Odour Assessment

Painthorpe Lane, Hall Green

Client: Jian Wang

Reference: 7695r1

Date: 13th March 2024

Report Issue

Report Title: Odour Assessment - Painthorpe Lane, Hall Green

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Executive Summary

Redmore Environmental Ltd was commissioned by Jian Wang to undertake an Odour Assessment in support of a mixed-use development comprising a hot food takeaway and residential unit at 5 Painthorpe Lane, Hall Green.

Odour emissions from hot food preparation on the premises have the potential to result in impacts at the proposed residential unit, as well as existing sensitive receptors within the vicinity of the site. As such, an Odour Assessment was undertaken in order to evaluate potential effects and identify the requirement for any additional mitigation to control potential impacts to an acceptable level.

The findings of the assessment indicated the odour risk was classified as high. This prediction does not infer that the proposed development would result in significant odour impact or affect local amenity levels. However, it does suggest that appropriate mitigation options are required to reduce potential effects to an acceptable level.

The proposed odour abatement strategy for the takeaway has been specified in line with the relevant guidance for kitchens with a high risk of impact. It therefore follows that with this mitigation in place, potential odour impact at nearby sensitive receptors including the proposed residential unit, would be reduced to an acceptable level.

Table of Contents

1.0 INTRODUCTION

1.1 Background

1.1.1 Redmore Environmental Ltd was commissioned by Jian Wang to undertake an Odour Assessment in support of a mixed-use development comprising a hot food takeaway and residential unit at 5 Painthorpe Lane, Hall Green.

1.1.2 Odour emissions from hot food preparation on the premises have the potential to result in impacts at the proposed residential unit, as well as existing sensitive receptors in the vicinity of the site. As such, an Odour Assessment was undertaken in order to evaluate potential effects and identify the requirement for any additional mitigation to control potential impacts to an acceptable level.

1.2 Site Location and Context

1.2.1 The proposed development is located at 5 Painthorpe Lane, Hall Green, WF4 3LA, at approximate National Grid Reference (NGR): 431773, 415335. Reference should be made to Figure 1 for a map of the site and surrounding area.

1.2.2 The proposals comprise demolition of the existing structure on the site and construction of a two-storey building which will accommodate a hot food takeaway on the ground floor and a residential unit at first floor level. Reference should be made to Figure 2 for a site layout plan.

1.2.3 The hot food takeaway will serve Chinese cuisine. Cooking methods will include boiling, deep frying, stir-frying, steaming and the use of microwaves. The operational hours of the takeaway will be 5pm to 11pm, Monday to Sunday.

1.2.4 Under the current proposals, air will be extracted from the hot food preparation area via a canopy. Air will then pass through a AB65S synthetic bag filter to remove grease and a separate RydAIR 'B Series' Electrostatic Precipitator (ESP) to abate fine particulates. The ESP will also be fitted with an ultraviolet (UV) lamp system to remove odourous compounds.

1.2.5 Treated air will be discharged to atmosphere via a high-velocity jet cowl which terminates approximately 1m above the eaves of the proposed building. Reference should be made to Figure 3 for a diagram of the proposed extract system.

1.2.6 Planning permission for the development was granted by Wakefield Council (WC) on 27th January 2022 subject to a number of conditions (planning reference: 21/00410/FUL). These include the following in relation to odour:

> "14) Prior to the hot food takeaway premises being brought into use an odour risk assessment and control scheme, detailing how venting requirements for the kitchen exhaust system and any other emissions associated with the hot food takeaway use will be controlled, has been submitted to and approved in writing by the Local Planning Authority. The submitted scheme shall make reference to DEFRA's best practice by Dr Gibson entitled EMAQ+ 'Control of Odour and Noise from Commercial Kitchen Exhaust Systems' document and how the scheme meets the requirements set out within this document. The approved scheme shall be implemented prior to use and shall be thereafter retained, maintained and operated for the lifetime of the development.
>
> Reason: In the interests of amenity, to accord with Policies D9 and D20 of the Council's adopted Local Development Framework Development Policies Document.".

1.2.7 An Odour Assessment has been undertaken in order to address the stated condition, evaluate the potential for impacts as a result of the development and consider the requirement for any mitigation to control effects to an acceptable level. This is detailed in the following report.

2.0 ODOUR BACKGROUND

2.1 Odour Definition

2.1.1 The Institute of Air Quality Management (IAQM) guidance[1] defines odour as:

> "[…] the human olfactory response (perception followed by psychological appraisal) to one, or more often a complex mixture of, chemical species in the air."

2.1.2 The stated definition is considered to be relevant in the context of this assessment.

2.2 Odour Impacts

2.2.1 The magnitude of odour impact depends on a number of factors and the potential for complaints varies due to the subjective nature of odour perception. The **FIDOL** acronym, is a useful reminder of the factors that will determine the degree of odour pollution. These are described by the IAQM[2] as follows:

- **F**requency - how often an individual is exposed to odour;
- **I**ntensity - the individual's perception of the strength of the odour;
- **D**uration - the overall duration that individuals are exposed to an odour over time;
- **O**dour unpleasantness - odour unpleasantness describes the character of an odour as it relates to the 'hedonic tone' (which may be pleasant, neutral or unpleasant) at a given odour concentration/ intensity. This can be measured in the laboratory as the hedonic tone, and when measured by the standard method and expressed on a standard nine-point scale it is termed the hedonic score; and,
- **L**ocation - the type of land use and nature of human activities in the vicinity of an odour source. Tolerance and expectation of the receptor. The 'Location' factor can be considered to encompass the receptor characteristics, receptor sensitivity, and socio-economic factors.

[1] Guidance on the Assessment of Odour for Planning v1.1, IAQM, 2018.

[2] Guidance on the Assessment of Odour for Planning v1.1, IAQM, 2018.

2.2.2 It is important to note that even infrequent emissions may cause loss of amenity if odours are perceived to be particularly intense or offensive.

2.2.3 The **FIDOL** factors can be further considered in relation to the following and the potential for an odour emission to cause a nuisance:

- The rate of emission of the compound(s);
- The duration and frequency of emissions;
- The time of the day that this emission occurs;
- The prevailing meteorology;
- The sensitivity of receptors to the emission i.e. whether the odorous compound is more likely to cause nuisance, such as the sick or elderly, who may be more sensitive;
- The odour detection capacity of individuals to the various compound(s); and,
- The individual perception of the odour (i.e. whether the odour is regarded as unpleasant). This is greatly subjective and may vary significantly from individual to individual. For example, some individuals may consider some odours as pleasant, such as petrol, paint and creosote.

2.3 Legislative Control

2.3.1 The main requirement with respect to odour control from premises not controlled under the Environmental Permitting (England and Wales) Regulations (2016) and subsequent amendments, such as commercial kitchens, is that provided in Section 79 of Part III of the Environmental Protection Act (1990). The Act defines nuisance as:

> "Any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance."

2.3.2 Enforcement of the Act, in regard to nuisance, is currently under the jurisdiction of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the Local Authority is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (1990). The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practicable means.

2.3.3 The legislative controls described above were considered as necessary throughout the undertaking of the assessment.

2.4 National Planning Policy

2.4.1 The revised National Planning Policy Framework[3] (NPPF) was published in December 2023 and sets out the Government's planning policies for England and how these are expected to be applied.

2.4.2 The purpose of the planning system is to contribute to the achievement of sustainable development. In order to ensure this, the NPPF recognises three overarching objectives including the following of relevance to odour:

> "c) An environmental objective - to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

2.4.3 Chapter 12 of the NPPF details objectives in relation to achieving well-designed place. It states that:

> "Planning policies and decisions should ensure that developments
>
> f) create places that are safe, inclusive and accessible and which promote health and well-being, with a high standard of amenity for existing and future users; and where crime and disorder, and the fear of crime, do not undermine the quality of life or community cohesions and resilience."

2.4.4 The implications of the NPPF have been considered throughout this assessment.

[3] NPPF, Ministry of Housing, Communities and Local Government, 2023.

2.5 Local Planning Policy

2.5.1 The Wakefield District Local Plan was adopted by WC on 24th January 2024. A review of document indicated the following policy of relevance to this assessment:

> "Policy LP56 - Design of New Development
>
> […]
>
> In order to maintain and enhance local diversity all new development shall make a positive contribution to the environment and amenity of its locality by virtue of high quality design, layout and landscaping. The Council will support the enhancement of public spaces, including provision of works of art in public places, and in appropriate cases this may be required as part of major development proposals. In particular proposals shall:
>
> […]
>
> n. Have no significant detrimental impact on the amenity of neighbouring users or residents and existing or prospective users;
>
> […]"

2.5.2 The implications of the above policy have been taken into consideration throughout the assessment.

3.0 METHODOLOGY

3.1 Introduction

3.1.1 The proposals have the potential to cause odour impacts as a result of emissions from cooking processes. An assessment has therefore been undertaken in accordance with guidance document 'Control of Odour and Noise from Commercial Kitchen Exhaust Systems' prepared by EMAQ+ for the Department for Environmental, Food and Rural Affairs (DEFRA)[4]. This document provides an update to the 2005 guidance[5] produced by DEFRA.

3.1.2 A summary of the assessment methodology is provided in the following Sections.

3.2 EMAQ+ and DEFRA Methodology

3.2.1 The EMAQ+ and DEFRA methodology provides an approach for identifying the risk of odour impact associated with food preparation premises and defining an appropriate level of mitigation to control potential effects to an acceptable level.

3.2.2 The first stage in the process is to score the proposed premises in accordance with the criteria outlined in Table 1.

Table 1 Risk Scoring Criteria

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 10m/s
	Moderate	10	Discharging 1m above eaves at 10 - 15m/s
	Good	5	Discharging 1m above ridge at 15m/s
Proximity of receptors	Close	10	Closest sensitive receptor less than 20m from kitchen discharge

[4] Control of Odour and Noise from Commercial Kitchen Exhaust Systems, EMAQ+, 2022.

[5] Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems, DEFRA, 2005.

Criteria	Score	Score	Details
	Medium	5	Closest sensitive receptor between 20 and 100m from kitchen discharge
	Far	1	Closest sensitive receptor more than 100m from kitchen discharge
Size of kitchen	Large	5	More than 100 covers or large sized takeaway
	Medium	3	Between 30 and 100 covers or medium sized takeaway
	Small	1	Less than 30 covers or small take away
Cooking type (odour and grease loading)	Very high	10	Pub (high level of fried food), fried chicken, burgers or fish & chips, Turkish, Middle Eastern or any premises cooking with solid fuel
	High	7	Vietnamese, Thai, Indian, Japanese, Chinese or steakhouse
	Medium	4	Cantonese, Italian, French, Pizza (gas fired)
	Low	1	Most pubs (no fried food, mainly reheating and sandwiches etc) or Tea rooms

3.2.3 The score obtained using the values shown in Table 1 is subsequently used to define the associated risk and odour control requirement. The relevant criteria are summarised in Table 2.

Table 2 Odour Control Requirement

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

3.2.4 A suitable odour control system can then be identified from the techniques summarised in the EMAQ+ and DEFRA guidance[6].

6 Control of Odour and Noise from Commercial Kitchen Exhaust Systems, EMAQ+, 2022.

4.0 ASSESSMENT

4.1 EMAQ+ and DEFRA Risk Assessment

4.1.1 The odour risk associated with the proposals was rated in accordance with the EMAQ+ and DEFRA methodology[7]. The results are summarised in Table 3.

Table 3 Odour Risk

Criteria	Score	Score	Notes
Dispersion	Moderate	10	Emissions will be extracted from the hot food preparation area within the kitchen via a canopy. fitted with bag filters for removal of grease from the air stream. Air will then pass through a AB65S synthetic bag filter to remove grease and then a RydAIR "B Series" ESP to remove fine particulates. The ESP will also be fitted with a UV lamp system to remove odorous compounds Treated air will be exhausted to atmosphere via a high-velocity jet cowl situated on the rear elevation of the building. The release point will be approximately 1m above the eaves of the building
Proximity of receptors	Close	10	The closest sensitive receptors are the proposed residential unit located directly above the hot food takeaway, within 20m of the development
Size of kitchen	Medium	3	The number of covers was unknown at the time of assessment. However, based on the layout and area of the proposed kitchen, a size classification of 'medium' is considered appropriate
Cooking type (odour and grease loading)	High	7	The cuisine type to be cooked on the premises is Chinese. As such, the cooking type was categorised as 'high' in accordance with the EMAQ+ and DEFRA criteria

4.1.2 As shown in Table 3, the odour risk for the proposed development was scored as 30. The risk was therefore classified as **high**, in accordance with the EMAQ+ and DEFRA criteria.

[7] Control of Odour and Noise from Commercial Kitchen Exhaust Systems, EMAQ+, 2022.

4.2 Odour Control

4.2.1 Based on the assessment results and the additional factors stated in the previous Section, it is recommended that the development includes mitigation suitable for a **high** level of odour risk. This should include removal of both potential particulate and gaseous phase pollutants. There are a number of options for abatement identified within the EMAQ+ and DEFRA guidance[8] that provide this level of control. These include:

- Emission collection - Odour should be collected via extraction hoods situated above the hot food preparation area;
- Grease filtration system - Mesh type grease filters, such as baffle or cartridge filters, should be included for the purpose of grease filtration. These are suitable for heavy grease loads and would provide a robust control of emissions from the cooking processes within the proposed hot food retail units;
- Fine dust filter - Bag, fan, ESP or High-Efficiency Particulate Arrestance (HEPA) filter should be included for removal of particulates from the air stream;
- Gaseous phase - An activated carbon filter rated with a 0.2 - 0.4 second residence time should be included for odour removal. Alternatively, an oxidation system such as ultraviolet light or ozone may be used; and,
- Dispersion - Emissions should be discharged vertically through a stack, high enough to ensure adequate dilution. The location of the stack should be positioned no less than 1 metre above the eaves of the building and positioned at least 2 metres away from any openable window.

4.2.2 As stated in the previous Section, air will be extracted from the hot food preparation area via a canopy. Air will then pass through an AB65S synthetic bag filter to remove grease followed by a RydAIR 'B Series' ESP to abate fine particulates. The ESP will also be fitted with a UV lamp to remove odourous compounds. Treated air will be discharged to atmosphere via a high-velocity jet cowl which terminates approximately 1m above the eaves of the proposed building.

The proposed measures are consistent with requirements specified for kitchens with a **high** risk of impact in the EMAQ+ and DEFRA guidance. As such, the mitigation is considered suitable to reduce potential effects associated with the scheme to an acceptable level.

[8] Control of Odour and Noise from Commercial Kitchen Exhaust Systems, EMAQ+, 2018.

4.2.3 The following maintenance schedule has been identified for the proposed abatement systems:

- The extract system will be serviced at intervals between one and three months, dependant on usage;
- A visual inspection of the ventilation system will be carried out at least once per week to check for grease build up and surface damage;
- The canopy and grease filters will be cleaned on a daily basis; and,
- All fans will be maintained on a regular basis as recommended by the fan manufacturer.

4.2.4 The proposed maintenance schedule has been specified in line with the EMAQ+ and DEFRA guidance. As such, it considered appropriate for implementation at the development.

5.0 CONCLUSION

5.1.1 Redmore Environmental Ltd was commissioned by Jian Wang to undertake an Odour Assessment in support of a mixed-use development comprising a hot food takeaway and residential unit at 5 Painthorpe Lane, Hall Green.

5.1.2 Odour emissions from hot food preparation on the premises have the potential to result in impacts at the proposed residential unit, as well as existing sensitive receptors in the vicinity of the site. As such, an Odour Assessment was undertaken in order to evaluate potential effects and identify the requirement for any additional mitigation to control potential impacts to an acceptable level.

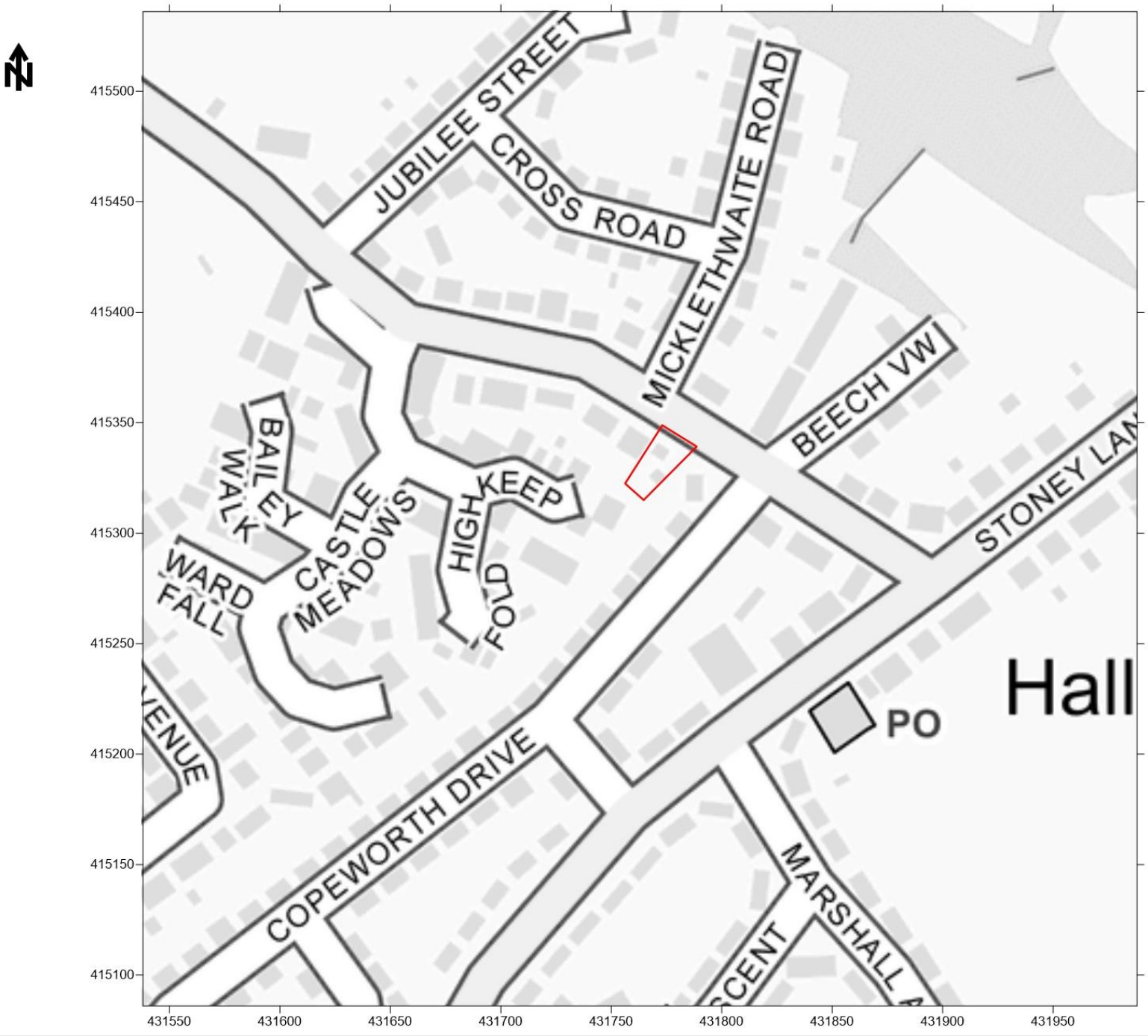
5.1.3 The results of the assessment indicated the odour risk was classified as **high**. This prediction does not infer that the proposed development would result in significant odour impact or affect local amenity levels. However, it does suggest that appropriate mitigation options are required to reduce potential effects to an acceptable level.

5.1.4 The proposed odour abatement strategy for the extraction system has been specified in line with the EMAQ+ and DEFRA guidance for kitchens with a **high** risk of impact. It therefore follows that with this mitigation in place, potential odour impact at nearby sensitive receptors would be reduced to an acceptable level.

6.0 ABBREVIATIONS

DEFRA	Department for Environment, Food and Rural Affairs
ESP	Electrostatic Precipitator
HEPA	High-Efficiency Particulate Arrestance
IAQM	Institute of Air Quality Management
NGR	National Grid Reference
WC	Wakefield Council

Figure



Legend

Site Boundary

Title
Figure 1 - Site Location Plan

Project
Odour Assessment
Painthorpe Lane, Hall Green

Project Reference
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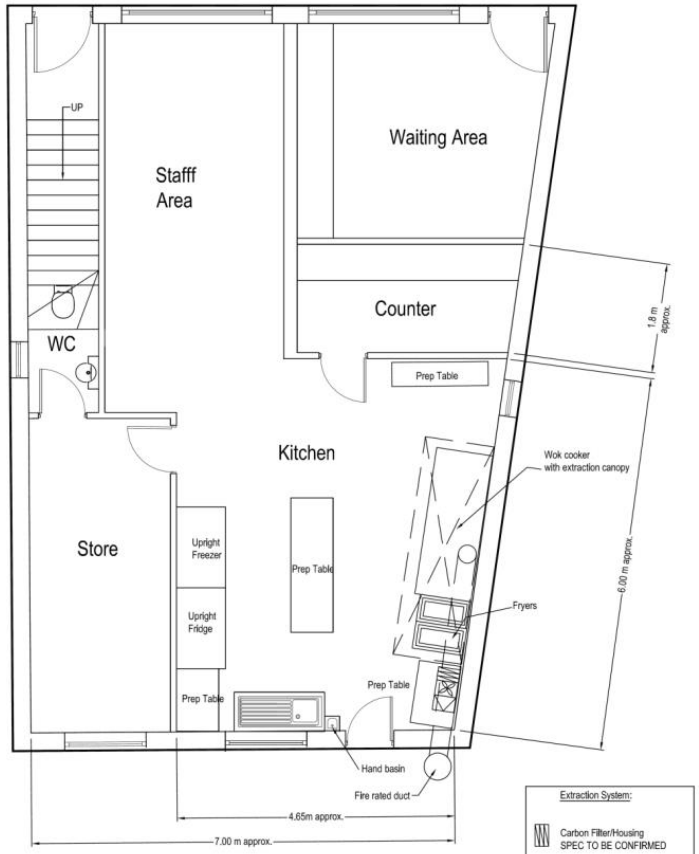


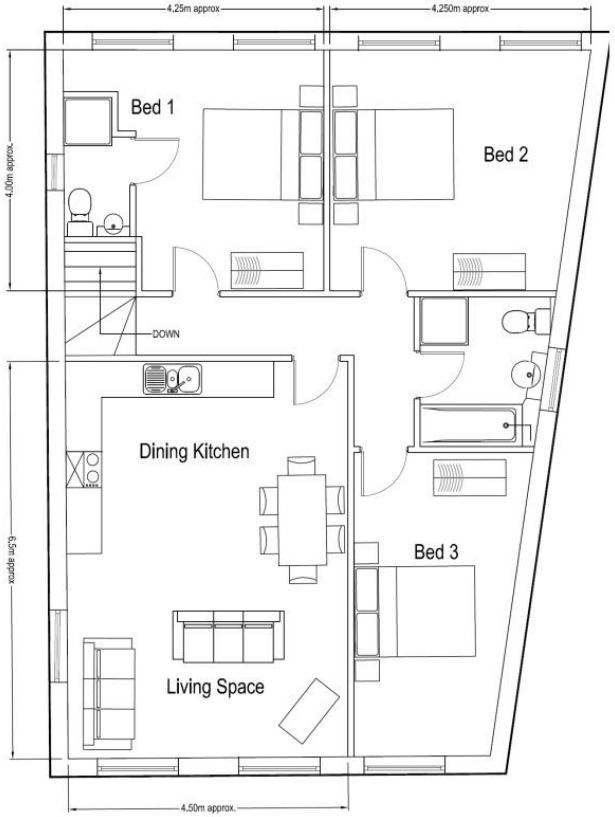
Proposed Ground Floor Plan (Shop property no.5)

scale1:50

Extraction System:

- Carbon Filter/Housing SPEC TO BE CONFIRMED
- Fan SPEC TO BE CONFIRMED
- Silencer SPEC TO BE CONFIRMED

Refer to specification for further details



Proposed First Floor Plan (new dwelling property 5A)

scale1:50

Legend

Title
Figure 2 - Proposed Site Layout Plan

Project
Odour Assessment
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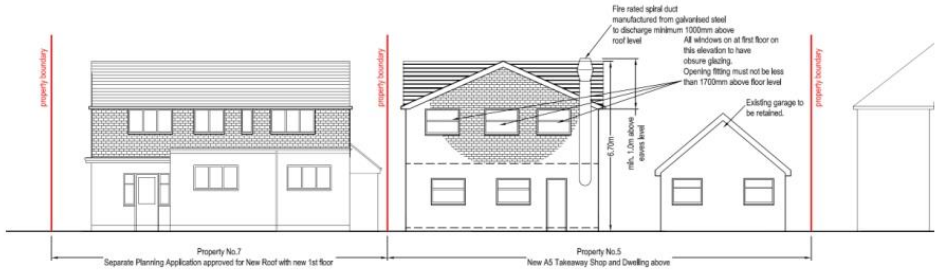
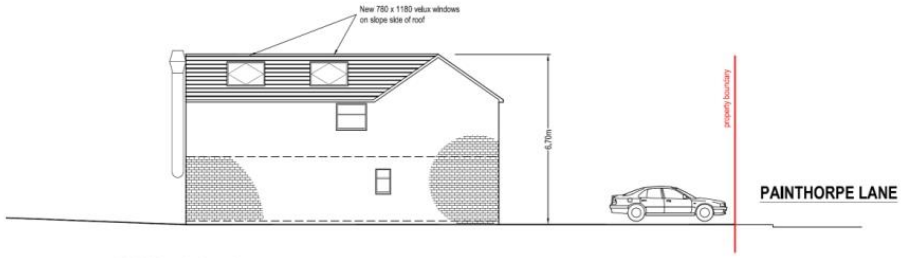
Wall - Ext.Brick finsh, cavity and block wall construction
Roof - Traditional timber trussed frame with slate roof tile finish.
Windows / Door - UPVC and double glazed

Proposed North Elevation
scale1:100



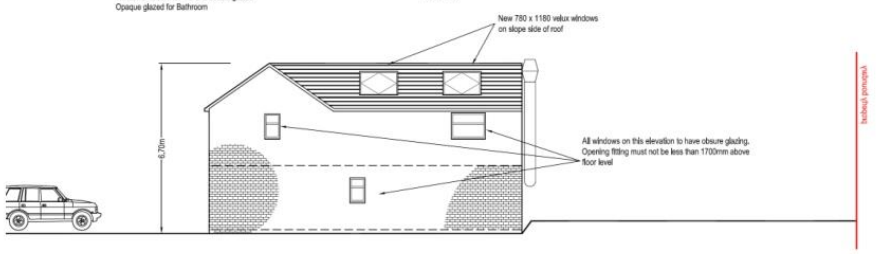
Proposed South Elevation
scale1:100

Wall - Ext.Brick finsh, cavity and block wall construction
Roof - Traditional timber trussed frame with slate roof tile finish.
Windows / Door - UPVC and double glazed



Wall - Brick finsh cavity wall construction
Roof - Traditional timber trussed frame with slate roof tile finish.
Windows / Door - UPVC and double glazed
Opaque glazed for Bathroom

Proposed West Elevation (New Shop)
scale1:100



Wall - Brick finsh cavity wall construction
Roof - Traditional timber trussed frame with slate roof tile finish.
Windows / Door - UPVC and double glazed
Opaque glazed for WC window

Proposed East Elevation (New Shop)
scale1:100

Legend

Title
Figure 3 - Proposed Elevations and Flue Location

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