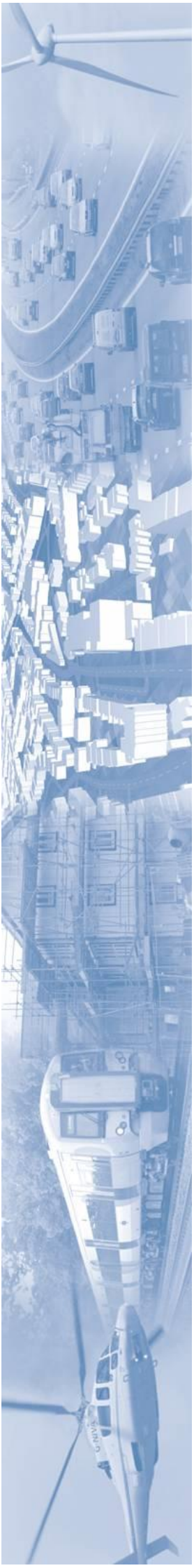


ENVIRONMENTAL CONSULTANTS

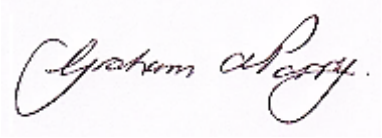
Report for:

Greggs

Greggs New Food on the Go Shops

Odour Impact Assessment

Status: FINAL **Date: 05.07.2018**

Author	Christine Park Senior Environmental Consultant
Approved By	 Graham Parry Managing Director
Report For	**Greggs** 31 Greenside Street Manchester M11 2HW
Date	05.07.2018
Version Number	A3227/OIA/002
Status	Final

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1. INTRODUCTION

ACCON UK Limited (ACCON) have previously been commissioned by Greggs to carry out an odour impact review in respect of two existing extract flue systems at Greggs shops in Reading and Bracknell.

The purpose of the odour impact assessment was to determine the extent to which odour emanating from the extract flues from the existing sites, which replicate the ovens, odour control systems and ventilation at typical Greggs shops, is likely to result in nuisance occurring at any residential properties in the vicinity of similar operations. The assessments can then be utilised to determine the acceptability with respect to odour emanating from new Greggs shops and whether detailed odour assessments may be required at proposed new locations.

The proposed extract system at any new sites would be at least of the standard of the current systems. Based on the opening hours of the current shops which have been reviewed they are unlikely to be open before 0600 hrs or after 1930 hrs, for town centre locations, although other locations may vary.

The general site layouts for the two shops which have been reviewed are illustrated in **Appendix 1**.

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2. ODOUR ASSESSMENT

2.1. Introduction

This odour review relates to the operation of Greggs shops and the potential odour impacts on any sensitive receptors in close proximity to any proposed new Greggs locations.

2.2. Nature and Effect of Odour

Odour is perceived by our brains in response to chemicals present in the air we breathe. Odour is the effect that those chemicals have upon us. Humans have sensitive senses of smell and they can detect odour even when chemicals are present in very low concentrations. Most odours are a mixture of many chemicals that interact to produce what we detect as an odour.

Different life experiences and natural variation in the population can result in different sensations and emotional responses by individuals to the same odorous compounds. Because the response to odour is synthesised in our brains, other senses such as sight and taste, and even our upbringing, can influence our perception of odour and whether we find it acceptable, objectionable or offensive.

2.3. Assessment Methodology

2.3.1. Guidance on Control of Odours from Kitchens

The Department for Environment Food and Rural Affairs (DEFRA) published guidance[1] (Now withdrawn and not presently replaced) on the control of odours from kitchens. Although the guidance is not statutory, it provides information on best practice techniques for the minimisation of odour and noise nuisance from kitchen exhaust systems. This source of guidance and ACCON's own experience form the basis of the assessment to determine whether occupiers of residential properties would consider that odour from a Greggs shop was acceptable or not.

2.3.2. General Principles in Controlling Odour

Ordinarily, the DEFRA guidance was used for premises where food is cooked for patrons on or off the premises and where a kitchen is used to prepare and cook food. In these instances a kitchen canopy extract system are invariably present.

The main purpose of a kitchen canopy is to extract excess heat, steam, fats, smoke and odour arising from cooking processes. Removal of these unwelcome by-products of kitchen activity helps to achieve a reasonably comfortable and safe working environment, protect the

[1] Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems. Report prepared by Netcen on behalf of Department for Environment, Food and Rural Affairs, January 2005

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working environment, as well as preventing the spread of the products from the kitchen area to other parts of the building.

Odours from cooking are contained both within the solid, liquid and gaseous material which is extracted by the kitchen canopy, and these different phases generally require different abatement techniques to reduce levels of odour to those levels which are acceptable to those in the vicinity.

Commonly the kitchen extract canopy will contain the first line of odour control through the incorporation of coarse grease filters, which take out just the largest grease particles from the extracted air stream. Such coarse grease filters tend to be a common feature of nearly all kitchen canopy systems.

The type and levels of odour control required downstream of the canopy is very much dependent on a number of factors. The principle ones are:

- **Type of food prepared**. This is probably the most dominant factor as the type of food, and particularly any spices used, dictates the chemical constituents present in the exhaust air;
- **Size of the cooking facility**. The number of covers the facility is designed to handle affects the intensity of odour in the exhausted air, and the air volume throughput the system must be designed to achieve; and
- **Types of cooking appliances used**. This dictates the level of fat, water droplets and temperature within the ventilation air.

The DEFRA guidance includes two Tables which classify the odour and grease content of extract air according to the general cooking type and equipment used. These are reproduced in **Appendix 2** (**Table 2A** and **Table 2B**). The information, in **Appendix 3**, has been used in this report to carry out the odour risk assessment for Greggs shops and for the specification of control measures where appropriate.

2.4. Odour Impact Assessment

Based on the generic proposals for Greggs retail sites, odour impact assessments were undertaken in accordance with the DEFRA "Guidance on the control of odour and noise from commercial kitchen exhaust"[2] (now revoked and not currently replaced). Additionally, 'sniff tests' were carried out at the two assessed existing Greggs shops by ACCON personnel who have had their odour acuity tested and both of them tested within the prescribed range for 'sniff testing' assessments. The potential source of odour at both shops is due to the following cooking methods:

- Final baking / cooking of bread baguettes, pasties, sausage rolls and sausages in standard convection ovens.

[2] DEFRA "Guidance on the control of odour and noise from commercial kitchen exhaust" available at https://www.gov.uk/government/publications/guidance-on-the-control-of-odour-and-noise-from-commercial-kitchen-exhaust

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- The cooking of bacon in standard convection ovens during the morning breakfast period.
- The warming of sausages, bacon and omelettes in gastronome pots on hot plates during the morning breakfast period.
- The rapid warming up of sandwiches, baguettes and wraps in turbo ovens.
- Preparation of coffees using commercial coffee machines.
- No frying or open grilling is undertaken in the shops.

2.4.1. Reading

For the Reading location, the closest existing residential properties are above the Greggs premises. The extract for the property is to the rear and exits into a small courtyard area. The flue terminates approximately 1.8m below the nearest residential window and the photographs taken during the site visit are included in **Figure 2.1**. The Odour Report Form for the site visit is included in **Appendix 4**.

2.4.2. Bracknell

For the Bracknell location, there are no sensitive residential properties within 50m of the extract of the premises. The extract for the property is to the rear and exits into a large loading bay area which serves the shops in the High Street area of the town. Photographs taken during the site visit are included in **Figure 2.2**.

According to DEFRA guidance the shop provides products within the range of foods in the "moderate" category, as show in **Table 2A** of **Appendix 2**. The menu mainly consists of hot and cold drinks, soup, pastries, pizzas, hot and cold sandwiches, cakes and other baked goods e.g. sausage rolls, pasties etc. The Odour Report Form for the site visit is included in **Appendix 4**.

2.5. Risk Assessment

The DEFRA guidance provides a means of risk assessing the impact of a any proposed catering establishment and existing uses. The key elements of the method are reproduced in **Appendix 3**. The method relies on scoring the proposal on four different aspects:

- **Dispersion** – where the extract vents to atmosphere are in relation to the building to which the vent is attached;
- **Proximity of receptors** – the location of the nearest residents;
- **The kitchen size** – number of covers, i.e. level of activity; and
- **Cooking type** – based on grease and odour loading.

The level of odour which is created by a premises will depend on the size of kitchen and type of cooking. These can be determined using categories which have been set out by DEFRA in their "Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems" and are replicated in **Appendix 2**.

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The scores for each aspect are summed to derive an overall significance score, an impact risk, and a statement about the odour control requirement. The guidance has been utilised where possible to determine the risk of odour nuisance from the store without any odour abatement in place.

For the example stores, the risk assessments are provided in **Tables 2.1** and **2.2**. The results of the assessment is a potentially High Risk of impact at the Reading store and Low Risk of Impact at the Bracknell store.

Table 2.1: Odour Risk Assessment - Reading

	Descriptor	Score	Impact Risk	Odour Control Requirement
Dispersion	Poor-Moderate	10 - 15	High	High level of odour control required
Proximity of Receptors	Close	10		
Size of food cooking area	Small	1		
Cooking Type	Final cooking of frozen part cooked goods using standard convection ovens	1		
TOTAL		**22-27**		

Table 2.2: Odour Risk Assessment - Bracknell

	Descriptor	Score	Impact Risk	Odour Control Requirement
Dispersion	Poor-Moderate	10 - 15	Low to Medium	Low Level odour control
Proximity of Receptors	Far	1		
Size of food cooking area	Small	1		
Cooking Type	Final cooking of frozen part cooked goods using standard convection ovens	1		
TOTAL		**13-18**		

2.6. The Odour Control Scheme

Section 2.4 has quantified that as a worst case (the Reading store) there is a 'high' risk of potential nuisance without any odour control measures in place.

Based on the information provided, the existing stores currently utilise an ETALINE fan by ruck Ventilatoren GmbH (Model No. EL 315 E2 01) and baffle grease filters by Grease Defender (Model No. FS50-2016-BA). These systems will provide a good level of odour control by dispersion and arrestment for the type of cooking which will be undertaken in a typical store and will minimise the potential for complaints.

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From the information provided in the data sheets for the fan, an exit velocity for the extract will be approximately 8m/s. The Reading store also has a pleated carbon filter installed which based on the 'sniff testing' carried out provided an adequate level of odour control when in close proximity to the extract.

It should be noted that it is important that these abatement systems should be regularly cleaned and maintained in order to ensure they work at their optimum capacity and to reduce any likelihood of nuisance complaints from nearby residential receptors.

2.7. Site Context

2.7.1. Reading

- There are existing flats located on the upper floors immediately above the store.
- The closest sensitive receptor window is located approximately 1.8m above the extract location;
- The store extracts into a courtyard area; and
- A site visit was undertaken during the "breakfast" period, with the extract operational. During the site visit, no odour was perceptible in close proximity to the extract, and with the current level of odour control there is unlikely to be nuisance complaints and ACCON are unaware of any having been received.

2.7.2. Bracknell

- There are no existing sensitive (residential) receptors within 50m of the extract;
- The extract is located to the rear of the property and exits into a large loading area which serves the premises as well as a number of other shops on the High Street; and
- A site visit was undertaken during the "lunch" period, with the extract operational, During the site visit, a very faint not unpleasant odour was perceptible directly at the flue extract;
- Based on the lack of any sensitive receptors in close proximity to the extract and with the current level of odour control, there is unlikely to be nuisance complaints and ACCON are unaware of any having been received.

2.8. Recommendations

This report has reviewed the available guidance on cooking odours and its control. The risk assessment method from DEFRA's guide has been used to classify the odour impact of the existing stores, to determine potential odour impacts from future shops. The result is that the existing extract system without mitigation would represent a potentially 'high' risk, at the Reading store and 'low' risk, at the Bracknell store, of impact if no odour control was implemented in the extraction system.

Based on the existing example premises, there is currently a good level of odour control being incorporated into new stores.

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Based on the risk assessment outcome, should this mitigation (similar or better) be implemented at future premises a good level of odour control should be achieved.

Accordingly, we recommend that the normal system of extraction and odour control is regularly maintained and clean in order to minimise the potential for any odour related complaints.

For future premises, based on the example existing premises which have been assessed by ACCON, and the relatively low level of odour control which is implemented in the stores, the main contributing factor to the likelihood of odour complaints will be the proximity of sensitive receptors to the extract flue. Based on DEFRA's guidance, if a receptor is within 20m an extract it is considered to be "close".

Table 2.3 provides a matrix which can be utilised to determine if a detailed odour assessment is likely to be required for a site.

Table 2.3: Requirements for a Detailed Odour Assessment

Distance to Closest Sensitive Receptor (m)	Detailed Odour Assessment Required?
0-5	Only required if no additional odour control is included (e.g. pleated carbon filter)
6-10	Unlikely to be required when "standard" extraction is included as detailed in **Section 2.6**
11-20	Highly unlikely to be required when "standard" extraction is included as detailed in **Section 2.6**
>20	Not Required when "standard" extraction is included as detailed in **Section 2.6**

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3. CONCLUSIONS

With respect to odour, it has been identified that with the current extract systems (or better) included in all future Greggs shops, flue extracts from proposed premises which are located more than 20m from any sensitive receptors should not require a detailed odour assessment.

Based on the matrix provided in **Table 2.3**, with the current level of ventilation (as included in the Bracknell store) there should not be a requirement for a detailed assessment for any sites where the flue will extract between 5m and 20m from any sensitive receptors.

If there are sensitive receptors within 5m of the proposed flue extract and the current ventilation system, with the addition of the pleated carbon filter are included (such as in the Reading store) there should not be a requirement for a detailed assessment.

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Appendix 1
Plans and Drawings

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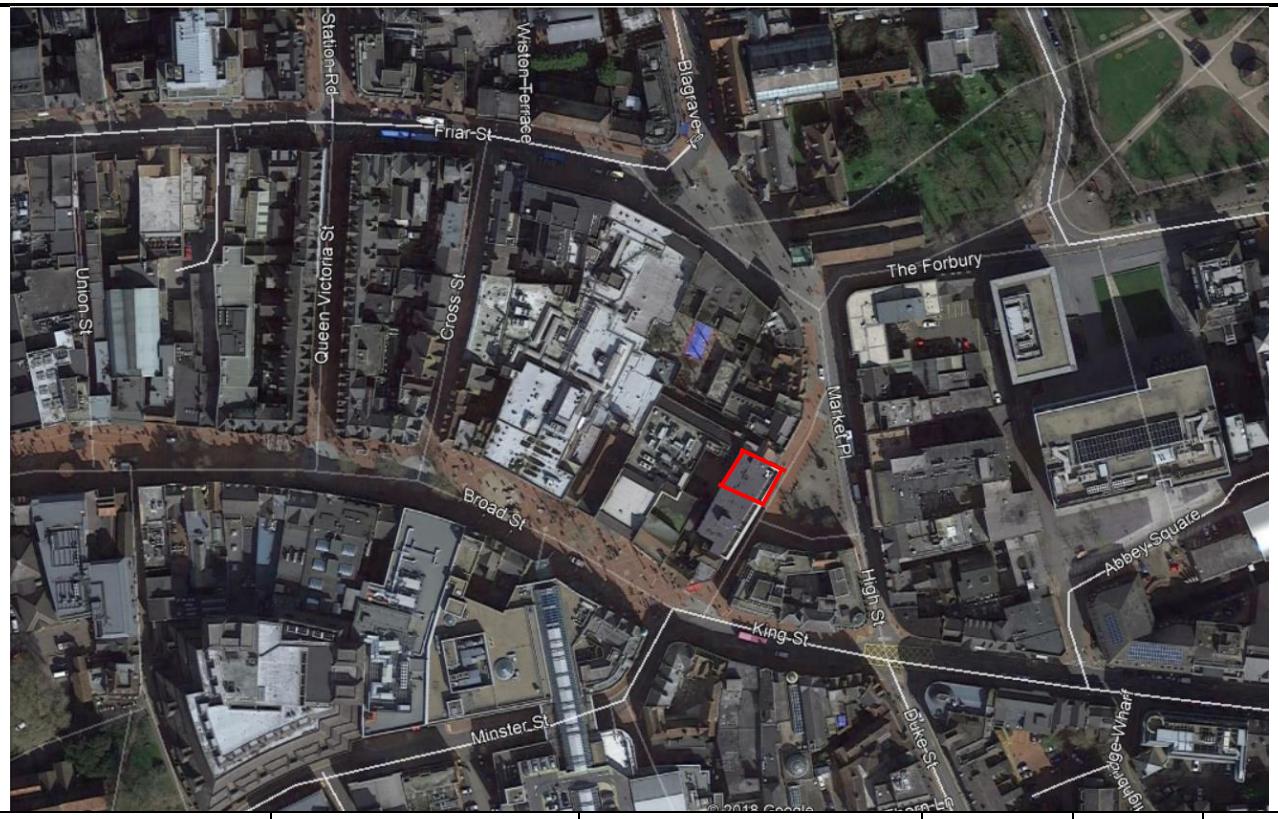
Appendix 1.1: Site Location Plan - Reading



LEGEND

Site Boundary

Client: Greggs		Description: Site Location Plan - Reading		Design	CP	09.04.2018	ACCON UK ENVIRONMENTAL CONSULTANTS
				Drawn	CP	09.04.2018	
Rev: A	Description: FINAL	Project: Greggs		Checked	CP	09.04.2018	*Appendix 1.1*
				Approved	GP	09.04.2018	Scale: Not to Scale

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Appendix 1.2: Rear Elevation Plan - Reading

LEGEND

Flue Extract

Client: Greggs		Description: Rear Elevation Plan - Reading		Design	CP	09.04.2018	ACCON UK ENVIRONMENTAL CONSULTANTS
				Drawn	CP	09.04.2018	
Rev: A	Description: FINAL	Project: Greggs		Checked	CP	09.04.2018	*Appendix 1.2*
				Approved	GP	09.04.2018	Scale: Not to Scale

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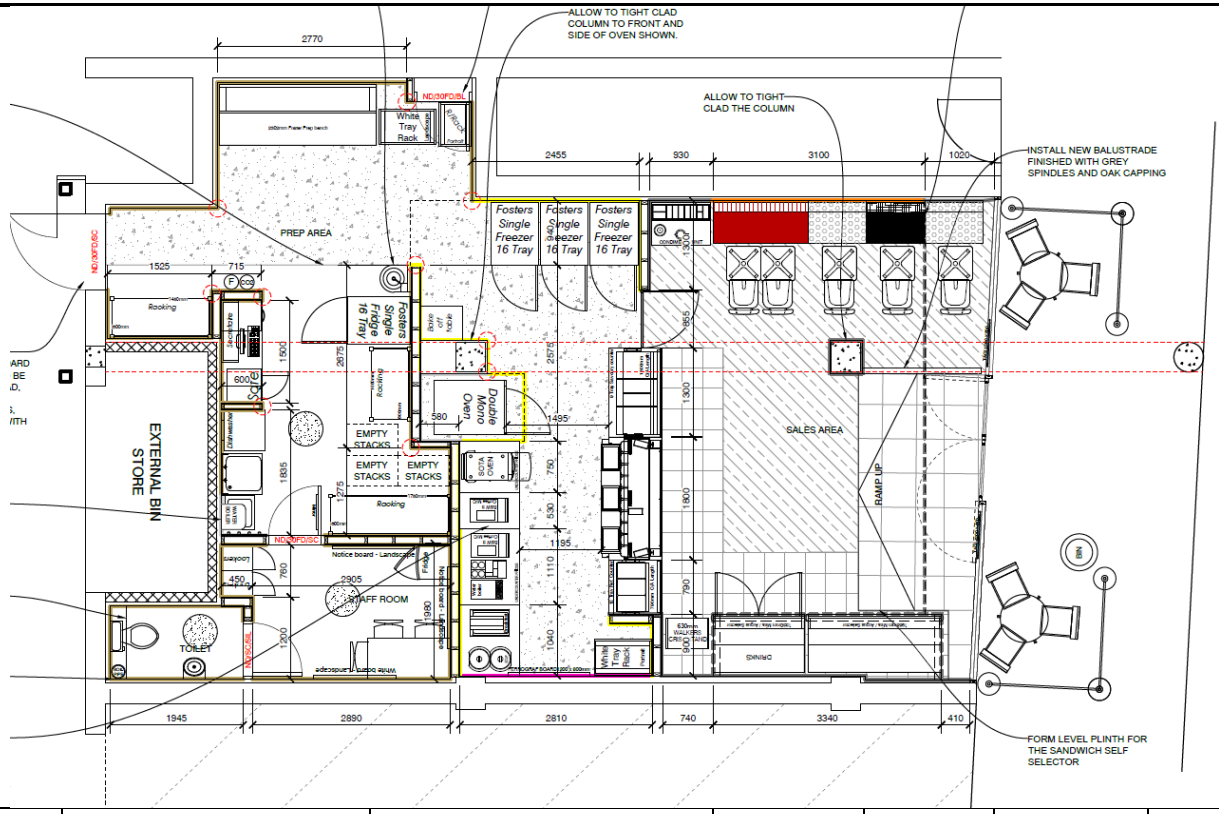
Appendix 1.3: Layout Plan - Reading



Client: Greggs		Description: Layout Plan - Reading		Design	CP	09.04.2018	accon UK ENVIRONMENTAL CONSULTANTS
				Drawn	CP	09.04.2018	
Rev: A	Description: FINAL	Project: Greggs		Checked	CP	09.04.2018	*Appendix 1.3*
				Approved	GP	09.04.2018	Scale: Not to Scale

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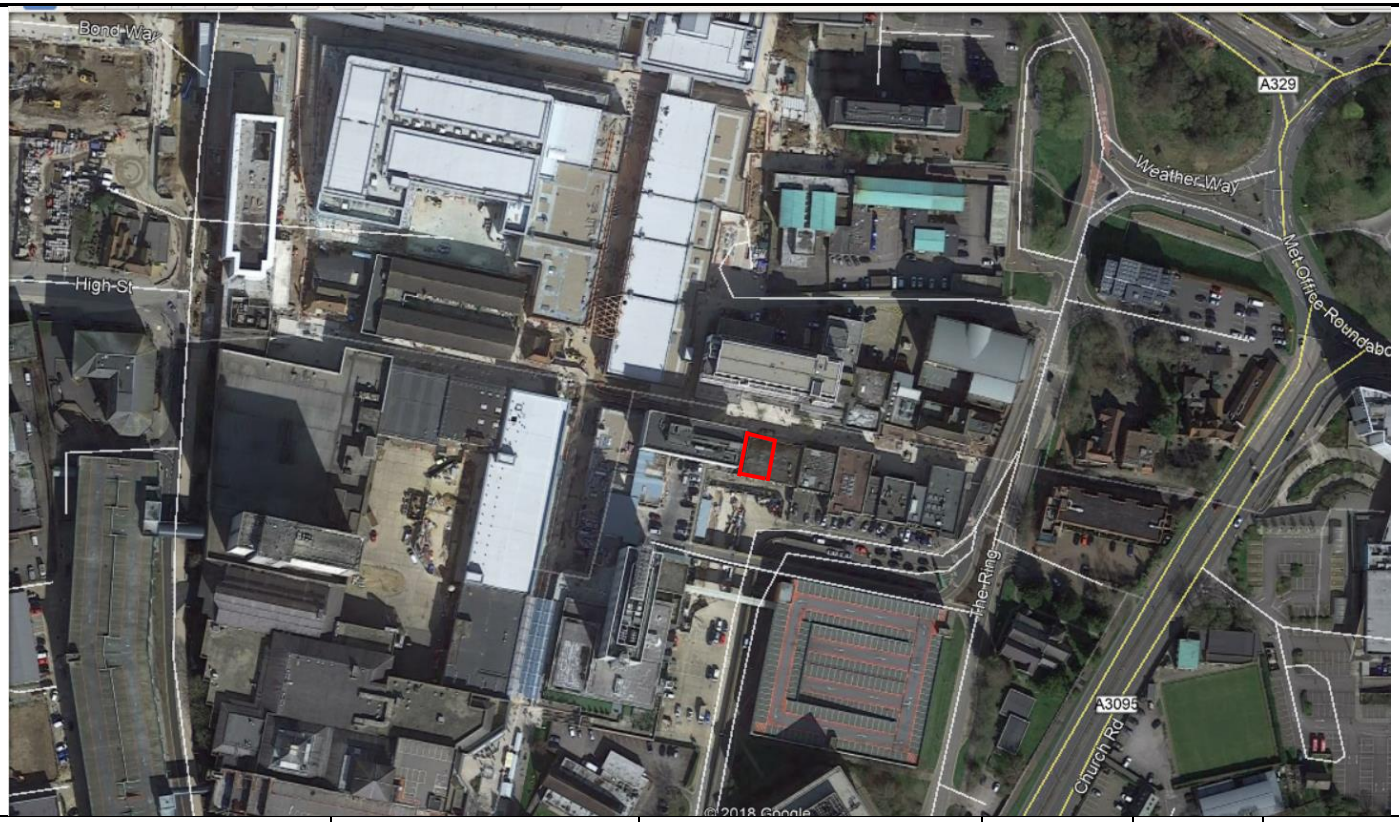
Appendix 1.4: Site Location Plan - Bracknell



LEGEND

Site Boundary

Client: Greggs		Description: Location Plan - Bracknell		Design	CP	09.04.2018	accon UK ENVIRONMENTAL CONSULTANTS
				Drawn	CP	09.04.2018	
Rev: A	Description: FINAL	Project: Greggs		Checked	CP	09.04.2018	*Appendix 1.4*
				Approved	GP	09.04.2018	Scale: Not to Scale

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Appendix 1.5: Rear Elevation - Bracknell

LEGEND

Flue Extract

Client: Greggs		Description: Rear Elevation - Bracknell		Design	CP	09.04.2018	ACCON UK ENVIRONMENTAL CONSULTANTS
				Drawn	CP	09.04.2018	
Rev: A	Description: FINAL	Project: Greggs		Checked	CP	09.04.2018	*Appendix 1.2*
				Approved	GP	09.04.2018	Scale: Not to Scale

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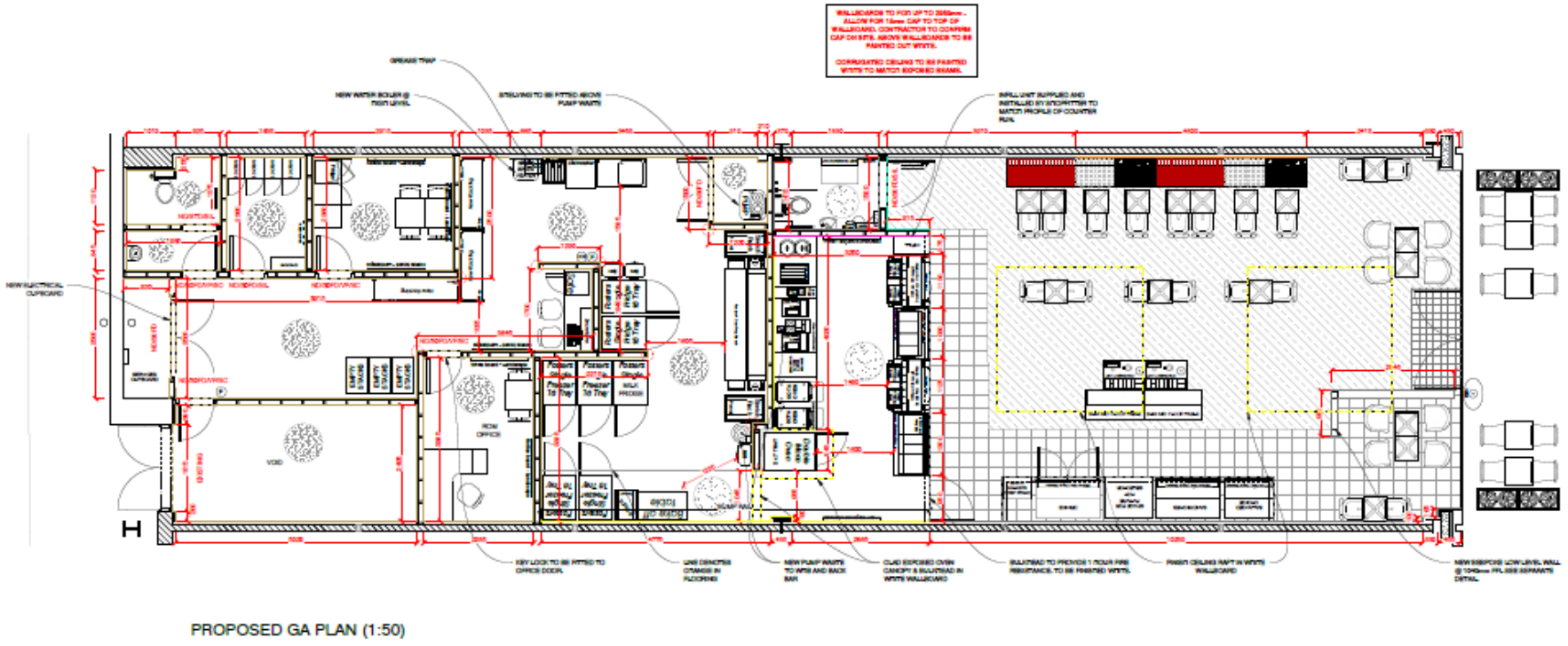
Appendix 1.6: Layout Plan - Bracknell



Client: Greggs		Description: Layout Plan - Bracknell		Design	CP	09.04.2018	accon UK ENVIRONMENTAL CONSULTANTS
				Drawn	CP	09.04.2018	
Rev: A	Description: FINAL	Project: Greggs		Checked	CP	09.04.2018	*Appendix 1.6*
				Approved	GP	09.04.2018	Scale: Not to Scale

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Appendix 2
Classification of Odour and Grease Content of Extract Air from Commercial Kitchens

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Table 2A: Table detailing the grease and odour content of various types of food

Catering establishment	Description	Odour content				Grease content			
		Low	Moderate	High	Very high	Low	Moderate	High	Very high
Tea shop		■				■			
Pizza restaurant	Herb		■				■		
Steakhouses	Fat		■				■		
French	Herbs/garlic		■				■		
Italian	Herbs/garlic		■				■		
Most pubs	Fat		■				■		
Chinese	Ginger, spices, oil		■					■	
Japanese	Spices, oil		■					■	
Cantonese	Spices, oil		■					■	
Indian	Spices, oil			■				■	
Thai	Spices, oil			■				■	
Vietnamese	Spices, oil			■				■	
Kebab	Fat cooking meat			■				■	
Fried Chicken	Oil, cooking meat				■				■
Pubs (fried)	Oil, cooking meat				■				■
Fish & chip	Oil				■				■
Fast food, burger	Oil, cooking meat				■				■

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Table 2B: Table detailing the grease & moisture content of various cooking appliances

Cooking appliance	Grease loading			Moisture content		
	Light	Medium	Heavy	Light	Medium	Heavy
Cooking pots	■					■
Bains Marie	■					■
Steam ovens	■					■
Pizza ovens		■			■	
Bratt pans		■				■
Oven ranges		■			■	
Flat top grills		■			■	
Chip fryers		■			■	
Salamanders		■			■	
Charcoal			■		■	
Gas fired open grills			■		■	
Char boilers			■		■	
Chinese wok ranges			■			■

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Appendix 3
DEFRA Odour Impact Risk Assessment Methodology

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Odour control must be designed to prevent odour nuisance in a given situation. The following score methodology is suggested as a means of determining odour control requirements using a simple risk assessment approach.

Impact Risk	Odour Control Requirement	Significance Score*
Low to medium	Low level odour control	<20
High	High level odour control	20-35
Very high	Very high level odour control	>35

*based on the sum of contributions from dispersion, proximity of receptors, size of kitchen and cooking type.

Criteria	Descriptor	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 20 m from kitchen discharge
	Medium	5	Closest sensitive receptor between 20-100m from kitchen discharge
	Far	1	Closest sensitive receptor greater than 100m from kitchen discharge
Size of kitchen	Large	5	More than 100 covers or large sized restaurant
	Medium	3	Between 30-100 covers or medium sized restaurant
	Small	1	Less than 30 covers or small restaurant
Cooking type (odour and grease loading)	Very high	10	Pub (high level of fried food), fried chicken, burgers or fish and chips
	High	7	Kebab, Vietnamese, Thai or Indian
	Medium	4	Cantonese, Japanese or Chinese
	Low	1	Most pubs, Italian, French, pizza or steakhouse

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Appendix 4
Site Visit Odour Report Forms

Odour Report Form – *Adapted from IPPC H4 'Odour Management', Environment Agency (2011)*

Odour Report Form		**Date:** 12.03.2018	**Project:** A3227 – Greggs Reading	
Test Location No.	**1.**	**2.**	**3.**	**4.**
Test Location Description	Outside Back Door	Top of fire escape in courtyard	Archway to courtyard access	Outside front door
Time	0930	0940	0950	1000
Weather Conditions	Overcast/light rain			
Temperature	8ºC			
Wind Speed/Direction	No wind as the flue discharges into an enclosed courtyard			
Distance to Source	0.5m	Approx. 8m above	10m south	15m east (other side of building)
Plant Operational?	Yes			
Intensity+ (*VDI 3882, Part 14*)	1	0	0	2*
Duration	0630 - 1930 hrs	N/A	N/A	0630 - 1930 hrs
Frequency	consistent	N/A	N/A	consistent
Notes and Odour Characteristics	Light smell of pastry/baked goods	N/A	N/A	Noticeable smell of pastry/baked goods
Current Receptor Sensitivity	High (residential)			
Future Receptor Sensitivity	High (residential)			

*****at the front of the building odour was detected which was not extracted through the ventilation system

Intensity+
0 No odour
1 Very faint odour
2 Faint odour
3 Distinct odour
4 Strong odour
5 Very strong odour
6 Extremely strong odour Ref: German Standard VDI 3882, Part 14

Odour Report Form – *Adapted from IPPC H4 'Odour Management', Environment Agency (2011)*

Odour Report Form		**Date:** 13.03.2018	**Project:** A3227 – Greggs Bracknell	
Test Location	**1.**	**2.**	**3.**	**4.**
Test Location Description	At back door	In Loading area behind store	In front of store	
Time	1145 hrs	1155 hrs	1205 hrs	
Weather Conditions	Overcast/light rain			
Temperature	8ºC			
Wind Speed/Direction	Light Wind			
Distance to Source	0.5m	10m	18m (other side of building	
Plant Operational?	Yes	Yes	Yes	
Intensity+ (*VDI 3882, Part 14*)	2-3	0	0	
Duration	0630 - 1730 hrs	N/A	N/A	
Frequency	consistent	N/A	N/A	
Notes and Odour Characteristics	Noticeable smell of pastry/baked goods	No odour detected	No odour detected	
Current Receptor Sensitivity	Low (no residential receptors within 50m)			
Future Receptor Sensitivity	Low (no residential receptors within 50m)			

Intensity+
0 No odour
1 Very faint odour
2 Faint odour
3 Distinct odour
4 Strong odour
5 Very strong odour
6 Extremely strong odour Ref: German Standard VDI 3882, Part 14

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