a *Very High* level of odour mitigation.
- 4.6 It should be noted that alternative systems might be available that provide a similar or better level of odour control. The suitability of any installed equipment would need to be confirmed by a suitably qualified and experienced commercial kitchen ventilation engineer.
- 4.7 It is also recognised that the location of the Premises is within an area where there are already numerous bars, cafes and restaurants. As such, commercial cooking odours are not out of context for the area, and it might be that nearby sensitive uses would be less sensitive to cooking odours from the Premises than they might otherwise be.
- 4.8 Following the implementation of suitable odour mitigation measures, appropriate to the identified level of odour risk, the proposed kitchen should comply with all relevant guidance, and its operation would unlikely lead to significant impacts on the amenity of nearby sensitive receptors.

Figure 1: Site Location Plan

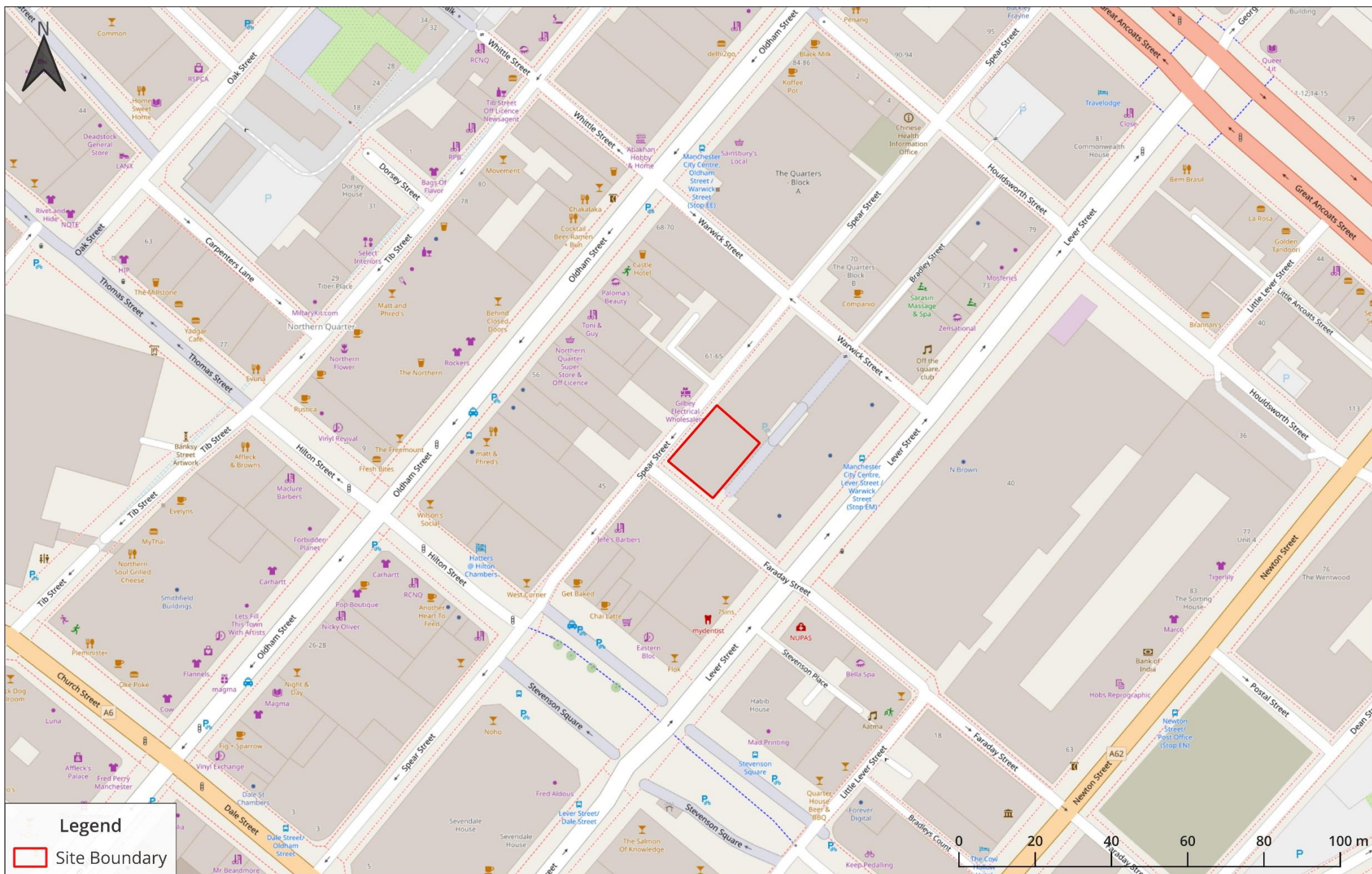


Figure 1: Site Location Plan

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