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environmental consultants

SYD BISHOP & SONS LTD

PARKER TOWER, HOLBORN, LONDON BOROUGH OF CAMDEN

DEMOLITION PHASE NOISE, DUST & VIBRATION MANAGEMENT PLAN

FEBRUARY 2016

SYD BISHOP & SONS LTD
PARKER TOWER, HOLBORN, LONDON BOROUGH OF CAMDEN
DEMOLITION PHASE NOISE, DUST & VIBRATION MANAGEMENT PLAN

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1. INTRODUCTION

1.1 Background

1.1.1 Southdowns Environmental Consultants Ltd was instructed by Syd Bishop & Sons (Demolition) Ltd (SBS) to produce a Noise, Dust & Vibration Management Plan (NDVMP) for the demolition phase of Parker Tower, Holborn, which is in the London Borough of Camden (LBC).

1.1.2 The purpose of the NDVMP is to identify the level of risk of adverse noise, dust and vibration effects which may be caused by the demolition phase of the scheme, and ensure that potential effects are appropriately controlled so that the project is delivered with minimal disruption to the local community.

1.1.3 The Parker Tower development proposal was granted planning permission in December 2014 subject to a section 106 legal agreement. The legal agreement includes the requirement to submit to LBC for approval:

- demolition management plan;
- a method statement to identify specific measures which will be implemented to control gaseous and particulate matter emissions; and
- baseline PM_{10} monitoring data at three locations, including one co-located with an anemometer;

1.1.4 This NDVMP forms part of the LBC proforma Construction Environmental Management Plan (CEMP) for the demolition phase.

1.1.5 The NDVMP has been prepared to assist SBS with their management of noise, dust and vibration emissions from site and to ensure that the principles of best practicable means (BPM) and best practice are being adhered to.

1.1.6 This document has been prepared in accordance with the principles and requirements of the Camden Minimum Requirements [1], Guide for Contractors Working in Camden [2] and SBS Demolition Management Plan using the LBC pro forma [3].

1.1.7 The draft of the document was discussed with LBC and the trigger levels have been updated from the draft following discussion and agreement with LBC Environmental Health Officer Maya Rhodes.

1.1.8 This document will be communicated within the SBS organisation throughout the demolition project, and will be reviewed for continuing suitability.

1.2 Report Structure

1.2.1 Details of the site and the proposed scheme are described in the following section of this report. The demolition methods to be used are summarised in Section 3, whilst noise, dust and vibration control measures are listed in Section 4. Baseline information is presented in Section 5, whilst the noise, dust and vibration risk assessments are presented in Sections 6, 7 and 8 respectively. Finally, the management and monitoring protocol is detailed in Section 9.

2. SITE DETAILS AND OUTLINE CONSTRUCTION PROGRAMME

2.1 Site Description

2.1.1 The Parker Tower project worksite is located within the administrative boundary of the LBC. The scheme includes conversion, refurbishment and two storey extension of the existing 13 storey office tower and demolition of the two-storey podium and replacement with a 3 storey residential building.

2.1.2 The proposed demolition works are for the demolition of the two storey podium building at the base of the tower and the removal of the exterior cladding and glazing to the tower and the demolition and removal of the thirteenth floor.

2.1.3 The site is surrounded by mixed use medium rise buildings including residential properties, offices and retail units. To the north-west, on Newton Street, are the 6 storey Thurstan and Holland Dwellings residential buildings. The Grade II listed Church of the Holy Trinity is located to the north (now offices) beyond a community hall. A 4 storey grade II listed terrace house (now offices), No. 60 Parker Street, is located opposite the site on Parker Street. To the west of the site is mixed used residential and commercial units at 39-41 Newton Street. Immediately to the east of the site is 51 Parker Street and the flat above 51 Parker Street is currently being refurbished with completion at the end of January 2016.

2.1.4 A plan showing the Parker Tower project worksite is presented in Figure A1 of Appendix A. The anticipated start date of the demolition works is in April 2016.

2.2 Site Constraints and Sensitive Receptors

2.2.1 Receptors identified as sensitive to potential noise, dust and vibration emissions during the construction of Parker Tower are listed in Table 2.1, including approximate distances to the worksite. These receptors have been identified using a combination of site walkovers, investigation on Google Street View and information available on the LBC website. A plan showing the location of receptors in relation to the site is presented in Figure A1 of Appendix A.

Receptor I.D.	Property	Approx. closest Distance from Site (m)	Receptor Type
R1	Holland Dwellings 1	2	Residential
R2	Holland Dwellings 2	4	Residential
R3	Thurstan Dwellings 1	6	Residential
R4	Thurstan Dwellings 2	6	Residential
R5	Thurstan Dwellings 3	6	Residential
R6	Thurstan Dwellings 4	6	Residential
R7	Hall	2	Community
R8	Church of the Holy Trinity (south Façade)	17	Office
R9	115 Kingsway (commercial)	2	Commercial
R10	Secrets and flat above- 51 Parker Street	2	Residential/ Commercial
R11	60 Parker Street (commercial)	7	Commercial
R12	10 Great Queen St	7	Office
R13	Chambers & Partners - 39-41 Parker St	10	Office
R14	Wimbledon Buildings - Newton St	12	Residential
R15	Dragon Court	35	Office
R16	St. Joseph's Primary School	35	Educational
R17	8 Newton Street Flats	35	Residential

TABLE 2.1 SENSITIVE RECEPTORS AND APPROXIMATE DISTANCES FROM SITE

2.3 Hours of Work

2.3.1 Normal working hours for the Parker Tower demolition worksite are as follows:

- Monday – Friday: 08:00 - 18:00 hrs; and
- Saturday: 08:00 - 13:00 hrs.

2.3.2 There will normally be no demolition activity undertaken outside of standard construction hours, including on Sundays, Public Holidays or Bank Holidays. Deliveries may occur outside these hours and the need for out of hours deliveries will only be to meet LBC's Highway requirements, if any.

2.3.3 Saturday working will be limited to soft strip activities using manual hand tools and be internal within the buildings. The material removed will be kept within the building and loaded into the skips during normal weekday working hours.

2.4 Demolition Programme

2.4.1 A work programme showing weekly demolition activities scheduled to take place for the Parker Tower demolition is presented in Table 2.2.

2.4.2 The demolition programme, which shows the main activities due to take place as part of the demolition phase of works, is derived from the detailed schedule of works presented in the SBS Demolition Programme.

2.4.3 The programme is indicative and subject to change.

2.5 Section 61 'Prior Consent' Agreement

2.5.1 Before any works commence on site, the Principal contractor will obtain 'prior consent' under section 61 of the Control of Pollution Act [4].

2.5.2 Details of the s61 'Prior Consent' application will contain as a minimum:

- particulars of the work (to include site layout);
- hours of work;
- methods to be used;
- equipment/plant details;
- steps to reduce Noise and Vibration (BPM);
- programme;
- predicted noise levels; and
- finalised monitoring arrangements.

Activity Name	Week Commencing																															
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32
Site Setup																																
Service Isolations																																
Asbestos Removal																																
Hoarding																																
Soft Strip to Pub (behind façade)																																
Scaffolding to Pub and Podium																																
Basement Propping																																
Soft Strip to Main Tower																																
Concrete Separation Podium and Pub																																
Slab Penetrations for Scaffold																																
Demolition of Pub and Podium																																
Hoarding of Pub Perimeter																																
Scaffold to Main Tower																																
Tower Roof Demolition																																
Façade Removal																																
Fire Escape Staircase Removal																																

TABLE 2.2 PARKER TOWER DEMOLITION PROGRAMME

3. DEMOLITION METHOD SUMMARY

3.1 Overview

3.1.1 The demolition methodology presented in this document has been derived from the Demolition Management Plan and additional information provided by SBS.

3.2 Plant and Equipment

3.2.1 Activity plant lists have been obtained from SBS and are presented in Table B1 of Appendix B.

3.3 Demolition Methods

Site Setup

3.3.1 Site facilities will be delivered to site on either a flatbed vehicle with hydraulic lift equipment or on the rear of hook wagons. The cabin will be lifted into position by the vehicles hydraulic lift equipment. Guide ropes may be fitted to the cabin to safely guide and direct the cabin during the lifting and manoeuvring operations.

Asbestos Removal throughout Site

3.3.2 Asbestos flash guards are contained within electrical boxes which are screw fixed to the walls. All cables / ducts running into the box will be cut using bolt cutters where possible or a grinder for larger cables (grinders will not be used on Saturdays). The electrical boxes will then be removed whole using screw drivers with appropriate heads and bars to help lever the box off the wall if required. The box will then be double bagged before being placed in a sealed skip.

Asbestos Removal – Basement Boiler Room

3.3.3 The asbestos cement flue will be saturated using an airless sprayer and will be continually sprayed to avoid drying out. Bigger openings will be made around the flue using hand tools. Fixings will be carefully removed and lowered to the ground and double wrapped for placement into a sealed skip.

Asbestos Removal – Upstairs of Pub / Basement

3.3.4 Any floor covering (carpet), furniture / fixed units which have been laid over or sitting on the tiles will be removed. The tiles will be lightly sprayed with an airless sprayer. Tiles will be lifted using scraper blades, bagged and placed into a contained skip. Using scrapers, the bitumen will be scraped up and put into bags. The area will be cleaned with an H type vacuums following removal.

Enclosures

3.3.5 A mobile tower; will be used for access and as a working platform. Two H Type vacuums will be utilised per enclosure. All loose fixings will be removed before commencing with enclosure cleaning with 'H' type vacuums and tack rags.

Hoarding

3.3.6 Hoarding will be erected to segregate the works area. Drums are to be set out at 2500mm centres and levelled using timber packers. 150x75mm sawn timber posts will be set in concrete inside the drum. A nail gun will be used to secure the posts and plywood sheets. Four 100x50mm sawn timber rails will be secured to face of posts using nails. Rails are to be clad with 18mm WBP plywood using 50mm galvanised nails. The plywood and trim will be painted with two coats of paint

Soft Strip to Pub

3.3.7 The pub building will be soft stripped back to the original shell and core. The soft strip is to include the removal of; floor coverings; carpet tiles, suspended ceiling (ceiling tiles and grid system), non-load bearing partitions; glass / metal stud with plasterboard, toilets and services. Carpet tiles and vinyl floor coverings will be removed using spades and scrapers. All floor materials will be removed to the skips on the car park ramp internally via the lift.

3.3.8 The suspended ceiling is made up of ceiling tiles suspended in grid metal tracking. The tiles will be removed by hand and lowered to the floor and placed into barrows / trolleys before being removed internally to the skips. Using hand tools, the metal tracking will be removed and loaded into barrows / trolleys and removed internally to the skips.

3.3.9 The timber stud partitions will be removed using suitable hand held tools, namely pinch bars, picks and hammers. The wall structure is to be dismantled by removing the plasterboard coverings using the hammers and bars. Once exposed the metal stud work is to be removed using hand tools; screw drivers where screwed and bars where nailed.

3.3.10 The glass partitions will be removed by releasing the panels from the fixings using hand tools. Materials will be removed and loaded into barrows or trolleys and removed to the skips.

3.3.11 Toilet wall and floor tiles will be removed using scrapers and spades. The toilet and sinks will be removed using hand tools to remove from the fixings whole, or broken out using mattocks or hammers. Waste materials will be loaded into barrows or trolleys and removed into skips.

Scaffolding to Pub and Podium

3.3.12 Scaffolding will be erected for the purposes of access and as a working platform for hand demolition. To prevent dust migration off site, the scaffolding will be fully sheeted with Monarflex. This will be erected to all visible elevations of the building. The scaffolding will be deconstructed lift by lift as the structural demolition proceeds.

Basement Propping

3.3.13 All steels pre- fabricated or assembled as frames to be delivered to site on 7.5 tonne flatbed lorry and unloaded into the designated unloading area. All steels to be loaded into basement via a temporary ramp and specifically made wheeled bogies.

3.3.14 Fully fabricated frames will be positioned with the fixings drilled first and Excalibur bolts fitted and tightened when base of frame has been aligned with the wall. Holes will be drilled for chemical fix anchors and then left to cure as above.

Soft Strip to Main Tower

3.3.15 The soft strip of the main tower will be similar to the methods described for the pub strip out and the waste will be cleared using the lifts to avoid the need for chutes.

Concrete Separation Podium and Pub

3.3.16 The segregation cuts through slabs will be formed using a 415v high frequency track saw unit. The track will then be bolted to the slab with 2 no rawl bolt fixings to each track set up. A series of guard mounted saw blades from 600mmØ to 800mmØ are remotely operated. The first operation is to pre-cut approximately 50mm deep. This process will be repeated to the preferred depths of the slab. The sawing process will be repeated when the above floor has been segregated.

Demolition of Podium

3.3.17 A Brokk 180 demolition robot will be positioned on the roof and will break out the concrete slab with the breaker attachment for top down demolition. Debris is to fall to the floor below and be cleared on a regular basis using a bobcat or excavator. Where practicable the concrete will be munched but it is noted there are thick beams where a breaker will be needed for the removal of concrete and the breaker may be needed to provide an access point for the muncher at each floor.

3.3.18 External walls to be hand demolished using a handheld pneumatic breaker. The process will then be repeated to the floor below. The external wall for a particular floor level will only be demolished once the floor has been removed, as far as practicable to provide a barrier for the floor demolition works.

Scaffold to Main Tower

3.3.19 Scaffolding will be erected for the purposes of access and use as a working platform for hand demolition. All elevations of scaffolding will be fully sheeted to prevent dust migration off site. The scaffolding will be erected to all visible elevations of the building. To the rear of the building, ladder beams will be required for the exposed section of the building above the adjacent structures and sheeted.

3.3.20 Scaffold to be tied back to into building at a maximum of 6m horizontally and 4m vertically. The scaffolding will be deconstructed lift by lift as the demolition proceeds.

Tower Roof Demolition

3.3.21 All the roof coverings and tanks will be demolished prior to demolishing the slab using reciprocating saws grinders and hand tools. The roof will be demolished using a Brokk 180. The Brokk will be taken to the roof using the hoist and positioned on the roof slab breaking the concrete using a breaker attachment. The debris will fall to the floor below and be cleared on regular intervals to prevent overloading of the floors.

Façade Removal

3.3.22 The curtain wall will be removed using hand tools and power tools with the assistance of a small star lifter crane. Star lift crane to be positioned on the floor above and using vacuum suckers attach to the glass panel. Operatives on the floor below will remove the cover plates and gaskets to allow the glass panel to be lifted out of the frame and lowered onto a trolley.

Fire Escape Staircase Removal

3.3.23 The Brokk is to be delivered on a flat bed or in a roll on/off skip before tracking its way to the staircase and up to the top landing. The Brokk will position itself on the stair flight to enable it to demolish the top landing and work its way down the stair flight to the half landing breaking the concrete with a breaker attachment.

3.3.24 Once the Brokk has demolished the landing and a flight of stairs, works will stop to allow the debris to be cleared into wheelie bins and taken down the lift to the skips in the compound. Once the debris is clear the half landing and the next flight can be demolished. This process will be repeated on each level

3.3.25 Once the glass panels have been removed, the transoms and mullions can be released either by unbolting or cutting using power tools if the bolts cannot be released.

3.4 Site Access

3.4.1 All construction vehicles will enter site from the existing entrance on Newton Street. Vehicles will turn left from Kingsway, continue on Parker Street and then right into Newton Street.

3.4.2 All deliveries to, and collections from, the site will be booked in with a minimum of 24 hours' notice. Drivers will call 20 minutes ahead of arriving on site to adhere to the delivery slots provided.

3.4.3 No vehicles are to park on Newton Street or Parker Street and, to adhere to the delivery slots provided.

3.4.4 All lorries will reverse into site to allow drop off skips on the base of ramp, to provide the maximum barrier effect from the adjacent wall (about 4m in height at this location).

4. NOISE DUST VIBRATION CONTROL MEASURES

4.1 Demolition Methods

4.1.1 The control measures detailed in this section have been developed in accordance with the proposed methods of deconstruction for this project which are summarised in Section 3 of this document. Deviation from approved method statements will be permitted only with prior approval from relevant parties. This will be facilitated by formal review before any deviation is undertaken.

4.2 Site Personnel

4.2.1 All operatives on site will be trained to ensure that noise, dust and vibration emission is minimised and that Best Practicable Means (BPM, as defined in Section 72 of the Control of Pollution Act 1974) are implemented at all times. Works will be checked regularly by Site Engineers to ensure that BPM is being undertaken and where necessary corrective actions implemented.

4.2.2 Employees must show consideration to the sensitive receptors and must not generate unnecessary noise when working on the site, or when leaving and arriving at work. This will be communicated through the site Induction, Start of Shift Briefings and Tool Box Talks with supervision on site at all times.

4.2.3 Suitable areas within the site compound will be provided for employees i.e. designated smoking areas, to reduce disruption around the site boundary.

4.2.4 Access to the work site will be facilitated at all reasonable times for inspection by the local authority environmental health personnel, following appropriate site specific induction and / or health and safety training.

4.3 General Noise Dust and Vibration Control Measures

4.3.1 The mitigation measures presented below have been developed in accordance with the guidance set out in the LBC minimum requirements and information for contractors.

4.3.2 BPM will be used to reduce noise and vibration levels at all times. Where practicable the control measures set out in BS 5228:2009+A12014 [5] will also be implemented.

4.3.3 The best practice measures set out in Chapter 5 and appendices of the Mayor of London's Supplementary Planning Guidance [6] will be implemented to control dust and emissions from the worksite.

4.4 General Demolition Control Measures include:

G1. development and implementation of a stakeholder communication plan that includes community engagement before work commences on site and includes stakeholder meetings.

G2. choice of methodology/technique for noisy and dusty operations (including site layout) has been considered in order to eliminate or reduce emissions at sensitive locations;

G3. fixed items of demolition plant will be electrically powered in preference to diesel or petrol driven;

G4. installation of solid hoarding around the site perimeter;

G5. equipment will be well-maintained and will be used in the mode of operation that minimises noise;
G6. equipment will be shut down when not in use or throttled down to a minimum during waiting period;
G7. plant employed for any activity associated with the construction works will be operated in a manner such that noise emissions are controlled and limited as far as reasonably practicable;
G8. avoid use of diesel or petrol powered generators by using mains electricity;
G9. use of electrically powered plant where practicable;
G10. make a complaints log available to the local authority when asked;
G11. agreement of monitoring locations with the LBC;
G12. vehicles shall not wait or queue on the public highway with engines running (unless the engine is required to power the operation of the vehicle e.g. concrete wagon); and
G13. all materials will be handled in a manner that minimises noise, vibrations and dust emission.

4.5 Noise and Vibration Control Measures

NV1. Where possible, works are to be carried out behind the building envelope to reduce noise impact on sensitive receptors;
NV2. hoarding will be installed around the perimeter of the worksite and 3.6m hoarding to the boundary with Holland and Thurston Dwellings;
NV3. the façade of the podium closest to the dwellings will be maintained as high and as intact as practicable during the demolition of each level of the podium;
NV4. mobile acoustic enclosure (or three sided surround) with absorptive lining will be used where practicable to mitigate noise from breakers and diamond sawing;
NV5. scaffolding to be covered with Monarflex MonarSound or similar to the façade of the podium facing Holland and Thurston Dwellings and the dwelling to the north and to be inspected and maintenance to sealed fixing points and overlaps;
NV6. materials will transported within the building and then placed into skips with care to minimise noise;
NV7. sound absorption panels will be used around the skips to minimise reflection of noise when material is placed in the skips;
NV8. loading of material into vehicles will, as far as reasonable practicable, be undertaken at the bottom of the ramp to provide the maximum barrier effect from the retaining wall;
NV9. where possible, breaking of concrete will be undertaken using non-percussive techniques (i.e. crushing, munching or splitting) though the thickness of the beams and creating a penetration into the slab and reach of the Brokk means breaking will be required in some areas;
NV10. plan for breaking activity to take place, where practical, during periods when occupants of the nearest buildings are least likely to be sensitive to vibration;
NV11. loading of material into vehicles will, as far as reasonable practicable, be undertaken within designated bays within the site boundary and close to the hoarding, to maximise the barrier effect;

NV12. all vehicles entering and leaving the site will be fitted with directional broadband reversing alarms as a mandatory requirement, and banksmen will be utilised, as far as reasonably practicable;
NV13. No deliveries will take place on Saturdays;
NV14. Saturday works will be limited to soft strip activities within the building and using manually powered hand tools;
NV15. noisy plant will be kept as far away as possible from sensitive areas;
NV16. each item of plant used will comply with the noise limits quoted in the relevant European Commission Directive 2000/14/EC/United Kingdom Statutory Instrument (SI) 2001/1701 [7] where reasonably available;
NV17. vehicles and mechanical plant employed for any activity associated with the demolition works will be fitted with effective exhaust silencers;
NV18. contact details of site management and person responsible for noise and vibrations to be cleared displayed on the site hoarding;
NV19. continuous noise monitoring system with trigger levels and LAeq remaining facility to allow site engineers to modify works to avoid exceedances of the site action levels;
NV20. vibration monitoring during demolition of the podium;
NV21. partial vibration isolation from Thurston and Holland Dwellings by the air gap from the ramp;
NV22. attended noise and vibration BPM audit and monitoring at receptors during breaking and sawing activities;
NV23. enhanced community relations and advances notice during breaking and sawing activities;
NV24. staff trained in BS5228, in particular methods to minimise noise during demolition;
NV25. where possible deliveries will be arranged to prevent vehicles queuing outside site; and
NV26. the management and monitoring programme detailed in Section 9 of this document will be strictly followed to at all times.

4.6 Dust Control Measures

D1. display of the name and contact details of person(s) accountable for air quality pollutant emissions and dust issues on the site boundary;
D2. display the head SBS office contact information;
D3. record and respond to all dust and air quality pollutant emissions complaints;
D4. regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to LBC when asked;
D5. regular dust soiling checks of buildings within 100m of site boundary and cleaning to be provided if necessary;
D6. increased frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions are being carried out, and during prolonged dry or windy conditions;

D7. regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised;
D8. soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust) hoarding will be installed around the perimeter of the worksite;
D9. recording of any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and the action taken to resolve the situation is recorded in the log book;
D10. site fencing, barriers and scaffolding to be kept clean using wet methods;
D11. no blasting, use of mechanical demolition instead;
D12. avoidance of run-off;
D13. plant layout to maximise distance between plant and dust sensitive receptors;
D14. cutting equipment to be used with water suppressant or suitable extract system;
D15. Monarflex scaffold sheeting will be employed to help contain dust;
D16. damping down of surfaces, particularly during dry weather;
D17. pulveriser attachments on the Brokk to be used instead of breakers where practicable;
D18. bagging and removal of any biological debris or damp down of material prior to demolition;
D19. use enclosed chutes or transfer of material within the building and covered skips;
D20. drop heights to be minimised wherever possible;
D21. no burning of waste wood or other materials on site;
D22. a suitable method for immediate clean-up of spillages of dusty materials in place;
D23. non-road mobile machinery (NRMM) used on site will operate ultra-low sulphur diesel (meeting the specification within EN590:2014 [8];
D24. all road vehicles to comply with the LEZ;
D25. it will be written into relevant sub contracts that all NRMM should meet Stage IIIB emission criteria, unless it can be demonstrated that Stage IIIB equipment is not available. If Stage IIIB equipment is not available, NRMM must be fitted with particle traps and / or catalytic exhaust treatment wherever possible and meet the requirements of the GLA exemption policy. A schedule of NRMM will be maintained on site and issued to LBC Environmental Officers at regular Intervals or uploaded onto the NRMM register. Diesel sources will be recorded on the same document;
D26. an inventory of all NRMM will be kept on site and all machinery should be regularly serviced and service logs kept on site for inspection;
D27. effective cleaning methods and retention of hard surfacing for site haulage routes;
D28. all loads entering and leaving site to be covered where appropriate;
D29. requirements for a change of shoes and clothes before going off-site to reduce transport of dust;
D30. 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;
D31. avoid dry sweeping of large areas;
D32. vehicle washing at site exit;

D33. application of dust suppressants at the exit of the demolition site
D34. use of hand mixing of concrete for hoarding drums rather than machine mixing;
D35. internal and external roads cleaned effectively, as required, to prevent dust from tyre contact;
D36. reuse and recycle waste to reduce dust from waste materials
D37. fine powders to be sealed after use and enclosed in containers or silos;
D38. three months baseline monitoring of PM_{10} prior to the commencement of works;
D39. real-time PM_{10} monitoring at three locations and email alerts on exceedance of the site action level and daily level; and
D40. the management and monitoring programme detailed in Section 9 of this document will be strictly followed to at all times.

5. BASELINE INFORMATION

5.1 Park Tower Baseline Monitoring

5.1.1 Prior to the commencement of demolition works in January 2016, continuous baseline noise and vibration monitoring had been undertaken by Sandy Brown Associates LLP as part of an environmental noise and vibration survey. From this noise survey report [9], measured noise levels have been extracted for this NDVMP, together with supplementary baseline data obtained.

5.2 Noise

5.2.1 Continuous ambient baseline noise monitoring was conducted prior to the commencement of demolition works at the Parker Tower worksite. Data was captured at a single location in the north-east corner of site between Wednesday 7th November and Monday 11th November 2012. Short term attended measurements were performed at a number of positions around the Parker Tower site on Wednesday 7th November and Monday 12th November 2012 to calculate the road noise levels expected on different facades of Parker Tower.

5.2.2 The measured free-field ambient noise levels were $L_{Aeq,16hr}$ 57dB These noise levels have been used to derive indicative average ambient noise levels during normal working hours prior under façade conditions of between $L_{Aeq,10hr}$ and $L_{Aeq,5hr}$ of between 60 and 66 dB, dependent on location in relation to the two dominant sources of noise, the Kingsway and High Holborn roads.

5.2.3 The baseline at the actual monitoring locations will be updated when the noise monitors are installed prior to the commencement of demolition works.

5.3 PM_{10} Concentrations

5.3.1 To provide an indication of the annual variation of ambient PM_{10} concentrations in the area, data has been obtained from Defra Background Maps for the year 2011 [10].

5.3.2 The Defra annual mean concentrations for 2011 at the appropriate grid square (530500,181500) show the annual mean PM_{10} concentration to be 27 μgm^{-3}. The future projection of the background PM_{10} concentrations has not been used because of concerns regarding the validity of future projections.

5.3.3 The LAQN [11] reports that the LBC roadside air quality monitoring station located at Shaftsbury Avenue measured an annual mean PM_{10} concentration of 27 μgm^{-3} in 2014.

5.3.4 Baseline PM_{10} monitoring using an indicative light scattering monitoring system has a mean concentration of 31 μgm^{-3} at the AQ1 and 32 μgm^{-3} at AQ3 monitoring locations from over 3 months of monitoring data available between October and February. The AQ2 baseline location is at a greater height (on top of the two storey podium) and in this location the mean concentration was 23 μgm^{-3}. The measured concentrations in this period are likely to be higher than the annual mean as a result of two Saharan dust events and winter inversions during the baseline monitoring period.

5.4 Vibration

5.4.1 Prior to the demolition works commencing the Peak Particle Velocity (PPV) baseline will be measured. Vibration from movement of trains on the Piccadilly line has been noted during site visits.

6. NOISE RISK ASSESSMENT

6.1 Overview

6.1.1 This section presents an assessment of the risk of demolition noise generated by the Parker Tower work site, and the associated potential adverse effects on the surrounding area.

6.1.2 An assessment of the risk of potential noise effects has been undertaken based upon the plant and equipment, scheduled construction activities and the programme of works as presented in this document.

6.1.3 Noise levels have been predicted at sensitive receptors arising from the demolition activities.

6.1.4 Receptor calculation locations have been defined following the sensitive receptors specified in Table 2.1, while the programme of works has been based on that provided in Table 2.2.

6.1.5 Activity plant lists have been obtained from SBS and are presented in Table B1 of Appendix B. Plant percentage on-times have been derived based on the usage of plant during a 10 hour working day (5 hours for Saturday) and the noise level has been calculated for this period.

6.2 Calculation Assumptions

6.2.1 Construction noise levels have been calculated using the methodology presented in BS 5228-1:2009+A1:2014 - Code of practice for noise and vibration control on construction and open sites.

6.2.2 Calculations have been made using the simple barrier correction method of 0\5\10 dB, as defined within BS 5228-1:2009+A1:2014, assuming flat topography surrounding the site.

6.3 Predicted Noise Levels

6.3.1 Predicted activity noise levels are presented in Table 6.1.

6.3.2 Worst-day in week receptor noise levels are presented in Table 6.2 and Saturday noise levels in Table 6.3. The predicted noise levels take account of BPM and site-specific mitigation measures stated in Section 4 of this document. The highest predicted façade noise level (i.e. the worst affected floor) for each property is presented.

TABLE 6.1

Receptor No.	Address	Calculated Activity Noise Level $L_{Aeq,T}$ dB													
		Site Setup	Asbestos Removal	Hoarding	Soft Strip to Pub (behind façade)	Scaffolding to Pub and Podium	Basement Propping	Soft Strip to Main Tower	Concrete Separation Podium and Pub	Slab Penetrations for Scaffold	Demolition of Pub and Podium	Hoarding of Pub Perimeter	Scaffold to Main Tower	Tower Roof Demolition	Façade Removal	Fire Escape Staircase Removal
R1	Holland Dwellings 1	64	65	70	69	71	68	68	85	83	84	68	69	77	72	77
R2	Holland Dwellings 2	64	59	72	63	71	68	62	83	84	82	64	69	77	67	77
R3	Thurstan Dwellings 2	64	56	72	60	71	68	59	82	82	82	62	69	77	66	76
R4	Thurstan Dwellings 3	64	54	73	59	71	68	57	83	82	83	61	69	77	66	76
R5	Thurstan Dwellings 4	64	53	74	58	71	68	56	84	81	83	61	69	76	66	76
R6	Thurstan Dwellings 5	*64*	*52*	*72*	*57*	*71*	*68*	*55*	*84*	*80*	*83*	*60*	*69*	*76*	*66*	*75*
R7	Hall	*60*	*51*	*71*	*56*	*67*	*64*	*54*	*85*	*79*	*85*	*59*	*64*	*75*	*67*	*75*
R8	Church of the Holy Trinity (south Façade)	*47*	*43*	*57*	*48*	*53*	*46*	*46*	*75*	*74*	*75*	*51*	*48*	*66*	*57*	*67*
R9	115 Kingsway (commercial)	*47*	*50*	*68*	*54*	*64*	*52*	*52*	*85*	*85*	*84*	*58*	*54*	*75*	*68*	*75*
R10	Secrets Night Club and flat above- 51 Parker Street	*47*	*45*	*70*	*44*	*54*	*44*	*48*	*75*	*75*	*74*	*48*	*51*	*75*	*68*	*76*
R11	60 Parker Street (commercial)	*46*	*42*	*63*	*47*	*56*	*42*	*45*	*81*	*74*	*78*	*53*	*49*	*75*	*65*	*75*
R12	10 Great Queen St	*50*	*44*	*70*	*57*	*61*	*45*	*51*	*84*	*77*	*84*	*64*	*52*	*81*	*65*	*71*
R13	Chambers & Partners - 39-41 Parker St	*56*	*49*	*61*	*53*	*57*	*50*	*50*	*71*	*72*	*78*	*58*	*51*	*66*	*60*	*67*
R14	Wimbledon Buildings - Newton St	*53*	*49*	*62*	*56*	*59*	*52*	*52*	*80*	*70*	*80*	*60*	*54*	*72*	*62*	*72*
R15	Dragon Court	*48*	*44*	*58*	*48*	*51*	*47*	*47*	*71*	*66*	*71*	*51*	*49*	*69*	*58*	*59*
R16	St. Joseph's Primary School	*48*	*39*	*49*	*44*	*47*	*42*	*43*	*65*	*65*	*65*	*47*	*43*	*63*	*50*	*59*
R17	8 Newton Street Flats	*48*	*44*	*57*	*51*	*54*	*47*	*47*	*76*	*77*	*76*	*56*	*50*	*69*	*58*	*69*

: PREDICTED RECEPTOR $L_{AEQ,T}$ NOISE LEVELS FROM INDIVIDUAL DEMOLITION ACTIVITIES

Notes:
[1] Shading identifies via gradient predicted noise levels from 75 – 80dB in orange and >80 dB in red.

Receptor No.	Address	$L_{Aeq,10hr}$ dB Week Commencing																														
		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18	Week 19	Week 20	Week 21	Week 22	Week 23	Week 24	Week 25	Week 26	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32
R1	Holland Dwellings 1	72	65	75	75	85	84	84	84	84	71	72	72	72	72	69	69	69	79	79	79	79	78	78	78	78	78	78	72	72	72	72	72
R2	Holland Dwellings 2	73	59	73	73	83	82	82	82	82	66	70	70	70	70	69	69	69	78	78	78	78	77	77	77	77	77	77	67	67	67	67	67
R3	Thurstan Dwellings 2	73	56	73	73	82	82	82	82	82	64	69	69	69	69	69	69	69	77	77	77	77	76	76	76	76	76	76	66	66	66	66	66
R4	Thurstan Dwellings 3	74	54	73	73	83	83	83	83	83	63	69	69	69	69	69	69	69	77	77	77	77	76	76	76	76	76	76	66	66	66	66	66
R5	Thurstan Dwellings 4	75	53	73	73	84	83	83	83	83	62	69	69	69	69	69	69	69	77	77	77	77	76	76	76	76	76	76	66	66	66	66	66
R6	Thurstan Dwellings 5	72	52	73	73	84	83	83	83	83	61	69	69	69	69	69	69	69	76	76	76	76	76	76	76	76	76	76	66	66	66	66	66
R7	Hall	71	51	69	69	85	85	85	85	85	60	65	65	65	65	64	64	64	76	76	76	76	75	75	75	75	75	75	67	67	67	67	67
R8	Church of the Holy Trinity (south Façade)	57	43	55	55	75	75	75	75	75	52	50	50	50	50	48	48	48	67	67	67	67	67	67	67	67	67	67	57	57	57	57	57
R9	115 Kingsway (commercial)	76	50	65	65	85	84	84	84	84	59	56	56	56	56	54	54	54	75	75	75	75	76	76	76	76	76	76	68	68	68	68	68
R10	Secrets Night Club and flat above- 51 Parker Street	70	45	56	56	75	74	74	74	74	51	53	53	53	53	51	51	51	76	76	76	76	77	77	77	77	77	77	68	68	68	68	68
R11	60 Parker Street (commercial)	63	42	57	57	81	78	78	78	78	53	51	51	51	51	49	49	49	75	75	75	75	75	75	75	75	75	75	65	65	65	65	65
R12	10 Great Queen St	70	44	63	63	84	84	84	84	84	64	55	55	55	55	52	52	52	81	81	81	81	72	72	72	72	72	72	65	65	65	65	65
R13	Chambers & Partners - 39-41 Parker St	62	49	60	60	71	78	78	78	78	59	53	53	53	53	51	51	51	67	67	67	67	67	67	67	67	67	67	60	60	60	60	60
R14	Wimbledon Buildings - Newton St	63	49	62	62	80	80	80	80	80	61	56	56	56	56	54	54	54	72	72	72	72	73	73	73	73	73	73	62	62	62	62	62
R15	Dragon Court	58	44	55	55	71	71	71	71	71	53	51	51	51	51	49	49	49	69	69	69	69	69	69	69	69	69	69	58	58	58	58	58
R16	St. Joseph's Primary School	52	39	51	51	65	65	65	65	65	49	46	46	46	46	43	43	43	63	63	63	63	63	63	63	63	63	63	50	50	50	50	50
R17	8 Newton Street Flats	58	44	57	57	76	76	76	76	76	56	52	52	52	52	50	50	50	69	69	69	69	70	70	70	70	70	70	58	58	58	58	58

TABLE 6.2: PREDICTED WORST DAY WEEKLY RECEPTOR NOISE LEVELS FROM THE COMBINED CONSTRUCTION ACTIVITIES

Notes: [1] Shading identifies predicted noise levels from 75 – 80 dB in orange and from >80 dB in red.

Receptor No.	Address	Calculated Noise Level $L_{Aeq,5hr}$ dB	
		Soft Strip to Pub (behind façade)	Soft Strip to Main Tower
R1	Holland Dwellings 1	41	38
R2	Holland Dwellings 2	38	36
R3	Thurstan Dwellings 2	36	33
R4	Thurstan Dwellings 3	34	30
R5	Thurstan Dwellings 4	34	29
R6	Thurstan Dwellings 5	32	28
R7	Hall	27	27
R8	Church of the Holy Trinity (south Façade)	19	11
R9	115 Kingsway	20	25
R10	Secrets Night Club - 43 Parker Street	20	27
R11	60 Parker Street	25	25
R12	10 Great Queen St	45	35
R13	Chambers & Partners - 39-41 Parker St	42	31
R14	Wimbledon Buildings - Newton St	37	25
R15	Dragon Court	24	19
R16	St. Joseph's Primary School	20	19
R17	8 Newton Street Flats	28	20

TABLE 6.3: PREDICTED DEMOLITION ACTIVITY NOISE LEVELS FOR SATURDAYS FOR SATURDAY

7. DUST RISK ASSESSMENT

7.1 Overview

7.1.1 The purpose of this assessment is to identify the category of risk from dust emission associated with the demolition phase, and to propose a suitable mitigation strategy to ensure negative impacts and adverse effects are controlled and reduced.

7.1.2 Dust from demolition processes contains a range of particle types and material sizes which can cause adverse effects. The pollutant of concern in this assessment is particulate matter (PM_{10}), defined as a mass fraction of airborne particulates with an aerodynamic diameter of 10 microns or less. Particulate matter less than 2.5 microns ($PM_{2.5}$) and nitrogen dioxide (NO_2) are also considered.

7.1.3 PM_{10} and $PM_{2.5}$ are respirable and can be drawn deep into the lungs and cause health problems. The fraction of dust that is larger than 10 µm is filtered by the nose and throat. PM_{10} and $PM_{2.5}$ can cause respiratory and cardiovascular illness and even death. NO_2 inflames the lining of the lung and can lead to shortness of breath and coughing and can reduce immunity to lung infections like bronchitis.

7.1.4 The assessment has been undertaken in accordance with The Mayor's Supplementary Planning Guidance (SPG) to control dust and emissions from construction related activities (2014). The main steps are as follows:

- identify magnitude of dust emission for each of the phases the worksite;
- Identify the sensitivity of the receptors;
- Identify the sensitivity of the area;
- determine potential risk category of each works phase; and
- outline how each risk will be mitigated.

7.1.5 The risk assessment follows the SPG procedure in that the risks are assessed prior to mitigation.

7.2 Site Evaluation

7.2.1 The level of risk attached to a construction site is dependent not only on the size and scale of a development, but also the construction activities, the timing of works (seasonality) and the sensitivity of the surrounding area.

7.2.2 Details of the worksite and the proposed scheme are presented in Section 2 of this document.

7.2.3 The construction methodology and construction vehicle access arrangements are summarised in Section 3 of this document. Proposed works consist of the deconstruction of the two storey building at the base of the 13 storey office tower, removal of the exterior cladding and glazing of the tower, the deconstruction and removal of the thirteenth floor and the clearance of the internal finishes and walls.

7.2.4 An initial assessment was conducted to establish if a detailed assessment was required. As there are human receptors within 50 m of the site the assessment will proceed to detailed assessment. As there are no ecological receptors within 50 m of the boundary of the site or 50 m from the routes used by construction vehicles on the public highway (up to

500 m from the site entrances) there is no requirement to proceed further with an geological receptor assessment.

7.2.5 The distance from source to sensitive receptor is a key factor for determining the potential dust effects from a construction site. As a general guide, the main effects are at distances of less than 100 m. The distances from source that dust effects are felt is dependent on the extent and nature of mitigation measures, prevailing wind conditions and the presence of natural screening by, for example, vegetation or existing physical screening such as boundary walls and buildings.

7.2.6 This risk assessment considers the potential effects of the demolition phase at sensitive receptors for:

- The risk of health effects from an increase in exposure to PM_{10} and $PM_{2.5}$; and
- Annoyance from deposition of dust and soiling.

7.2.7 A map showing the worksite and distance buffers to nearby sensitive receptors is illustrated in Figure A2 and from the trackout route in Figure A3.

7.2.8 The dust emission magnitude has been considered for the demolition prior to mitigation, as required by the SPG.

7.2.9 Demolition activities include asbestos removal, stripping the interior of the pub and main tower building, concrete separation of the pub and podium, demolition of the pub and podium, tower roof demolition, tower building façade removal and fire escape staircase removal. Materials removed will be transferred internally within the building and disposed of into on the site skips at the bottom of the ramp.

7.2.10 The dust emission magnitude for the demolition phase has been assessed as Large as the work involves working with a potentially dusty material (concrete) and demolition activities > 20 m above ground level.

7.2.11 The sensitivity of the receptors needs to be considered for both dust and soiling effects on people and property and health impacts. There are high sensitivity receptors to dust and soiling effects on people and property, including residential receptors.

7.2.12 There are also high sensitivity receptors to human health impacts including residential and school receptors. There are 10-100 receptors within 20 m of the site. Between 20 – 100 m of the demolition area there will be approximately 200 dwellings and St. Joseph's primary school; between 100 – 350 m there is approximated to be more than 500 dwellings.

7.2.13 There is 10-100 high sensitivity receptors within 20 m and with a baseline annual mean PM_{10} concentration of between 24 and 28 μgm^{-3} the sensitivity of the area to human health impacts is considered to be High and the sensitivity of the area to dust and soiling effects on people and property.

7.2.14 Figure A2 shows the locations of the closest sensitive receptors and distance buffer bands from the site.

7.2.15 Table 7.1, below categorises the sensitivity of the area to the activity phases.

Sensitivity of the Area	Demolition
Dust Soiling Impacts	**High**. 10-100 receptors within 20 m of site.
Human Health Impacts	**High.** 10-100 receptors within 20m of the site with baseline PM_{10} concentrations between 24 and 28 μgm^{-3}.

TABLE 7.1: SENSITIVITY OF THE AREA

7.2.16 By considering the dust emission magnitude and the sensitivity of the area the risk of dust impacts can be defined as High risk for the demolition phase. A summary of the dust risk category is presented below in Table 7.2.

Summary	Demolition
Dust Soiling	High Risk
Human Health	High Risk

TABLE 7.2: SUMMARY DUST RISK CATEGORY

7.3 Baseline Conditions

7.3.1 Baseline information is presented in Section 5 of this document. The baseline dust and ambient air quality is influenced by road traffic, public transport and dust from construction sources. Data from the Shaftesbury Avenue automatic monitoring station indicates that the annual mean PM_{10} concentration for 2014 (to date) is 27 μgm^{-3}. This also the concentration obtained so far during the baseline survey.

7.4 Dust and Emission Control Measures

7.4.1 Dust and emission control measures are detailed in Section 4.

7.4.2 Site staff will conduct site inspections and report the visual observations in a dust inspection log which will be kept on site.

7.4.3 A personal responsible for dust and emissions will be appointed and there contact details displayed on the site boundary so that residents, businesses and stakeholders can contact them, if required.

7.4.4 Potential health impacts from dust emissions to site personnel will be addressed in the sites health and safety documentation.

8. VIBRATION RISK ASSESSMENT

8.1 Overview

8.1.1 This section presents an assessment of the potential risk regarding vibration generated by the construction works detailed in this document, and the associated adverse effects on the surrounding area.

8.1.2 The risk assessment has been based on an appraisal of the plant listed in this document, examining the likelihood of each item generating significant levels of vibration at receptors.

8.1.3 Receptor locations have been defined following the sensitive receptors specified in Table 2.1, while the programme of works has been based on that provided in Table 2.2.

8.2 Guidance Vibration Limits

8.2.1 Estimated vibration levels have been evaluated against guidance presented in relevant British Standards.

Building Damage

8.2.2 According to BS 7385 Part 2 [12] for residential or light commercial buildings, the threshold for the onset of potential cosmetic damage (i.e. formation of hairline cracks on drywall surfaces or the growth of existing cracks in plaster or drywall surfaces) to buildings varies with frequency. This ranges from a Peak Particle Velocity (PPV) (component) of 15 mms^{-1} at 4 Hz, rising to 20 mms^{-1} at 15 Hz, and to 50 mms^{-1} at and above 40 Hz. BS 7385: Part 2 also states that the probability of building damage tends towards zero at 12.5 mms^{-1} peak component particle velocity.

Subjective Response

8.2.3 According to guidance provided in BS 5228 Part 2, the threshold of vibration perceptible to humans lies around 0.14 to 0.3 mms^{-1}. The Standard also indicates that PPVs of around 1 mms^{-1} in residential environments are likely to cause complaints, but can be tolerable provided prior warning and explanation of the works is given to residents; whilst, vibration magnitudes of around 10 mms^{-1} are likely to be intolerable for more than a very brief exposure to this level.

Peak Particle Velocity Level	Description	Magnitude of Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.	Very Low
0.3 mm/s	Vibration might be just perceptible in residential environments.	Low (LOAEL)
1.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.	Medium (SOAEL)
10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level.	High

TABLE 8.1: MAGNITUDE OF DEMOLITION VIBRATION EFFECTS

8.3 Deconstruction Vibration

8.3.1 The use of a Brokk with hydraulic breaker attachments and hand-held pneumatic breakers may generate vibration effects at sensitive receptors during the deconstruction phase of this scheme. This plant will be used during the concrete separation of the podium and pub, slab penetration for scaffold, demolition of the pub and podium, tower roof demolition and fire escape staircase removal.

8.4 Estimation of Vibration Effects

8.4.1 Vibration effects at receptor locations during the breaking activity have been estimated, as this activity is considered to be the most significant vibration-induction activity.

8.4.2 Measured data obtained by Southdowns during the operation of an excavator with hydraulic breaker attachment has been used to derive a reference source level for the purpose of this assessment. The source vibration measurements, which are presented in Table 8.2 were obtained to provide an indication of the attenuation in vibration at source-receiver distances of up to 10 m.

Plant	Distance (m)	
	5	10
Breaker mounted to 3T excavator	1.2 mms^{-1}	0.7 mms^{-1}

TABLE 8.2: MEASURED PEAK PARTICLE VELOCITIES

8.4.3 Interpretation of the measured data presented in Table 8.2 shows that at eight meters from source, the three tonne excavator (which is comparable to a Brokk robot) was found to cause vibration levels of just above the 1.0 mms^{-1} considered as a medium magnitude effect, and beyond 10 m measured data fall to below 1 mms^{-1}, and are therefore considered as a low magnitude effect.

8.4.4 The demolition programme indicates that, for the period of works covered by this management plan, breaking activity may take place at various locations across the site, at least 2 m from any sensitive receptor. Therefore, a high magnitude of effect may be present.

8.4.5 It should be noted that the magnitude of vibration arising from demolition activities depends upon many factors and is highly variable, the presence of coupling between structural elements, providing energy transmission, can exacerbate as well as dampen vibration magnitudes. On this basis, the measured data presented in Table 8.2 should be considered as estimates of vibration which may occur during breaking activity at Parker Tower.

8.5 Vibration Control Plan

8.5.1 To control and minimise vibration effects caused by construction activity, the vibration mitigation measures listed in Section 4 of this report will be adopted at all times.

8.5.2 Particular care should be taken to reduce the use of the hand-held pneumatic breakers and the Brokk 180 with breaker attachments along the north-eastern boundaries of the site due to the presence of party walls.

8.5.3 A structural damage trigger level of below 10 mms^{-1} will be in place for the party wall at the north east end of the basement.

8.5.4 In cases where heavy breaking activity is scheduled to be undertaken within close proximity to receptor locations (<10 m), potential vibration impacts will be carefully managed and monitored. Where possible, such construction activities will be scheduled during periods when occupants of the nearest buildings are least likely to be sensitive to vibration. Also, the occupants of buildings in the surrounding area will be given sufficient notice of the planned construction works and are given sufficient information about the nature of the works. In addition, it is advised that continuous vibration monitoring is undertaken at the vibration monitoring locations detailed in Table 9.1, and during such works careful attention will be given to continuously measured vibration levels, to ensure that vibration does not exceed an acceptable limit.

9. MANAGEMENT AND MONITORING PROCEDURE

9.1 Purpose

9.1.1 This section details the approach to be taken by the site operators to ensure that noise, dust and vibration emissions are controlled, monitored and any problems or complaints are dealt with in a satisfactory manner.

9.2 On-Site Management of Noise Dust and Vibration

9.2.1 The Site Manager (or designated persons on site) will be responsible for the management of noise, dust and vibration emissions, and will be tasked with implementing the measures set out in this document.

9.2.2 The noise, dust and vibration control measures stated in Section 4 of this report will be adopted for the construction of this project.

9.2.3 Prior to the approval of any methodologies (i.e. method statements), discussions and workshops will be held with the relevant sub-contractor to ensure BPM is employed when carrying out all operations. Discussion will include measures to be adopted to minimise and/or change working practices that could foreseeably have the potential to cause excessive noise, dust or vibration.

9.2.4 Information relating to the control of noise, dust and vibration will be communicated to all site operatives through the site induction, start of shift briefings and tool box talks. As such, all site operatives will be trained to ensure that best practicable means are implemented at all times, and to show due consideration to sensitive receptors.

9.2.5 The monitoring programme set out in this section of the document will be implemented and maintained during construction of the project.

9.2.6 In recognition of the potential noise, dust and vibration impacts to receptors in the vicinity of the works, a process of public liaison and consultation will be maintained throughout the deconstruction period to ensure that neighbours are briefed on key site activities and given the opportunity to influence the works as appropriate.

9.3 Monitoring Procedure

9.3.1 As part of the overall management of noise, dust and vibration effects, SBS will implement an appropriate programme to monitor ambient noise, dust and vibration levels prior to the commencement of construction works.

9.3.2 The purpose of the environmental monitoring is to enable on-going and proactive management of noise, dust and vibration effects to sustain compliance with BPM and the limits agreed with the London Borough of Camden.

Monitoring Locations

9.3.3 Continuous unattended monitoring will be undertaken at suitable locations around the site. Noise, vibration and dust monitoring locations have been proposed and are listed in Table 9.1. A plan showing the proposed monitoring locations is presented in Figure A4 of Appendix A.

Monitoring Location ID	Closest Sensitive Receptor	Receptor Type	Environmental Aspect	Monitoring Position
N1	Thurston Dwellings	Residential	Noise	Microphone located on North West site boundary hoarding. (Free-field conditions)
N2	Holland Dwellings	Residential		Microphone located on North East site boundary. (Free-field conditions)
N3	51 Parker Street	Commercial/ Residential		Microphone located on South West site boundary. (Facade conditions)
VB1	Party wall of podium	Commercial	Vibration	Geophone fixed to party wall of podium closest to 51 Parker Street at basement level
AQ1	Thurston Dwellings	Residential	Dust/PM_{10}	Located on North West site boundary hoarding.
AQ2	Holland Dwellings	Residential		Located on North East site boundary hoarding.
AQ3	51 Parker Street	Commercial/ Residential		Located on South East site boundary hoarding.

TABLE 9.1: PROPOSED MONITORING LOCATIONS

9.3.4 Continuous PM_{10} monitoring is currently being undertaken to obtain a 3 month baseline. The baseline locations are similar to the proposed demolition monitoring locations though AQ3 will be moved to adjacent to 51 Parker Street once the flat above Secrets becomes occupied. AQ3 is currently located on the southern hoarding at the junction of Parker Street and Newton Street as there was no power or access at the hoarding location near 51 Parker Street.

9.3.5 The Mayor of London's Best Practice Guidance outlines the requirement for a "*…minimum of two automatic particulate monitors to measure PM_{10} levels*" for 'high or medium risk' sites such as Parker Tower. The proposed monitoring locations should form a transect across site to allow analyses of the source contributions to be carried out when necessary (e.g. when trigger thresholds are exceeded).

9.3.6 The Camden CMP proforma states that where a site is high risk for four particulate monitors should be used but it is noted a S.106 agreement is in place for three particulate monitors and an anemometer.

9.3.7 The monitoring locations provide sufficient noise, vibration and dust monitoring coverage at sensitive receptors around the site.

The use of an anemometer at one of the PM_{10} monitoring locations is also recommended to aid the identification of dust emissions sources.

Monitoring Duration

9.3.8 Based on the construction programme and risk assessments that have been undertaken and this document, it is proposed that noise and dust monitoring continues as proposed through to project completion.

9.3.9 Unattended vibration monitoring is proposed for the duration of the demolition activities involving the use of the breaker. Attended vibration monitoring will take simultaneous measurements to establish a transfer function between the VB1 monitoring location to the Parker Tower basement wall and the nearby offices behind.

Suitability

9.3.10 The monitoring proposal will be subject to agreement with LBC.

9.3.11 On-going review of monitoring locations should be undertaken throughout the duration of the project in response to periods of intense construction work or following receipt of concerns raised by nearby sensitive receptors.

Reporting

9.3.12 Monitoring data will be communicated in a monthly report containing presentation of the continuous monitoring data, with assessment against Site Action Levels and trigger levels (as presented in Section 9.4), including the cause and times that any exceedances occurred, and the action taken to stop the exceedance and prevent re-occurrence. A copy will be issued to LBC Environmental Health Officers on request.

9.3.13 In addition to monthly reports, monitoring data will be remotely accessible to enable on-demand interrogation. Furthermore, instant email alerts will be sent to relevant site personnel when Site Action Levels are exceeded. System checks will be competed on the first working day of the week to ensure the monitors are functioning correctly and logging data. An email will be issued to SBS and LBC Environmental Health Representatives confirming functionality. Where equipment fault is detected corrective action will be identified and implemented.

Alerts

9.3.14 In cases where the monitoring exercise indicates that a Site Action Level has been exceeded, the following steps will be undertaken:

- identification of the activity responsible for causing the exceedance
- where an Amber exceedance occurs due to site activity the site manager will monitor site emissions relevant to the alert, ensure BPM is being applied and where necessary review methods of working to reduce receptor levels to below the criteria. The site manager will also assess whether remaining work could continue to exceed the Amber threshold and if so, modify working methods, where practicable, giving reference to the mitigation measures set out in Section 4 of this report;
- where a Red exceedance is due to site activity the site manager will stop the relevant activity whilst alternative demolition methodology options are investigated, and where practicable adopted. If effective remedial action is not obvious, the site will consider an alternative technique or additional mitigation measures; and

- where Red exceedance alerts are received, details of the exceedance, the source and remedial action taken will be logged using an Incident Report Form, which will be made available to the local authority for review.

9.3.15 If elevated noise levels, dust concentrations or vibration levels are consistently experienced, SBS will commit to undertake a comprehensive BPM review of construction activities which may be contributing to the elevated levels.

9.4 Site Action Levels

9.4.1 To monitor noise, dust/PM_{10} and vibration impacts and the adoption of BPM, a series of Site Action Levels will be used to provide notification that investigation/action is required. Site action levels will be incorporated into the overall monitoring procedure which is set out in the following section and will be reviewed periodically throughout the project.

9.4.2 It is proposed to use 75dB as a trigger for the days when breaking and cutting are not taking place and 85 dB (or 79-81 dB for the tower roof demolition) for the days when the concrete separation or breaking is taking place.

9.4.3 The Site Action Levels for the monitors, also presented in Table 9.2 below, have been derived using the highest predicted demolition noise levels for the construction phase presented within this management plan. Site actions have been derived using the following rules:

- the 10 hour Red action noise level is 75 dB $L_{Aeq,10hr}$ or predicted worst day receptor noise level levels in Table 2.2 (85 dB $L_{Aeq,10hr}$ for days with breaking of the podium and 77-81 during tower roof demolition);
- the 1 hour Amber action noise level is 75 dB $L_{Aeq,1hr}$ or predicted worst day receptor noise level levels in Table 2.2 (85 dB $L_{Aeq,1hr}$ for days with breaking of the podium and 77-81 during tower roof demolition); and
- on Saturdays the trigger level will be set to the ambient $L_{Aeq,5hr}$ +3dB.

9.4.4 The amber SAL for PM_{10} is a 15 minute concentration of 150 μgm^{-3} and a higher red alert for PM_{10} of 250 μgm^{-3} has also been set.

9.4.5 A daily alert level with a 24 hour concentration of 50 μgm^{-3} has also been put in place. This is an indicative assessment and does not to assess compliance with the Air Quality Strategy (AQS) PM_{10} limit values as a reference method needs to be used to assess compliance with the limit values. The AQS limit values are for exposure to PM_{10} concentrations in those locations where members of the public are regularly present for the averaging period of the objective.

9.4.6 The occupational dust exposure of people in the work place is addressed through health and safety legislation.

9.4.7 Proposed site action levels are presented in Table 9.2. To ensure site action levels remain valid and effective, all levels will be regularly reviewed and amended where necessary, in agreement with LBC.

Monitoring Location ID	Site Action Level							
	Noise (dB, $L_{Aeq,T}$)				Particulates (PM_{10}, $\mu gm^{-3}{}_{15\ min}$)		Vibration (PPV $mms^{-1}{}_{5\ mins}$)	
	Weekdays 08:00 – 18:00 hrs		Saturdays 08:00 – 13:00 hrs		At all times		Weekdays 08:00 – 18:00 hrs; and Saturdays 08:00 – 13:00 hrs	
	Amber ($L_{Aeq,1hr}$)	Red ($L_{Aeq,10hr}$)	Amber	Red	Amber	Red	Amber	Red
All	75/85(breaking days)	75/85(breaking days)	60	63	150	250 (50 24hr)	2 (1 for dwellings)	5 (2 for dwellings)

TABLE 9.2: SITE ACTION LEVELS AT MONITORING LOCATIONS REPRESENTATIVE OF SENSITIVE RECEPTORS

Vibration:

[1] The PPV limits are based on an amber limit of 1 mms^{-1} for monitors which are stationed at a sensitive receptor and 2 mms^{-1} for monitors positioned on the site boundary or in commercial receptors.

[2] Following the attended vibration monitoring survey during breaking the monitor trigger level will be offset with the transfer function;

[3] Structural vibration triggers will also be in place

Particulates:

[3] The amber threshold concentration of 150 μgm^{-3} and red threshold of 250 μgm^{-3} may be exceeded on occasions due to ambient sources of PM_{10} other than the Parker Tower works;

[4] PM_{10}, $\mu gm^{-3}{}_{15\ min}$ alert dust concentration threshold is presented as the main cell value, the PM_{10}, μgm^{-3} daily alert dust concentration threshold is shown in brackets;

[5] Thresholds are set to incorporate a 1.3 multiplier designed to allow for the loss of volatile PM; and

[6] The Site Action Levels are derived from The Mayor's Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance July 2014.

9.4.8 For works on Saturday the trigger is reduced to the ambient noise level +3dB and if a trigger Is received the audio will be investigated and if demolition noise is audible and intrusive the works will be ceased until suitable mitigation measures are put in place so that the noise from the Saturday works are no longer intrusive.

9.5 Public Liaison and Consultation

9.5.1 Following the assessment procedure in The Mayor's Control of Dust and Emissions Supplementary Planning Guidance identifies the Parker Tower project as a 'high risk' site for the demolition phase. In a project of this scale, it is recognised that strong, relevant and proactive communication is required in order to inform neighbours and third parties who have interests in the project's progress.

Community liaison actions will include:

- management of stakeholder contact and distribution list;
- public meetings/presentations with community representatives will be undertaken on a quarterly basis as a minimum. The frequency of meetings will be increased, where necessary, in response to either an ad-hoc request, or request for increased frequency;
- monthly newsletters;
- interim look ahead notices; and
- procedures for dealing with emergencies and complaints.

9.5.2 Monthly newsletters will contain the information listed below and will be issued electronically to the stakeholder distribution list. Hard copies will be displayed at prominent positions on the perimeter hoarding.

- details of contact names and numbers;
- 24/7 helpline number;
- forthcoming activities on site;
- planning and design related activities;
- specific mitigation/control measures relevant to forthcoming activities; and
- anticipated completion dates for noise significant activities.

9.5.3 In addition to monthly newsletters, interim look-ahead notices will provide a pre-emptive community relations approach to cover upcoming works of particularly high sensitivity. The notices will contain a brief description of the proposed works, together with environmental control measures to be adopted, and will enable community stakeholders to plan activities taking into account upcoming site operations. Interim look-ahead notices will also be used to inform stakeholders of any out-of-hours works, including oversized site deliveries, which have not previously been notified.

9.6 Overruns

9.6.1 In the event of emergency overruns of works beyond the specified hours, LBC Planning and Environmental Health departments will be notified as soon as reasonably practicable. The overrun procedure will only be used in emergency and not as a regular function and is not anticipated to be required.

9.7 Complaints Procedure

9.7.1 All noise, dust or vibration complaints will be referred to the Construction Manager for immediate investigation. Complaints received outside of core working hours will be investigated at the start of the next working day unless the complaint requires immediate action (e.g. noise from an on-site alarm), in which case the 24-hour on-site security team will be briefed to address such issues which require immediate action.

9.7.2 Following receipt of a complaint, the construction manager will undertake an initial appraisal to check whether BPM is being used to control noise, dust and vibration, and to assess suitable corrective action.

9.7.3 To prevent further complaints of the same nature, corrective actions will be enforced for the remainder of those works.

9.7.4 Depending on the circumstance, the complaint investigation may include interrogation of historic noise, dust or vibration data from the nearest monitoring station, and/or the undertaking of additional attended measurements with assessment of those measurements against relevant thresholds. Attended surveys should incorporate a BPM audit to ensure that the BPM measures outlined in Section 4 of this report are being adhered to.

9.7.5 If complaints are received on a Saturday the construction manager will investigate the noise levels at the complainants property are audible and intrusive SBS cease works until suitable mitigation measures are put in place so that the noise from the Saturday works are no longer intrusive.

9.7.6 It should be recognised that further more involved investigative work may be required following the initial appraisal. The Construction Manager will also identify the requirement

for any alterations to the existing noise/dust/vibration monitoring and reporting programme as part of the complaint investigation.

9.7.7 All complaints received will be recorded, investigated and corrective actions implemented and feedback given to the complainant. SBS will maintain a log of any complaints received, subsequent actions taken to investigate the complaint and any actions which have been put in place to rectify the situation (if found necessary). A copy of the complaint log will be provided to LBC for review on request.

10. REFERENCES

1. London Borough of Camden. Camden's Minimum Requirements for building/construction/demolition sites. 2012

2. London Borough of Camden. Guide for Contractors Working in Camden. 2008.

3. SBS. Demolition Management Plan (LBC CMP Proforma). 2015.

4. SI. Control of Pollution Act. 1974.

5. BSI. BS 5228: 2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites.

6. Mayor of London. The Control of Dust and Emissions During Construction and Demolition: Supplementary Planning Guidance, 2014.

7. European Commission Directive 2000/14/EC/United Kingdom Statutory Instrument (SI) 2001/1701.

8. European Committee for Standardisation. EN590:2014. Automotive fuels Diesel Requirements and test methods. 2009.

9. Sandy Brown Associates LLP. Parker Tower Planning Report Version E. 2014

10. Department for Environment, Food & Rural Affairs. Background Air Quality Mapping Data for Local Authorities, 2011.

11. Environmental Research Group, King's College London. London Air Quality Network, 2015. http://www.londonair.org.uk/LondonAir/Default.aspx accessed December 2015.

12. BSI. BS 7385: 1993 Evaluation and Measurement for Vibration in Buildings; Part 2 guide to damage levels from groundborne vibration.

APPENDIX A: FIGURES

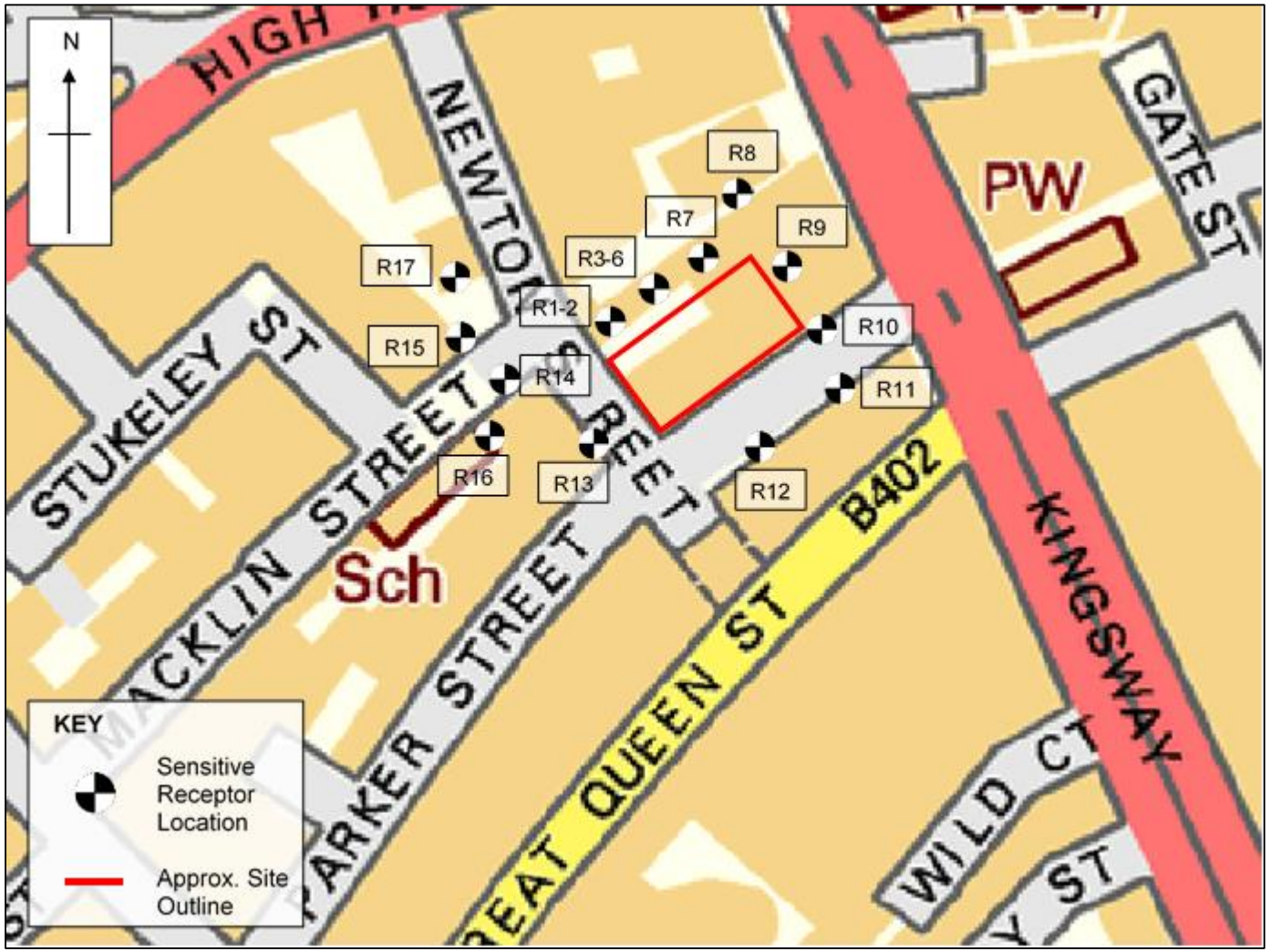

FIGURE A1: NOISE RECEPTOR LOCATION PLAN

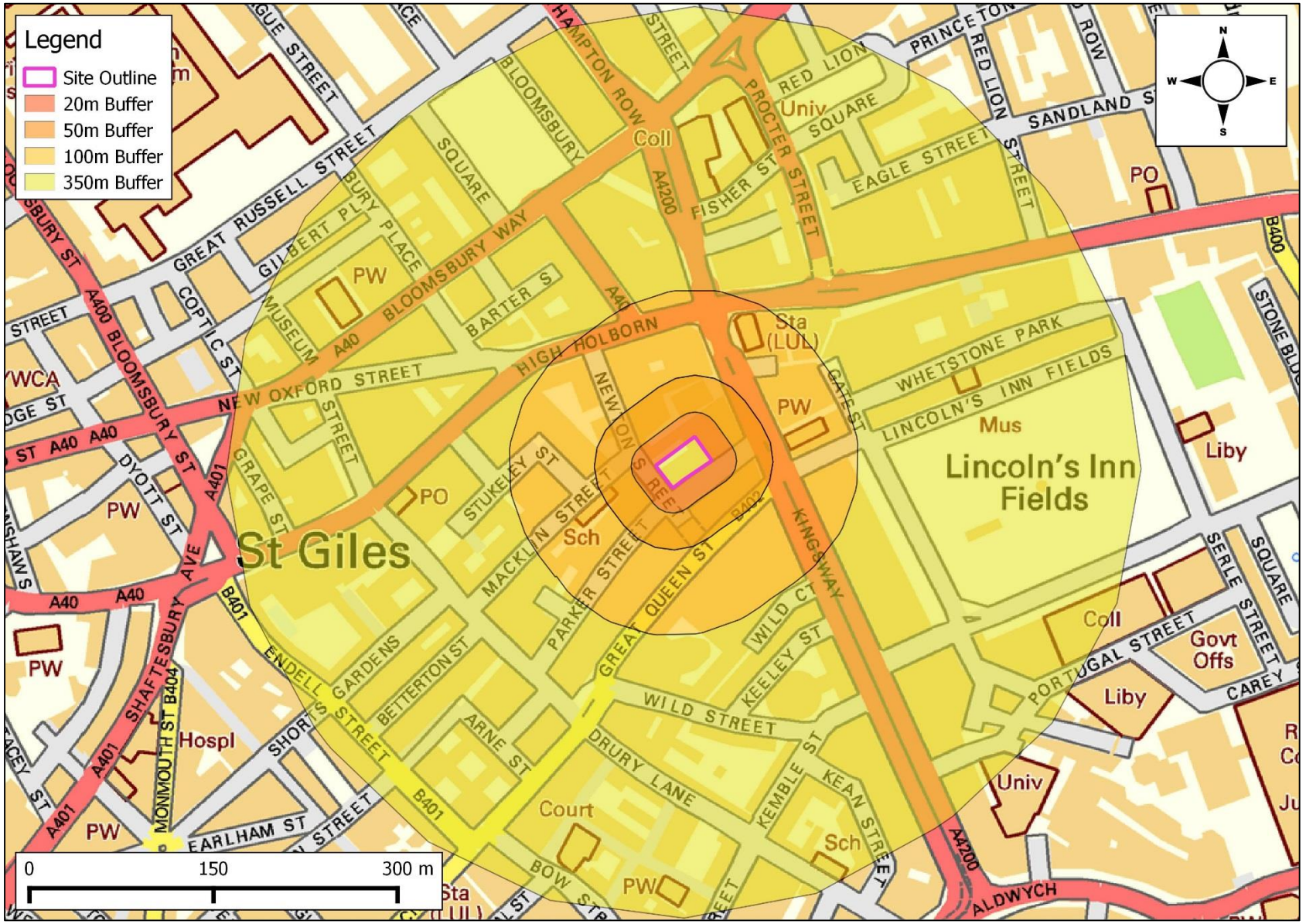

FIGURE A2: DUST SENSITIVE RECEPTOR LOCATIONS AND DISTANCE BUFFER PLAN

FIGURE A3: HGV TRACKOUT DUST SENSITIVE DISTANCE BUFFER PLAN

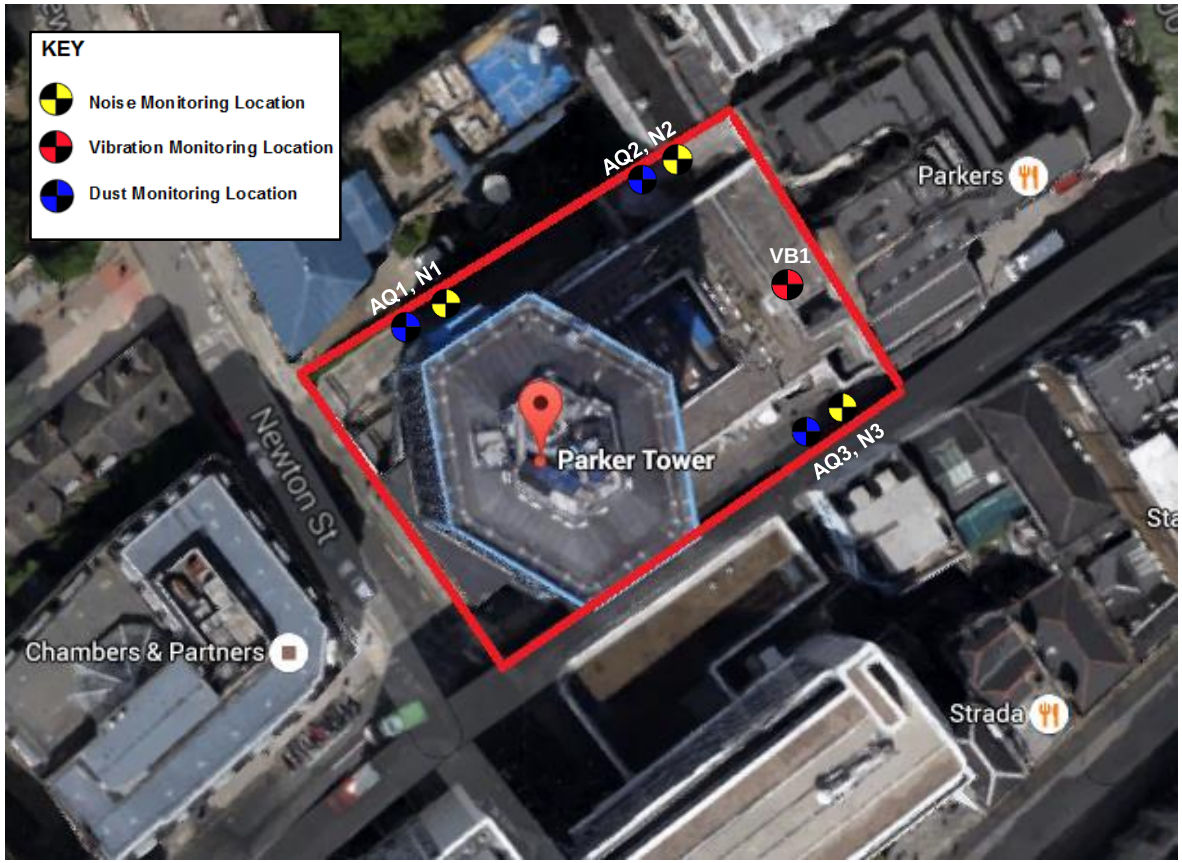

FIGURE A4: PROPOSED NOISE, DUST AND VIBRATION MONITORING LOCATIONS

APPENDIX B: TABLES

Activity	Plant Name	% On	No. Plant
Site Setup	Hi-ab	20	1
Asbestos Removal	Hand Tools	50	4
	Skip wagon	10	1
	H Type Vac	50	2
	Negative Pressure Unit	100	1
Hoarding	Hand Tools	60	5
	Nail Gun	30	1
	Flat bed lorry	10	1
Soft Strip to Pub (behind façade)	Hand Tools	30	5
	Powered hand tools	20	2
	Reciprocating saw	10	1
	Skip wagon	10	2
Scaffolding to Pub and Podium	Hiab		1
	Hand tools	70	5
	Flat bed lorry	10	3
Basement Propping	Hand tools	50	5
	Flat bed lorry	20	1
Soft Strip to Main Tower	Hand Tools	30	5
	Powered hand tools	20	2
	Reciprocating saw	10	1
	Skip wagon	10	2
Concrete Separation Podium and Pub	Hand-held breaker	40	4
	Diamond Saw	60	2
Slab Penetrations for Scaffold	Hand-held breaker	40	4
	Diamond Saw	60	2
Demolition of Pub and Podium	Hand-held breaker	40	4
	Brokk 180 with breaker	60	1
	Tracked excavator	40	1
	Skip wagon	10	2
Hoarding of Pub Perimeter	Hand Tools	60	4
	Flat bed lorry	10	1
Scaffold to Main Tower	Hiab	25	1
	Hand tools	70	5
Tower Roof Demolition	1 hand breakers	40	1
	Brokk 180 with breaker	60	1
	Tracked excavator	40	1
	Skip wagon	10	2
Façade Removal	Handtools	40	4
	Hoist	40	1
	Disc Cutter	10	1
	Star Lifter	20	1
	Skip wagon	20	2
Fire Escape Staircase Removal	1 hand breakers	40	1
	Brokk 180 with breaker	60	1
	Tracked excavator	40	1
	Skip wagon	10	1

TABLE B1: ACTIVITY PLANT LIST

Incident Reference:		Date:		Time:	
YES/NO	**NOISE**				
	Exceedance Location:				
	Notified Level: dB, $L_{Aeq\ 1\ Hour/\ LAeq\ 10\ Hour/}$				
	Criterion: dB, $L_{Aeq\ 1\ Hour\ LAeq\ 10\ Hour/}$				
YES/NO	**DUST**				
	Exceedance Location:				
	Notified Level: $\mu gm^{-3}{}_{15\ minute}$				
	Criterion: $\mu gm^{-3}{}_{15\ minute}$				
YES/NO	**VIBRATION**				
	Exceedance Location:				
	Notified Level: PPV, $mms^{-1}{}_{5\ minute}$				
	Criterion: PPV, $mms^{-1}{}_{5\ minute}$				
DESCRIPTION OF INCIDENT:					
ACTION TAKEN:					
Report Filed By:					

TABLE B2: NOISE, DUST AND VIBRATION INCIDENT REPORT FORM