DEMOLITION METHOD STATEMENT

Existing Steel Structures
Alpha Park
Chandlers Ford

April 2015

Contents

1. Introduction 3
   1.1 Existing Site Description 3
   1.2 Proposed Outline Methodology 4
      a) Arrangements prior to Commencement of Works
      b) Enabling Works prior to Demolition
      c) Pre-structural demolition works
      d) Structural Demolition Works
      e) Site Plan
      f) Impact Assessment and Proposed Controls
      g) Specific Health and Safety Procedures
      h) Site Management Chart 6

2. Arrangements prior to Commencement of Works 7
3. Enabling Works prior to Demolition 8
4. Structural Demolition Works 11
5. Site Plan 13
6. Impact Assessment and Proposed Controls 14
7. Specific Health and Safety Procedures 20
   Site Inductions
   Site Working Hours
   Signage
   Hazardous Materials
   Leptospirosis
   Hot Works
   Traffic Management
   COSHH Assessment Library
   Risk Assessment Library

Appendices

Appendix 1
Noise Assessment – Demolition Phase

Appendix 2
Air Quality Assessment – Demolition Phase

1.0 Introduction

This method statement has been prepared by Bower Contracting Limited (BCL) for the demolition of existing steel structures at Alpha Park, Chandlers Ford.

Bower contracting will act in the role of **Principal Contractor** for the demolition works.

Pre-demolition preparation works (i.e. soft stripping and where applicable asbestos removal) will be completed in accordance with separate method statements

Preparation for structural demolition will commence from Q2 (2nd Quarter) 2015

1.1 Existing Site Description

Buildings

The structures consist of steel frame work with block and brick infill to the side walls.

The roofs are made up of steel corrugated panels covering rock wool insulation.

The buildings are situated in an enclosed area with entrance from School Lane.

1.2 Proposed outline methodology

The methods proposed to carry out the demolition and related works are to ensure the health and safety of the public as well as the workforce, and to minimise the effect on the environment in terms of noise, vibration and dust. These methods are described in detail in the following sections and are outlined below:

a) Arrangements prior to commencement of works – (Section 2)

Third party considerations as listed in Section 2 will include:

- Arrangements to be made with Eastleigh Borough Council
- Notification to statutory utility companies
- Notifications to Police and Fire Brigade

Other pre-start arrangements will include:

- Carry out pre-start noise and dust surveys
- Employment of specialist consultants

b) Enabling works prior to demolition (Section 3)

- Establish site offices and welfare complex
- Establish noise and dust monitoring stations

c) Pre-structural demolition works

- Terminate existing services terminated prior to commencement of works
- Access and egress to the site is proposed via southern perimeter road

d) Structural demolition works (Section 4)

- Selection of equipment to minimise noise and vibration
- Description of demolition methodology
- Material separation, crushing and stockpiling on site for future use to significantly reduce vehicle movements

e) Site Plan (Section 5)

- A site location plan is shown in section 5. Further details regarding occupancy of adjacent buildings are required to determine locations of hoarding, location of welfare facilities, access and egress points and locations for monitoring noise and dust.

f) Impact assessment and proposed controls (section 6)

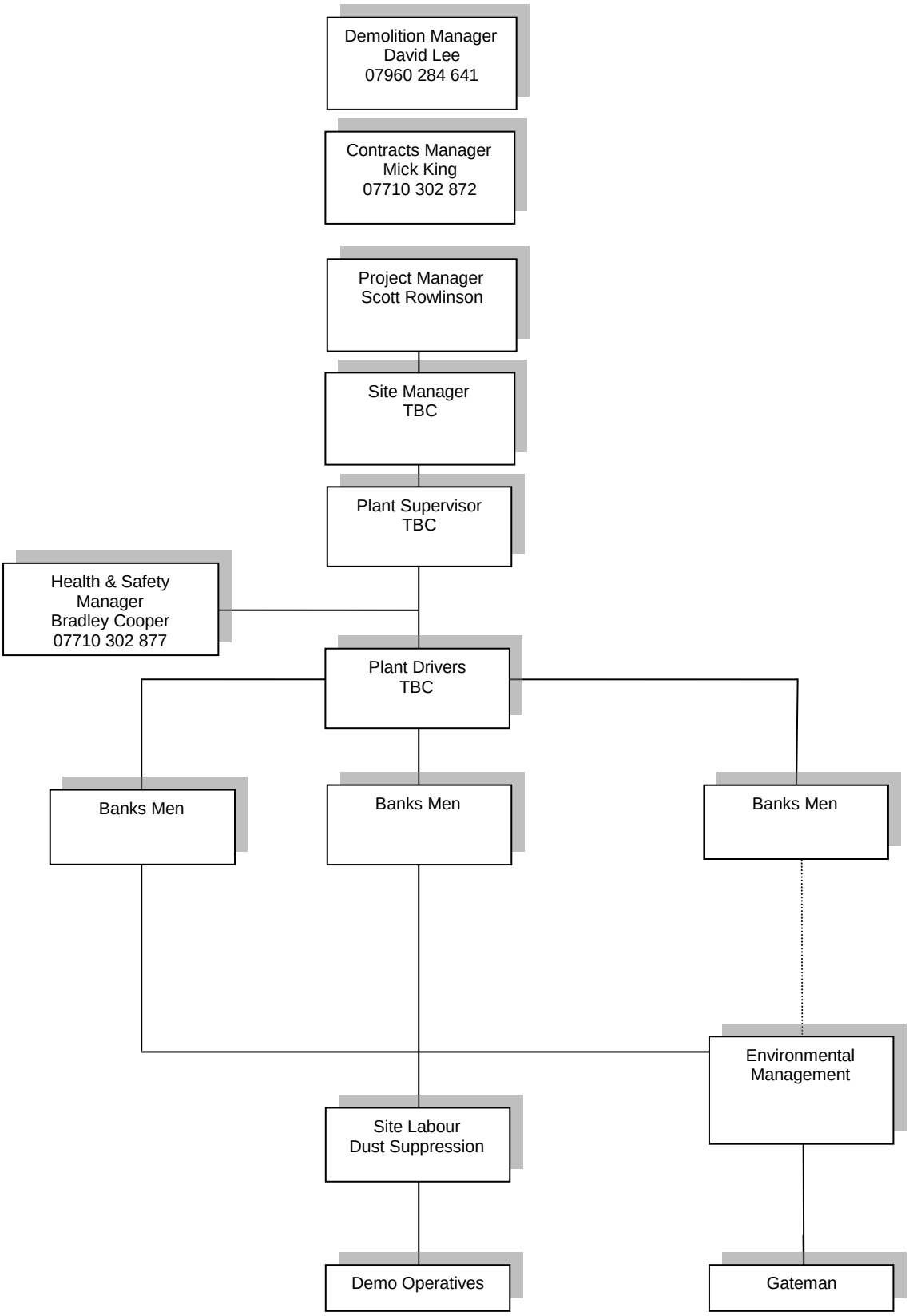
- This section will highlight items and actions that will be taken to reduce the impact of the demolition process

g) Specific Health & Safety procedures (Section 7)

Specific H&S procedures associated with demolition works include:

- Site inductions
- Signage
- Hazardous materials – removal and disposal
- Hot works
- Traffic management (banksman)
- COSSH assessment library
- Risk assessment library
- Leptospirosis

1.2(h) - SITE MANAGEMENT CHART



2.0 Arrangement prior to Commencement of Works

Prior to commencing on site, the following arrangements will have been made by Bower Contracting Limited (BCL) and the CDM Coordinator:

- Notification to the statutory utilities regarding the location and termination of supplies into the site and provision of the necessary temporary supplies.
- Notification to local council - Section 80 of the Building Act 1984 regarding the commencement of demolition works.
- HSE notification - F10 form under C.D.M 2007 requirements.
- Notification to local Police and Fire Brigade.
- Complete structural survey of all blocks.
- Deconstruction sequence and methodology agreed.

Prior to commencing on site, the following arrangements will have been made by BCL:

- Employ licensed asbestos removal contractor to instigate submission of form ASB5 to the HSE and obtain site registration number from the Environment Agency

All necessary awards, party wall / boundary agreements and permissions will be arranged and in place before commencing works on site.

Bower contracting will liaise closely with the Client and arrange meetings to highlight work techniques; noise and dust – implications / control; progress and upcoming activities.

The condition of the existing entrance roadway, street furniture, fences and boundary walls etc. will be agreed and confirmed.

3.0 Enabling Works prior to Demolition

- Welfare
  Oasis unit and portable toilet units will be established in the site compound.

- Establish noise and dust monitoring.

  Noise and dust levels will be monitored throughout the works in accordance with local authority noise and dust protocols.

  To assist the reduction of noise levels generated at site level the following precautions will be put in place.

  - All vehicles, plant and machinery will be fitted with exhaust mufflers and well maintained throughout the project.
  - Daily greasing to mitigate any noise from stiff plant joints.
  - Compressors – generators will be super silenced with lined sealed acoustic covers that will be kept closed when in use.
  - Demolition will be undertaken with the use of acoustic reducing methods such as the use of pulverisers to reduce the building concrete to small manageable size pieces that fall directly to the floor below the working floor.
  - Any machines not in use will be switched off and isolated.
  - As far as reasonably practicable plant and equipment will be placed as far away from the site boundary and any noise sensitive buildings.
  - Access to site will be via School Lane which will minimise any effect on local traffic.
  - Care will be taken when loading and unloading vehicles on site with careful instruction from banksman.
  - No works for plant maintenance will be carried out unless absolutely necessary.

  In the unlikely event of any of the trigger levels being breached during demolition, the work will cease and the methods reviewed. These could include wherever possible:

  - The use of barriers to deflect the sound;
  - Acoustic enclosures; and
  - Stop works until change of weather conditions (wind direction)

  Noise readings will be taken at four boundary locations daily, recorded and kept in the site file.

  Trigger levels will be added to this document once baselines have been recorded.

- Establish demolition sequence.

  At the earliest opportunity the integrity of the various floor structures will be ascertained to determine the demolition sequence.

The demolition sequence will be detailed and the 360° excavator operators / banksmen inducted.

3.0 Enabling Works prior to Demolition

- Services

  Existing services no longer needed on site will be terminated by Bericote Properties prior to commencement of demolition works.

  One of the main risks during demolition and dismantling is penetrating live services. All precautions will be taken to prevent any such occurrences.

  Temporary supplies (water) will be provided for the demolition works for dust suppression needs.

  Vigilance will be maintained during the works to ensure that, should further services be discovered not previously recorded, damage is not caused to person or property.

  All service duct covers in the site boundary will be protected with steel plates to prevent damage. All drainage will be concrete plugged to prevent debris from entering.

4.0 Structural Demolition Works

During the course of the demolition works the safety and welfare of the general public, neighbours and site operatives is paramount. Every effort will be made to ensure disruption is minimised.

4.1 Shrubs

During the internal hot works of the building a 16 tonne 360□ excavator will clear all shrubs and self-set tree saplings established around the site perimeter and building exterior.

Using a ditching bucket the 16 tonne 360□ excavator will scrape the shrubs and tree saplings at ground level (only) around the site and place into stock pile, when all areas of shrubs and tree saplings have been removed and gathered into stockpile the 16 tonne 360□ excavator will load out to a designated skip for recycling. A banksman will attend to the 16 tonne 360□ excavator at all times who will assist with any areas that are too close to perimeter walls for the machine to safely remove.

4.2 Buildings

The buildings will be demolished using a 360□ excavator with shear attachment.

Starting at the west gable end of the first building the 360□ excavator will prise a hole at the top of the west end of the site. The gable end tin sheets will then be peeled off to reveal the steel frame work behind. The 360□ excavator will then cut the left steel truss at the bottom parallel with the side walls of the buildings, this process will then be repeated on the right side of the steel truss. The gable end truss will now be left in position by the top ridge steel and the steel purlins.

The 360□ excavator will the push the roof section in a downward motion the top ridge steel and the purlins will bend at the next truss but keep in position to the stable steel truss. The 360□ excavator will then peel the roof sheets away and clear any insulation lagging then cut the top ridge steel and the purlins this will allow the steel truss to fall into the foot print of the building to be removed and sheared into 5ft sections for loading away into 40 yard skip.

This process will continue in the same manor for the next steel truss, the 360□ excavator will then be positioned inside the building where the side brick walls can be easily accessed and pulled into the building foot print. The side columns will be sheared to above the brick wall height and left in position to be removed at a later time by the top burner.

This process will continue through the buildings to the last structural bay where the 360□ excavator will bend the second to last steel truss downward leaving it in position then cutting the bottom of the gable end truss. The right side will be cut in the same manor before the 360□ excavator folds the gable end truss in to the building foot print.

The remaining side walls and back gable end will have the brick work and steel columns demolished in the same process as previously mentioned.

The 360□ excavator will clear all steel work and brick as the work is in process leaving a clean slab. The steel stump columns that have been left will have the

holding bolts cut flush with the concrete floor slab and once free will be picked up by the 360□ excavator and placed into a 40 yard skip designated for steel recycling.

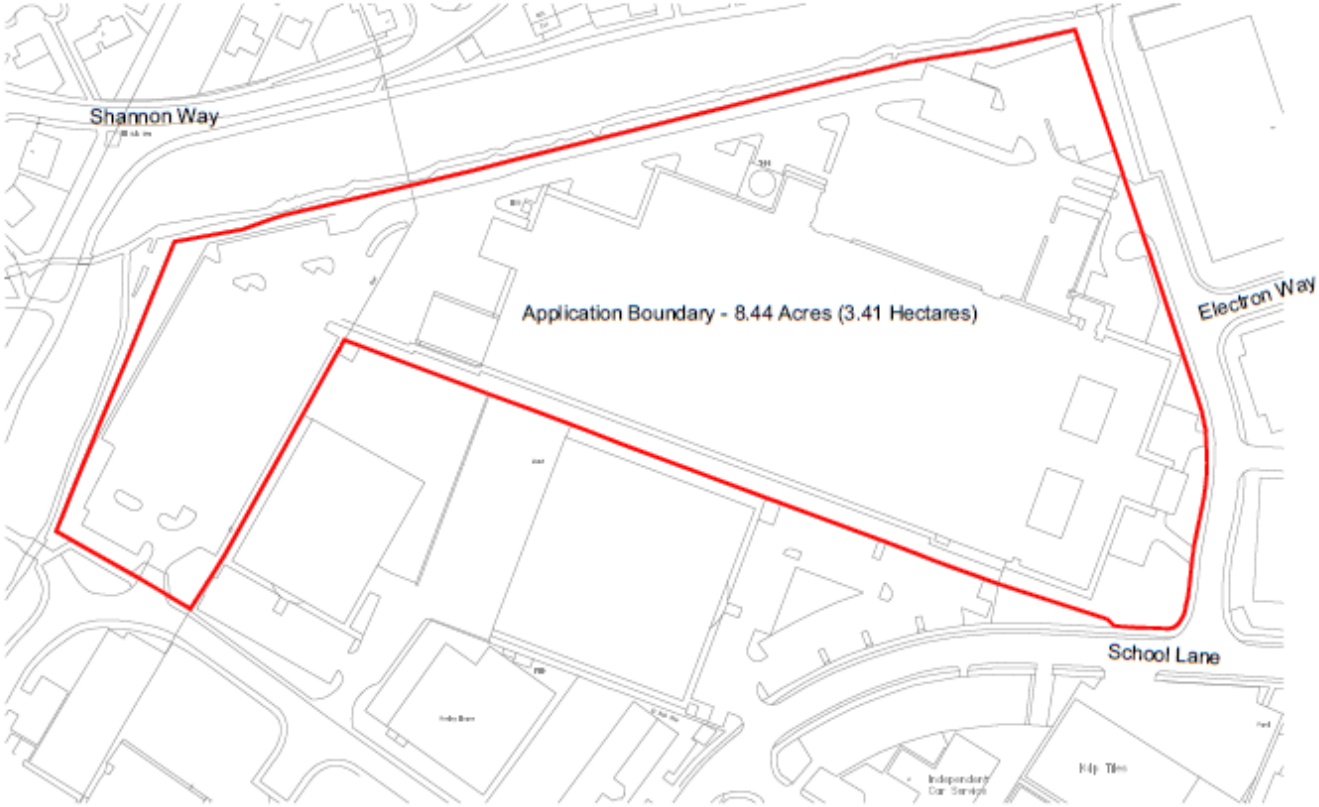
4.3 Hardstanding

With the slab clear of demolition arisings a 210, 360 degree excavator with hammer attachment will pepper the slab with holes in 1 meter rows. This is to create a series of holes to enable the slab to be lifted with ease and break into manageable size pieces.

When the entire slab has been prepared the 210, 360 degreeexcavator will change to bucket attachment and working from a corner of the slab will lift the broken arisings and cast aside of the broken slab into a stock pile for further processing.

The stock pile of lifted slab will be processed by a 210, 360 degree excavator using a muncher attachment to pulverise the concrete and segregate re-bar . re- bar will be munched into manageable sized bundles and placed into waiting 40 yard skip designated for metal recycling.

Footings will be removed after the slab has been fully lifted with the footings being processed with the muncher. Again re – bar will be segregated and loaded to correct waste stream. Hammer attachment may be used on the footings if they are found to be too big for the muncher initially.



N

25m SCALE 1:1250

Alpha Park, Chandlers Ford

Location Plan

BERICOTE

umc architects

Drawing Status:	Planning
Drawn / Checked:	JBM / DMc
Date:	03.02.2023
Scale:	1:1250 @ A0
Drawing no:	Revision:
13123 P0-01	A

6.0 Impact Assessment and Proposed Controls

Demolition processes give rise to conditions that, unless carefully controlled, can have an adverse and direct effect on the General Public and the surrounding environment.

This section will highlight items and actions that will be taken to reduce the impact of the demolition process. These details will be expanded in further detail in task specific method statements.

Impact	Control
Pollution	- **Asbestos: refer to existing survey, controlled removal, continuous air / background monitoring, Health monitoring for operatives.** - **Respiratory protective equipment** **Dust: damp down with fine water spray – Dust** - **Boss, pumped supply, well hole within building.** **Pigeon infestation: Environmental clean and dispose of pigeon droppings / carcases from** - **within buildings and structures.** **Fuel stored in double skinned bowser, drip trays under static plant, spill kits adjacent to refuelling.**
Air Quality	- **The site is mainly surrounded by industrial units. Residential properties are located within 50m to the north of the site. No ecological receptors, as defined by the guidance, are located within 50 m of the site.** - **The estimated annual mean 2014 PM10 concentration in the study area is 18µg/m3. Taking the above factors into consideration the sensitivity of the area to dust soiling and human health impacts is considered to be of a medium level.** - **The enclosed Air Quality Assessment provides a detailed assessment of the effects of the demolition on air quality and provides recommendations which will effectively control the effects during demolition activities.** - **Following the implementation of the recommendations, it is considered that impacts during the proposed demolition activities will be of negligible significance and would not have a significant adverse effect on local air quality.** - **As the total volume of the existing building to be demolished is greater than 50,000m3, there will**

	potentially be a high level of dust during the demolition. - **Dust levels will be monitored throughout the works in accordance with local authority dust protocols1.** - **Refer to attached Air Quality Assessment, prepared by Aecom which provides further details of mitigation measures which will be incorporated.**
Noise	- **The enclosed Noise Assessment for the demolition works was carried out by WYG.** - **Demolition noise levels at the façade of existing and proposed noise sensitive properties are predicted to be within the fixed limit criteria.** - **The noise change assessment (ABC Method) demonstrated that the demolition noise impact is considered to not be significant at noise sensitive locations, following the implementation of mitigation measures which includes:** ▪ **erecting a 2.5m temporary hoarding;** ▪ **Regular noise monitoring;** ▪ **Controlling noise at source;** ▪ **Avoiding unnecessary revving of engines and equipment will be switched off when not required;** ▪ **Maintaining internal haul routes and maintained avoiding steep gradients;** ▪ **Using rubber linings in chutes and dumpers to reduce noise;** ▪ **Starting up plant and vehicles sequentially rather than altogether;** ▪ **Plant will be reviewed to ensure that it is the quietest available for the required purpose.** - **Please refer to enclosed Noise Assessment for the demolition works, which provides further details of mitigation measures which will be incorporated during the demolition works.**

Contamination	-	**A ground investigation and a desk study were undertaken by Hydrock at the Site.**
	-	**The only soil contamination at concentrations likely to have an impact on human health identified during the investigation is the presence of asbestos fibres (at low concentrations). Any handling of the soils as part of the demolition and ground works may be considered to present a risk of the soils becoming airbourne and a risk to human health (site workers and neighbours).** **As such, suitable asbestos precautions in accordance with CAR2012 will be required, to include (but not be limited to):** ▪ **All site staff shall have asbestos awareness training;** ▪ **All staff shall be issued with and be made wear suitable PPE and RPE;** ▪ **Air monitoring shall be undertaken by a suitable qualified specialist, including**
	-	**perimeter monitoring.** **A geo-environmental specialist will provide a watching brief during the removal of the slabs/hardstanding and foundations to look for contamination not previously identified. The demolition contractor will be made aware that**
	-	**work must be stopped if any necessary further investigation is required.** **The contractor must inform the geo-environmental specialist of any contamination encountered.** **As VOC and petroleum hydrocarbons were identified in groundwater. Treatment of any groundwater removed will be undertaken, prior to disposal at an appropriately licensed disposal facility.**
Site Security **H & S of Site** **Operatives, Staff and General Public**	- - - - -	**Maintain secure site boundary fencing.** **Provide full time security.** **Staff / Operatives to sign in and out of site.** **Banksman at site entrance to protect pedestrians / traffic when vehicles accessing / egressing the site.** **Board up access points in pedestrian bridges.**

Structural Stability	**-**	**Sequence demolition works to ensure structural stability is maintained – demolish top downwards on a bay-by-bay basis.**
	-	**Demolition sequence in accordance with method statement.**
	-	**Continuously clear debris arising.**

6.0 Impact Assessment and Proposed Controls

Impact	Control
Soft Stripping	- **Prior to demolition remove all furniture, fittings, partitions, floor coverings etc to remove fire risk and to maintain clean crushed hardcore / concrete.**
Live Services	- **Client to terminate live services at site boundary and provided temporary supplies.** - **Prior to soft strip check sockets / switches etc.** - **Prior to demolition of ground bearing slab carry out CAT cable scan.** - **Protect duct covers with steel plate.**
Demolition	- **40T 360° excavators fitted with a combination of hydraulic cruncher and breaker attachments to demolish down to floor level** - **Exclusion zones to be established. Banksman to control 360° excavator operations.** - **Materials processed at ground level, 360° excavators fitted with hydraulic cruncher, site** - **crusher.**
Hot Cutting	- **Hot Works Permit** - **Appropriate PPE** - **Health surveillance (monitor for lead)** - **Good personal hygiene regime** - **Clear all combustible materials** - **Fire extinguishers present**

6.0 Impact Assessment and Proposed Controls

Impact		Control
Vehicle Movements	-	**Draw up Traffic Management Plan.**
	-	**Banksman to control traffic when entering / leaving site to protect pedestrians and other road users.**
	-	**Banksman to control traffic / plant movements on site.**
	-	**Banksman to prevent vehicles parking in road outside the site.**
	-	**Coordinate deliveries, traffic movements to avoid rush hour etc.**
	-	**Provide wheel washing / road cleaning.**
	-	**Ensure stable ground conditions.**
	-	**Locate underground services, protect where necessary.**
Mobile Phones	-	**No mobile phones on site – (restricted to site managers, and senior staff only)**
Smoking	-	**Smoking only in designated smoking areas**
Drugs & Alcohol	-	**No person who is under the influence of alcohol or drugs will be admitted to site.**

7.0 Specific Health and Safety Procedures

- Site Inductions.

All site operatives will attend an induction course prior to commencing work on site. Part of the induction process will be to ensure that the operatives are aware of the method statement with the associated Risk and Coshh assessments of their task; method statement demolition sequence, residents; works in buildings containing asbestos and 'no-go' areas ie. Drop Zones etc.

- Site working hours

Site working hours will be, unless otherwise authorised: -

08.00 - 19.00h	Monday to Friday
07:00 – 13:00h	Saturday

No working on Sundays or Bank Holidays, unless otherwise agreed in writing with Local Authority.

- Signage.

Signs will be erected on the site hoardings warning of the nature of the works being undertaken.

A notice board at the site entrance will detail mandatory PPE to be worn on site.

Signs within the site will warn of ‘Demolition in Progress’, ‘Drop Zones’, ‘Well Holes’, ‘Excavations’ etc.

Signs warning of “Construction Traffic Emerging” will be posted 200m either side of the entrance.

The site notice board will display the F10, Insurances, First Aid, Emergency Procedures, and Site Rules etc.

Fire escape routes will be displayed in all areas of the building where works are carried out. The escape routes will change as the works progress and will be updated regularly.

- Hazardous Material.

All hazardous materials above will be removed ahead of any adjacent demolition however a certain amount of soft stripping may be required in order to provide adequate access for removal purposes.

Once location, access, quantity and type of hazardous substance is known separate detailed method statements will be produced prior to works commencing.

Fluorescent tubes will not be thrown away with normal waste. They will be collected and inserted into cardboard tubes. The tubes will be taken separately to a licensed disposal facility. Similarly fridges, televisions/monitors and air con units will be separated and disposed of accordingly.

- Leptospirosis.

Good personal hygiene must be maintained since there is a risk of contracting Weil's disease if rats are present.

Leptospirosis is much less severe if it is treated promptly and staff will be made aware that the disease starts with a flu-like illness with a persistent and severe headache. Staff will be encouraged to report any illness to a doctor telling about their line of work.

- Hot Works.

Contractors will take all reasonable steps to avoid the outbreak of fire, particularly during 'hot' work involving the use of naked flame or intense heat.

A 'Hot-Works' permit to work system will be enforced when any works of this nature are undertaken.

All combustible materials will be cleared and fire extinguishers will be provided adjacent to the working zone.

Hot works will cease 1 hour before the end of a working shift and the area thoroughly checked by the Site Foreman /Supervisor prior to leaving site.

If necessary, fire blankets will be used to protect timber materials.

It will be impressed on the workforce that the site has a 'No Smoking' policy and we will prevent the accumulation of rubbish on the site.

- Traffic management

A banksman wearing high visibility clothing will be posted at the site entrance to protect pedestrians or warn approaching traffic whilst marshalling wagons or delivery vehicles on/off the site.

The roadway will be regularly swept during the course of the working day to maintain cleanliness and to minimise the mess that vehicles leaving the site can cause.

All deliveries to and from site, in particular H.G.V's, will be carefully controlled to ensure minimal disruption to the local environment is caused.

Site and road conditions will be continuously monitored and adequate facilities will be provided for wheel washing and road cleaning should it be necessary.

- COSSH Assessment Library.

In accordance with the COSHH Regulations 2002, made under the Health and Safety at Work etc. Act 1974, the health of persons exposed to substances hazardous to health in the workplace will be protected. The regulations impose duties upon employers and their employees.

Substances hazardous to health in the workplace are either materials or products imported into the workplace or products produced by the processes. The demolition contractor is to ensure that the exposure of employees to substances hazardous to health is either prevented or, where this is not reasonably practicable, adequately controlled.

So far as is reasonably practicable, the prevention or adequate control of exposure will be secured by measures other than personal protective equipment.

Where measures taken do not prevent, or provide, adequate control of exposure then, in addition to taking those measures, the demolition contractor will provide employees with, and ensure proper use of, suitable personal protective equipment that will adequately control their exposure.

A library of COSHH assessments will be attached in conjunction with the method statement.

- Risk Assessment Library.

In accordance with The Management of Health and Safety at Work Regulations 1999 bower contracting is to assess all work practices to be encountered during the contract and produce Risk Assessments referring to the worst case situation for activities not eliminated by the method of works chosen as defined in the Method Statement.

The Risk Assessment will reflect both the likelihood that harm will occur and its severity to employees and other people who may be affected such as visiting contractors and members of the public.

A Risk Assessment is not an end in itself. It is a management tool that allows dangers to be evaluated and suitable measures to be taken to prevent damage or harm from occurring.

A library of Risk Assessments relative to the buildings will be attached in conjunction with the Method Statement.

The Risk Assessments Library will be updated throughout the contract should conditions change and/or new methods preferred.

DOCUMENT 1

NOISE ASSESSMENT
DEMOLITION PHASE

Bericote Properties Limited

Proposed Employment Development

Alpha Park, Chandler's Ford

Demolition Noise Assessment

March 2015

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Contents Page

1.0 Introduction 1

1.0 Purpose of this Report 1

2.0 Assessment Criteria 4

3.0 Assessment Methodology 5

4.0 Noise Survey 8

5.0 Assessment of Effects 10

6.0 Conclusions of Noise Assessment 13

Appendix Contents

Appendix A – Acoustic Terminology and Abbreviations

Appendix B – Sketches

1.0 Introduction

1.0 Purpose of this Report

This report presents the findings of a noise assessment undertaken in support of a planning application for the erection of 3 no. separate industrial/distribution units including access and servicing arrangements, car parking, landscaping and associated works at Alpha Park, Chandler's Ford. This version of the report has been prepared to consider noise from the demolition process of the development and be included as part of the demolition method statement.

A description of the existing noise environment in and around the site is provided. Noise surveys have been undertaken and the results used to verify predictions of the short-term and long-term effects of noise. The noise levels from the proposed development have been predicted at local representative receptors using CADNA noise modelling software which incorporates CRTN and ISO 9613 methodologies and calculations.

1.2 Legislative Context

This report is intended to provide information relevant to the local planning authority and their consultees in support of a detailed planning application for the above proposed development. Policy guidance with respect to noise is found in National Planning Policy Framework. With regard to noise and planning, NPPF contains the following 4 short statements (section 123):

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;

- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;

- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and

- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

The national Planning Practice Guidance web-based resource was launched by the Department for Communities and Local Government (DCLG) on 6 March 2014 to support the National Planning Policy Framework and make it more accessible. The overall aim of the guidance, tying in with the principles of the NPPF and the Explanatory Note of the Noise Policy Statement for England, is to *identify whether the*

overall effect of noise exposure is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.

A summary of the effects of noise exposure associated with both noise generating developments and noise sensitive developments is presented within the PPG: Noise and repeated as follows:

Table 1.1 NPPG Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No Specific Measures Required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No Specific Measures Required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Observed Adverse Effect	Prevent

The NPPF, NPSE and PPG do not, however, present absolute noise level criteria which define SOAEL, LOAEL and NOEL which is applicable to all sources of noise in all situations. Therefore, within the context of the Proposed Development, national planning policy and appropriate guidance documents including the 'World Health Organisation Community Noise Guidelines' (1999), 'BS 8233 – Guidance on Sound Insulation and Noise Reduction for Buildings' (2014) and 'BS 4142: 2014 Methods for rating and assessing industrial and commercial sound'; Section 2.0 presents the noise level criteria used as a basis of this assessment.

The PPG also states that *neither the NPSE nor the NPPF (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of the proposed development.*

2.0 Assessment Criteria

2.1 National Planning Practice Guidance - Assessment Criteria

In order to enable the assessment of the proposed development in terms of LOAEL and SOAEL, Table 2.1 presents equivalent noise levels and associated actions with the target noise level criteria identified. The noise level criteria detailed below have been derived from standards and design guidance:

> *BS 5228-1: 2009 + A1:2014 'Code of Practice for Noise and vibration control on construction and open sites'*

The Planning Practice Guidance web-based resource was launched by the Department for Communities and Local Government (DCLG) on 6 March 2014 to support the National Planning Policy Framework and make it more accessible. For the purpose of this assessment, the target noise level criteria are noted in italics in the table below.

Table 2.1 Noise Level Criteria and Actions (Demolition Noise Assessment)

Effect Level	Assessment	Noise Level Criteria	Action / Justification
No Observed Adverse Effect Level	Demolition Noise Assessment	**ABC Method** Site L_{Aeq} noise levels are 10dB below the relevant threshold values **Fixed Limits** In rural areas noise levels exceed 50dB In urban areas noise levels exceed 55dB	No Action Required Complaints Relating To Plant Noise Unlikely
Lowest Observed Adverse Effect Level	Demolition Noise Assessment	**ABC Method** Site L_{Aeq} noise levels are equal/ below the relevant threshold values **Fixed Limits** In rural areas noise levels exceed 60dB In urban areas noise levels exceed 65dB	Mitigate to achieve site noise levels below relevant category threshold Values correspond to ABC Method of significance Effect at Dwellings Annex E.3.2 of BS 5228.
Significant Observed Adverse Effect	Demolition Noise Assessment	**ABC Method** Site L_{Aeq} noise levels are higher than the relevant threshold values *Or* Construction activities cause noise levels to increase by more than 3dB (where ambient noise levels exceed threshold Values) **Fixed Limits** In rural areas noise levels exceed 70dB In urban areas noise levels exceed 75dB)	Mitigate to achieve site noise levels below relevant category threshold Values correspond to ABC Method of significance Effect at Dwellings Annex E.3.2 of BS 5228.
Unacceptable Observed Adverse Effect	Demolition Noise Assessment	**ABC Method** Site L_{Aeq} noise levels are higher than the relevant threshold values *Or* Construction activities cause noise levels to increase by more than 10dB (where ambient noise levels exceed threshold Values) **Fixed Limits** In rural areas noise levels exceed 80dB In urban areas noise levels exceed 85dB	Mitigate to achieve site noise levels below relevant category threshold Values correspond to ABC Method of significance Effect at Dwellings Annex E.3.2 of BS 5228.

3.0 Assessment Methodology

3.1 Noise Modelling Methodology

Three dimensional noise modelling will be undertaken based on the monitoring data to predict source noise levels at a large number of locations both horizontally and vertically. CADNA noise modelling software has been used. This model is based on the Department of Transport Calculation of Road Traffic Noise (CRTN) and ISO 9613 noise propagation methodology and allows for detailed prediction of noise levels to be undertaken for large numbers of receptor points and different noise emission scenarios both horizontally and vertically. The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. Input data, assumptions and model settings as given in the table below have been used.

Table 3.1 Modelling Parameters Sources and Assumptions

Parameter	Source	Details
Horizontal distances – around site	Ordnance Survey	Ordnance Survey
Ground levels – around site	Ordnance Survey	Ordnance Survey
Ground levels – other areas	Site Observations and Ordnance Survey	OS 1:25,000 contours and OS 1:10,000 spot heights.
Traffic data – main surrounding roads	WYGE	Traffic flows for local roads based on WYGE observations and experience.
Traffic data – local roads	WYGE	Traffic flows for local roads based on WYGE observations and experience.
Building heights – around site	WYGE Observations	8 m height for two storey residential properties, and 4 m for Bungalows
Barrier heights	WYGE Observations	All existing barriers at 1.0 m with the exception of hedges and trees which are assumed to offer no noise protection.
Receptor positions	WYGE	1 m from façade, height of 1.5 m for ground floor, 4 m for first floor properties with ground floor or bungalow dormer windows. 7 m for dormer windows on two storey properties. 1.5 m height for model grid and monitoring locations for validation.
Reflections	WYGE	First order reflections have been applied based on mirror image sources
Absorbent Ground	CADNA	Frequency dependant ground absorption has been applied based on values specified in VDI 2714/16 clause 6.3.
Façade Correction	CADNA	Façade corrections have been incorporated into the modelling

It is acknowledged that a number of these assumptions will affect the overall noise levels presented in this report. However, it should be noted that certain assumptions made, as identified above, are worst case.

3.31 Model Input Data – Demolition Phase

Information regarding noise emissions from equipment used during the demolition phase has been be obtained from Annex C of BS 5228-1:2009+A1: 2014 *Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*. This annex presents a range of current sound level data on typical site equipment and common site activities.

This data is obtained by field measurements for items of plant in actual use on construction and open sites in the UK. Levels quoted in the database are based on an average (logarithmic) of measured sound levels, and where appropriate have been derived from more than one model of similarly sized plant. The results are presented as un-weighted octave band activity L_{eq} levels, and overall A-weighted activity L_{eq} levels in dB. All sound pressure levels are standardized to 10 metres from the plant.

The items of plant and associated noise levels shown in the tables below have been used for the purposes of this assessment and consider the range of typical activities likely to be employed during the demolition/construction phase of the proposed development. Items of mobile plant have been positioned in the areas on the development site that are close to both existing and proposed residential dwellings.

Table 3.2 Mobile Plant Demolition Phase

Mobile Plant	BS 5228-1:2009 Annex C Ref.	Octave Band Sound Pressure Levels (Hz)								Model Input L_{Aeq} at 10 m
		63	125	250	500	1K	2K	4K	8K	
Wheeled Loader x1	Table C.2 No.26	87	82	77	78	73	70	64	57	79 dB
Articulated Dump truck x2	Table C.2 No.33	85	87	77	75	76	73	69	62	81 dB
Tracked Excavator x1	Table C.2 No.19	95	84	79	73	70	68	64	57	77 dB
Breaker	Table C.1 No.45	79	81	83	79	77	75	70	62	82 dB
Tracked Crusher	Table C.1 No.45	93	86	79	81	75	71	66	59	82dB

Sensitive Receptors

Table 3.2 below summarises receptor locations that have been selected to represent worst-case residential receptors with respect to direct noise from the site. First floors of nearest properties have been represented. The locations of the receptors are shown on SK02 in Appendix B.

Table 3.2 Existing Receptor Locations

Ref.	Description	Grid References		Height (m)
		Closest Source	Approximate Distance To Source (m)	
R1	9, Forth Close	442697.4	120514.9	4.0
R2	1, Burnham Beeches	442723.8	120566.6	4.0
R3	1, Burnham Beeches	442735.2	120585.3	4.0
R4	2 Chepstow Close	442799.5	120617.6	4.0
R5	112, Shannon Way	442876.3	120623.7	4.0
R6	82, Monmouth Close	442904.5	120630.3	4.0
R7	78, Monmouth Close	442973.6	120648.0	4.0
R8	70, Monmouth Close	443007.0	120662.4	4.0
R9	63, Monmouth Close	443042.5	120660.4	4.0

4.0 Noise Survey

4.1 Noise Survey Methodology

A monitoring survey was undertaken to characterise baseline ambient noise levels currently experienced on the site and to establish the relative local background and traffic noise levels.

Equipment used during the survey included:

B&K 2260	Environmental Noise Analyser (WYG1)	s/n	2361273
B&K 4231	Calibrator	s/n	2176211
Rion NL-52	Environmental Noise Analyser (WYG15)	s/n	1221575

The measurement equipment was checked against the appropriate calibrator at the beginning and end of the measurements, in accordance with recommended practice and no drift was observed. The accuracy of the calibrators can be traced to National Physical Laboratory Standards, calibration certificates for which are available on request.

A baseline monitoring survey was undertaken at five locations (as specified in the following table and shown in SK01 of Appendix B) from Friday 3rd October 2014 to Wednesday 8th October 2014. Attended short term measurements were undertaken at four locations during the day, evening and night-time periods with one additional location being measured unattended over a 118 hour period. The raw data collected from the long term monitoring is available upon request.

Measurements were taken in general accordance with BS 7445-1:2003 *The Description and Measurement of Environmental Noise: Guide to quantities and procedures*. Weather conditions during the survey period were observed as being dry with scattered showers. Anemometer readings confirmed that wind speeds were less than 5 ms^{-1} at all times during the survey with a predominant westerly wind direction.

Table 4.1 Noise Monitoring Locations

Ref	Description	Grid Reference	
		X	Y
LT1	North of site adjacent to properties on Monmouth Close	442954.4	120605.9
ST1	Pavement outside No. 9 Monmouth Close	442932.0	120645.9
ST2	Pavement adjacent to Shannon Way	442745.2	120603.3
ST3	Pavement outside No. 11 Monmouth Close	442658.7	120476.5
ST4	Pavement adjacent to Shannon Way to the south of the site	442999.8	120434.6

4.2 Noise Survey Results

Existing ambient noise levels around the site are dominated by noise from the industrial site. Road traffic noise from Bournemouth Road is also audible.

Ambient and background noise levels are usually described using the L_{Aeq} index (a form of energy average) and the L_{A90} index (i.e. the level exceeded for 90% of the measurement period) respectively. Road traffic noise is generally described using the L_{A10} index (i.e. the level exceeded for 10% of the measurement period).

The results of the statistical measurements and frequency measurements conducted during the survey are summarised in the following table; following representations from Eastleigh and Test Valley Borough Councils', background L_{A90} and L_{A10} noise levels are presented as modal averages. All values are sound pressure levels in dB (re: 2 x 10^{-5} Pa).

Table 4.2 Results of Baseline Noise Monitoring Survey (Average Levels)

Period	Duration (T)	Monitoring Date and Times	Location	$L_{Aeq,T}$ (dB)	$L_{Amax,T}$ (dB)	$L_{Amin,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
Weekday Day 07:00 - 23:00	46 hours	03/10/2014 - 08/10/2014 07:00 - 23:00	LT1	49.9	74.7	33.3	42.5	40.3
Weekday Night 23:00 – 07:00	24 hours	03/10/2014 - 08/10/2014 23:00 - 07:00		50.0	94.1	31.3	43.6	38.2
Weekend Day 07:00 - 23:00	32 hours	04/10/2014 - 05/10/2014 07:00 - 23:00		48.1	82.3	33.5	41.6	38.8
Weekend Night 23:00 – 07:00	16 hours	04/10/2014 - 05/10/2014 23:00 - 07:00		40.6	67.0	29.9	39.2	36.6
Day 07:00 - 19:00	15 Mins	08/10/2014 12:50	ST1	50.9	75.5	45.6	51.5	47.2
	15 Mins	08/10/2014 12:31	ST2	57.2	77.6	44.4	56.1	46.3
	15 Mins	08/10/2014 12:12	ST3	48.2	65.7	43.2	50.2	44.9
	15 Mins	08/10/2014 11:42	ST4	69.0	85.6	52.7	72.8	57.5
Evening 19:00 - 23:00	15 Mins	07/10/2014 22:40	ST1	43.8	59.4	39.8	45.5	41.6
	15 Mins	07/10/2014 22:20	ST2	49.4	76.0	41.3	47.1	43.2
	15 Mins	07/10/2014 22:02	ST3	44.6	66.1	39.4	44.1	41.1
	15 Mins	07/10/2014 21:40	ST4	62.4	81.9	42.8	63.9	48.1
Night 23:00 - 07:00	15 Mins	07/10/2014 23:02	ST1	42.4	59.0	38.6	43.4	40.7
	15 Mins	07/10/2014 23:22	ST2	43.1	66.3	39.3	44.2	41.3
	15 Mins	07/10/2014 23:41	ST3	44.8	60.0	40.0	46.1	42.0
	15 Mins	08/10/2014 00:03	ST4	48.7	71.7	39.4	45.2	41.3

All values are sound pressure levels in dB re: 2x 10^{-5} Pa

5.0 Assessment of Effects

5.1 Demolition Phase – Noise Assessment

Noise levels from potential demolition activity associated with the development of the site have been assessed in accordance with BS 5228-1: 2009 + A1 2014 criteria which indicate if a significant effect is likely to occur at noise sensitive properties.

Point sources representing all likely items of plant have been represented in the model and in the case of mobile plant these have been placed in worst case location with respect to nearby noise sensitive premises. Worst case assumptions regarding the 'on-time' of individual plant items have also been made and represented in the calculations. In order to ensure that the assessment is worst case, it is assumed that all proposed construction activity is occurring simultaneously.

5.1.1 Significance based on fixed limits

The table below shows predicted levels of demolition noise at existing noise sensitive properties for comparison with the recommended noise limit criteria.

Table 5.19 Demolition Noise Assessment Results (Fixed Limits Method)

Ref	Demolition Noise Level (dB(A))	Criteria (dB(A))	Within Recommended fixed noise limit
CR1	67.4	70.0	Yes
CR2	65.9	70.0	Yes
CR3	65.2	70.0	Yes
CR4	65.6	70.0	Yes
CR5	68.0	70.0	Yes
CR6	68.2	70.0	Yes
CR7	68.9	70.0	Yes
CR8	66.7	70.0	Yes
CR9	65.5	70.0	Yes

The results indicate that the noise levels at the façades of the existing noise sensitive properties would be within the recommended criteria. Noise levels within the fixed limit criteria are likely to result in internal conditions where conversation would not be difficult.

5.1.2 Significance based on noise change – ABC Method

The table below presents the findings of a daytime demolition noise assessment at noise sensitive properties surrounding the site. Daytime is regarded as Weekdays 07:00 – 19:00 and Saturdays 07:00 – 13:00.

Table 5.20 Demolition Noise Assessment Results (ABC Method) – Daytime

Nearest Sensitive Receptors	Measured Existing Ambient Noise Level (L_{Aeq})	Rounded to nearest 5 dB	Predicted Site Noise	Category	Threshold	Significant Effect?
CR1	49.9	50.0	67.4	A	65	Yes
CR2	49.9	50.0	65.9	A	65	Yes
CR3	49.9	50.0	65.2	A	65	Yes
CR4	49.9	50.0	65.6	A	65	Yes
CR5	49.9	50.0	68.0	A	65	Yes
CR6	49.9	50.0	68.2	A	65	Yes
CR7	49.9	50.0	68.9	A	65	Yes
CR8	49.9	50.0	66.7	A	65	Yes
CR9	49.9	50.0	65.5	A	65	Yes

In accordance with ABC method of assessment outlined in BS 5228-1:2009 A1 +2014, a significant effect is deemed to occur if the site noise level exceeds the threshold level for the category appropriate to the ambient noise level. It can be seen from the results tabulated above that all nearby noise sensitive premises included in this assessment are currently exposed to ambient noise levels which comply with Category A.

When the category threshold values are compared to the site noise level experienced at the noise sensitive properties during the demolition/construction phase of the development it is shown that the site noise levels are above the relevant threshold value and the impact is considered to be significant during the daytime hours on Weekdays 07:00 – 19:00 and Saturdays 07:00 – 13:00. Therefore potential noise mitigation measures have been considered in section 6.0.

6.0 Demolition Phase Mitigation

The table below presents the findings of a daytime construction noise assessment incorporating the beneficial effects of erecting a 2.5 metre solid temporary hoarding along the North West of the development site in front of potentially sensitive locations, as shown in SK02b of Appendix B. It is also recommended the Demolition/Construction and Environmental Management Plan (CEMP) in Appendix C be followed in order to keep demolition noise within the relevant criteria.

Table 6.1 Demolition Noise Assessment (With Mitigation) (ABC Method) – Daytime

Nearest Sensitive Receptors	Measured Existing Ambient Noise Level (L_{Aeq})	Rounded to nearest 5 dB	Predicted Site Noise	Category	Threshold	Significant Effect?
CR1	49.9	50.0	64.7	c	65	No
CR2	49.9	50.0	63.2	A	65	No
CR3	49.9	50.0	62.3	A	65	No
CR4	49.9	50.0	62.5	A	65	No
CR5	49.9	50.0	64.7	A	65	No
CR6	49.9	50.0	64.5	A	65	No
CR7	49.9	50.0	64.0	A	65	No
CR8	49.9	50.0	61.9	A	65	No
CR9	49.9	50.0	60.5	A	65	No

When the category threshold values are compared to the site noise level experienced at the noise sensitive properties during the demolition phase of the development (incorporating the 2.5m hoarding), it is shown that the site noise levels are below the relevant threshold value and below the fixed limit criteria of 70dB, therefore the impact is considered not to be significant at all locations.

7.0 Conclusions of Noise Assessment

This report presents the findings of a noise assessment undertaken in support of a planning application for the erection of 3 no. separate industrial/distribution units including access and servicing arrangements, car parking, landscaping and associated works at Alpha Park, Chandler's Ford. This version of the report has been prepared in order to consider noise from the demolition process of the development.

NPPF Section 123

Section 123 of the NPPF gives four test points relating to noise. Considering these the following conclusions can be drawn:

Demolition Noise Assessment

Demolition noise levels at the façade of existing and proposed noise sensitive properties are predicted to be within the fixed limit criteria. A noise change assessment (ABC Method) has demonstrated that the demolition noise impact is considered to not be significant at noise sensitive locations, following the implementation of mitigation which includes the erection of a 2.5m temporary hoarding

Appendices

Appendix A – Acoustic Terminology and Abbreviations

An explanation of the specific acoustic terminology referred to within this report is provided below.

dB — Sound levels from any source can be measured in frequency bands in order to provide detailed information about the spectral content of the noise, i.e. whether it is high-pitched, low-pitched, or with no distinct tonal character. These measurements are usually undertaken in octave or third octave frequency bands. If these values are summed logarithmically, a single dB figure is obtained. This is usually not very helpful as it simply describes the total amount of acoustic energy measured and does not take any account of the ear's ability to hear certain frequencies more readily than others.

dB(A) — Instead, the dBA figure is used, as this is found to relate better to the loudness of the sound heard. The dBA figure is obtained by subtracting an appropriate correction, which represents the variation in the ear's ability to hear different frequencies, from the individual octave or third octave band values, before summing them logarithmically. As a result the single dBA value provides a good representation of how loud a sound is.

L_{Aeq} — Since almost all sounds vary or fluctuate with time it is helpful, instead of having an instantaneous value to describe the noise event, to have an average of the total acoustic energy experienced over its duration. The $L_{Aeq,\ 07:00\ -\ 23:00}$ for example, describes the equivalent continuous noise level over the 12 hour period between 7 am and 11 pm. During this time period the L_{pA} at any particular time is likely to have been either greater or lower that the $L_{Aeq,\ 07:00\ -\ 23:00}$.

L_{Amin} — The L_{Amin} is the quietest instantaneous noise level. This is usually the quietest 125 milliseconds measured during any given period of time.

L_{Amax} — The L_{Amax} is the loudest instantaneous noise level. This is usually the loudest 125 milliseconds measured during any given period of time.

L_n — Another method of describing, with a single value, a noise level which varies over a given time period is, instead of considering the average amount of acoustic energy, to consider the length of time for which a particular noise level is exceeded. If a level of x dBA is exceeded for say. 6 minutes within one hour, then that level can be described as being exceeded for 10% of the total measurement period. This is denoted as the $L_{A10,\ 1\ hr}$ = x dB.

The L_{A10} index is often used in the description of road traffic noise, whilst the L_{A90}, the noise level exceeded for 90% of the measurement period, is the usual descriptor for underlying background noise. L_{A1} and L_{Amax} are common descriptors of construction noise.

R_w — The *weighted sound reduction index* determined using the above *measurement* procedure, but weighted in accordance with the procedures set down in BS EN ISO 717-1. Partitioning and building board manufacturers commonly use this index to describe the inherent sound insulation performance of their products.

An explanation of abbreviations used within this report is provided below.

CADNA – Computer Aided Noise Abatement

DMRB – Design Manual for Roads and Bridges

HGV – Heavy Goods Vehicle

UDP – Unitary Development Plan

UKAS – United Kingdom Accreditation Service

WYGE – WYG Environment

Appendix B – Sketches

SK01 Noise Monitoring Locations

SK02 Sensitive Receptor Locations + 2.5m Hording Location

Appendix C – Demolition and Environmental Management Plan (DEMP) – Noise

A demolition noise assessment has been undertaken in accordance with BS 5228:2009 A1 + 2014 which demonstrates that noise from daytime construction activity on the site is not considered to be significant. The full details of the assessment are presented in the noise technical report which supports the proposed scheme.

Despite the favourable assessment, a number of additional mitigation measures are recommended to keep demolition noise to a minimum. The following practices are derived from those detailed in BS 5228-1:2009 and those most appropriate to the site are outlined below.

Source Noise Control

Wherever possible noise will be controlled at source.

a) avoid unnecessary revving of engines and switch off equipment when not required;

b) keep internal haul routes well maintained and avoid steep gradients;

c) use rubber linings in, for example, chutes and dumpers to reduce impact noise;

d) minimize drop height of materials;

e) start up plant and vehicles sequentially rather than all together.

As far as reasonably practicable, sources of significant noise such as crushing will be enclosed or screened. The extent to which this can be done depends on the nature of the machine or process to be enclosed and their ventilation requirements. For maximum benefit, screens will be close to the source of noise.

Plant Location

The plant and activities to be employed on that site will be reviewed to ensure that they are the quietest available for the required purpose; this is in accordance with best practicable means. For an existing operational site, where reasonably practicable, noisy plant or activities will be replaced by less noisy alternatives if noise problems are occurring. Noise from existing plant and equipment can often be reduced by modification or by the application of improved sound reduction methods, but this will only be carried out after consultation with the manufacturer. Suppliers of plant will often have ready-made kits available and will often have experience of reducing noise from their plant.

Working Methods

Where reasonably practicable, quiet working methods will be employed, including use of the most suitable plant, reasonable hours of working for noisy operations, and economy and speed of operations.

Scheduling of Works

It is proposed that the scheduling of any construction works at the site be within daytime hours. The following hours of construction working are proposed;

a) Monday to Friday: 07:00 – 19:00
b) Saturday: 07:00 – 13:00
c) Sundays and Bank Holidays: No Working

Maintenance

Regular and effective maintenance by trained personnel is essential and will do much to reduce noise from plant and machinery. Increases in plant noise are often indicative of future mechanical failure.

Training

Operatives will be trained to employ appropriate techniques to keep site noise to a minimum, and will be effectively supervised to ensure that best working practice in respect of noise reduction is followed. All employees will be advised regularly of the following, as part of their training:

a) the proper use and maintenance of tools and equipment;

b) the positioning of machinery on site to reduce the emission of noise to the neighbourhood and to site personnel;

c) the avoidance of unnecessary noise when carrying out manual operations and when operating plant and equipment;

d) the protection of persons against noise;

e) the operation of sound measuring equipment (selected personnel).

Special attention will be given to the use and maintenance of sound-reduction equipment fitted to power tools and machines.

Community Relations

Good relations with people living and working in the vicinity of site operations are of paramount importance particularly properties along Shannon Way, Forth Close and Burnham Beeches. Early establishment and maintenance of these relations throughout the duration of site operations will go some way towards allaying people's fears. It is suggested that good relations can be developed by keeping people informed of progress and by treating complaints fairly and expeditiously. The person, company or organization carrying out work on site will appoint a responsible person to liaise with the public.

In general, the longer the duration of activities on a site, the more likely it is that noise from the site will prove to be an issue. In this context, good public relations and communication are important. The hours of working will be planned in advance and disseminated. There will be a need to adhere strictly to the stated schedule and ensure that the community is informed of their likely durations.

Noise Monitoring

On-site noise levels will be monitored regularly, particularly if changes in machinery or project designs are introduced, by a suitably qualified person appointed specifically for the purpose. The following monitoring scheme is proposed;

Noise Monitoring Scheme

Noise monitoring during the demolition phase will be undertaken in accordance with the guidance presented in Annex G of BS 5228-1:2009 which states that the following information will be recorded:

a) the measured values of L_{Aeq} and, where appropriate, $L_{pA(max)}$ or L_{A01}, together with details of the appropriate time periods;

b) details of the instrumentation and measurement methods used, including details of any sampling techniques, position of microphone(s) in relation to the site and system calibration data;

c) any factors that might have adversely affected the reliability or accuracy of the measurements;

d) plans of the site and neighbourhood showing the position of plant, associated buildings and notes of site activities during monitoring period(s);

e) notes on weather conditions, including where relevant, wind speed/direction, temperature, presence of precipitation, etc.;

f) time, date and name of person carrying out the measurement.

Proposed demolition noise monitoring locations are shown on the accompanying SK03. It is proposed that noise levels will be routinely monitored and reported at these locations for 4 hours during construction activities on a monthly basis. Additional measurements will be undertaken to establish whether specific equipment or practices will be capable of achieving the Noise Emission Limits as set out below or in light of any complaints.

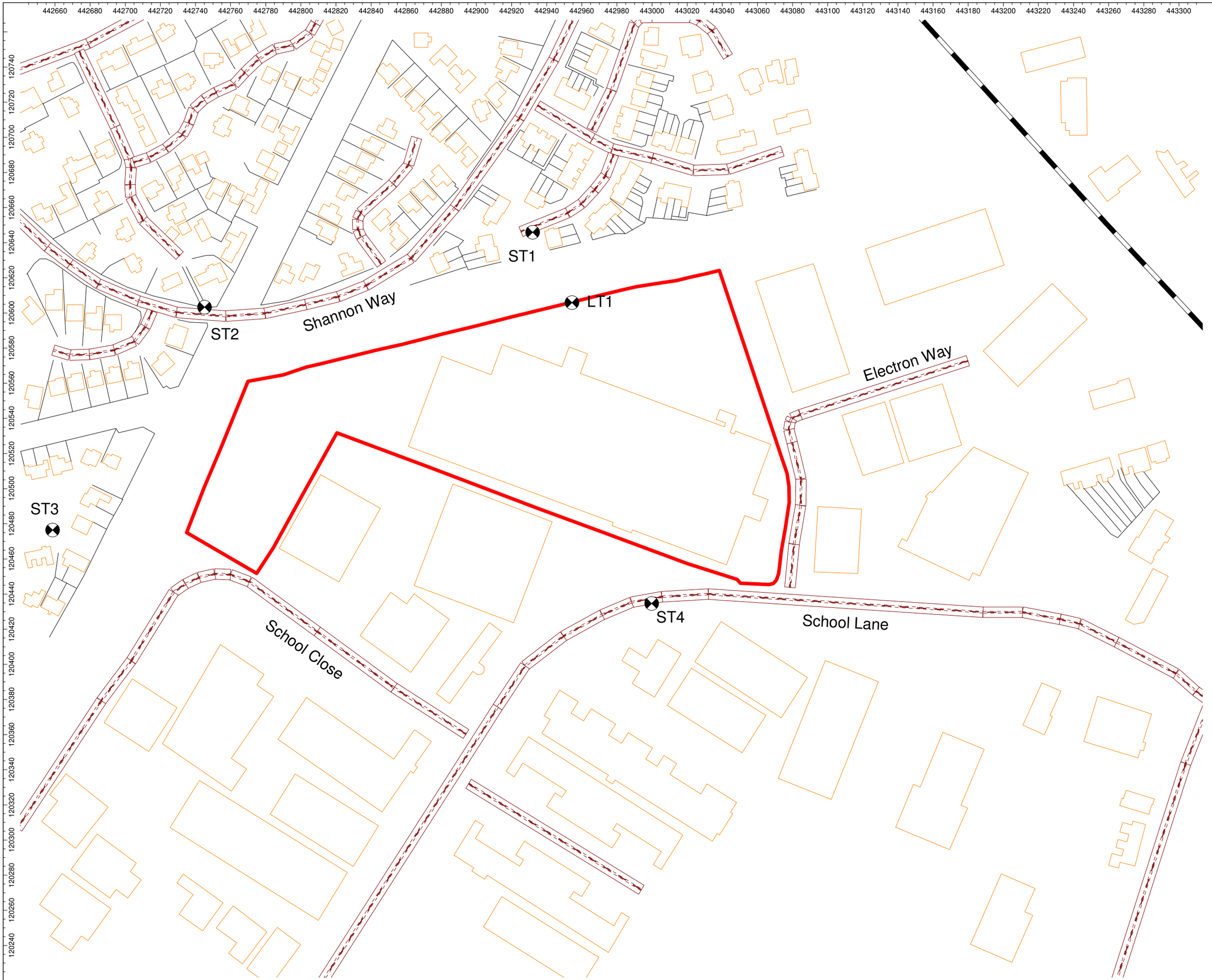
Vibration Monitoring

Vibration monitoring will be undertaken during the construction phase; monitoring will record ppv, max displacement, VDV and acceleration. Measurement will generally be undertaken in accordance with the procedure described in BS ISO 4866:2010: Guidelines for the measurement of vibrations and evaluation of their effects on structures.

Works will stop and alternative methods employed if vibration exceeds 5mm/s.

Records of the monitoring will be consistent with the requirements of BS7385:1990 and will include:

- Description of the vibration source
- Type and condition of the building
- Purpose of the measurement
- Reference to BS7385
- Position of transducer and manner of coupling type and make of transducer
- Frequency range and linearity
- Assessment of the sources of error
- PPV recorded and associated frequency



Client:
Bericote Properties Ltd.

Project:
Alpha Park,
Chandler's Ford

Project Number:
A086327

Drawing Title / Scenario:
Noise Monitoring Locations

Drawing Number:
SK01

Key:

Site Boundary:

Scale : Not to scale

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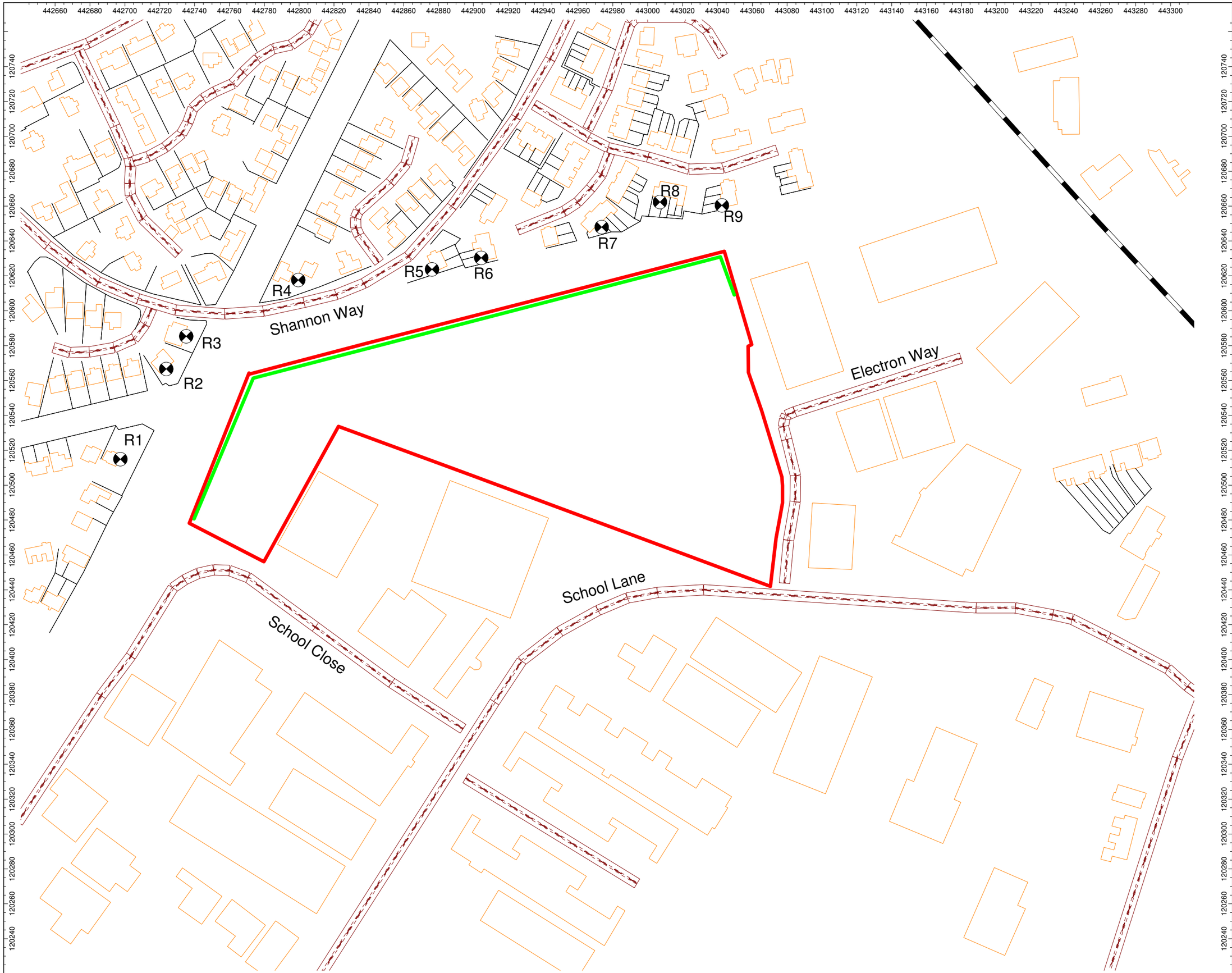

Client:
Bericote Properties Ltd.

Project:
Alpha Park,
Chandler's Ford

Project Number:
A086327

Drawing Title / Scenario:
Sensitive Receptor and Barrier Locations

Drawing Number:
SK02

Key:

Site Boundary:

Proposed 2.5m Temporary Hording:

Scale : Not to scale

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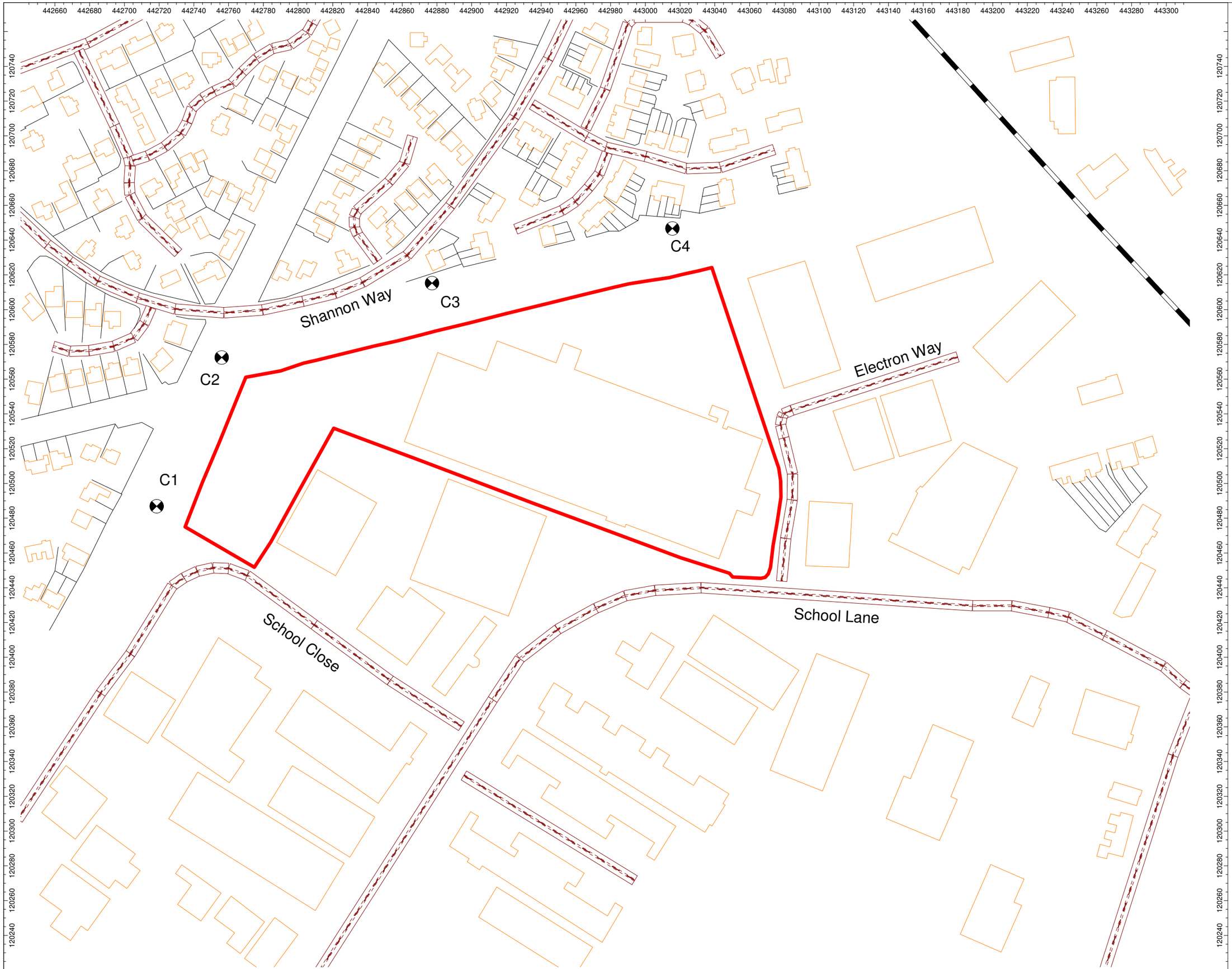

Client:
Bericote Properties Ltd.

Project:
Alpha Park,
Chandler's Ford

Project Number:
A086327

Drawing Title / Scenario:
Proposed
Demolition Noise
Monitoring Locations

Drawing Number:
SK03

Key:

Site Boundary:

Scale : Not to scale

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DOCUMENT 2

AIR QUALITY ASSESSMENT
DEMOLITION PHASE

Air Quality Demolition Phase Assessment

Alpha Park, Chandler's Ford



Prepared by:  ..... Checked by:…  … … …
……

Zadie Stock
Graduate Consultant

Sam Pollard
Associate Director

Approved by:.....  .....

Gareth Collins
Technical Director

Proposed Employment Development, Alpha Park - Air Quality Demolition Phase Assessment

Rev No	Comments	Checked by	Approved by	Date
0	Initial draft for internal review	SJP	GMC	24/03/15
1	Draft for client comment	SJP	GMC	24/03/15
2	Issue	SJP	GMC	07/04/15

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Table of Contents

1 Introduction 4

2 Legislative Framework and Planning 5
2.1 National and European Air Quality Legislation and Policy 5
2.2 Planning Policy 5

3 Pollutants of Concern 7
3.1 Nitrogen Dioxide (NO_2) 7
3.2 Particulate Matter (PM_{10}) 7
3.3 Construction Dust 7

4 Assessment Methodology 8
4.1 Scope of the Assessment 8
4.2 Methodology 8

5 Assessment Results 12
5.1 Requirement for a Detailed Assessment 12
5.2 Assessment of Risk of Dust Impacts 12
5.3 Mitigation Measures and Residual Effects 13

6 Conclusions 17

Appendix 1: Air Quality Objectives and Limit Values 19
Appendix 2: Figures 21

Table 1: Potential Dust Emission Class Criteria for Demolition Activities 9
Table 2: Sensitivity of the Area to Dust Soiling Effects on People and Property 10
Table 3: Sensitivity of the Area to Human Health Impacts 10
Table 4: Sensitivity of the Area to Ecological Impacts 11
Table 5: Risk of Dust Impact – Demolition 11
Table 6: Number of Sensitive Receptors and Sensitivity 12
Table 7: Outcome of Defining the Sensitivity of the Area 13
Table 8: Summary Dust Risk Table to Define Site-Specific Mitigation 13
Table 9: Mitigation Measures for a High Risk Site 14
Table 10: UK Air Quality Objectives set to Protect Human Health 18
Table 11: EU Limit Values set to Protect Human Health 19

Figure 1: Site Location and Potential Dust Impacts (Without Mitigation) 21

1 Introduction

AECOM Ltd was commissioned by Bericote Properties Limited to undertake an assessment of potential dust and air quality effects associated with proposed demolition activities at the site of the Proposed Employment Development, Alpha Park, Chandler's Ford. The purpose of the assessment is to determine the potential dust effects associated with the demolition of existing structures on the proposed development site. Air quality effects associated with the construction and operation of the proposed development have been considered in a separate planning application (ref. F/15/75988 and 15/00294/FULLS).

The proposed works will include the demolition of existing steel frame structures at Alpha Park, Chandlers Ford. The site area is approximately 3.5 ha and currently consists of a purpose built 1980's manufacturing facility with ancillary offices and a further extension. The main unit is of steel portal frame construction with panel cladding under a pitched steel roof[1].

A qualitative demolition phase assessment has been undertaken in accordance with the Institute of Air Quality Management's (IAQM) guidance on the assessment of dust from demolition and construction[2] to determine the potential dust and vehicle emission impacts. Taking into consideration the risk of potential impacts occurring, appropriate mitigation measures have been recommended.

[1] Demolition Method Statement prepared by Bower Contracting Limited (BCL), Jan 2015

[2] Holman et al (2014). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf

2 Legislative Framework and Planning

2.1 National and European Air Quality Legislation and Policy

2.1.1 Local Air Quality Management

The provisions of Part IV of the Environment Act 1995 establish a national framework for air quality management, which requires all local authorities in England, Scotland and Wales to conduct local air quality reviews. Section 82(1) of the Act requires these reviews to include an assessment of the current air quality in the area and the predicted air quality in future years. Should the reviews indicate that the objectives prescribed in the UK Air Quality Strategy[3] and the Air Quality (England) Regulations[4,5] will not be met, the local authority is required to designate an Air Quality Management Area (AQMA). Action must then be taken at a local level to ensure that air quality in the area improves. This process is known as 'local air quality management' or LAQM.

2.1.2 UK Air Quality Strategy

The UK Air Quality Strategy (AQS) identifies nine ambient air pollutants that have the potential to cause harm to human health and two for the protection of vegetation and ecosystems. These objectives aim to reduce the impacts of the pollutants to negligible levels. The objectives are not mandatory but rather targets that local authorities should try to achieve. The objectives are provided in Appendix 1.

2.1.3 European Air Quality Directives

The Air Quality Framework Directive (96/62/EC) on ambient air quality assessment and management defines the policy framework for 12 air pollutants known to have a harmful effect on human health and the environment. The limit values for the specific pollutants are set through a series of Daughter Directives. The limit values have been transposed into The Air Quality Standards Regulations 2010 (SI 2010 No. 1001) and are a legal requirement that the UK Government is required to meet. The limit values are provided in Appendix 1.

2.2 Planning Policy

2.2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in March 2012 (Communities and Local Government (CLG), 2012)[6] and concisely sets out national policies and principles on land use planning. The planning practice guidance was later revised and updated in March 2014 (CLG, 2014)[7], with specific reference to air quality. The planning practice guidance states that the planning system should consider the potential effect of new developments on air quality where relevant limits have been exceeded or are near the limit. Concerns also arise where the development is likely to adversely effect upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation (including that applicable to wildlife). In addition, dust can also be a planning concern, for example, because of the effect on local amenity.

When deciding whether air quality is relevant to a planning application the planning practice guidance states that a number of factors should be taken into considerations including if the proposed development will give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations.

The air quality assessment undertaken should be proportionate to the nature and scale of the development proposed and the level of concern about air quality. Mitigation options, where necessary, will depend on the proposed development and should be proportionate to the likely impact. It is important therefore that local planning

[3] Defra (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.
[4] Defra (2000). The Air Quality (England) Regulations, 2000 (SI 2000/928).
[5] Defra (2000). The Air Quality (England) Regulations, 2000 (SI 2000/928).
[6] Communities and Local Government (2012) National Planning Policy Framework
[7] Communities and Local Government (2014) Planning Practice Guidance

authorities work with applicants to consider appropriate mitigation so as to ensure the new development is appropriate for its location and unacceptable risks are prevented (CLG, 2014).

2.2.2 Local Planning Policy

The Eastleigh Borough Local Plan Review (2001 – 2011) contains a number of policies relevant to air quality. In particular, Chapter 3 addresses policies relevant to Environmental Sustainability within which Policy 32.ES states:

"Proposals for uses which may generate air, land, or water pollution, will only be permitted if the Borough Council is satisfied that they have been designed to control their impact to an acceptable level"

In addition, Policy 33.ES states:

"Where new development appears likely to have a significant impact on air quality in the locality, or future occupiers of the development may be subject to unacceptable air quality, the Council will require a suitable air quality assessment to be carried out prior to consideration of the application."

Policy 60.BE in Chapter 4 of the Eastleigh Borough Local Plan Review requires proposals to take into account the context of the site. It states:

" Development proposals which are in accordance with the other policies in this plan will be permitted provided they meet all the following criteria:...

> *ix. are an appropriate use for the locality and avoid unduly interfering, disturbing or conflicting with adjoining or nearby uses, especially in terms of noise, fumes, dust, overlooking, loss of daylight, loss of outlook, vibration, or from floodlighting or security lighting;"*

Test Valley Borough Council's Planning Policies HAZ 03 and AME 05 are policies which consider the approval of proposed developments in relation to environmental impacts.

With regard to pollution, Policy HAZ03 states:

"Development which would, or could potentially give rise to pollution, will only be permitted if it will not have an adverse impact on adjoining uses or the natural environment, or pose a risk to health as a result of any discharges or emissions to water, land or air."

Policy AME 05 addresses unpleasant emissions and states:

"Development likely to generate unpleasant emissions will be permitted provided that the amenity of people in the locality is not adversely affected.

Residential development or other uses resulting in regular human occupation will only be permitted close to sources of unpleasant emissions if the impact of the emissions on the intended users of the development would be reduced to an acceptable degree through appropriate mitigation measures."

Air quality will also be influenced through implementation of the Hampshire Local Transport Plan (2011 – 2031). Policy Objective 10 of which states an aim to "*Contribute to achieving local targets for improving air quality and national carbon targets through transport measures, where possible and affordable."*

3 Pollutants of Concern

Pollutants of concern include nitrogen dioxide (NO_2), particles (PM_{10}) and construction dust.

3.1 Nitrogen Dioxide (NO_2)

The Government and Devolved Administrations adopted two Air Quality Objectives for NO_2 to be achieved by the end of 2005. These are:

- An annual mean concentration of 40 µg/m^3; and
- A one-hour mean concentration of 200 µg/m^3, not to be exceeded more than eighteen times per year

NO_2 and nitric oxide (NO) are collectively known as oxides of nitrogen, or NO_x. All combustion processes produce NO_x emissions, predominantly in the form of NO, which then undergoes conversion in the atmosphere to NO_2, mainly as a result of its reaction with ozone (O_3). It is NO_2 that has been most strongly associated with adverse effects upon human health. Nitrogen dioxide can irritate the lungs and lower resistance to respiratory infections such as influenza.

3.2 Particulate Matter (PM_{10})

The Government and the Devolved Administrations adopted two Air Quality Objectives for PM_{10} to be achieved by the end of 2004:

- An annual mean concentration of 40 µg/m^3 (gravimetric); and
- A 24-hour mean concentration of 50 µg/m^3 (gravimetric) to be exceeded no more than 35 times per year.

Particulate matter is composed of a wide range of materials arising from a variety of sources, and is typically assessed as total suspended particulates, or as a mass size fraction. The European air quality standards have adopted the PM_{10} standard for the assessment of fine particulate matter. This expresses particulate levels as the total mass size fraction at or below an aerodynamic diameter of 10 µm. Particles of this size are able to penetrate beyond the nose and throat deep into the respiratory system reaching the bronchi and lungs.

3.3 Construction Dust

Dust is defined as all particulate matter up to 75 µm in diameter and comprising both suspended and deposited dust, whereas PM_{10} is a mass fraction of airborne particles of diameter of 10 microns or less. The health impacts associated with dust include eye, nose and throat irritation in addition to the nuisance caused by deposition on cars, windows and property. Dust and PM_{10} emissions arise from a number of sources, so both construction activities and emissions from vehicles associated with the construction site need to be considered.

Literature suggests that the most sensitive vegetation species appear to be affected by dust deposition at levels above 1000 mg/m^2/day which is five times greater than the level at which most dust deposition may start to cause a perceptible nuisance to humans. Most species appear to be unaffected until dust deposition rates are at levels considerably higher than this. Without mitigation, some construction activities can generate considerable levels of fugitive dust, although this is highly dependent on the nature of the ground and geology, time of year construction occurs in, length of time specific construction activity (e.g. boring) occurs for and prevailing meteorology during this activity.

4 Assessment Methodology

4.1 Scope of the Assessment

The proposed demolition works have the potential to impact on local air quality and therefore the risk of dust impacts occurring has been qualitatively assessed in accordance with the IAQM guidance2.

The main impacts that may arise due to demolition activities are:

- Dust deposition resulting in the soiling of surfaces;
- Visible dust plumes, which are evidence of dust emissions;
- Elevated PM_{10} concentrations as a result of dust-generating activities on site; and
- An increase in the concentrations of airborne particles and nitrogen dioxide resulting from exhaust emissions of diesel-powered vehicles and equipment used on site.

Activities on construction sites with the potential to generate dust and emissions can be categorised into four types of activities, which are:

- Demolition – any activities associated with the removal of existing structures on site;
- Earthworks – includes the processes of soil-stripping, ground-levelling, excavation and landscaping;
- Construction – any activities relating to the provision of new structures on site; and
- Trackout – the transport of dust and dirt from the construction site onto the public road network where it may be deposited and resuspended by traffic using the network.

This assessment focuses on Demolition Phase impacts, and as such the potential for dust emissions has been assessed for this activity only.

4.2 Methodology

The following steps, as defined in the IAQM guidance2, were followed:

- STEP 1 - Screen the requirement for a detailed assessment. Human and ecological receptors were identified and distance to the site and construction routes were determined;
- STEP 2 - Assess the risk of dust impacts. The potential risk of dust impacts occurring for each activity was determined, based on the magnitude of the potential dust emissions and the sensitivity of the area;
- STEP 3 - Identify the need for site-specific mitigation. Based on the risk of impacts occurring, site specific mitigation measures were determined; and
- STEP 4 - Define impacts and their significance. The significance of the potential residual dust impacts (taking mitigation into account) for each activity was determined.

Further details regarding the construction phase assessment methodology are provided in the following sections.

4.2.1 Screen the Need for a Detailed Assessment

No construction dust assessment is required if:

- there is no human receptor within 350m of the site boundary or 50m of the construction routes, up to 500m from the site entrance; or
- there is no ecological receptor within 50m of the site boundary or 50m of the construction routes, up to 500m from the site entrance.

4.2.2 Assessment of Risk of Dust Impacts

A site is allocated to a risk category on the basis of the scale and nature of the works and the sensitivity of the area to dust impacts. Where there is uncertainty regarding the level of risk, a precautionary approach should be taken with the higher risk category being applied.

4.2.2.1 Potential Dust Emission Magnitude

Table 1 describes the potential dust emission magnitude criteria for demolition activities. In addition to these criteria, factors such as seasonality, building type, duration and scale are considered.

Table 1: Potential Dust Emission Class Criteria for Demolition Activities

Potential Dust Emission Class	Criteria
Large	Total Building volume: > 50,000 m^3 Potentially dusty construction material (e.g. concrete) On-site crushing and screening Demolition activities: > 20 m above ground level
Medium	Total Building volume: 20,000 – 50,000 m^3 Potentially dusty construction material Demolition activities: 10 – 20 m above ground level
Small	Total Building volume: < 20,000 m^3 Materials with low potential for dust release (e.g. metal cladding or timber) Demolition activities: <10 m above ground level

4.2.2.2 Definition of Study Area Sensitivity

In conjunction with the potential dust emission magnitude, the sensitivity of the area is used to derive a risk classification for the site for each dust-generating activity. The sensitivity of the area takes account of a number of factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of PM_{10}, the local background concentration; and
- Site-specific factors, such as weather, natural shelters (trees), to reduce the risk of wind-blown dust.

The type of receptors at different distance from the site boundary or dust generating activities and from the likely construction routes should be included. Guidance on the sensitivity of receptors to dust soiling, health effects of PM_{10}, ecological effects and additional factors, are reported in Box 6, Box 7, Box 8 and Box 9 in the IAQM guidance.

Table 2, Table 3, and Table 4 define how the area sensitivity maybe defined for dust soiling, human health and ecosystem impacts, respectively. The sensitivity of the area should be derived for each construction activity, and the highest level of sensitivity considered in the assessment. Professional judgement must also be applied to determine the area sensitivity.

Table 2: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 3: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration ($\mu g/m^3$)	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table 4: Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Distance bandings are measured from the dust emission source. Where this is not known then the distance has been measured from the site boundary.

4.2.2.3 Definition of Risk Impacts

The dust emission magnitude for demolition activities is combined with the sensitivity of the area in order to determine the risk of impact without mitigation. The risk categories for demolition are show in Table 5. The dust risk categories are used to define the site-specific mitigation measures, which are defined in a form suitable for implementation by means of a planning condition or legal obligation, and should be included in a Dust Management Plan and/or Environmental Management Plan.

A development site with 'negligible' risk does not require mitigation measures, except those required by legislation.

Table 5: Risk of Dust Impact – Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

5 Assessment Results

5.1 Requirement for a Detailed Assessment

The Proposed Employment Development site at Alpha Park, Chandler's Ford is located mostly within Eastleigh Borough, although part of the western side of the site falls within Test Valley Borough. The surrounding area is mainly industrial with some residential properties located within 50m to the north of the site. The existing buildings are situated in an enclosed area with entrance from School Lane.

In accordance with the IAQM guidance2, a detailed construction phase assessment is required as there are human receptors within 50 m of the boundary of the site. No ecological receptors, as defined by the IAQM guidance, are located within 50 m of the site.

The works comprise of demolition of the existing structures. These structures consist of steel frameworks with block and brick infill to the side walls1. The current roofs are made up of steel corrugated panels. The footprint of the existing building is 166,112sq ft.

5.2 Assessment of Risk of Dust Impacts

The proposed demolition works have the potential to generate emissions of dust and PM_{10} within the boundaries of the demolition areas. Whilst the majority of this dust would be contained within the boundaries, some will be transported in the air to sites outside these areas, potentially giving rise to adverse impacts off-site.

Demolition phase activities with the potential to generate dust and emissions include:

- Site preparation and establishment;
- Demolition of existing infrastructure;
- Windblown material from areas with no vegetation cover;
- Material transfer to and from trucks/lorries;
- Material spills during transportation and handling; and/or
- Vehicle/plant movements on unpaved haul routes.

5.2.1 Sensitivity of the Area

Dust sensitive receptors have been identified in the vicinity of the Alpha Park site. A summary of the receptors and sensitivity for demolition activities is reported in Table 6. It should be noted that only demolition of the existing buildings has been assessed for dust risk in this assessment.

Table 6: Number of Sensitive Receptors and Sensitivity

Activity	Number of Receptors and Sensitivity			
	<20 m	**<50 m**	**<100 m**	**<350m**
Demolition	<10 Medium (Industrial)	10-100 High (Residential)	10-100 High (Residential)	>100 High (Residential)

There are less than 10 receptors with medium sensitivity to dust soiling effects and to the health effects of PM_{10} located within 20 m of the proposed demolition area, and around 10-100 high sensitivity receptors located within 50 m of this area.

There is no PM_{10} continuous monitoring undertaken in proximity to the development site, therefore mapped PM_{10} concentrations in 2014 have been obtained from the Defra LAQM website[8]. The estimated annual mean PM_{10} concentration foor the study area is 18 µg/m^3. The proposed development site does not contain, nor is in close

[8] http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2011.

proximity to any National or International Designated Site with respect to ecological receptors. A summary of the sensitivity of the area is presented in Table 7.

Table 7: Outcome of Defining the Sensitivity of the Area

Activity	Sensitivity of the Surrounding Area		
	Dust Soiling	Human Health	Ecological
Demolition	Medium	Medium	N/A

5.2.2 Definition of Dust Emissions Magnitude and Risk of Impacts

The demolition of existing structures will be carried out using a 360° excavator with shear attachment1. All steel work and brick will be cleared as the work is in progress leaving a clean slab. The existing structure will be demolished top downwards on a bay-by-bay basis. After the initial demolition stages the excavator will be positioned inside the building where the side brick walls can be easily accessed and pulled into the building foot print. This will help contain dust and debris within the building and therefore dust dispersion will be minimised.

In accordance with the criteria in Table 1, as the total volume of the existing building to be demolished is greater than 50,000m^3, there will potentially be dusty construction material (e.g. concrete) and there will be on-site crushing, the dust emission magnitude is considered to be 'large'.

Based on this dust emission magnitude and the sensitivity of the area (medium), the resulting risk of dust impacts defined in accordance with the criteria in Table 5 is summarised in Table 8. The dust risk categories in Table 8 have been used to define appropriate site-specific mitigation measures, which are reported in the mitigation measures section (Section 5.3).

Table 8: Summary Dust Risk Table to Define Site-Specific Mitigation

Source	Dust Soiling	Human Health	Ecology
Demolition	High	High	N/A

5.3 Mitigation Measures and Residual Effects

There are a number of mitigation measures that can be employed to lessen the nuisance and human-health impacts of the dust and PM_{10} generated during construction activities. The mitigation measures should be incorporated into a Construction Environmental Management Plan (CEMP) to ensure that they are implemented effectively.

All potential dust-generating activities and locations should be identified prior to commencement of work.

Dust should be controlled at source by the use of appropriate plant handling techniques, good maintenance and housekeeping. A list of appropriate mitigation measures is presented in Table 9.

Should effective mitigation measures be enforced and implemented within a Dust Management Plan and/or CEMP then the residual impact of the construction phase will be 'not significant' for all the activities, with respect to dust soiling and PM_{10} effects.

It should be noted that these conclusions are based upon a conservative approach to the assessment. The distances between the dust-generating activities and dust-sensitive receptors may be greater than those stated.

Table 9: Mitigation Measures for a High Risk Site

Activity	Mitigation Measures	Key
Communications	Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	Highly Recommended
	Display the head or regional office contact information.	Highly Recommended
	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document.	Highly Recommended
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	Highly Recommended
	Make the complaints log available to the local authority when asked.	Highly Recommended
	Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book.	Highly Recommended
	Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are coordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.	Highly Recommended
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.	Highly Recommended
	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.	Highly Recommended
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	Highly Recommended

Activity	Mitigation Measures	Key
	Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction[9].	Highly Recommended
Preparing and maintaining the site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible	Highly Recommended
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	Highly Recommended
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.	Highly Recommended
	Avoid site runoff of water or mud.	Highly Recommended
	Keep site fencing, barriers and scaffolding clean using wet methods.	Highly Recommended
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	Highly Recommended
	Cover, seed or fence stockpiles to prevent wind whipping.	Highly Recommended
Operating vehicle/machinery and sustainable travel	Ensure all vehicles switch off engines when stationary - no idling vehicles	Highly Recommended
	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	Highly Recommended
	Impose and signpost a maximum – speed-limit of 15mph on surfaced and 10mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).	Highly Recommended
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	Highly Recommended
	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)	Highly Recommended

[9] Institute of Air Quality Management (2012), Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites.

Activity	Mitigation Measures	Key
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	Highly Recommended
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	Highly Recommended
	Use enclosed chutes and conveyors and covered skips.	Highly Recommended
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	Highly Recommended
	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	Highly Recommended
Waste Management	Avoid bonfires and burning of waste materials.	Highly Recommended
Demolition	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	Highly Recommended
	Ensure water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	Highly Recommended
	Avoid explosive blasting, using appropriate manual or mechanical alternatives.	Highly Recommended
	Bag and remove any biological debris or damp down such material before demolition.	Highly Recommended

If unmitigated, construction activities at the proposed development site have the potential to result in high risk for demolition activities. However, the implementation of appropriate mitigation measures, enforced through a Dust Management Plan or Environmental Management Plan, should effectively reduce the effects to negligible significance for all construction activities.

Exhaust emissions from construction vehicles and machinery will also impact on air quality during the construction phase. The number of construction vehicles using the local road network is likely to be small in comparison to normal traffic flows. Material separation, crushing and stockpiling on site for future use is planned, which will significantly reduce vehicle movements. The impact of emissions from such vehicles is therefore considered to be of negligible significance.

6 Conclusions

AECOM was commissioned to undertake a construction phase assessment to determine the potential dust impacts associated with demolition activities at the site of the Proposed Employment Development, Alpha Park, Chandler's Ford. The works include demolition of the existing steel-frame structures currently on the site of the proposed development.

A qualitative demolition phase assessment has been undertaken in accordance with the Institute of Air Quality Management's (IAQM) guidance on the assessment of dust from demolition and construction2 to determine the potential demolition phase effects.

With regard to potential impacts during the demolition phase, the assessment concludes the following:

- The site is mainly surrounded by industrial units. Residential properties are located within 50m to the north of the site. No ecological receptors, as defined by the guidance, are located within 50 m of the site.
- The estimated annual mean 2014 PM_{10} concentration in the study area is 18µg/m^3.
- Taking the above factors into consideration the sensitivity of the area to dust soiling and human health impacts was considered to be 'Medium'.
- As the total volume of the existing building to be demolished is greater than 50,000m^3, there will potentially be dusty construction material (e.g. concrete) and there will be on-site crushing, the potential dust emission magnitude is considered to be 'large'.
- The potential risk of dust soiling and human health impacts was determined to be 'High' during demolition activities, based on the 'large' dust emission magnitude and 'medium' sensitivity of the area.
- Appropriate mitigation measures were recommended to effectively control the effects during the construction phase. Dust levels will be monitored throughout the works in accordance with local authority dust protocols1.
- Following the implementation of appropriate mitigation measures, it is considered that impacts during the proposed demolition activities will be of 'negligible' significance and would not have a significant adverse effect on local air quality.

Appendix 1: Air Quality Objectives and Limit Values

Table 10: UK Air Quality Objectives set to Protect Human Health

Pollutant	National Air Quality Objective		Date to be Achieved by and Maintained thereafter
	Concentration	Measured as	
Benzene	5.0 µg/m^3	Annual Mean	31.12.2010
1,3-Butadiene	2.25 µg/m^3	Annual Mean	31.12.2003
Carbon Monoxide	10.0 mg/m^3	8-hour Mean	31.12.2003
Lead	0.25 µg/m^3	Annual Mean	31.12.2008
Nitrogen Dioxide	200 µg/m^3 not to be exceeded more than 18 times a year	1 Hour mean	31.12.2005
	40 µg/m^3	Annual Mean	
Particles (PM_{10})	50 µg/m^3 not to be exceeded more than 35 times a year	24 Hour Mean	31.12.2004
	40 µg/m^3	Annual Mean	31.12.2004
Particles ($PM_{2.5}$)	25 µg/m^3	Annual Mean	2020
Sulphur Dioxide	266 µg/m^3 not to be exceeded more than 35 times a year	15 Minute Mean	31.12.2005
	350 µg/m^3 not to be exceeded more than 24 times a year	1 Hour Mean	31.12.2004
	125 µg/m^3 not to be exceeded more than 3 times a year	24 Hour Mean	31.12.2004
Ozone	100 µg/m^3 not to be exceeded more than 10 times a year	8 Hour Mean	31.12.2005

Table 11: EU Limit Values set to Protect Human Health

Pollutant	EU Limit Value	Measured as	Date to be Achieved by and Maintained thereafter
Benzene	5 µg/m^3	Annual Mean	1 January 2010
Carbon Monoxide	10.0 mg/m^3	8-Hour Mean	1 January 2005
Lead	0.5 µg/m^3	Annual Mean	1 January 2005
Nitrogen Dioxide	200 µg/m^3 not to be exceeded more than 18 times per year	1 Hour Mean	1 January 2010
	40 µg/m^3	Annual Mean	
Ozone(Target)	120 µg/m^3 not to be exceeded more than 25 times per year	8-hour Mean	1 January 2010
Particles (PM_{10})	50 µg/m^3 not to be exceeded more than 35 times per year.	24 Hour Mean	1 January 2005
	40 µg/m^3	Annual Mean	1 January 2005
Particles ($PM_{2.5}$)	25 µg/m^3	Annual Mean	1 January 2015
Sulphur Dioxide	350 µg/m^3 not to be exceeded more than 24 times per year	1 Hour Mean	1 January 2005
	125 µg/m^3 not to be exceeded more than 3 times per year	24 Hour Mean	1 January 2005

Capabilities on project:
Environment

Appendix 2: Figures

Figure 1: Site Location and Potential Dust Impacts (Without Mitigation)

