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REAR OF 20 NORCOT ROAD, READING

ODOUR ASSESSMENT - SPRAYBOOTH

TECHNICAL REPORT: RFE-0508-23-02-02 AQ FINAL

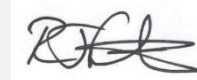
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1 INTRODUCTION

RF Environmental Ltd (RFE) has been commissioned to undertake an odour assessment in support of a planning application at the rear of 20 Norcot Road, within the administrative boundary of Reading Borough Council (RBC).

The operational phase of the proposed development, which involves the process of spray painting vehicles, has the potential to cause loss of amenity to existing receptors, from additional emissions associated with the spray painting activities.

The assessment comprises a qualitative risk-based assessment considering the potential effects of odour on the amenity of existing sensitive receptors.

The assessment does not consider the health-impacts associated with the proposed development and does not substitute as a permit application, should one be required by the Environmental Agency or RBC.

1.1 Proposed Development

The proposed development includes a dedicated spray paint enclosure as a component of a larger workshop area spanning approximately 327m². Additionally, the workshop area incorporates supplementary facilities to support its operations, including office space, a kitchen, and a small storage area.

The proposed spray painting booth is the Hercules 6000 Series spraybooth. A schematic and an example of the spray painting booth is presented in Figures' A1 and A2 of Appendix A.

The existing site comprises a vehicle repair garage, which the proposed development will expand upon. The proposed development is located behind 20 Norcot Road, to the east.

The site plan is presented in Figure A3 of Appendix A.



2 LEGISLATION, POLICY AND GUIDANCE

2.1 Planning Policy

2.1.1 National Policies

National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) (2021)¹ sets out the government's planning policies for England but does not refer directly to odour.

2.1.2 Local Policy

RBC's Local Plan² was adopted on 4th November 2019. There are no policies directly relating to odour from spray painting booths.

2.2 Guidance

National Planning Practice Guidance

The government has revised and updated the national planning practice guidance³ to support the NPPF in order to make it more accessible. The guidance mentions that odour and dust can also be a planning concern, because of the effect on local amenity.

IAQM's Guidance

IAQM's guidance on the assessment of odour for planning⁴, is used for assessing odour impacts for planning purposes. It states that: *"The relevant Planning Authority must consider whether a proposed development (an odour source itself or nearby new receptors such as residential dwellings) will be a suitable use of the land."*

The guidance can be used to assess the effects of odour on amenity and does not relate to health. It takes into account a number of approaches to assessing odour impacts associated with proposed developments, including qualitative assessment techniques, such as, a risk assessment approach and dispersion modelling, or quantitative techniques, such as, complaint histories, odour sampling and sniff tests.

The guidance is not intended to provide or replace guidance on odour for environmental protection regulatory purposes.

Defra's Guidance

Defra's guidance note⁵ provides guidance on the conditions appropriate for the control of emissions into the air from the re-spraying of road vehicles.

¹ Ministry of Housing, Communities and Local Government. National Planning Policy Framework. July 2021.

² Reading Borough Council. Reading Borough Local Plan 2019.

³ Ministry of Housing, Communities and Local Government. 2019. Planning Practice Guidance: Air Quality. Available from: <https://www.gov.uk/guidance/air-quality--3> (Accessed 15/06/2023)

⁴ IAQM, 2018. Guidance on the assessment of odour for planning. Version 1.1. July 2018.

⁵ Defra, 2013. Process Guidance Note 6/34(11). Statutory guidance for re-spraying of road vehicles. July 2013.



The note is one of a series of statutory notes giving guidance on the Best Available Techniques (BAT). The notes are all aimed at providing a strong framework for consistent and transparent regulation of installations regulated under the statutory Local Air Pollution Prevention and Control (LAPPC) regime.

HSE Guidance

The Health and Safety England (HSE) provides guidance⁶ specifically related to isocyanate paint spraying, and focusses on the management of spray booths and the ventilation, extraction and control systems. This guidance refers to the process operation and workers safety, as opposed to planning guidance.

Environment Agency Guidance

The Environment Agency (EA) and Defra published guidance⁷ in 2016 on the control and monitoring of emissions for an environmental permit and was most recently updated in November 2022. The guidance provides details on how to carry out a risk assessment in support of an environmental permit.

The Environment Agency's H4 Odour Management⁸ guidance covers regulatory requirements with regard to odour, advice on the management of odour and the aspects that should be dealt with in an odour management plan (OMP). The guidance also provides hedonic scores for a variety of odours, these range from +4 for very pleasant odours to -4 for foul ones.

⁶ HSE, 2014. Isocyanate paint spraying. Safely managing spray booths and rooms.

⁷ Defra and EA, 2016. Control and monitor emissions for your environmental permit. 24/11/22. Available from: <https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit>. Accessed 15/06/23

⁸ EA, 2011. H4 Odour Management. How to comply with you environmental permit. March 2011.



3 ASSESSMENT METHODOLOGY

3.1 Assessment Approach

For the purpose of this assessment, a predictive method (risk-based assessments using Source- Pathway-Receptor concept) was used.

IAQM guidance is limited to assessing the effect of odour on amenity and not on human health. For exposure to odour to occur, there must be an emission source to the atmosphere, a pathway for the odour to travel and a receptor that could experience adverse effects. This is known as the Source-Pathway-Receptor (S-P-R) concept. The S-P-R concept presents the hypothetical relationship between the source (S) of the odour, the pathway (P) by which exposure might occur, and the receptor (R) that could be adversely affected.

Source Odour Potential

The first step is to categorise the source odour potential of the site activities as small, medium or large. This is achieved by taking into account the following factors:

- scale of the odour release (magnitude);
- how inherently odorous the emission is; and
- the relative pleasantness/unpleasantness of the odour (its hedonic tone).

Indicative Odour Exposure Standards, as described by the Environment Agency, can be used as defaults where no sector or site-specific dose response relationship has been carried out. The IAQM guidance provides the benchmark odour criteria, shown in Table 3.1 overleaf, originally sourced from the H4 Environment Agency guidance on odour management.

Criterion, C ₉₈ ou _E /m ³	Offensiveness	Odour Emission Sources
1.5	Most Offensive	Processes involving decaying animal or fish remains Processes involving septic effluent or sludge Biological landfill odours
3.0	Moderately Offensive	Intensive livestock rearing Fat frying (food processing) Sugar beet processing Well aerated green waste composting
6.0	Less Offensive	Brewery Confectionary Coffee

TABLE 3.1: H4 BENCHMARK ODOUR CRITERIA

The H4 Environment Agency guidance refers to the measurement scale for hedonic tones. The scale typically ranges from +4 for very pleasant odours to -4 for foul ones. Neutral odours score 0. This score refers to the type of smell, irrespective of its strength (intensity) and can help to decide how offensive an odour may be. Everyday odours and their respective hedonic scores are presented in Table 3.2.

Description	Hedonic Score
Bakery (fresh bread)	3.53
Coffee	2.3
Hay	1.31
Raw potato	0.26
Rope (hemp)	-0.16
Kipper - smoked fish	-0.69
Paint	-0.75
Mothballs	-1.25
Disinfectant, fresh tar	-1.60
Wet wool, wet dog	-2.28

TABLE 3.2: H4 HEDONIC SCORES FOR EVERYDAY ODOURS



Effective Pathway

The next step refers to the exposure pathways, which is how the odour emissions may reach the receptors. The effectiveness of the pollutant pathway for odour through the air versus the dilution/dispersion of the odorous emissions in the atmosphere needs to be estimated. The pollutant pathway from source to receptor can be categorised as ineffective, moderately effective, or highly effective. Factors to consider include:

- distance of sensitive receptors from the odour source;
- whether the receptors are downwind;
- effectiveness of the point of release in promoting good dispersion; and
- topography and terrain between the source and the receptor.

Risk of Odour Exposure (Impact)

In the third step, the risk of odour exposure (impact) is predicted by combining the source odour potential and the pathway effectiveness, using IAQMs example risk ranking matrix presented in Figure A4 of Appendix A.

Magnitude of Odour Effects

The likely magnitude of odour effects at the receptor locations is estimated by considering the odour exposure (impact) and the receptor sensitivity together, using the example matrix in Figure A5 of Appendix A. The likely magnitude of odour effects may be classed as 'negligible', 'slight adverse', 'moderate adverse' or 'substantial adverse'.

The final step for most assessments is to estimate the overall odour effect on the surrounding area as a result of the site, development or process. This assessment must take into account the different magnitude of effects at different receptors, and the total number of receptors that experience these different effects. IAQM guidance recommend the suggested descriptors for the total magnitude of odour effects, as reproduced in Figure A6 of Appendix A. IAQM guidance suggest that "where the overall effect is greater than 'slight adverse', the effect is likely to be considered significant."

Receptors

IAQM guidance (2018) recommends classifying each receptor in terms of its sensitivity.

Examples of receptors with a high sensitivity would include residential dwellings, hospitals, schools, etc, all of which would be expected to be present continuously and/or expect a high level of amenity. Receptors with a medium sensitivity may include places of work such as commercial and retail premises, and receptors with a low sensitivity may include industrial use of land or footpaths, as exposure will only be for a limited amount of time.



There are residential receptors within 20m of the proposed development and are considered to have a 'high' sensitivity to odour emissions.

Meteorological Data

Meteorological data from Heathrow were used. This meteorological station is located c. 37km east of the site. The wind rose is presented in Figure A7 of Appendix A.



4 QUALITATIVE ODOUR RISK ASSESSMENT

4.1 Source Odour Potential

Magnitude of odour source

Both the proposed workshop and spray painting booth has a floorspace of 327.8m² and therefore the spray painting booth, which is the odour emitting source, covers a small area.

The offensiveness of the odour related processes involving paint spraying is not quantified in the IAQM guidance. However, the EA's H4 guidance proposes a hedonic score of -0.75 for paint, which is classified as neutral (0) to unpleasant (-2), as presented in Table 3.2.

The process activity will be contained within the booth and the air is extracted via a twin dry filter system and exhausted to atmosphere. The two stage filtration incorporated within the extraction system includes a 50mm EU2 paint stop filter and EU3 blue pre-filter; this ensures that emissions meet EPA requirements. The manufacturers guidance states that by using recommended filters with regular changes, 99% of pollutants can be captured⁹. Therefore, leading to little or no residual odour.

It is therefore assumed the source odour potential is 'small'.

Effective Pathway

The closest residential receptors are within 20m of the site, to the northeast, and are considered to have a 'high' sensitivity to odour emissions. Receptors with a high sensitivity to odour emissions are located within 30m to the north and southeast of the site. Residential receptors are located within 100m of the site to the south and southwest.

The closest receptors with a 'high' sensitivity will be downwind of the proposed development when referring to the predominant wind direction. The wind direction for 2019 is shown in Figure A7 of Appendix A.

It is recommended to position the stack towards the back of the spray booth, thereby increasing the distance between the emission source and the receptors located in the downwind direction from the site.

With recommendations in place, the pathway effectiveness is considered moderately effective.

4.2 Odour Risk

The risk of odour exposure (impact) at the 'high' sensitivity receptors is defined as 'Negligible Risk' based on Figure A4 of Appendix A.

⁹ Todd Engineering. Hercules. 6000 Series Spraybooth & Ovens. Data Sheet, 01/08/2018.



Using IAQM's table presented in Figure A5 of Appendix A, the likely magnitude of odour effect at the worst-case receptors is negligible.

Receptor details and location	Source Odour Potential	Pathway (Transport Effectiveness)	Odour Exposure	Receptor Sensitivity	Likely Odour Effect
Worst-case Residential Receptors	Small	Moderately Effective Pathway	Negligible Risk	High Sensitivity	Negligible Effect

TABLE 4.1 ODOUR RISK ASSESSMENT SCORING



5 CONCLUSIONS

Based on a qualitative risk-based assessment, it is predicted that the proposed spray painting booth would have a negligible odour effect on worst-case receptors. Based on IAQM guidance and professional judgement, and the implementation of the manufacturers recommended maintenance measures, including regular filter changes, the overall effect is “not significant”.

Appendix A: Figures

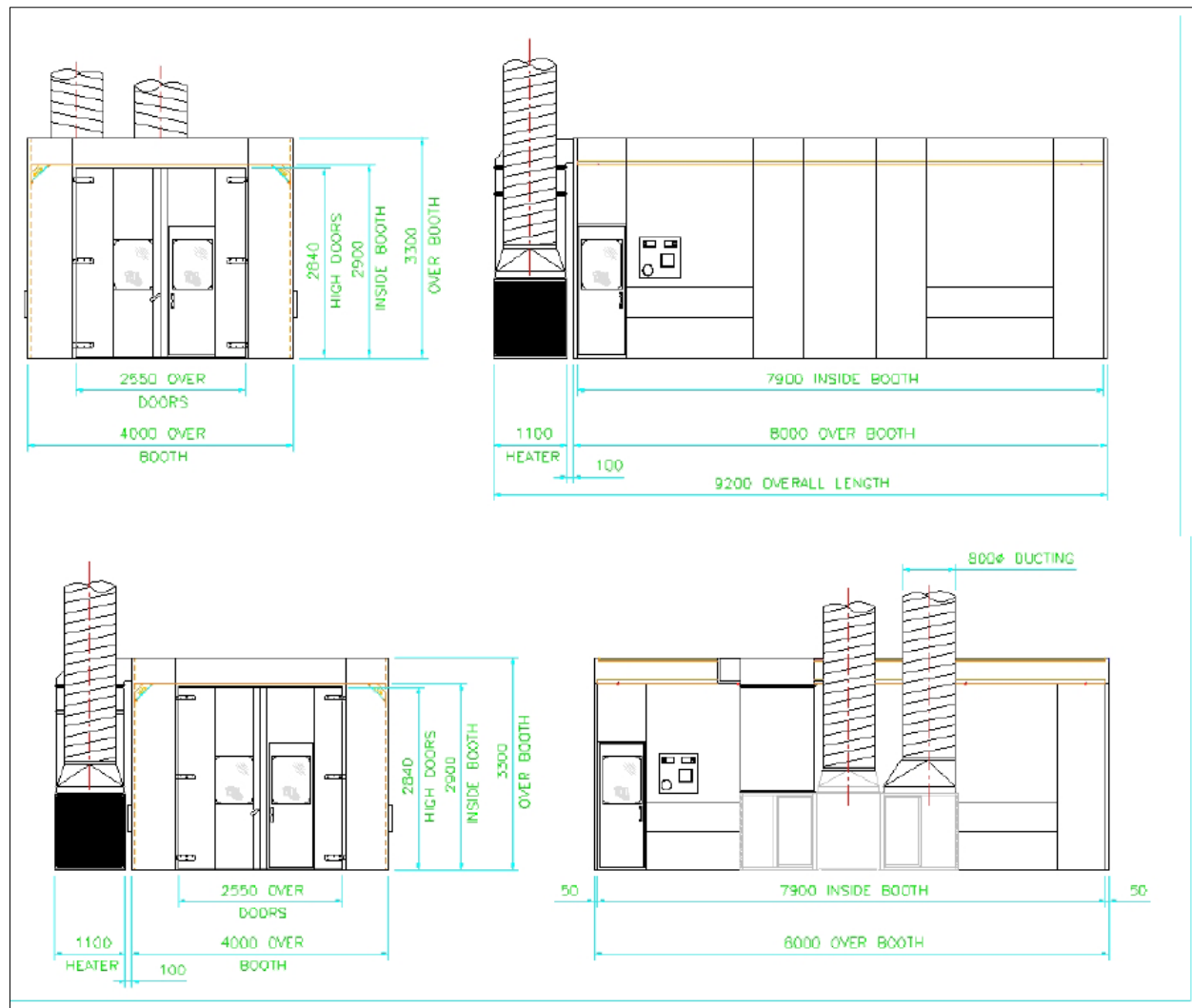


FIGURE A1: PROPOSED SPRAYBOOTH SCHEMATIC



FIGURE A2: PROPOSED HERCULES 6000 SERIES SPRAYBOOTH

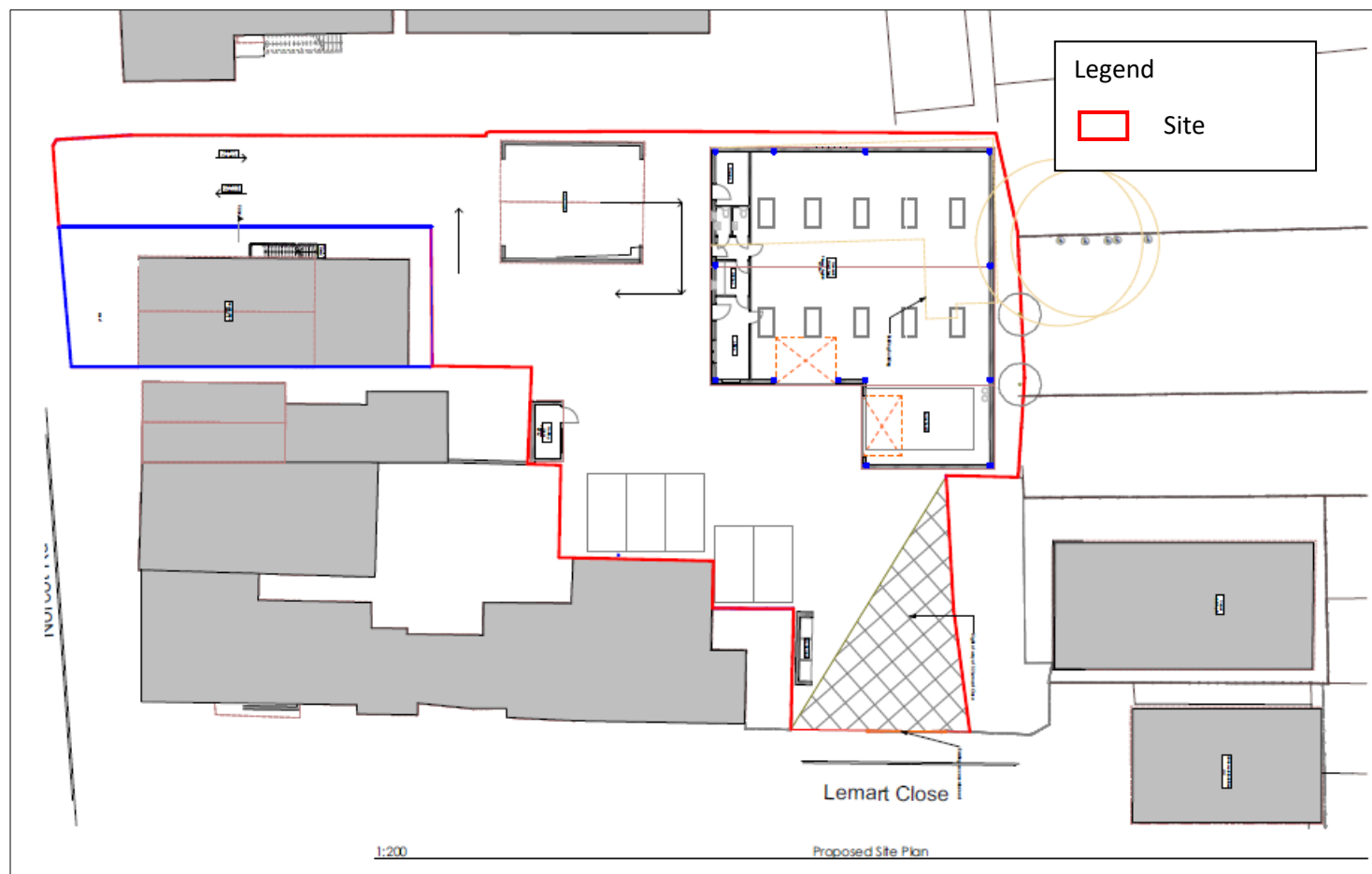


FIGURE A3: PROPOSED HERCULES 6000 SERIES SPRAYBOOTH

		Source Odour Potential		
		Small	Medium	Large
Pathway Effectiveness	Highly effective pathway	Low Risk	Medium Risk	High Risk
	Moderately effective pathway	Negligible Risk	Low Risk	Medium Risk
	Ineffective pathway	Negligible Risk	Negligible Risk	Low Risk

FIGURE A4: IAQM'S RISK OF ODOUR EXPOSURE (IMPACT) AT THE SPECIFIC RECEPTOR LOCATION

Risk of Odour Exposure	Receptor Sensitivity		
	Low	Medium	High
High Risk of Odour Exposure	Slight Adverse Effect	Moderate Adverse Effect	Substantial Adverse Effect
Medium Risk of Odour Exposure	Negligible Effect	Slight Adverse Effect	Moderate Adverse Effect
Low Risk of Odour Exposure	Negligible Effect	Negligible Effect	Slight Adverse Effect
Negligible Risk of Odour Exposure	Negligible Effect	Negligible Effect	Negligible Effect

FIGURE A5: IAQM'S LIKELY MAGNITUDE OF ODOUR EFFECT AT THE SPECIFIC RECEPTOR LOCATION

Receptor details and location	Source Odour Potential	Pathway (Transport Effectiveness)	Odour Exposure	Receptor Sensitivity	Likely Odour Effect
54 Church Street (Residential, 500 m upwind)	Medium	Ineffective Pathway	Negligible Risk	High Sensitivity	Negligible Effect
4 High Street (Residential, 300 m upwind)	Medium	Moderately Effective Pathway	Low Risk	High Sensitivity	Slight Adverse Effect
The Villas (Residential, 500m downwind)	Medium	Moderately Effective Pathway	Low Risk	High Sensitivity	Slight Adverse Effect
The Crescent (Residential, 250m downwind)	Medium	Moderately Effective Pathway	Low Risk	High Sensitivity	Slight Adverse Effect

FIGURE A6: IAQM'S EXAMPLE SUMMARY OF THE LIKELY ODOUR EFFECTS AT EXISTING SENSITIVE RECEPTORS

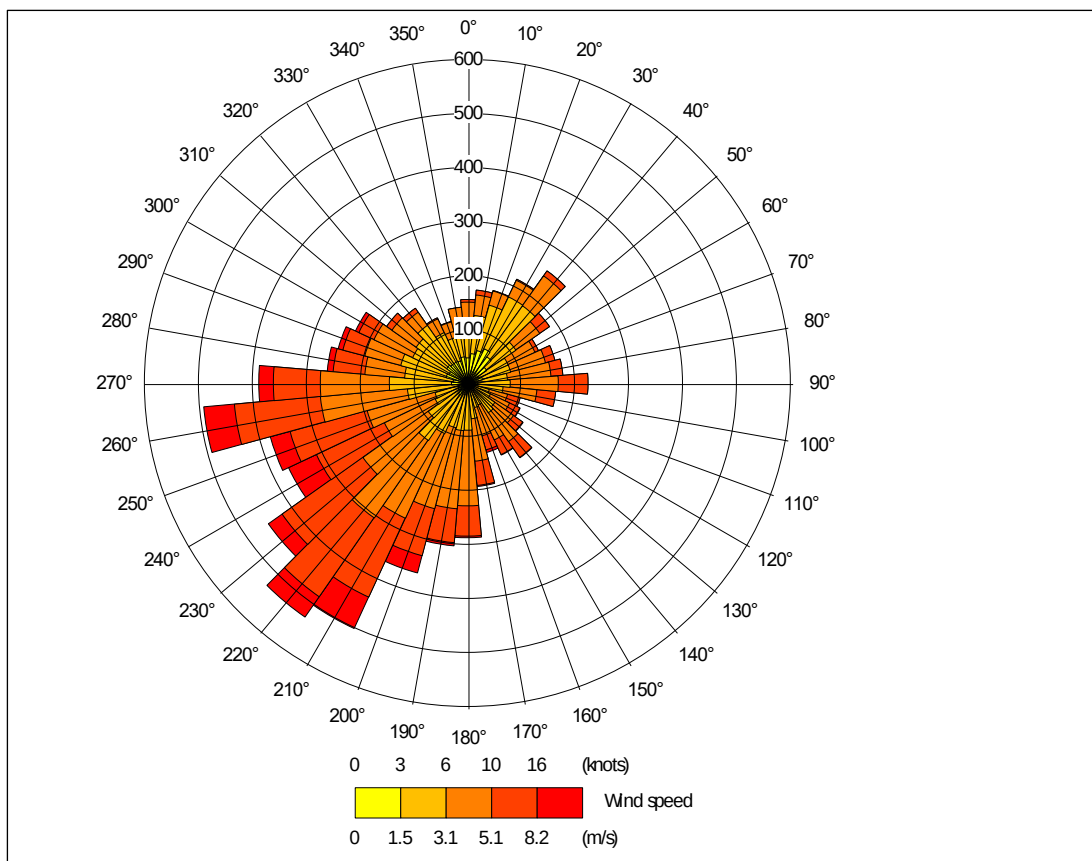


FIGURE A7: WINDROSE CHART HEATHROW 2019