

TONY CASTLE

**LAND AT NORWAY
LANE, ARUN
DISTRICT COUNCIL**

**AIR QUALITY
ASSESSMENT**

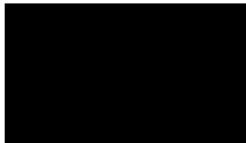
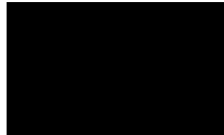
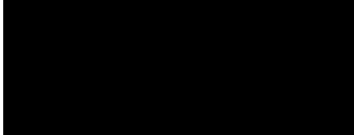
OCTOBER 2018

FINAL REPORT

2270W-SEC-00002-01

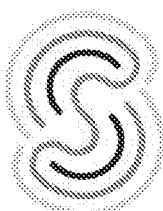
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FINAL REPORT**

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REVIEW AND AUTHORISATION			
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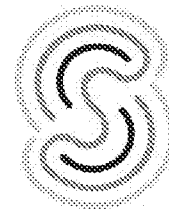


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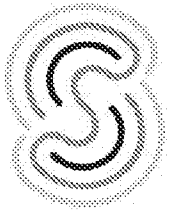
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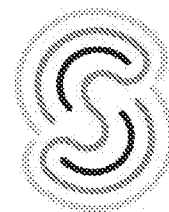
1. INTRODUCTION

1.1 Background

- 1.1.1 Southdowns Environmental Consultants Ltd (Southdowns) was commissioned by Tony Castle in October 2018 to produce an air quality assessment for a proposed development on land at Norway Lane, within the boundary of Arun District Council (ADC).
- 1.1.2 This assessment has been prepared to accompany a planning application for the introduction of two dwellings consisting of one mobile home and one touring caravan with associated amenity and care facilities.
- 1.1.3 This document has been prepared in accordance with the principles and requirements of the Institute of Air Quality Management and Environmental Protection UK's guidance, '*Land-use Planning & Development Control: Planning for Air Quality*' [1].

1.2 Report Structure

- 1.2.1 Details of the site and the proposed scheme are described in the following section of this report. Relevant air quality policy and guidance are outlined in Section 3 and the assessment methodology is detailed in Section 4. The existing baseline conditions are presented in Section 5, site suitability and mitigation measures discussed in Section 6 and the assessment is summarised in Section 7.



2. SITE DETAILS

2.1 Site Description

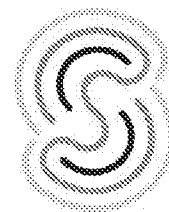
- 2.1.1 The development site is located on Norway Lane, in the Arun District (AD). To the south west the site is bounded by New Road (A259) and to the north east the site is bounded by Rustington golf course. The site lies 200m north east of a built-up housing estate. The site is separated from the roadway by mature trees and a wide embankment totalling approximately 12m in width.
- 2.1.2 There are shrubs and mature trees located on the north east and south site boundaries, separating the site from the roadway. A wide embankment totalling approximately 12m in width lies between the A259 and the site and a 1.5m wooden fence lies to the west of site concealing the entrance. In addition, grassland lies to the north west of site.
- 2.1.3 The land comprises an area of approximately 750 m² which is currently concreted land seeking to gain residential planning permission.

2.2 Project Description

- 2.2.1 The project will involve the introduction of two dwellings consisting of one mobile home and one touring caravan with associated amenity and care facilities. The land will not involve major demolition or construction works.
- 2.2.2 The earliest year of operation for the purpose of this assessment is 2018.

2.3 Sensitive Receptors

- 2.3.1 Sensitive receptors are locations where people or wildlife may be adversely affected by changes in air quality or dust soiling. High-sensitivity receptors can include residential receptors, medium-sensitivity receptors can include workplaces and low-sensitivity receptors can include amenity areas, such as parks.
- 2.3.2 A plan showing the proposed site layout and site location plan is presented in Figures A1 and A2, respectively, of Appendix A. The introduced receptors are residential.



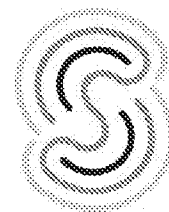
3. AIR QUALITY POLICY, GUIDANCE AND CRITERIA

3.1 Air Quality, Dust and Emissions

- 3.1.1 The pollutants of concern for the proposed development are nitrogen dioxide (NO₂) and particulate matter (PM).
- 3.1.2 NO₂ is produced through the combustion of fossil fuels, used for transport and energy requirements. Emissions of oxides of nitrogen (NO_x) from exhausts comprise nitric oxide (NO) and NO₂. NO undergoes oxidation in the atmosphere to form NO₂. High concentrations of NO₂ can cause lung inflammation, shortness of breath and coughing, and cause reduced immunity to lung infections like bronchitis.
- 3.1.3 PM can result directly from emissions from local sources (primary) or further afield, often having originated as other pollutants and reformed in the atmosphere (secondary). Primary sources are of most relevance to this assessment and can include emissions from combustion processes, commonly in vehicles, and dust from construction activities. Exposure to high concentrations of PM₁₀ and PM_{2.5} can cause respiratory and cardiovascular illness and even death. PM₁₀ is defined as a mass fraction of airborne particulates with an aerodynamic diameter of 10 microns (µm) or less. PM_{2.5} is defined as a mass fraction of airborne particulates with an aerodynamic diameter of 2.5 microns or less. PM₁₀ and PM_{2.5} are respirable and can be drawn deep into the lungs and cause health problems. The fraction of dust that is larger than 10 µm is filtered by the nose and throat.

3.2 EU & National Air Quality Policy and Guidance

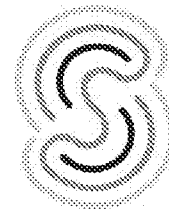
- 3.2.1 The EU Air Quality Directive (Directive 2008/50/EC) [2] came into force in June 2008, and was transposed into legislation in England, Wales, Scotland and Northern Ireland in the Air Quality Standards Regulations 2010 [3]. The Directive introduced legally-binding targets for national governments to reduce air pollution to levels at which no or minimal effects on human health are likely to occur. The obligation to meet the requirements of the Directive falls primarily upon the Secretary of State for the Environment in England, and appropriate Ministers in the Devolved Administrations, who are designated as the appropriate “competent authority”.
- 3.2.2 The Air Quality (England) Regulations 2000 [4], as amended by the Air Quality (England) (Amendment) Regulations 2002 [5], define air quality ‘objectives’ for a number of key pollutants. The air quality objectives are set at a range of different levels and averaging times for different pollutants.
- 3.2.3 The NO₂ and PM objectives are summarised in Table 3.1 overleaf.
- 3.2.4 The annual mean (long-term) objective limit applies at locations where individuals might be expected to spend a large majority of their time, for example residential properties. In the case of the hourly mean (short-term), this applies at locations where people might reasonably be expected to spend at least an hour (such as outdoor spaces and leisure areas).



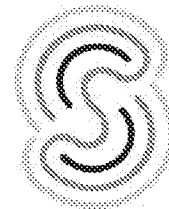
Pollutant	Air Quality Objective		Date to be Achieved By
NO ₂	40 µg/m ³	Annual mean	31 December 2005
	200 µg/m ³ not to be exceeded more than 18 hours in a year	Hourly mean	31 December 2005
PM ₁₀	50 µg/m ³ not to be exceeded more than 35 times a year	24-hour mean	31 December 2004
	40 µg/m ³	Annual mean	31 December 2004
PM _{2.5}	25 µg/m ³	Annual mean	2020 (but not in UKAQS)
	15% reduction urban background	Annual mean	2010-2020

TABLE 3.1: SUMMARY OF UK AIR QUALITY OBJECTIVES FOR NO₂, PM₁₀ AND PM_{2.5} FOR PROTECTION OF HUMAN HEALTH

- 3.2.5 The Environment Act 1995 [6] introduced the requirement for local authority management of air quality. Part IV of the Act details the duties of local authorities in carrying out their local air quality management (LAQM) responsibilities. The duties include the requirement for review and assessment of air quality and production of regular Updating and Screening Assessments (USA) and Progress Reports.
- 3.2.6 The Act also requires the preparation of a national air quality strategy, setting health-based air quality objectives for specified pollutants. These requirements led to the development of the UK Air Quality Strategy, which was adopted in 1997 and revised in 2000, 2003 and the current revision issued in 2007 [7].
- 3.2.7 The current Air Quality Strategy (AQS) updated previous versions of the strategy to set out new objectives for local authorities undertaking their local air quality management duties. It also introduced a national policy framework for exposure reduction to fine particulates. The objectives in the current UK AQS are in some cases more onerous than those in the EU Directive and Air Quality Standards Regulations 2010 and the Strategy also contains further objectives for a wider range of pollutants.
- 3.2.8 The Environmental Protection Act 1990 (EPA) [8] deals with statutory nuisance. Nuisance caused by dust is regulated by the statutory nuisance provisions under Part III and is defined in s.79(1)(d) as: “*Any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance*”.
- 3.2.9 Statutory nuisance is not intended to secure a high level of amenity but rather to act as a basic safeguard that is intended to deal with excessive emissions. The perpetrator of the alleged nuisance has a defence of best practicable means (BPM) which provides a basis for balancing the interests of the site and residents.
- 3.2.10 There are no UK standards or statutory guidance relating to deposited dust and nuisance, although a deposition rate of 200 mg/m²/day is often used as a threshold for potentially significant nuisance effects.



- 3.2.11 The Clean Air Act 1993 (CAA) [9] updates previous versions of the CAA and details the legislative requirements for the heights of chimneys and flues where the burn rates exceed certain criteria, for appliances fuelled by gaseous matter this is 366.4kW.
- 3.2.12 The National Planning Policy Framework (NPPF) was first published in 2012 and subsequently updated in July 2018 [10]. Paragraph 181 states: *"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."*
- 3.2.13 The roles of the planning authority and pollution control authorities are defined in paragraph 183: *"The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."*
- 3.2.14 The National Planning Practice Guidance (NPPG) [11] provides guiding principles on how planning can take into account of the impact of new development on air quality. The guidance states that air quality assessments should take into account the following:
- a description of baseline conditions and how these could change;
 - relevant air quality concerns;
 - the assessment methods to be adopted and any requirements around verification of modelling air quality;
 - sensitive locations;
 - the basis for assessing impact and determining the significance of an impact;
 - construction phase impact; and/or
 - acceptable mitigation measures.
- 3.2.15 The guidance provides a flow chart detailing the process that should be followed in determining an application. An application should proceed to decision with appropriate planning conditions or obligations if the proposed development, with mitigation in place, would not lead to an unacceptable risk from air pollution, prevent sustained compliance with EU limit values or fail to comply with the requirements of the Habitats Regulations [12].



3.3 Local Air Quality Policy and Guidance

- 3.3.1 Air Quality Management Areas (AQMA) are designated by local authorities when reviews of air quality identify that levels of pollutants are too high and are not forecast to meet the targets required by the UK Air Quality Strategy. There are currently no AQMAs within Arun.
- 3.3.2 Arun District Council (ADC) adopted the Arun Local Plan (ALC) [13] on 18th July 2018, and covers the period 2011 – 2031, setting out policies that support the delivery of appropriate development in the District. Strategic policies relating to air quality are:

Policy QE DM3 – Air Pollution

“All major development proposals will be required to assess the likely impacts of the development on air quality and mitigate any negative impacts by:

- a. Ensuring the development is located within easy reach of established public transport services;*
- b. Maximising provision for cycling and pedestrian facilities;*
- c. Encouraging the use of cleaner transport fuels on site, through the inclusion of electric car charging points; and*
- d. Contributing towards the improvement of the highway network where the development is predicted to result in increased congestion on the highway network.*

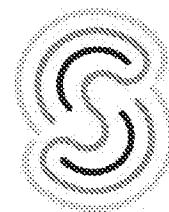
Development proposed nearby any Air Quality Management Area (AQMA) declared within the District within the Plan period, will require an air quality assessment to identify likely impacts of development upon the designated area. Developers will be required to ensure delivery of the actions set out within any Air Quality Action Plan.

Industrial development which is regulated by environmental permits (that creates or results in dust, smell, fumes, smoke, heat, radiation, gases, steam or other forms of pollution) must be located in such a position which ensures that the health, safety and amenity of users of the site or surrounding land is not put at risk and the quality of the environment would not be damaged or put at risk.

Developments shall also be consistent with all other Local Plan policies.”

3.4 Non-Statutory Guidance

- 3.4.1 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have produced a document entitled: *Land-Use Planning & Development Control: Planning for Air Quality* [1] that provides guidance on how to ensure that air quality is properly accounted for in the development control process. This guidance provides advice on describing air quality impacts and assessing their significance.
- 3.4.2 This document advises: *“...arriving at a decision about a specific proposed development the local planning authority is required to achieve a balance between economic, social and environmental considerations.”* The document also provides descriptors for magnitude of change, receptor sensitivity and the process for assessment of significance. This guidance is for developers, in the production of air quality assessments, and for reviewers.



4. ASSESSMENT METHODOLOGY

4.1 Assessment Procedure

4.1.1 This air quality assessment has been undertaken as follows:

- i. consultation with Arun District Council to agree the methodology and data to be used in this assessment;
- ii. review of ADC's 2017 Annual Status Report [14] and Defra's background maps [15];
- iii. an initial screening assessment;
- iv. consideration of whether new receptors will be introduced in areas with NO₂ and PM₁₀ concentrations; and
- v. recommendations on how the proposed development could be improved to reduce emissions and air quality impacts on introduced receptors.

4.1.2 The assessment follows the procedure as defined in the EPUK guidance, using published information in the public domain.

4.2 Screening Criteria

4.2.1 The EPUK guidance provides criteria for establishing whether a development will require an air quality assessment. The criteria are set out in a two-stage approach, with initial simple screening criteria:

4.2.2 In order to meet the criteria in Stage 1, the development must have:

- 10 or more residential units or a site area of more than 0.5 ha; and
- more than 1,000 m² of floor space for all other uses or a site area greater than 1 ha

4.2.3 Combined with any of the following:

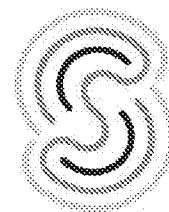
- more than 10 parking spaces within the development; and
- a centralised energy facility or combustion process.

4.2.4 The development site area is less than 1 ha, therefore the development does not meet the initial criterion.

4.2.5 The proposed development has fewer than 10 proposed parking spaces and, as such, does not meet the EPUK screening criteria for operational assessment. No further assessment has been undertaken and any air quality impacts arising from the proposed development will be negligible.

4.3 Construction Dust

4.3.1 Construction and demolition activities are not anticipated as part of the proposed development. Therefore, no assessment of construction and demolition has been undertaken.



5. BASELINE CONDITIONS

5.1 Local Air Quality

- 5.1.1 The site is within the administrative boundary of Arun District Council (ADC). The proposed development site is not located within an Air Quality Management Area (AQMA) as a result of the district's good air quality.
- 5.1.2 ADC conducts air quality monitoring at various locations within and around the district as part of its local air quality management (LAQM) duties. The 2017 Annual Status Report details the most recent air quality information published by ADC.
- 5.1.3 The report shows that the majority of monitoring locations within the district have shown no clear trend upwards or downwards in NO₂ concentrations between 2013 and 2017, but show continued low levels of NO₂ concentrations between 2013 and 2017, meeting the national air quality objectives (AQO) in all reported years. All other air quality objectives have been met in recent years.

5.2 Monitoring

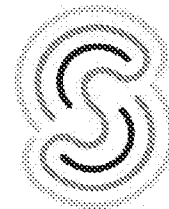
- 5.2.1 ADC conducts NO₂ monitoring using passive diffusion tubes. The nearest roadside diffusion tube monitoring station is located to the west of The Body Shop Roundabout, on the A259, to the southwest of the development site. The diffusion tube monitoring station is situated 2m from the kerb, whereas the development site is located approximately 12 m from the A259. It should be noted that the development site location is situated on a dual carriageway with little residential development nearby, whereas directly opposite the diffusion tube station, the road opens out into 4 lanes to allow for two junctions leading off the A259 on either side of the road. This may result in idling vehicles, potentially resulting in higher NO₂ concentrations at the diffusion tube station. Additionally, it is noted that the development site location benefits from a natural vegetation barrier between the A259 and the receptor, which the diffusion tube station does not have. The above factors indicate that the concentrations at the diffusion tube station are likely to be higher than the development site. Furthermore, monitoring data between 2013 and 2017 presented in Table 5.1 show this site achieved the AQO in all reported years. ADC does not currently conduct continuous monitoring of NO_x, NO₂ and PM₁₀.
- 5.2.2 Defra's local authority guidance TG(16) [16] states that when the annual mean NO₂ concentration at diffusion tube locations is less than 60 µg m⁻³, the short term (one-hour) AQO for NO₂ is unlikely to be exceeded. In recent years, the annual mean concentrations have been well below 60 µg m⁻³ at the diffusion tube site.

Description	X, Y	Distance from site	Type	2013	2014	2015	2016	2017	AQO
(Litt02) A259 Toddington	503439, 103364	1.6km	Roadside	28	20	25.8	24.4	25.3	40

TABLE 5.1: DIFFUSION TUBE MONITORING ANNUAL MEAN NO₂ CONCENTRATIONS (µg m⁻³)

5.3 Defra Background Maps

- 5.3.1 Predicted background pollutant concentrations are available from the Defra website for 1 km² grid squares across the UK. Concentrations of NO₂, NO_x PM₁₀ have been extracted



for the grid square centred on 504500, 103500, which overlays the site, and summarised in Table 5.22.

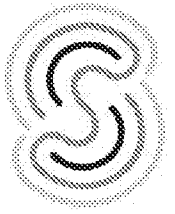
- 5.3.2 Modelled predictions of mean annual background concentrations are within the AQOs for NO_x , NO_2 and PM_{10} for all reported years, showing a slight gradual decrease for each pollutant.

Pollutant	Predicted Annual Mean Concentration at the Development Site		
	2015	2018	2020
NO_2	10.6	9.8	9.1
NO_x	14.2	13.0	11.9
PM_{10}	13.9	13.7	13.5

TABLE 5.2: PREDICTED BACKGROUND POLLUTANT CONCENTRATIONS ($\mu\text{g m}^{-3}$)

5.4 Summary of Baseline Conditions

- 5.4.1 The comparative locations of the diffusion tube monitoring location and site location indicates that the concentrations at the diffusion tube station are likely to be higher than the development site. ADC does not undertake continuous monitoring within its area.
- 5.4.2 The annual NO_2 concentration recorded at a representative passive diffusion tube roadside monitoring location indicates that the concentration at the development site is likely to fall well within the AQO.
- 5.4.3 Predicted annual mean NO_2 concentrations which overlay the development site, as shown in Table 5.2, are likely to be well within $60 \mu\text{g m}^{-3}$ and so the hourly mean NO_2 objective is unlikely to be exceeded and is not considered further in this assessment. Predicted annual mean PM_{10} concentrations are also expected to be well within the AQOs at the development site, since background PM_{10} levels are low.



6. SITE SUITABILITY AND MITIGATION

6.1 Introduced Receptors

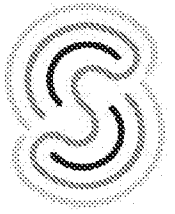
6.1.1 The review of baseline conditions has identified that NO₂ and PM₁₀ concentrations at the site are likely to be well with AQOs. Receptors introduced by the proposed development will not, therefore, be exposed to pollutions levels that exceed AQOs. The site is suitable for use in terms of air quality and air quality is not a constraint to development.

6.2 Mitigation

6.2.1 No mitigation is required in respect of negligible operational impacts.

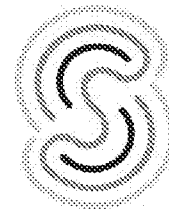
6.2.2 No mitigation is required for receptors introduced as a result of proposals. However, the following could be considered in order to reduce exposure further:

- careful placement of air inlet and outlet locations, on the side away from the road;
- positioning of mobile homes with as great a distance from the road as reasonably practicable;
- orientation of the mobile homes to ensure that windows and doors are pointing away from the road-side as far as reasonably practicable; and
- creation of further barriers between the road and the site, i.e. use of natural barriers in the form of trees and shrubs and / or man-made barriers such as fences or living walls.



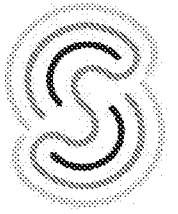
7. CONCLUSIONS

- 7.1.1 The results of the assessment indicate that baseline air quality conditions at nearby existing receptors are well within the annual mean NO₂ national objective of 40 µgm⁻³. The objectives for one-hour NO₂, annual mean PM₁₀ and daily PM₁₀ are also likely to be met at the site.
- 7.1.2 Ambient concentrations of NO₂ and PM₁₀ are predicted to decrease in future years.
- 7.1.3 The site does not fall within, near or adjacent to any Air Quality Management Area (AQMA).
- 7.1.4 Introduced receptors will not be exposed to pollution levels that exceed AQOs. Air quality is not a constraint to development and no mitigation of air quality is necessary.



8. REFERENCES

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APPENDIX A: FIGURES

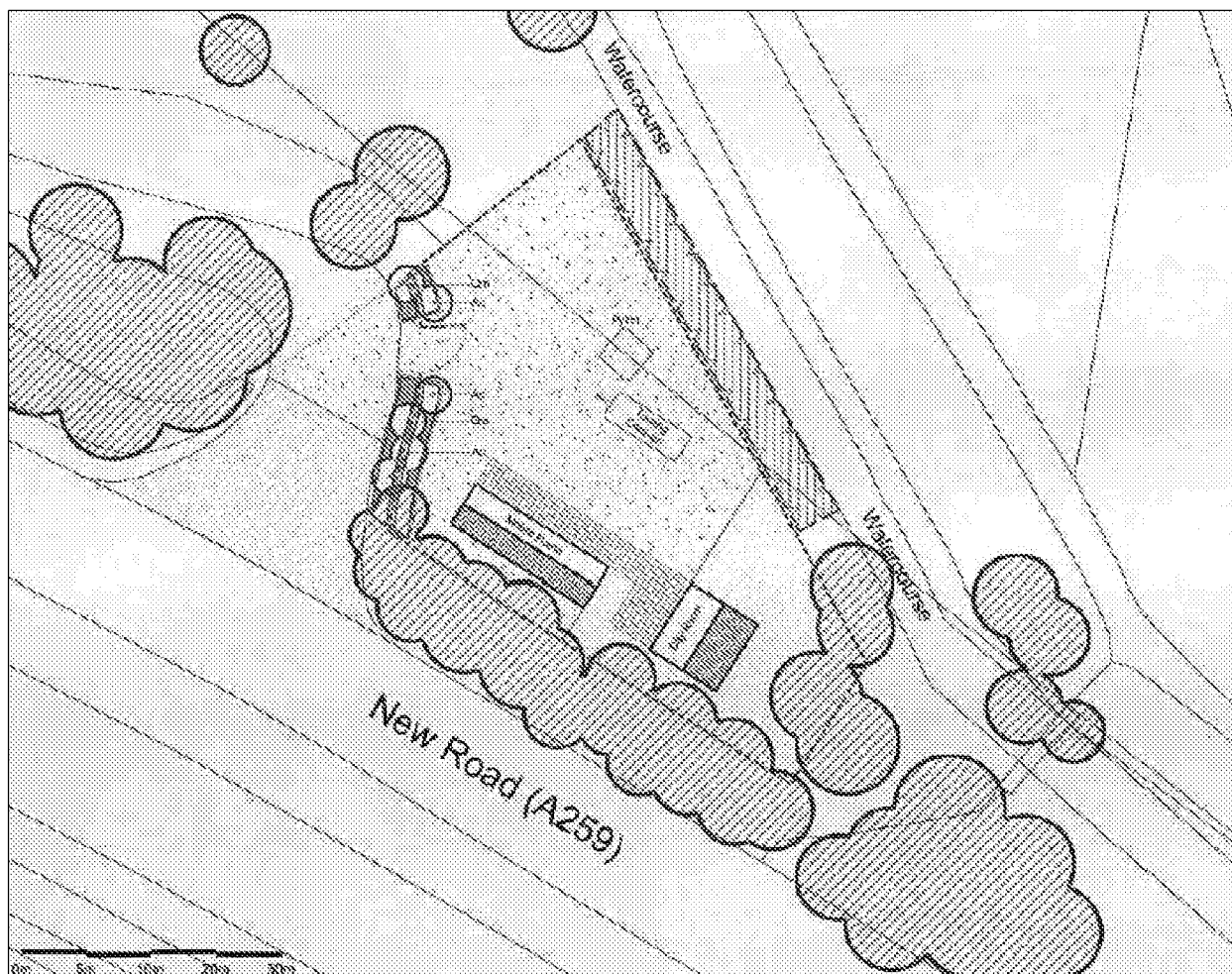
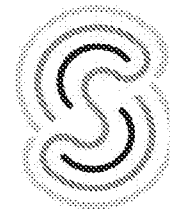


FIGURE A1: PROPOSED SITE LAYOUT

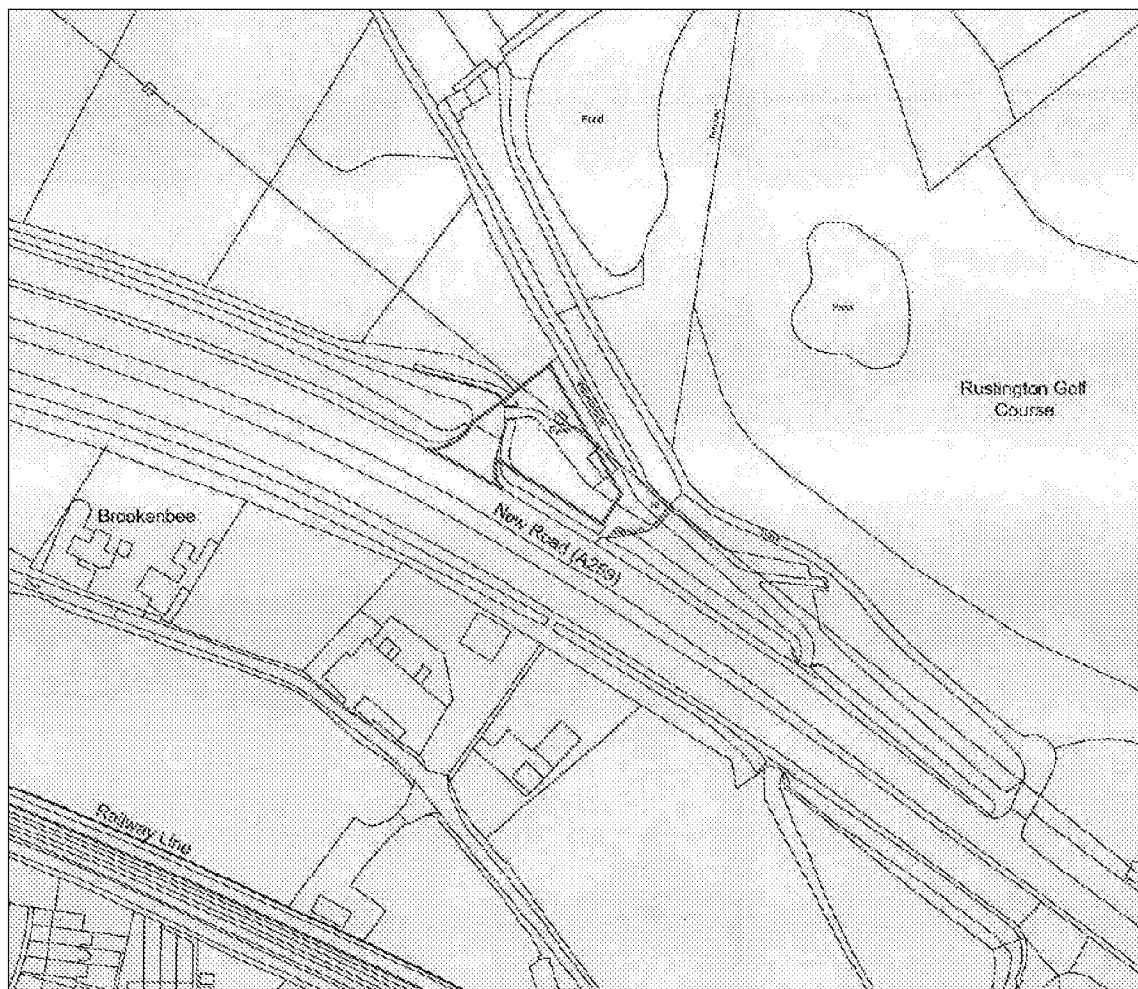
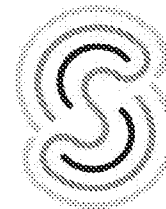


FIGURE A2: SITE LOCATION PLAN