118 CURTAIN ROAD

Demolition and Construction Management Plan

Condition 15 (Planning ref: 2018/0363)

09 September 2021

Contents

1 Document Details

Project name	118 Curtain Road
Project address	118 Curtain Road, Hackney, London, EC2A 3PJ
Client name	Curtain Road Properties Limited
Client contact no	020 7535 2222

Authorised by	Company	Title	Signature
Lee Prpa (MRICS)	Creative Property UK LLP	Development Manager	
Mark Simmonds (MCIOB)	Creative Property UK LLP	Development Director	

Revision	Date	Purpose	Amendment	Updated by	Initial
01	09/08/21	Draft for review		Lee Prpa	LP
02	09/08/21	Final for submission	Various	Lee Prpa	LP

1.1 Introduction and Objectives of Development and Construction Management Plan (CMP)

This CMP is in response to Condition 15 of Planning Permission **2018/0363** to avoid hazard and obstruction being caused to users of the public highway, in the interest of public safety and amenity, in order to prevent the construction of the development having an unacceptable environmental impact upon neighbouring properties and to protect air quality, human health and to contribute to National Air Quality Objectives.

[The development shall be carried out in accordance with the details and measures as part of this demolition and construction management plan, which shall be maintained throughout the entire construction period.]

Location:

118 Curtain Road

Hackney

London EC2A 3PJ

This detailed Construction Management Plan has been produced by Creative Property UK LLP.

1.2 Declaration

Construction work shall not commence until the Client and London Borough of Hackney LBH are satisfied that this CMP has been satisfactorily developed – and written confirmation of its acceptance has been received.

1.3 Circulation

Revision	Issued to:	Name & Role	Office Location & Contact Details
02.	Client: Curtain Road Properties Limited	n/a	c/o Creative Property UK LLP 5th Floor Edison House 223-231 Old Marylebone Road London NW1 5QT
02.	Bureau Veritas	Project Consultant	
02.	CMA Planning	Project Consultant	
02	London Borough of Hackney	Local Authority	

2 Project Details

2.1 Brief Description of Project

The site is located within the London Borough of Hackney. The site is bordered by Curtain Road to the west and Dereham Street (also referred to as Dereham Place) to the south. The Strongrooms bar, restaurant and recording studios are located to the north of the site at 120-124 Curtain Road, and The Office Group's office development project is located on the eastern boundary at 74 Rivington Street, which is currently under construction.

The site currently consists of a part 3, part 2 storey building with a single level of basement spanning the footprint of the site. The development consists of change of use from storage and distribution (Use Class B8) to offices (Use Class B1) including the conversion and extension of the building with the erection of three additional storeys to provide B1 office floorspace, together with the provision of associated secure cycle parking facilities and refuse and recycling storage.

The outline scope of works to which this plans relates consists of the following:

- Removal of residual asbestos remaining present on implementation of the consented Development, partial demolition of the existing building, including roof demolition, partial south façade demolition and localised internal slab demolition to create risers and new lift core
- UKPN Substation upgrade and installation of primary services
- Coring of existing columns and bracing with steel plates
- Erection of new column frame structure and supports

- Formation of new concrete lift core (inc. overrun) and setting in/casting of new floor slabs to all levels
- Installation of external wall system/rainscreen clad to envelope and localised cladding of existing walls
- Installation of flat roof and terracing
- Internal office fit out to CAT B standard
- External landscaping and planting to terraces
- Finishing and decoration

2.2 Project Programme Dates

Planned commencement Date: January 2022

Target Completion Date: January 2024

3 Project Targets

3.1 Common Targets

To complete the project works:

- On time.
- To specification.
- Within budget.
- To prevent the construction of the development having an unacceptable environmental impact upon neighbouring properties and to protect air quality and human health
- To ensure that all relevant legislation is complied with.
- Target Zero accidents, incidents, defects, environmental incidents.

3.2 Project Specific Targets (including health, safety, quality, and environment)

- 100% CSCS Cards for operatives
- Safe and secure site
- On time, on budget and defect free
- To achieve a BREEAM rating of Excellent
- To achieve a considerate constructor, score of 40 or over.

4 Project Team Details and Organisation

4.1 Professional Team Chart

Role	Company	Contact Address	Telephone No.
Client	Curtain Road Properties Limited	c/o Creative Property UK LLP, 5th Floor, Edison House, 223-231 Old Marylebone Road, London NW1 5QT	020 7535 2222
Development Manager / Client Representative	Creative Property UK LLP	Creative Property UK LLP, 5th Floor, Edison House, 223-231 Old Marylebone Road, London NW1 5QT	020 7535 2222
Principal Contractor / Main Contractor	tbc	tbc	tbc
Architect, Lead Designer & Principal Designer	Adjaye Associates	Ground & first floor, Edison House, 223-231 Old Marylebone Road, London NW1 5QT	020 7258 6140
Civil & Structural Engineer	Skidmore, Owings & Merrill (SOM)	The Broadgate Tower, 20 Primrose St, London EC2A 2EW	020 7798 1000
MEP Engineer (including BREEAM & Sustainability)	Scotch Partners	90 High Holborn, London WC1V 6BH	020 3544 5400
Cost Manager	Gleeds	95 New Cavendish St, London W1W 6XF	0207 631 7000
Planning Consultant	CMA Planning	Timber yard, Drysdale St, London N1 6ND	020 7749 7686
Party Wall Surveyor	GIA Surveyors	The Whitehouse, Belvedere Rd, London SE1 8GA	020 7202 1400
Transport Consultant	Transport Planning Practice	TPP House, 129 Low Lane,Horsforth, Leeds, LS18 5PX	0113 205 0080
Noise & Vibration Consultant Fire Engineer Approved Inspector	Bureau Veritas	66 Prescot St, London E1 8HG	020 7661 0700
Utilities Consultant	Noveus	Suite D Orwell House, The Strand, Wherstead, Ipswich IP2 8NJ	01473 602222

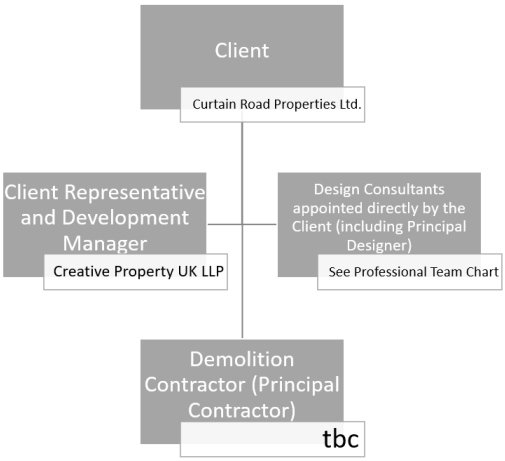
4.2 Main Contract / Principal Contractor Team

To be populated once appointed.

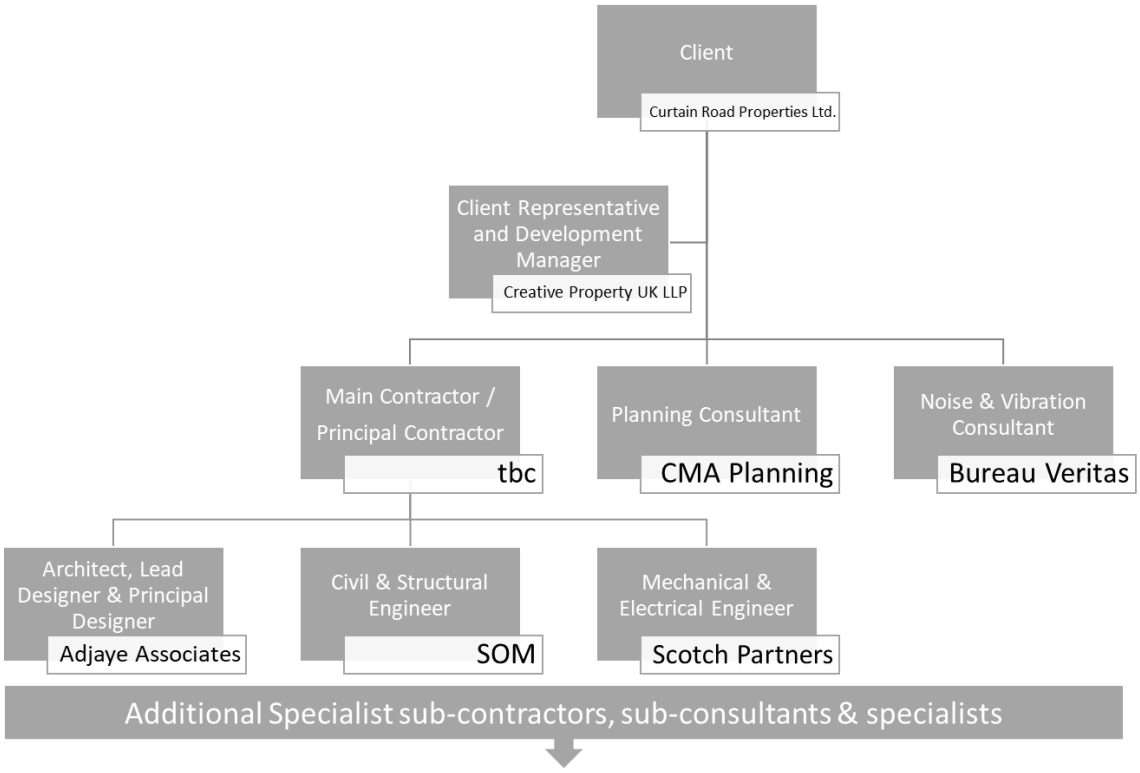
Role	Company	Contact Address	Telephone No.

4.3 Anticipated Project Structure

4.3.1 Demolition Phase



4.3.2 Construction Phase



4.3.3 Roles and Responsibilities of the Principal / Main Contractor's Project Team

This must be used as a check list throughout the various stages of the project.

Key:

- Client/Clients Representative (Client)
- Principal Designer (PD)
- Principal/Main Contractor (PC)

Actions / responsibilities – General	**Role**
Read and comply with the Principal / Main Contractor's Health and Safety policy and Company management system.	All
Actions / responsibilities – pre-construction	
Organise / chair project start up meeting.	Client
Obtain any tender Health & Safety information such as pre-construction information pack. Prepare and maintain the Construction phase plan.	PC / PD
Identify significant hazards and read the relevant sections within the Company management system. Obtain from the HSQ&E advisor guidance and advice as required.	PC / PD
Once complete, issue the Construction phase plan to project team and all contractors.	PC / PD
Prepare a site logistics plan and transport and traffic management plan.	PC
Obtain and display a copy of the F10 addition notification from the Client Representative / notify other authorities as required.	PC
Hazardous waste notification to Environmental Agency.	PC
Obtain and display a copy of the Health and Safety policy statement.	PC
Obtain and display the current insurance certificate.	PC
Contact the service authorities and establish the location of existing services.	PC / PD
Prepare a project directory.	PC / PD
Notify third parties e.g. adjacent projects, neighbouring houses, schools, businesses, etc. where necessary.	PC
Plan and arrange site welfare facilities.	PC
Plan and arrange temporary services and electrics.	PC
Check that the temporary site building(s) comply with the requirements of the code of practice for fire prevention on construction sites.	PC
Ensure a comprehensive fire risk assessment is carried out.	PC
If the project is over £3m, ensure a fire detection system is installed within the project offices.	PC
Review and complete project environmental aspects and impacts form.	PC / PD
Complete environmental checklist.	PC / PD
Complete a site waste management plan.	PC
Actions / responsibilities – Procurement	
Ensure that all subcontractors that are put onto the tender list are competent, they have a good Health and Safety record and have passed the pre-qualification procedure and that they have carried out similar work to the project.	PC
Arrange post-tender meetings with all potential subcontractors to discuss Health and Safety considerations	PC
Ensure Health and Safety compliance forms part of the successful subcontractor's contract	PC

Conduct all subcontract pre-start meetings	PC
Supply the appointed subcontractors with a copy of the project Construction phase plan, site rules, meeting agenda's and schedule of meeting dates	PC
Actions / responsibilities – Health & safety planning	
Obtain Designers risk assessments were appropriate and issue to the subcontractors.	PC
Display emergency telephone numbers on the site notice boards.	PC
Ensure subcontractors have produced method statements and risk assessments prior to any work starting.	PC
Ensure all subcontractor method statements and risk assessments are reviewed before work starts and any lifting requirements are passed onto the Appointed Person for review.	PC
Ensure all operatives, staff and members of the professional team attend the project inductions	PC
Ensure all subcontractors have identified hazardous substances and issued the associated COSHH assessment and material data sheets.	PC
Review all COSHH assessments.	PC
Ensure areas have been allocated for material storage and that precautions and measures are in place for the storage of any hazardous materials.	PC
Ensure adequate PPE is available for visitors.	PC
Actions / responsibilities – Health & safety planning	
Ensure major incident plan has been communicated to staff and preventive actions implemented.	PC
Ensure transport and traffic management plan implemented and communicated to staff.	PC
Ensure lifting operations are planned, controlled & supervised at all times. That a project lifting procedure is compiled maintained and reviewed.	PC
Ensure that daily co-ordination and weekly review lifting team meetings are held and recorded.	PC
Maintain construction programme and ensure subcontractors are working to the latest programme.	PC
Actions / responsibilities – supervision and co-ordination	
Ensure all risk assessments, method statements and COSHH assessments are communicated by the subcontractors to their operatives.	PC
Issue requirements for weekly toolbox talks to subcontractors.	PC
Implement red, yellow, and green card system.	PC
Implement and maintain monthly subcontractor performance league table.	PC
Organise, attend and manage meetings as appropriate.	PC
Carry out daily inspections and review subcontract compliance with method statements and risk assessments	PC
Where necessary, issue improvement / prohibition notices to subcontractors.	PC

Actions / responsibilities – inspections / records / audits	
Ensure welfare facilities are maintained to the required standard.	PC
Obtain and maintain up to date plant registers from all subcontractors.	PC
Maintain an up-to-date register of operative training certificates.	PC
Maintain and keep up to date the construction phase plan, transport plan, traffic management and major incident plan.	PC
Maintain an up-to-date accident book.	PC
Complete the company accident report form(s) in the event of a reportable incident.	PC
Investigate reportable accidents/incidents.	PC
Ensure an F2508 is completed and submitted to the HSE for all reportable accidents/incidents.	PC
Notify the HSQ&E department of all reportable accidents/incidents and near misses.	PC
Carry out daily inspections of the site boundary and hoardings.	PC
Carry out daily inspections of all work areas.	PC
Carry out weekly fire safety checks and inspections.	PC
Ensure inspections are carried out on scaffolding: • every 7 days • before use • after any modification / alteration • after any event that could have affected its stability	PC
Ensure all mobile towers have a ‘Scaff Tag’, recorded on a plant register and that they are inspected: • every 7 days. • before use, including after and adjustment. • after any event that could have affected stability.	PC
Ensure all hoists and lifts are recorded on a plant register and inspected: • before first use and visual daily check. • weekly by operator. • every 6 months by manufacturer / installer. • in accordance with manufacturers recommendations.	PC
Ensure that all lifting equipment is identified and recorded onto the project lifting plan and that inspections are carried out on all lifting equipment and accessories i.e. cranes, slings, chains, eye bolts etc. in line with the lifting procedure and project lifting plan.	PC
Carry out and record weekly site safety inspections.	PC
Carry out inspections on excavations daily prior to work, and after any event that could have affected stability.	PC
Inspect confined spaces prior to any works ensure all plant is recorded onto a plant register and that it is inspected before use and in accordance with manufacturers recommendations and planned maintenance schedule.	PC
Ensure all electrical equipment is PAT tested and inspected before use and every 3	PC

months.	
Carry out safety inspections/system checks on the site conditions.	PC
Carry out Health and Safety system audits on the implementation of the Company management. system	PC
Report Health & Safety performance to the client within the project reports and client meetings.	PC
Provide the Principal Designer/Client Representative with the relevant documentation required for the H&S file.	PC
Chair the project four weekly Health, Safety & Environmental review meeting.	PC
Attend the project four weekly Health, Safety & Environment review meeting.	PC / PD

Roles and responsibilities of the Client

Throughout the project the client will be responsible for:

- ensuring that suitable arrangements are made to manage the project safely.
- ensuring that Designers and Contractors are promptly supplied with information relevant to their purposes.
- ensuring that the Principal Contractor is informed of the minimum time to be allowed for planning and preparation before construction commences.
- Appointing a Principal Designer and a Principal Contractor
- Ensure that construction does not commence before a construction phase plan is in place.

Roles and responsibilities of the Design Team

The design team will be responsible for:

- not commencing work on a project unless the Client is aware of his duties.
- avoiding risk to construction workers, cleaners, maintenance workers, and anyone affected by their activities, together with anyone using the structure if it is designed as a workplace.
- eliminating hazards, and reducing the risk from remaining hazards, giving priority to collective measures
- providing sufficient information regarding the design to assist the client, the Principal Designer, other designers, and contractors.
- not carrying out design (other than initial design) for a notifiable project unless a Principal Designer has been appointed.
- providing information regarding a notifiable design promptly so that the health and safety file may be prepared and issued on completion of the project.
- ensuring that the design considers the requirements of the Workplace Health, Safety Welfare Regulation 1992

Roles and responsibilities of the Principal Designer

Principal Designer is responsible for:

- Advising and assisting the client and coordinating and liaising with both the designers and the principal contractor.
- Ensuring that the information required from the client is obtained and issued. However, the Principal Designer will not be required to prepare a formal pre-construction health and safety plan. Information required from the client, designers and others must be included in the package issued to the principal contractor (pre-construction information pack)
- Preparing the health and safety file and passing it on to the client at the end of the construction phase.

Roles and responsibilities of the Principal Contractor
Principal Contractor is responsible for: • Must not commence work unless they have been provided with the name of the principal designer • Principal contractors must ensure that every contractor is informed of the minimum time provided for planning and preparing before they commence construction works. • The principal contractor must ensure that every construction worker is provided with suitable site induction training. • The principal contractor must ensure that his employees have been provided with the necessary information and training, and that other contractors have complied with a similar duty. • The principal contractor is responsible for planning, managing, and monitoring the construction works, and for ensuring that the other contractors carry out their duties. • The principal contractor is responsible for giving access to the relevant parts of the construction phase plan to the other contractors, and for consulting with those contractors before finalising the relevant parts of the plan • The principal contractor is required to identify to each contractor the information required for the health and safety file, and to ensure that the information is promptly provided to the coordinator.

5 Project establishment – offices, welfare, storage & security

5.1 Site Welfare Provision and Arrangements

For the construction works welfare facilities shall be located within the basement of the site and project offices on the ground floor, please refer to Existing Site Plans at Appendix A for context. An access to the welfare facilities will be provided via the entrance on Dereham Place (western door), whilst the rear site entrance on Dereham Place (eastern door) will be used as an emergency exit. There will be an operative at the entrance doors to control access in and out of the welfare facility/site office at all times whilst the site is operational.

The facilities provided will consist of:

- Site office/office space
- A meeting room/First Aid room/ induction room
- A drying room complete with benches and lockers for personal items
- An adequately sized canteen, with provision boiling water, heating food, and refrigerator
- Toilets and shower facilities (male and female) which will allow operatives to leave work in a clean condition and prevent passing of construction dust to the home environment
- Temporary lighting, emergency lighting and temporary fire detection

The facilities will have dedicated cleaning staff to ensure they are maintained safe and clean throughout the course of the Project.

5.2 Project Security Arrangements

Security of the site is very important and ongoing liaison between the Principal/Main Contractor, the client team, Transport for London (TfL) and LBH will be crucial to ensure that the robust access / egress process is effective throughout the project's lifespan.

The security needs are considered for the project at the planning stage and reviewed throughout the contract. Special attention is made to deter access by children and to protect the members of the public. All visitors will be directed to the project office from where access into the construction area will be controlled.

As noted within Section 7.3 of this plan, initial discussions with TfL have been undertaken with regards to site layout, security/safety and traffic management, the principles of which have been accepted and discussions will be on-going, and all necessary agreements/licenses shall be obtained prior to the commencement of the works.

5.2.1 Security arrangements for the project boundary

All hoarding lines will be sufficiently illuminated. All hoarding lines with potential vehicular impact will be fronted with red and white painted baulk timbers on the ground. All scaffolding will be clad in Monoflex sheeting.

Site delivery points will be marshalled by trained and competent banksmen to prevent unauthorised access. All entry points/gates will remain locked when not in use. For specific hoarding arrangements please see Site Traffic Considerations at section 7.3.

5.2.2 Security arrangements for compound, offices, store areas

There shall be a Logistics Manager employed who will work alongside the site security arrangements and the Construction Manager to set up and maintain compound, office, and storage facilities.

5.2.3 Security arrangements for the plant and equipment

All plant and equipment will be securely stored away by the various specialist trade contractors within the site and/or within lockable storage containers and tool chests.

5.2.4 The security systems and devices

A computerised access control system is to be implemented to provide the security pass control for access/egress into the construction site. A biometric operating turnstile system will be in place at the pedestrian entrance to the site during the construction phase. All gates will remain locked when not in use, and gates will be manned by a trained and competent worker.

To gain access into the welfare compound, all new site operatives will contact the Site Manager and be promoted to share information that includes name, company, purpose of visit and date/time of arrival, this shall be stored within the Site Visitor Book. Following this, every worker shall undertake their project induction and complete a security application form (including capturing biometric data if necessary). All non-construction worker visitors will be escorted round site with a trained operative of appropriate level at all times.

5.2.5 Subcontractors' security responsibilities

All subcontractors will ensure that their workforce is checked prior to carrying out any works on site. These checks will include eligibility to work in the UK and their competency. Further safety training checks will be carried out by the Principal/Main Contractor before allowing entry to the site utilising the CITB website.

All subcontractors will ensure that all their offices, storage and workshop areas are securely locked up when not in use, clean and tidy.

5.2.6 Security measures to protect workforce and public

Public protection will be provided through the implementation and operation of the traffic management considerations. Secure public protection hoardings will be erected around the perimeter of the site and provided with temporary lighting where necessary. For details on hoarding arrangements please see Section 7.3 (Site Traffic Considerations).

Protecting the workforce and the public is paramount, therefore permanent traffic marshals will be employed to manage and oversee all vehicles movements to and from site. A permanent marshal will be placed at the site entrance at Curtain Road to monitor all deliveries and all personnel, operatives and record all visitors entering/exiting the site via the pedestrian entrance on Dereham Place.

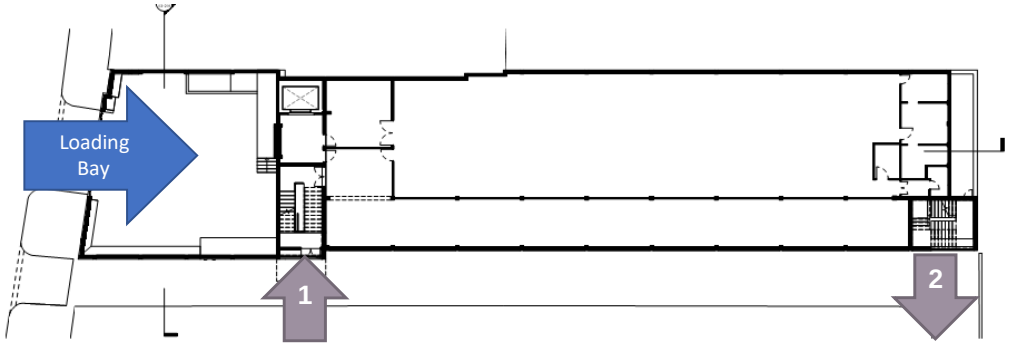
Contact details for the key staff, such as Site Manager and liaisons will be displayed at the site entrances and appropriate hoarding locations to deal with any enquires or matters of site security.

6 Project Method Statements

The following construction method statements cover all phases of the development. The necessary measures and controls for noise and air quality preservation are detailed in the proceeding section and relevant Risk Assessment at Appendix B.

6.1 Demolition Construction Method

During the initial project stages the front internal loading bay on Curtain Road will be used for the removal of materials. Dereham Place entrances will be utilised as the main pedestrian entrance (1) and the rear door as an emergency exit (2).



At an early stage a gantry will be formed on Curtain Road outside the building frontage, accessible from first floor level. During the hard-demolition phase materials will then be taken to first floor level and deposited to wait and load lorries from first floor level. Further details can be found at Section 7.3.

A general-purpose access scaffold will be erected around the outside of the building, enclosed in a fire-resistant reinforced plastic sheeting, to enable the deconstruction works to be carried out safely. This scaffold will be boarded at all levels.

Localised slab demolitions will occur, primarily making an opening at level 1 for the new lift shaft, and other minor openings for services risers. Once this is formed the roof will be demolished and the debris will be moved through the internal slab opening to ground level, from there demolition debris will be transported to the front lobby space and removed via Curtain Road.

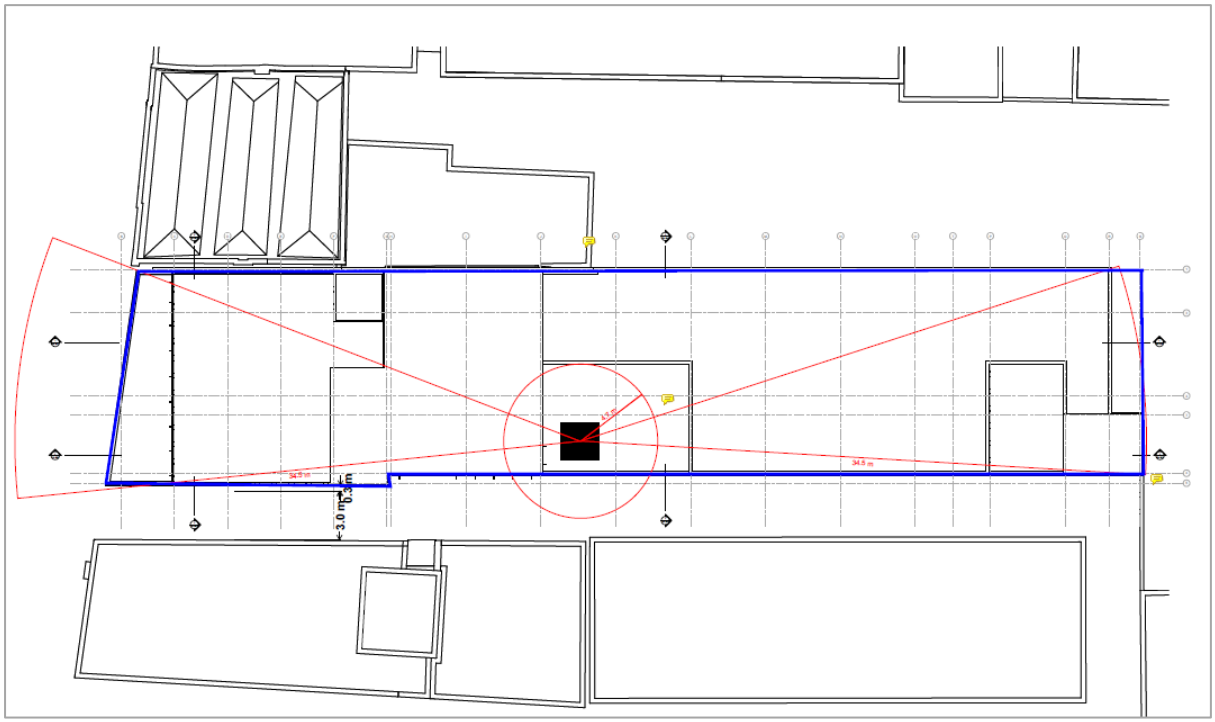
6.2 Superstructure and Fit-out Construction Method

The existing concrete columns will be strengthened, by bracing with external steel plates/ties to provide lateral stability to support the additional structure weight. 40mm holes will be cored through each column of which will provide the lateral support and fixing for the steel plates.

The supports for the new 3 storey frame will be connected to the capping of the existing frame structure after the new 2nd/3rd floor slab has been formed. As much of the structure as reasonably possible will be designed, constructed, and machined off-site, arriving in kit form.

Lorries will be loaded/offloaded within the loading area located outside the site entrance on Curtain Road.. A scaffold gantry with a pedestrian walkway underneath will be erected on Curtain Road. Further details can be found at Section 7.3.

A bottom-up construction method is proposed utilising lightweight panelised systems craned into place using an articulated tower crane. The image below shows an indicative crane location.



6.3 Envelope Construction Method

The Principal/Main Contractor will develop the envelope sequence to ensure that the building is watertight as soon as possible. Where necessary, using several different types of cladding and different methods of install for each element. On completion of each phase of the structure the cladding works will commence utilising the scaffold erected.

The roof is an insulated felt membrane system. This will be completed from roof level using the scaffold as protection to the perimeter of the building. These works will be fed using the tower crane.

A hoist will be located at ground floor level to assist the erection of the structure loading out of facing materials and also preloading of fit out materials. This hoist will be removed once the internal lifts are complete and loading out will be within the internal confines of the building.

6.4 Fit-out Methodology

The office fit-out phase will commence with first-fix of mechanical and electrical equipment, and installation of primary plant. From there, non-loadbearing office partitions and containment will be installed, followed by second fix mechanical equipment. Finally, fixtures and fittings will be constructed, second fix electrical and architectural finishes/decoration.

The Principal/Main Contractor will works its way out of the building so as to safeguard and maintain all finishes for a snag-free product.

6.5 External Street Works

Risk Assessments and Method Statements will be prepared prior to works commencing and the sequence and method agreed with the London Borough of Hackney and TfL prior to commencement. All Contractors employed will be licenced by LBH and employ competent operatives as required by the New Roads and Streetworks Act and will be supervised by the Principal/Main Contractor's suitably qualified management team.

7 Arrangements for Managing and Controlling Specific Project Risks

7.1 Noise & Vibration Control Measures and Measures to Preserve Air Quality

7.1.1 Noise and Vibration Thresholds and Control Measures

The control of noise and vibration levels associated with construction activities will be undertaken through two approaches. Firstly, through design (both operational and physical measures); and, secondly through specific noise and vibration mitigation measures (from good construction practice). All measures shall be implemented by the Principal/Main Contractor.

7.1.1.1 Construction Noise Thresholds

The proposed noise emission limits for construction activities undertaken within the site are presented in the table below. There will be no construction works undertaken during the evenings, night-time periods, on Saturday afternoons, Sundays or on public holidays. In exceptional circumstances, should works be required to continue beyond the agreed construction working hours, this would be agreed in advance with LBH Environmental Health Department/Officer.

Table 01: Construction Noise Thresholds

Period		Construction Noise Threshold (free-field)
Day of Week	Time of Day (T)	dB $L_{Aeq,T}$
Monday - Friday	08.00 – 18.00	75
Saturday	08.00 – 13.00	75

The proposed construction noise thresholds are consistent with those typical of construction sites in urban areas. Where measured noise levels exceed the construction noise limits outlined above, the Principal/Main Contractor will investigate the cause of the exceedance and take appropriate measures, following the Noise and Vibration Exceedance Protocol at Appendix C. Please note the threshold limits are external noise levels.

In context of airborne noise within the music studios at 120-124 Curtain Road from the construction activities, an external noise threshold of 75 dB $L_{Aeq,T}$ should be broadly be consistent with the unoccupied noise limit of NR 15 L_{eq} (it is duly acknowledged this is frequency dependent) within studios as outlined in planning Condition 15 part (a)(i).

7.1.1.2 Construction Vibration Thresholds

The construction vibration action level provided in the table below relates to typical site construction activities and is based upon guidance provided in BS 5228-2:2009+A1:2014. Note that a lower limit of 0.5 mm/s PPV has been recommended, consistent with proposed limits attached to the planning consent at condition 15 part (a)(i).

Table: Vibration Action Level

Construction Activity	Vibration Level (mm/s PPV)	Effect
All Activities	0.5	It is likely that vibration of this level will be barely perceptible but may still cause complaint. However, can often be tolerated if prior warning and explanation is provided as outlined in the liaison strategy at 7.1.3.
	15.0	Onset of possible cosmetic damage to residential or light commercial buildings.

In the event that a complaint of excessive vibration levels is received, additional vibration monitoring exercises will be undertaken at impacted sensitive receptors as required. If the levels of vibration recorded are determined to exceed those stated in the table above, the cause will be investigated, and the responsible activity ceased until appropriate mitigation measures have been applied to prevent adverse impact on neighbouring occupiers and property users, as per the Noise and Vibration Exceedance Protocol at Appendix C.

7.1.1.3 Construction Noise and Vibration Thresholds within 118 Curtain Road

Based on the results of the On-site Noise and Vibration Testing Report (Appendix D), it is recommended the following noise and vibration limits are not exceeded on the 118 Curtain Road-side of the party wall separating 118 Curtain Road and 120-124 Curtain Road, and monitoring equipment should be set up for the duration of the works. Should these limits be achieved, it is expected that noise and vibration limits as defined in Condition 15(a)(ii) will be satisfied within the recording studios contained at 120-124 Curtain Road.

- Vibration: 1 mm/s PPV;
- Noise: 100 dB L_{Aeq} (acknowledging that the specific criteria relates to NR 15, it is expected this will still be met for an overall noise level of 100 dB L_{Aeq} within 118 Curtain Road based on pre-commencement testing) and 110 dB L_{Amax}.

7.1.1.4 General Noise and Vibration Control Measures

The Principal/Main Contractor and all subcontractors will be required to follow standard, reasonable, techniques that aim to minimise noise and vibration disturbance as outlined in BS 5228-1:2009+A1:20141 and BS 5228-2:2009+A1:2014. This will include the following measures:

- Electrical items of plant will be used instead of diesel plant where possible, particularly in sensitive locations;
- Plant will be started up sequentially rather than all together;
- Loading/unloading activities will be located away from residential properties and shielded from those properties where practicable;
- Drop heights of materials will be minimised;
- Continuous noisy plant will be housed in acoustic enclosures, where practicable;
- Effective exhaust silencing and plant muffling equipment will be fitted and maintained in good working order;
- Static plant known to generate significant levels of vibration will be fitted with vibration dampening features;

- Each item of plant used will be carefully selected so as to comply with the noise limits quoted in the relevant European Commission Directive 2000/14/EC/United Kingdom Statutory Instrument 2001/1701;
- Consideration will be given to the recommendations set out in Annex B (Noise sources, remedies and their effectiveness) of Part 1 of BS 5228;
- Equipment will be well-maintained and where possible will be used in the mode of operation that minimises noise;
- Plant and equipment will be shut down when not in use;
- Semi-static equipment will be sited and orientated as far as is reasonably practicable away from occupied buildings and, where feasible, will be fitted with suitable enclosures;
- Mobile construction plant will be located, as far as is reasonably practicable, away from adjacent occupied buildings or as close as possible to noise barriers or site hoardings to provide additional screening from sensitive noise receptors;
- Materials will be handled in a manner that minimises noise;
- Vehicles will not wait or queue on the public highway;
- Reversing alarms will incorporate one of the following features where practicable: directional sounders, broadband signals, self-adjusting sounders, flashing warning lights. Alternative comparable systems may be used to minimise noise and nuisance from reversing alarms;
- All appropriate contractor personnel will be instructed on BPM measures to reduce noise and vibration as part of their induction training, and followed up by tool box talks;
- Noisy activities will be staggered in time and space where feasible;
- Only designated haul routes (on site) will be used;

7.1.1.5 Site Area

All construction work activities will be undertaken within the designated operational site boundaries; including areas designed to accommodate stockpiles and haul routes.

7.1.1.6 Reversing

The Principal/Main Contractor will manage the noise from any reversing alarms by means of the following:

- The site layout will be designed to limit and where reasonably practicable, avoid the need for the reversing of vehicles.
- A banksman will be utilised to avoid the use of reversing alarms.
- Reversing alarms incorporating one or more of the features listed below or any other comparable system will be used: highly directional sounders, broadband signals, self-adjusting output sounders, flashing warning lights.

7.1.1.7 Erection of Physical Barriers

Where deemed appropriate (through risk assessment), physical barriers will be erected around activities that are expected to generate particularly high noise levels to provide screening attenuation.

7.1.1.8 Heavy Goods Vehicle - Delivery Management

Normal HGV deliveries will be restricted to standard daytime construction working hours only thereby minimising the potential for disturbance to neighbouring residents.

7.1.1.9 Training

All site personnel will receive training appropriate to the nature of their roles and responsibility; the training will include specific information in relation to noise and vibration management. All staff will receive induction training that will incorporate environmental awareness training and specific training in relation to noise and vibration, if their work activities are assessed as being particularly noise/ vibration emission prone. On site toolbox training will enable site workers to understand how their actions will interact with the environment and potentially impact upon sensitive receptors near to their work areas.

7.1.2 Noise and Vibration Monitoring

The noise and vibration monitoring needs to give cognisance to agreed limits, and adhere to the following as minimum:

- All site monitoring equipment should be installed and monitored by a fully qualified acoustic consultant using appropriate grade sound level meter(s) and seismic monitoring (vibration) systems at the identified measurement locations;
- The sound level meter(s) would be calibrated before and after the survey period using techniques traceable to national standards. It is envisaged that the noise measurements will be undertaken using unattended noise monitoring stations at appropriate locations. It is recommended visits are made weekly to the stations to allow for downloading, swapping out of batteries and general maintenance. The monitoring stations will be capable of being accessed remotely to view live noise levels and download electronically. When and if limits are exceeded at monitoring locations (except for when a given studio is known to be in use and unrelated to construction works), an alert (including email and text message) should be sent to the consultant managing the equipment and to relevant site personnel, such as the site manager. Construction works should then cease until a suitable method can be identified to continue the task whilst satisfying proposed limits;
- Seismograph(s) (calibrated to a traceable standard by a UKAS-accredited laboratory) should be installed at the agreed locations. The seismographs will enabled to monitoring continuous vibration is terms of PPV, and be fitted with audible and visible alarms, which will trigger when the vibration limits are exceeded. The monitors should be visited weekly to download, swap out the batteries and provide some general maintenance, however, the monitors should be capable of being accessed remotely to view live data and download as necessary. When and if limits are exceeded at monitoring locations (except for when a given studio is known to be in use and unrelated to construction works), an alert (including email and text message) should be sent to the consultant managing the equipment and to relevant site personnel, such as the site manager. Construction works should then cease until a suitable method can be identified to continue the task whilst satisfying proposed limits.
- Noise and vibration monitoring will be carried out at those receptors who have the potential to experience disturbance during the construction phase. The On-site Noise and Vibration Testing Report at Appendix D shows that the business occupier at 120-124 Curtain Road shall require noise and vibration monitoring, which will be undertaken at the 118 Curtain Road-side of the Party Wall. Additional monitoring will be undertaken at appropriate site boundary locations for other sensitive receptors.

7.1.3 Liaison Strategy for Adjacent Businesses & Property Occupiers

The Principal/Main Contractor will be responsible for managing the interface between the project and the community in which the works are being undertaken. The following procedures will be implemented:

- Local residents and businesses will be informed of the commencement and likely duration of the construction work activities through a letter drop. The letter will include a contact telephone number which will be manned at all-times when work activities are being undertaken on site;
- If work activities have the potential to generate noise levels in excess of the Construction Noise Threshold levels at noted above, written agreement will be obtained from HBC and local residents/occupiers informed of the works at least 48 hours prior to works commencing;
- If 24-hour working is required as an engineering necessity, HBC will be notified in advance, including all measures to minimise disruption to local residents/occupiers, who will also be notified in advance. In the event of extended or 24 hour working required for health and safety reasons, i.e. cessation of work would leave an unsafe situation; HBC will be notified within 24 hours of the works being made safe. In such case, the processes and techniques will be reviewed to reduce the potential for re-occurrence;
- With respect to the adjacent business and property occupiers/users of 120-124 Curtain Road specifically, regular liaison between Principal/Main Contractor Site Management and the adjacent business / property occupier management will be undertaken in order to inform on construction progress, upcoming works and to create an open forum to be to discuss issues/impact on both parties. Scheduling of potentially high noise and vibration construction activities will take place in order to help minimise disturbance, therefore construction liaison will be essential.

7.1.4 Auditing and Reporting

Compliance with the requirements of this CMP and statutory legislation with regard to noise and vibration will be monitored through routine auditing and inspections. The schedule for auditing is outlined as follows.

- Daily checks to ensure working hours are being complied with and all mitigation measures outlined within the CMP are being complied with (to be undertaken by Principal/Main Contractor's Site Foreman)
- Weekly inspection (to be completed by Principal/Main Contractor) to ensure compliance with this CMP; review of complaints received etc.
- Construction noise or vibration complaints; to be investigated as per the requirements of this CMP by those identified with responsibilities. Complaints to be investigated as set out previously in this document.

7.2 Dust Management Plan to Control Dust and Fume Emissions

Works will be planned carefully so that all reasonable and practicable steps are taken to minimise dust and fumes during construction works. The Principal/Main Contractor will ensure that controls are integrated into the planning of all activities, any activities likely to give rise to dust and/or fumes and their control measures are identified within CPHSP and RAMS submitted by the Trade Contractors. The following primary considerations will be given to control dust and fumes on site:

- Where possible, the construction activities will be planned to eliminate harmful dust and fumes.
- If elimination is not possible, harmful dust and fumes will be controlled so that they are not breathed in by anyone.
- The Principal/Main Contractor will incorporate dust and fumes management procedures into site set up and logistics plan (site speed limits, wheel wash, location of canteen bins, skips and toilets, covering of vehicles, skips etc.
- Where possible, machinery, fuel, chemical storage, and dust generating activities will be located away from the site boundaries and sensitive receptors. Barriers may need to be erected.

- Regular servicing on all fans and filters will be undertaken to ensure they are properly maintained.
- Where possible, tools and plant will be fitted with dust extraction, collection devices and water suppressant – if these are available.
- It may be necessary for site operatives to wear RPE to protect them from effects of dust and fumes. This will be identified by task specific RAMS.
- Hard standing areas will be provided for vehicles and waste storage. These will be regularly inspected and cleaned to ensure that dust and construction dirt is not spread into public domain.
- Where possible, cutting grinding and sawing will be avoided by using prefabricated materials.
- Plant and equipment will comply with relevant emissions limits and will be regularly maintained and switched off when not in use.
- Where possible, vehicles, plant and equipment will be fitted with exhaust filtration systems to prevent fumes.
- The Principal/Main Contractor will ensure that toilets are situated away from receptors and maintained regularly.
- A dedicated Dust Management Plan can be found at Appendix E.

7.3 Traffic Management Considerations

The traffic management plan has been developed so that the project may be carried out without risk of personal injury, damage to plant / vehicles, properties and site and local users. This plan covers both procedures inside the site boundary and procedures within the highway.

This plan will be brought to the attention of those concerned and a copy readily displayed on site. The control measures identified in this plan will be effectively implemented, monitored and reviewed regularly. Any alteration to working practices will be evaluated and incorporated into this plan and the review date recorded.

Key project challenges have been considered with a view of limiting impact on highways as far a feasible and limiting where possible deliveries. The construction logistics and traffic management procedures noted below have already been discussed with TfL. These discussions are on-going however the principles of the key proposals have been acknowledged and agreed by TfL.

7.3.1 Considerations made in preparation of this plan include

A construction site must be organised in such a way that, so far as is reasonably practicable, pedestrians and vehicles can move without risks to health or safety. Highway traffic routes must be assessed and planned to optimise use, by putting in place appropriately sized vehicles to suit with steps to ensure safety. A traffic route will not be deemed satisfactory unless suitable and sufficient steps are taken to ensure that:

- Pedestrians or vehicles may use it without causing danger to the health or safety of persons near it
- Clearly designated unloading points to ensure pedestrian and vehicle segregation
- Any door or gate for pedestrians which leads onto a traffic route is sufficiently separated from that traffic route to enable pedestrians to see any approaching vehicle or plant from a place of safety

- There is sufficient separation between vehicles and pedestrians to ensure safety or, where this is not reasonable practicable:
  - Other means for the protection of pedestrians are provided
  - Effective arrangements are used for warning, any person liable to be crushed or trapped by any vehicle of its approach
- Any loading bay has at least one exit for the exclusive use of site personnel
- Each traffic route must be:
  - Indicated by suitable signs where necessary for reasons of health and safety
  - Regularly checked
  - Properly maintained
  - No vehicle is to be driven with the site unless, so far as is reasonably practicable, that the traffic route is free from obstruction and permits sufficient clearance
- A full assessment will be completed to evaluate traffic management proposals with the purpose to mitigate public pedestrian interface risks
- Provide “pedestrians only” areas within the site where possibly.
- Provide “construction vehicles only” area where only designated personnel can enter (loading bays).
- Provide where necessary trained ‘traffic marshals’.
- Provide safe pedestrian routes to and from work locations.
- Provide safe construction vehicle routes around the project.
- Location of cabins, welfare etc.
- Plan / drawing of access and egress to the project.
- Local routes/road systems including one-way schemes, car parking etc.
- Specific areas where the project will need to provide traffic control.
- Speed limits / height and width restrictions.
- Parking restrictions if necessary.
- Other local traffic characteristics: rail crossing, vehicular, cyclist and pedestrian flow.
- Mobilising / demobilising of plant.
- Deliveries to project / loading / storage areas.
- Vehicle route / area / turning / reversing.
- Signage.
- Temporary lighting.
- Vehicle maintenance / refuelling areas (with appropriate emergency / environmental considerations).
- Installation of Tower Crane including any associated road closure.
- Display project management contact details at site boundary.
- Vehicular (standard and emergency) and pedestrian access requirements.

7.3.2 Site Traffic Description

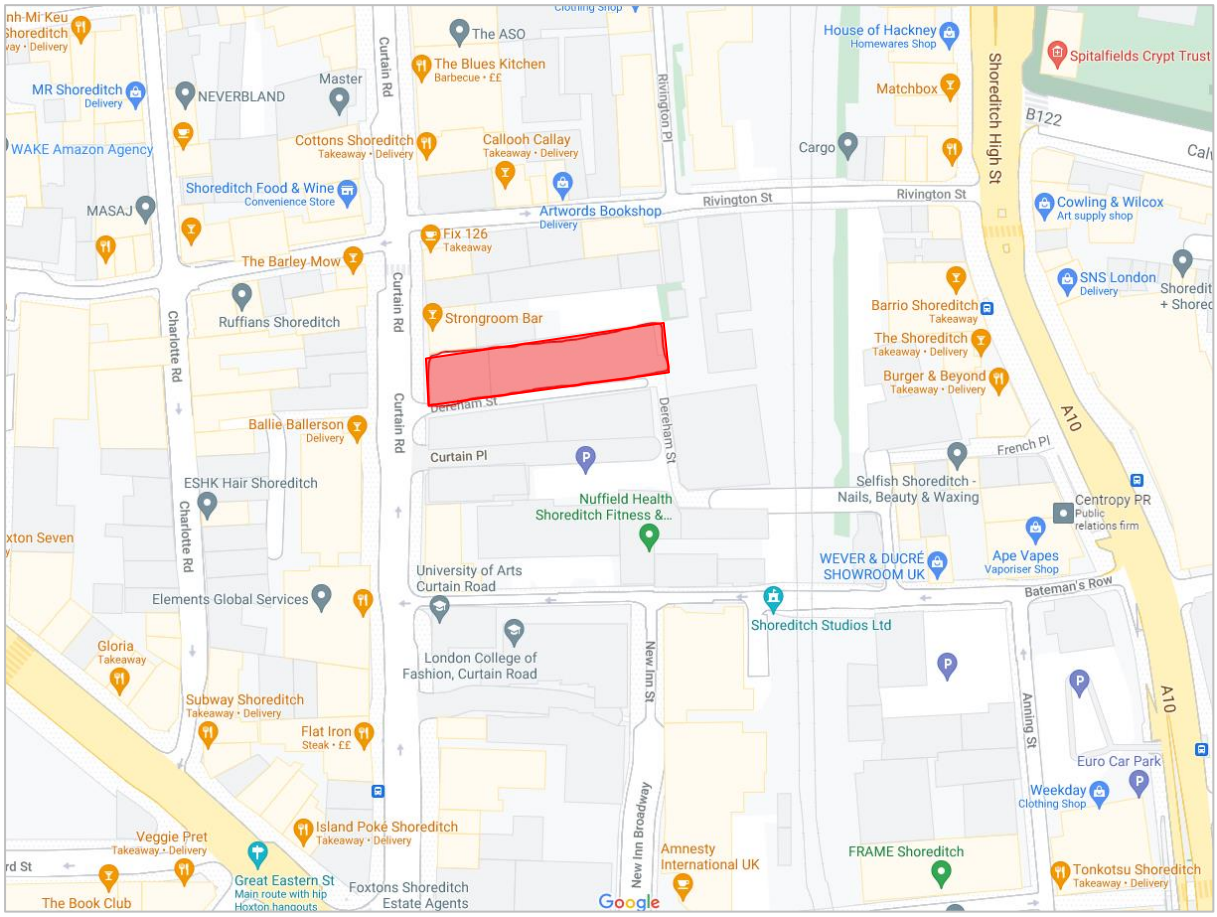
The site is located on Curtain Road and bounded by Dereham Place. The properties in the vicinity of the site are a mix of commercial, retail and residential, with the majority of cafes, restaurants, shops and public houses located on Curtain Road, Rivington Street, Shoreditch High Street and Old Street (A5201). As well as this, the site is well served by numerous public transport links via underground, rail stations and bus routes.

Currently, access to the site on foot is provided via Curtain Road and Dereham Street (via French Place leading to Shoredicth High Street).

Curtain Road is a one-way road running south to north, intersecting with Great Eastern Street and Old Street. Curtain Road varies in width from 2-3 lanes to accommodate two lanes of traffic, and bus stands/stops and parking/loading bays at various locations. Immediately outside the property the road width is at one of widest points, accommodating two lanes of traffic and parking/load bays either side. The road is a TFL red-route and has a speed limit of 30 mph.

Key
Site
Lane of traffic and direction
Existing loading bay
Existing site access and drop curb

To the south elevation Dereham Place is a unadopted road and serves as a public right of way leading from Curtain Road to Shoreditch High Street (via French Place). The road is regularly fly parked by numerous vehicles, usually tradesman working in the vicinity. The road is poorly lit at night and is prone to antisocial behaviour and thus the majority of pedestrian/bicycle travel between Curtain Road and Shoreditch High Street occurs via Bateman Row on the south or by Rivington Street to the north of the site.



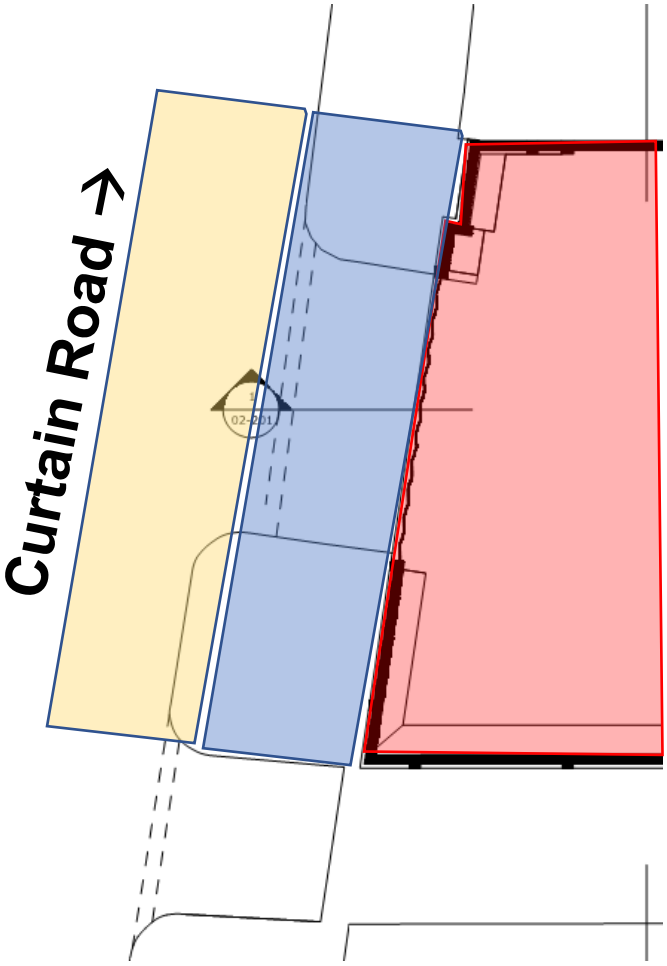
7.3.3 Site Perimeter, Hoarding Arrangements & Bay Suspensions

During the initial project stages the existing building's loading bay will be utilised for removing materials, with pedestrian access from the Dereham Street entrance. The perimeter existing building will be maintained as the site boundary.

As noted within the methodology section, for the partial demolition and main works a scaffold gantry (accessible from first floor level) with a pedestrian walkway underneath shall be erected on Curtain Road, suitably clad and illuminated. This would segregate pedestrians from construction operations. This would be erected either out of working hours or at weekends subject to further discussion/agreement with TfL.

All external site hoarding boundaries will be fully secured with a timber hoarding or Heras fencing, notably on the western elevation adjoining Curtain Road and the southern elevation (affronting Dereham Place).

The existing loading bay adjacent to the site would be suspended and a raised loading bay created to protect the section of the existing pavement and provide a suitable loading area for deliveries, therefore allowing vehicles to stand in front of the site for unloading safely.



Key
Site
Gantry
Suspended Loading Bay

On Curtain Road, the perimeter will include baulk timbers at the base of the hoarding line to protect the site boundary from potential vehicular impact from vehicles using Curtain Road. To the south, on Dereham Place further consultation will take place with LBH to determine if the hoarding will be erected so to ensure a minimum 1.5m clearance from the adjacent building line so as to maintain pedestrian access via this road can be maintained, or whether this road will be fully secured with a 2m timber hoarding or Heras fencing.

7.3.4 Access Arrangements

7.3.4.1 "Construction Vehicles Only" Site Access

"Construction vehicles only" site access double gates will be included in the hoarding line on the west elevation (Curtain Road). This will establish a single, secure and controlled point of vehicular entry into the site boundary, ensuring vehicles are admitted quickly and safely by traffic marshals. Dedicated traffic marshals will ensure the gates are kept secure at all times.

7.3.4.2 "Pedestrian Only" Access

"Pedestrians only" site access will be controlled via a single point of entry to the welfare area accessed from Dereham Place. A designated entrance will be formed through security fencing. During the construction phase the access will be secured, and a biometric turnstile

system will be utilised for all operatives and visitors to sign in, enter and exit the site directly from the welfare.

All pedestrian and vehicle routes will have appropriate signage and will be clearly designated in accordance with the HSE HSG144:2009 “The Safe Use of Vehicles on Construction Sites” guidance.

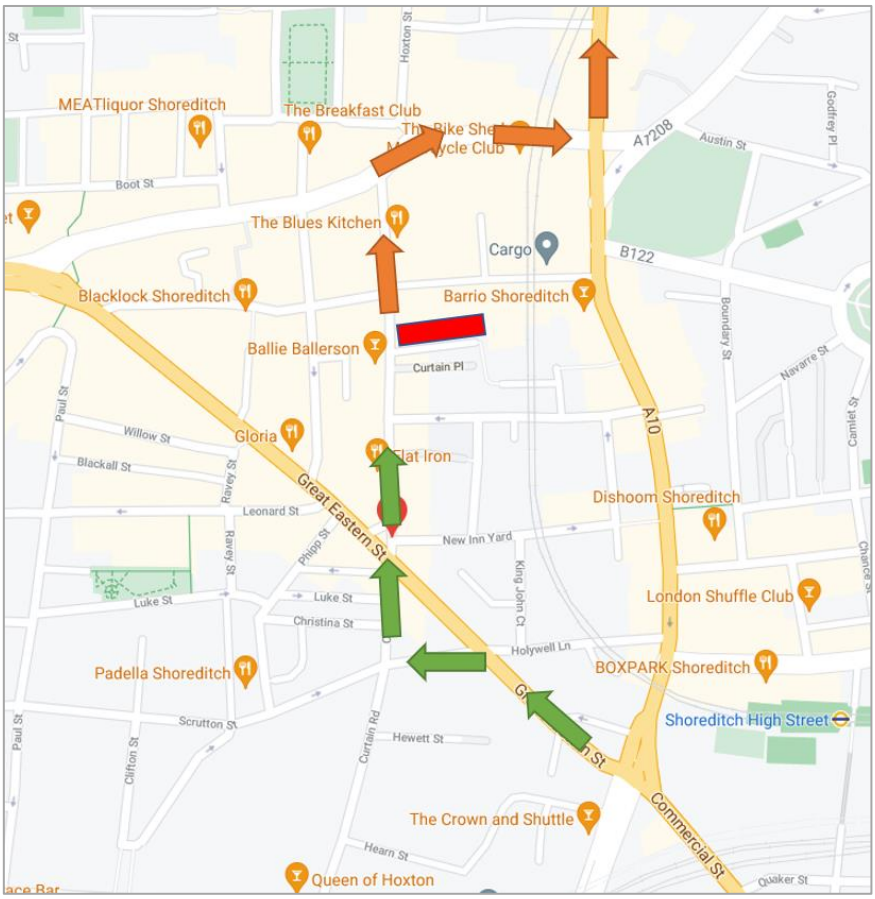
7.3.5 Construction Traffic Management and Routing

The arrangements for deliveries to the project including the specific requirements relating to Curtain Road will be communicated to all supplying subcontractors prior to awarding contracts.

A delivery management system will be used to record available time slots and to prevent multiple deliveries from arriving at once.

Weekday deliveries to avoid the peak hours of 8am to 9.30am and 4.30pm to 6.00pm will be prioritised wherever possible. Deliveries to site will be instructed to approach from the South via the A1202 Great Eastern Street which is part of the Transport for London Road Network (TLRN). Vehicles will then turn onto Holywell lane and then Curtain Road and proceed to the site’s unloading pit lane. The pit lane will be created using red and white demountable barriers which can be taken into the kerbside outside of working hours. The delivery lorry will then pull into the pit lane under instruction from the traffic marshals for unloading.

After unloading, the traffic marshal will supervise the delivery lorry whilst it exits the pit lane and re-joins the traffic in order to return to the A10 using Curtain Road, then turning left onto Old Street and right towards the A10. Delivery vehicles will generally be restricted to rigid body vehicles of approximately 10m in length. With longer 15m Articulated vehicles used for larger deliveries.



Generally, materials will be scheduled to arrive on site to suit the progression of the works. Upon arrival they will be checked for suitability and quality, and then they will be distributed directly to the point of use.

7.3.5.1 Location and details of deliveries

All vehicle deliveries will be via the loading bay on Curtain Road.

Demolition Phase: Approximately 3-4 vehicles per day, mainly wait-and-load of short duration.

Construction Phase: Approximately 4 vehicles per day on the external loading bay which will be wait-and-load.

7.4 Storage of Materials (particularly hazardous materials) and Work Equipment

Materials will be stored in metal storage containers at the risk of the Trade Contractors. All hazardous materials will be stored in a designated area, with a spill kit and clear signage warning of the dangers. Any flammable substance storage areas shall be clearly located on the site fire plan and will be sited to minimise risk. Fuel Tanks will be bunded and spill kits will be provided for use by trained personnel.

7.5 Ecological Considerations

The removal of Virginia Creeper Parthenocissus sp. Will be undertaken at the property on the roof and northern façade.

A watching brief for nesting birds will be maintained throughout the construction period. Where nesting birds are observed all works in the immediate vicinity will cease with immediate effect. The project ecologist or the Principal/Main Contractor sustainability team will be contacted for advice.

7.6 Existing Statutory Services

The position of live services within the building will be ascertained and labelled and where excavation is required CAT scanning techniques will be carried out using trained operatives. All operatives working on site will be briefed on existing services.

Temporary structures such as hoarding and standing scaffolding will be coordinated with the statutory authorities to ensure they can maintain their assets.

7.7 Dealing with – water, electricity, and gas, including overhead power lines and temporary electrical installations

All electricians will have a minimum JIB Electricians Card (ECSCS).

All electrical installations shall be installed to BS7671 (formally the IEE Wiring Regulations) by experienced electricians holding relevant City & Guilds qualifications. A 300 Ampere Mains Distribution Unit (MDU) will be sited in the switch room in the basement and will be kept locked at all times.

Temporary electrics, water, data etc. to be run within the site to services site accommodation and floor plates. Safety lighting will be provided to hoarding in accordance with LBH requirements.

7.8 Preventing falls

Robust fixed scaffold handrails will be installed to voids and suitable edge protection will be installed to all edges. All working platforms will have ladder access, double guard rails and inside handrails and toe boards.

All working at height activities will be subject to the issue and approval of a detailed RAMS before any works commence. All work at height will be in full compliance with The Work at Height Regulations and will follow the hierarchy of controls.

7.9 Works with or near fragile materials

Any works involving fragile materials will be assessed in detail to ascertain and understand the methodology and sequence to be adopted. Robust scaffold handrails and signage will be in place during the works to prevent fall and damage. All voids shall be protected following the Principal/Main Contractor void protection procedure.

7.10 Control of lifting of operations

Any associated crane lifts will be controlled by a designated lifting supervisor and banksman. A robust lifting plan shall be developed and maintained throughout the project by a CPCS Appointed Person.

7.11 Maintenance of plant and equipment

Daily (visual), weekly, 6 monthly and annual checks will be carried out on all items of plant and equipment and logged to ensure that all is in good working order.

8 Environmental Management

8.1 Demolition and Construction Waste Management Plan

The identification and process relating to the projects waste production and management has been outlined in this Demolition and Construction Waste Management Plan.

The Client and Principal/Main Contractor will take all reasonable steps to ensure that – (a) all waste from the site is dealt with in accordance with the waste duty of care in section 34 of the Environmental Protection Act 1990 and the Environmental Protection (Duty of Care) regulations 1991; and (b) materials will be handled efficiently and waste managed appropriately.

The following waste management procedure will be implemented within the detailed Site Waste Management Plan (SWMP) completed before construction works commence and which will include the following:

- Project details
- Revision record
- the Principal/Main Contractor's site team waste responsibilities
- Waste disposal details
- Waste minimisation details listing what actions will be taken pre-contract or at design stage to minimise waste and actions on the project to apply the waste hierarchy
- Waste recycling targets for the project in line with the project's BREEAM requirements
- The types of waste to be generated. Details of each type of waste that is to be produced on the project must be recorded in this section with an estimation of the amount of waste we think will be produced. This also records how the waste is disposed of, who is removing it and where it is going to; plus, the associated Duty of Care documentation actual waste movements are to be updated during the project
- Site layout and waste arrangements which explains waste segregation who is removing different types of waste
- Post completion declaration

A draft template of the draft SWMP is contained at Appendix F.

The Principal/Main Contractor will:

- Estimate the type of wastes that will be generated on site during the execution of the project, and undertake dedicated Waste Workshops with designers and subcontractors if required
- Determine segregation potential and disposal routes for waste and identify waste contractors (from the Principal/Main Contractor's approved waste services suppliers list) and/or subcontractor carriers
- Obtain duty of care documentation from all waste contractors and/or subcontractor carriers and record in SWMP
- Ensure that relevant WAC testing is carried out and if required
- Ensure reporting requirements are included in subcontractor orders
- Include SIC codes on orders with waste contractors and/or subcontractor carriers
- Set up segregation of waste on site as far as reasonably practicably

- Register any required exemptions required for the Use, Treatment, Storage or Disposal of waste.
- Provide separate segregation for plasterboard/ gypsum waste and hazardous/special waste
- Obtain details of every removal of waste via a Waste Transfer Note (for Controlled Waste) or Consignment Note (for Hazardous or Special Waste)
- Ensure the SWMP maintained and reviewed

8.2 Contaminated Ground

There are no ground excavation works planned within the building, save for minor basement slab breaking. In the event that contamination is found at any time when carrying out the project it will be reported in writing within 7 days to the LBH and once the Local Planning Authority has identified the part of the site affected by the unexpected contamination, the development will be halted on that part of the site. An assessment will be undertaken in accordance with the requirements of the site investigation, and where remediation is necessary a remediation scheme, together with a timetable for its implementation, will be submitted to and approved in writing by LBH in accordance with the requirements of the approved remediation scheme. The measures in the approved remediation scheme will then be implemented in accordance with the approved timetable. Following completion of measures identified in the approved remediation scheme a validation report will be submitted to and approved in writing by the Local Planning Authority in accordance with the implementation of the remediation scheme prior to works continuing on the relevant part of the site.

8.3 Groundwater Control

It is envisaged that as not further excavation of the basement is occurring, groundwater control conditions are not a presumed risk and ground water is unlikely to be encountered within any limited main basement slab breaking out. Nevertheless, a watching brief by operatives will be maintained for any basement slab breaking out.

8.4 Water Discharge Agreements

Temporary discharge consent will be obtained for disposal of construction site run off water, having first passed through a settlement tank or filtration system, where appropriate.

Construction site domestic sewage will be directed to existing sewers with the appropriate consent from the controlling statutory body – Thames Water. Consent will be obtained from Thames Water to discharge trade effluent to public foul sewer. Toilet facilities provided are to be used at all times and any problems with the facilities will be reported to the Principal/Main Contractor. No waste or effluent will be discharged to public foul sewer unless consent has been obtained for the site.

8.5 Wildlife, habitat and Archaeological Protection

A preliminary ecological appraisal has been undertaken for the development by Wardell Armstrong and submitted as part of the planning application. Mitigation measures are outlined in the report in order to reduce the severity and magnitude of proposed works to an acceptable level for identified habitats and species. Ecological enhancements are recommended which will result in a net gain in biodiversity within the site and surrounding area. Enhancements will include planters with nectar-producing species, the installation of black redstart boxes and the installation of swift nest boxes.

It is considered within the report that there are no significant ecological constraints to the development. With appropriate mitigation measures and enhancements the ecological receptors identified in the

report would not be adversely affected by the development, and the biodiversity of the existing site (considered to be low) improved.

The requirements of the Wildlife and Countryside Act 1981 (as amended), the Countryside and Rights of Way Act 2000, the Conservation of Habitats and Species Regulations 2010 (as amended) and other relevant legislation and policy guidance in respect to species and habitat conservation shall be complied with. Due to the distance of designated sites from the Site and intervening habitats, no disturbance impacts are anticipated during this phase. No effects are predicted.

There will be no loss of adjacent habitats and damage to these habitats will be mitigated through standard construction control measures. These habitats may experience some disturbance during the construction phase from increases in noise, dust, and visual disturbance and this could deter animals from using these habitats during this phase of works. The effects will be temporary and limited to the areas immediately adjacent to the Site boundary. It is expected that any wildlife will return once works cease.

A watching brief for nesting birds will be maintained throughout the construction period. Where nesting birds are observed all works in the immediate vicinity will cease with immediate effect. The project ecologist or the Principal/Main Contractor's sustainability team will be contacted for advice.

8.6 Management of fuel (oil & diesel)

A designated holding area will be made available and controlled by the Logistics Manager / Gate man. COSHH store, secondary containment, spill kits, plant nappies/drip trays, emergency response plan in place and tested regularly, storage a minimum of 10m from a drain or watercourse.

Do not store tanks on the top of containers unless a suitable and sufficient risk assessment has been produced and reviewed by the HSQ&E Manager.

Tanks will be self-bunded with 110% capacity and lockable, and drip trays and bunded areas will be provided.

9 Community Engagement

The site is based close to the business district in the city of London in the area of Shoreditch. The local area is heavily populated with bars and restaurants. There are various residential, offices and other business uses near the project site which are situated on Curtain Road.

The following process will be adopted as part of the project community engagement approach.

9.1.1 Key Activities to be undertaken

- Newsletters – will be displayed on site hoarding.
- Site notice board
- Regular review meetings with neighbours.
- Feedback questionnaire and site suggestion box.
- Project weblink
- CCS – The project will be registered with the CCS scheme and the Principal/Main Contractor will be fully cooperative with this scheme during the course of the entire project.

Particular engagement/liaison will be undertaken with regards to noise and vibration impact as highlighted in section 7.1.3.

Appendix Contents

Appendix A

Existing Site Plans

General Notes:

Drawing to be read in conjunction with the specification and all relevant drawings.

Do not scale from this drawing.

Contractor to check all dimensions on site. Adjaye Associates to be advised of any discrepancies between this drawing and site conditions immediately.

Rev.	Date	Description

Status:
Planning
Rev.:
P

Client:
Curtain Road Properties Ltd

Project:
Curtain Road

Drawing Title:
Site Location Plan

Drawing No.:
CRD-AA-RF-MP-A-01-001

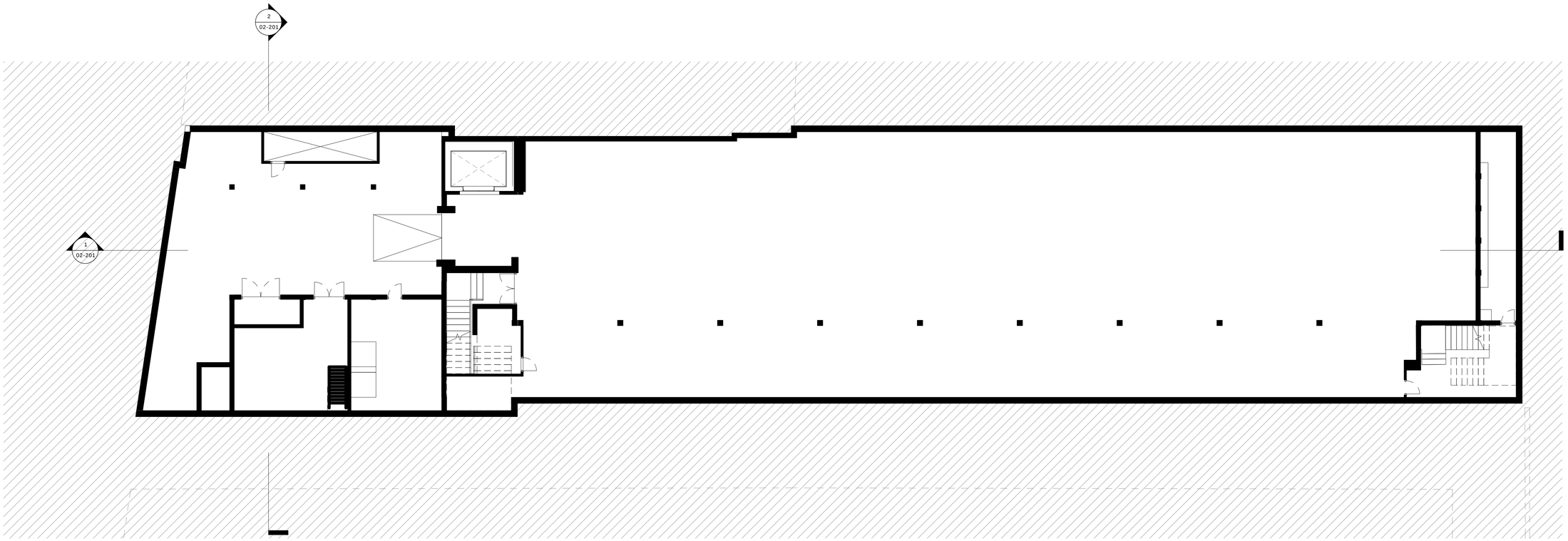
Scale: 1:1250@A3

Date: 31/01/2018

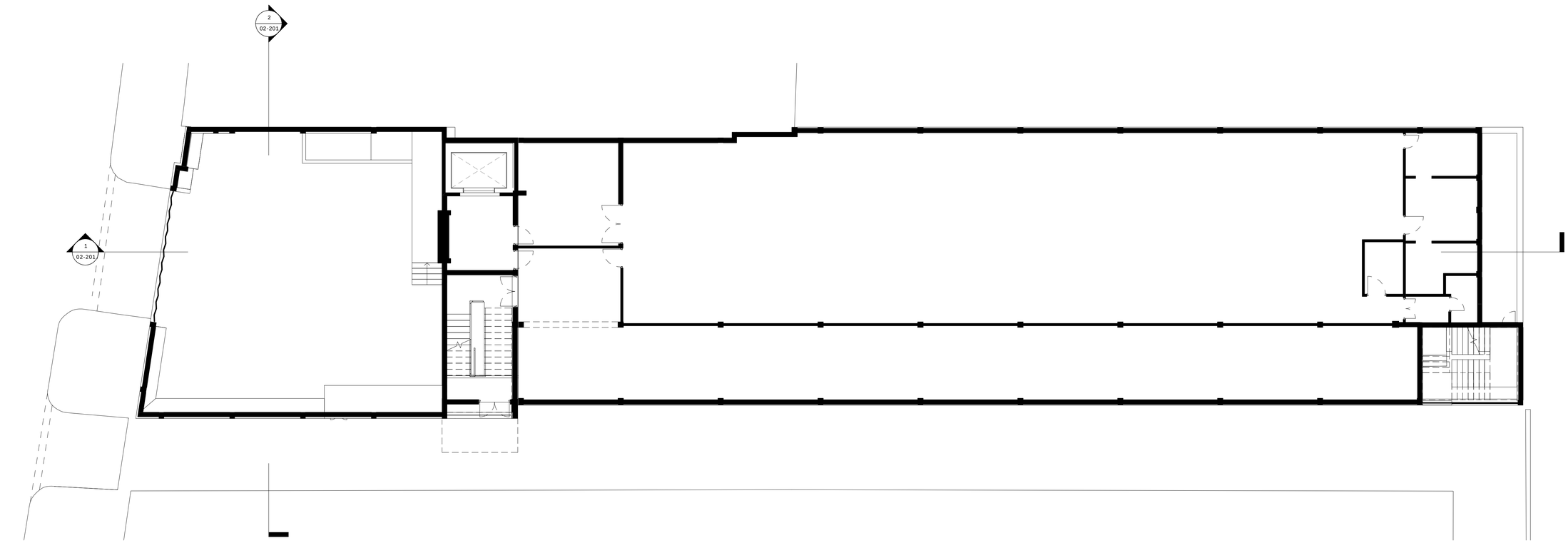
Drawn By: AL

Checked By: FC

Adjaye Associates
The Edison
223-231 Old Marylebone Road
London NW1 5QT
Phone: +44 (0)20 7258 6140
email: info@adjaye.com



1 Basement
1 : 100



2 Ground Floor Plan
1 : 100

0 5 10 m

General Notes:

Drawing to be read in conjunction with the specification and all relevant drawings.

Do not scale from this drawing.

Contractor to check all dimensions on site. Adjaye Associates to be advised of any discrepancies between this drawing and site conditions immediately.

Revision	Date	Description
P	18/01/31	Planning

Status: Planning

Rev.: P

Client: Curtain Road Properties Ltd

Project: Curtain Road

Drawing Title: Basement and Ground Floor

Drawing No.: CRD-AA-B1-00-MP-A-02-001

Scale: 1 : 100 @ A1

Drawn By: AL

Date: 18/01/31

Checked By: FC

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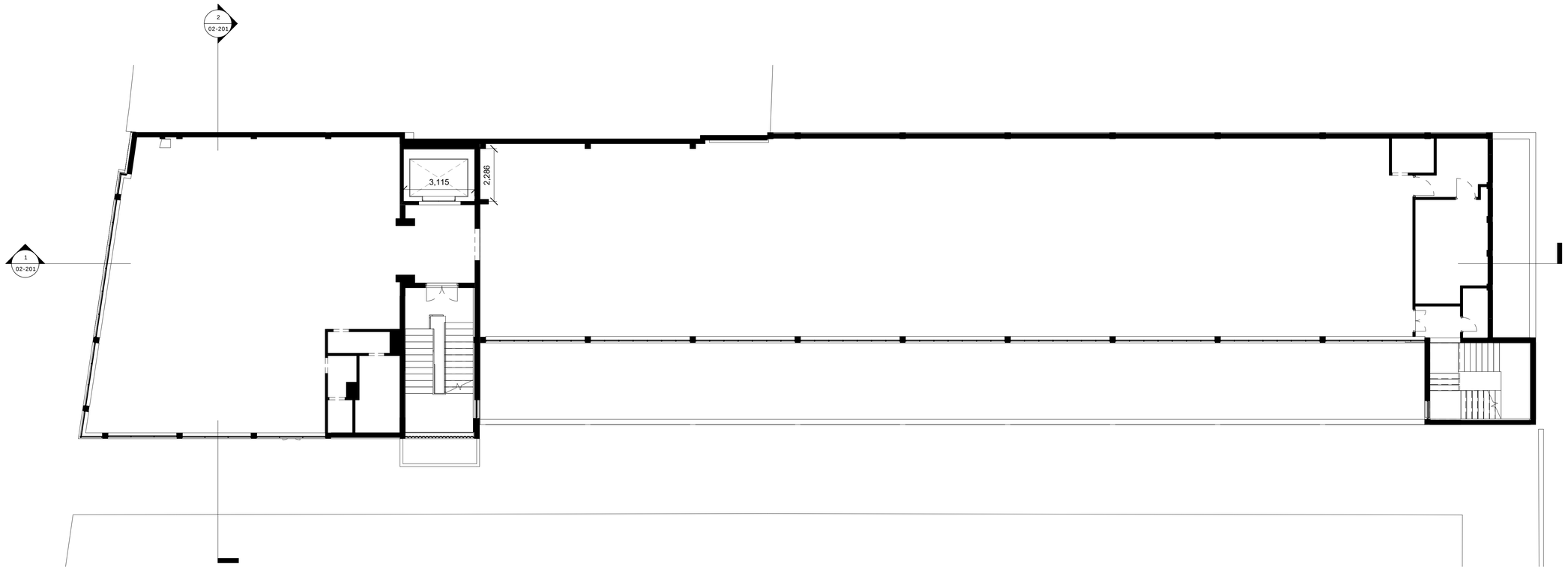
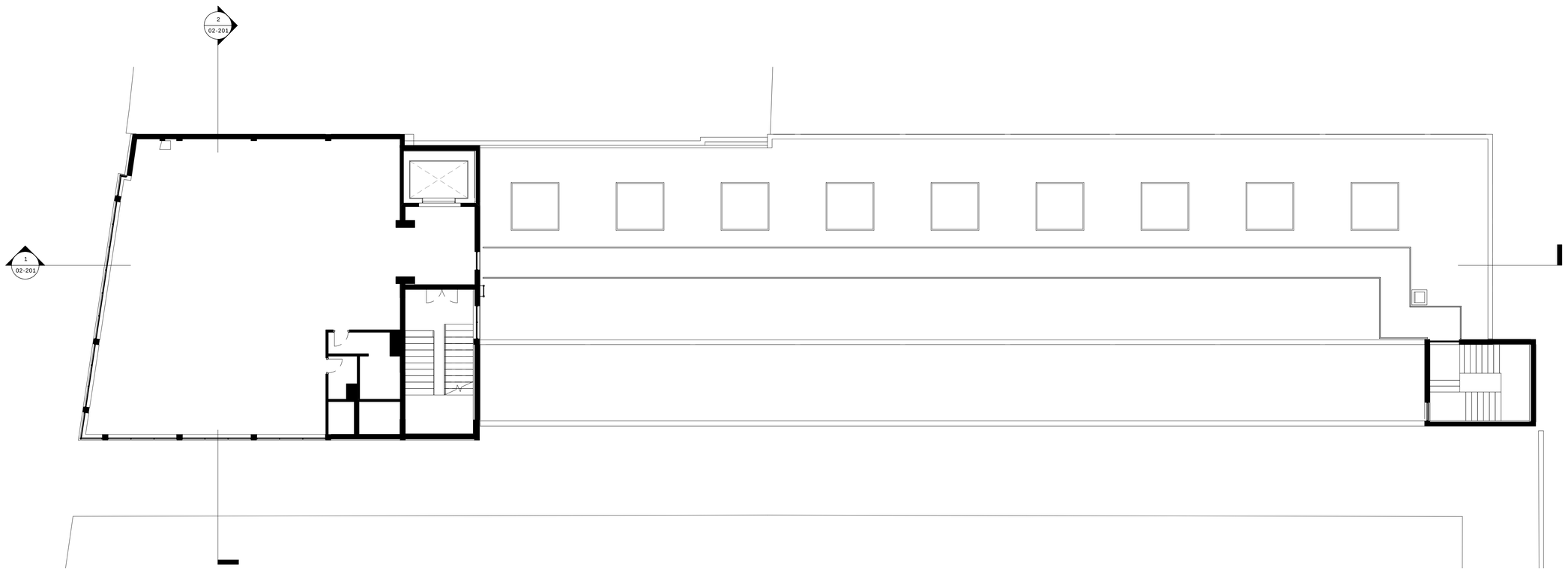


1 First Floor
1 : 100



2 Second Floor
1 : 100

0 5 10 m

General Notes:

Drawing to be read in conjunction with the specification and all relevant drawings.

Do not scale from this drawing.

Contractor to check all dimensions on site. Adjaye Associates to be advised of any discrepancies between this drawing and site conditions immediately.

Revision	Date	Description
P	18/01/31	Planning

Status: Planning

Rev.: P

Client: Curtain Road Properties Ltd

Project: Curtain Road

Drawing Title: First and Second Floor

Drawing No.: CRD-AA-01-02-MP-A-02-002

Scale: 1 : 100 @ A1

Drawn By: AL

Date: 18/01/31

Checked By: FC

Adjaye Associates

The Edison
225-231 Old Marylebone Road
London NW1 5QT

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Appendix B

Environmental Risk Assessment

A Construction Environmental Risk Assessment has been created for 118 Curtain Road. This allows the Principal/Main Contractor to assess the likelihood of construction activities causing harm to the local environment. This includes the description of potential hazards and impacts and outlining precautions/control measures to reduce environmental risks during the construction phase.

Client: **Curtain Road Properties Ltd.**
Project: **118 Curtain Road**
Date: **19 August 2021**
Title: **Construction Envrionmental Risk Assessment**
Revision: **0**

Key				
Risk Impact Matrix				
Probability Score	High	50	75	100
	Medium	25	50	75
	Low	5	25	50
		Low	Medium	High
		Impact Score		

Ref. No.	Activity	X	Risk Description	Current Status	Owner	Probability (L, M, H)	Impact Severity (L, M, H)	Overall Risk	Mitigating Action	Residual Probability (L, M, H)	Residual Impact Severity (L, M, H)	Residual Risk Score
001	Contamination		Potential for pollution of water, groundwater and land from spillages. Potential prosecution and significant fines	Open	Principal Contractor	M	H	75	COSHH store, secondary containment, spill kits, plant nappies/drip trays, emergency response plan in place and tested regularly, storage a minimum of 10m from a drain or watercourse, bowsers will be locked.	L	M	25
002	Waste Disposal		Impacts related to disposal of waste to landfill (global warming, pollution of land and water, resource depletion, vermin). Potential prosecution and significant fines.	Open	Principal Contractor	M	M	50	SWMP, off-site manufacture, take-back of pallets, protection, cable drums, reuse of waste materials on site, engaging with/donation to charity, segregation, waste carriers/management licenses, transfer and consignment notes.	L	M	25
003	Waste Disposal		Pollution of land/water due to inappropriate storage (e.g. vandalism, damage to containers) (Emergency scenario).	Open	Principal Contractor	M	H	75	Secure site, COSHH store. Making sure storage area a minimum of 10m from a drain or watercourse, storage away from traffic routes.	L	M	25
004	Waste Disposal		Pollution of land/water due to inappropriate disposal via unlicensed contractors (Emergency scenario)	Open	Principal Contractor	M	H	75	Cross check of waste management contractor monthly report with waste transfer notes received, licenses and permits checked and in date, skips covered prior to leaving site, part E returned completed for consignment notes, correct classification of waste, chemical testing of soil, crush produced in line with Aggregate Quality Protocol.	L	H	50
005	Water or Energy Use		Resource depletion, global warming	Open	Principal Contractor	H	M	75	Energy efficient site set up, timers on heaters, PIRs, LED temporary lighting on temporary electrical connection, early connection to the grid.	M	M	50
006	Water or Energy Use		Depletion of water resources	Open	Principal Contractor	L	H	50	Water efficient site set up, trigger guns on hoses, recirculating wheel wash, water butts for damping down etc.	L	M	25
007	Water or Energy Use		Impacts related to a potential water leak (depletion of large volumes of water being wasted, damages to site and buildings), (emergency scenario)	Open	Principal Contractor	M	H	75	Drainage plan in place, warning signage / cordons placed around valves, pipes, joints which are linked to water tanks, appropriate leak detection, emergency plan in place and tested regularly.	L	M	25
008	Nuisance		Disturbance to the local community	Open	Principal Contractor	H	M	75	Agreed working hours understood, communicated and kept to, sensitive receptors identified and communicated with, noise/vibration and dust generating works identified, logistics plan to avoid disturbance, acoustic barriers in place where required, noise and vibration monitoring in place, EHO communicated with throughout.	L	M	25
009	Site run-off		Potential for exceeding limits set by Trade Effluent Consent, legal non compliance and impact on sewerage provider.	Open	Principal Contractor	M	M	50	Trade effluent consent and monitoring being undertaken by Principle Contractor, emergency plan in place and tested regularly.	L	L	5
010	Site run-off		Potential for pollution of surface waters, harm to aquatic ecosystem	Open	Principal Contractor	L	M	25	Disposal to foul drain only, drainage plan in place, emergency plan in place and tested regularly.	L	L	5
011	Material Use		Resource depletion, impacts associated with manufacturing and distribution (transport emissions, resource use, waste), global warming.	Open	Principal Contractor	H	M	75	Off-site manufacture maximised, FSC/PEFC timber, SWMP in place, over-ordering prevented, just in time deliveries, delivery management system in place.	L	M	25
012	Ecology		Disturbance to flora and fauna, damage to habitat, damage to Special Sites of Scientific Interest (SSSIs), Special Protection Area (SPAs), Special Area of Conservation (SACs), RAMSAR sites, Areas of Outstanding Natural Beauty, Local or National Nature Reserve etc.	Open	Principal Contractor	L	M	25	Ecology report in place and required control measures in place and monitored. Only ecology works are tree trimming- this will be done outside of nesting season. Workforce aware of ecological issues through TBTs, DABs and morning induction.	L	L	5
013	Chemical		Potential for Fgas (or other refrigerant) leaks - Damage to the ozone layer and global warming due to refrigerant leaks, infrequent maintenance, inappropriate refrigerant storage, handling and disposal.	Open	Principal Contractor	M	M	50	Compliance with f-gas registrations, planned preventative maintenance schedule in place for airconditioning, competent contractor employed, correct paperwork retained, disposal of any refrigerant in compliance with waste legislation i.e. hazardous waste consignment note, part E returned.	L	M	25
014	Asbestos		Release of asbestos fibres due to disturbance of asbestos - Air pollution and impact to human health due to release of asbestos fibres.	Open	Principal Contractor	M	H	75	Compliance with H&S requirements, disposal of asbestos in compliance with waste regulations i.e. hazardous waste consignment note, part E returned.	L	M	25
015	Achaeology & Heritage		Potential for damaging unforeseen finds during any excavation works (Emergency scenario)	Open	Principal Contractor	L	H	50	Adequate protection measures in place as specified in report, planning conditions, inspected regularly, emergency plan in place and tested, workforce aware through TBTs, DABs and morning induction.	L	L	5

Client: **Curtain Road Properties Ltd.**
Project: **118 Curtain Road**
Date: **19 August 2021**
Title: **Construction Envrionmental Risk Assessment**
Revision: **0**

Key				
Risk Impact Matrix				
Probability Score	High	50	75	100
	Medium	25	50	75
	Low	5	25	50
		Low	Medium	High
		Impact Score		

Ref. No.	Activity	X		Risk Description	Current Status	Owner	Probability (L, M, H)	Impact Severity (L, M, H)	Overall Risk	Mitigating Action	Residual Probability (L, M, H)	Residual Impact Severity (L, M, H)	Residual Risk Score
016	Travel			Emissions due to project related transport (e.g. transport to site of site staff/operatives, transport of construction materials) - Air pollution and global warming due to air emissions from vehicles	Open	Principal Contractor	M	M	50	Use of technology e.g. TEAMS/ZOOM for site related meetings, delivery booking system, just in time deliveries, use of public transport where possible.	L	L	5
017	Fire			Air emissions and threat to habitat and people due to fire onsite.	Open	Principal Contractor	M	L	25	H&S plans in place and tested, ordering of only those flammable materials in quantities needed, e.g. chemicals, fuel, regular removal of waste, drainage plan, permit system for hot works.	L	H	50
018	Flood			Potential for abnormal precipitations causing floods - Floods, damage to buildings, wildlife, and all surrounding environment, disruption to normal operations.	Open	Principal Contractor	M	M	50	Drainage plan in place, emergency plan in place and tested regularly. GOV.uk flood information service for the area is being checked regularly.	L	L	5

Appendix C

Noise and Vibration Exceedance Protocol

In the event of an exceedance of the noise and vibration limits (Action Levels) stipulated within this CMP, then the below procedure should be followed. Please note that all exceedances are to be recorded on a weekly report to be issued to the project team.

Step 1: Live continuous noise monitoring installed at the monitoring location(s) identified.

Step 2: Live email alerts set up to the Construction Manager and Environment Manager

Step 3: In the event that Action Levels are exceeded, the Environment Manager shall notify the site team to investigate. Site team to check the work areas and identify which activity is causing the exceedance.

Step 4: Once the cause of exceedance is identified, the Environment Manager is to stipulate further mitigation measures to be implemented and closely monitor works and noise/vibration outputs for a minimum of 30 minutes.

Step 5: If no further exceedances occur then the activity will continue, and all operatives involved in the activity shall be re-briefed with a toll-box talk on working methods.

Step 6: In the event that further exceedances occur, then the works will cease and alternative or mitigated techniques to reduce noise/vibration will be explored within discreet areas of the site for the activity causing the exceedance, and/or close liaison with the impacted receptor will be undertaken to advise of when this method of works can occur to minimise impact.

Appendix D

On-site Noise and Vibration Testing Report

Curtain Road Properties Ltd

Pre-Commencement Noise & Vibration Testing

118 Curtain Road

Acoustic Report

11666526 – August 2021

Move Forward with Confidence

BUREAU VERITAS

Document Control Sheet

Identification	
Client	Curtain Road Properties Ltd
Document Title	Pre-Commencement Noise & Vibration Testing - 118 Curtain Road
Bureau Veritas Ref No.	11666526

Contact Details	
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Configuration				
Version	**Date**	**Author**	**Reason for Issue/Summary of Changes**	**Status**
1	10/08/21	A Bevilacqua	Draft for Client Review	Live

	Name	Job Title	Signature
Prepared By	A Bevilacqua MIOA	Senior Consultant	
Reviewed By	Craig Scott BEng (Hons) MIOA	Business Unit Manager – Acoustics & Vibration	

Contents

1 Executive Summary

1.1 Curtain Road Properties Ltd has appointed Bureau Veritas (BV) to identify and review the noise and vibration impact of demolition and construction activities which will likely be required to develop the 118 Curtain Road conversion project, located in Shoreditch.

The noise and vibration survey and assessment has been undertaken on the operational activities of construction equipment, in line with the Noise and Vibration Testing Statement (ref: 6479815/cs/L02, 22nd June 2021, included in Appendix 2) related to Condition 15(a)(ii) contained within Hackney Borough Council Decision Notice (ref: 2018/03663) dated 24th May 2019. The Decision Notice details the following as part of Condition 15 for the production of a Demolition and Construction Management Plan prior to the commencement of works connected to the planning consent: *"i. Details as to how the construction of the development can be carried out without exceeding the following noise and vibration levels at a location (or locations) to be agreed by the Local Planning Authority: 1. NR 15 Leq,15min; 2. 25 dB LAmax; 3. 0.5 mm/s PPV."*

"ii. Details of on-site testing which demonstrates that the construction of the development can be carried out without exceeding the noise and vibration levels set out at part i above."

1.2 The project design team exercise, led by Skidmore Owings and Merrill (SOM) Structural Engineers, explored the likely demolition and construction techniques and activities required to develop 118 Curtain Road. This exercise has been undertaken in collaboration with the noise and vibration consultants at Bureau Veritas. The construction activities considered representative to induce highest levels of structure-borne noise and vibration transmission have been tested and a summary of the outcome is provided below.

1.3 Specific adjacent business and property occupiers are not identified in Condition 15. Due to the shared party wall, inherently the adjacent business and property occupiers at 120-124 Curtain Road are likely to be most susceptible to noise and vibration and at various stages in this report we specifically refer to that neighbouring property. The impact on all adjacent business and property occupiers are considered in our conclusions and recommendations

1.4 The testing builds on the assumptions in Bureau Veritas November 2018 Acoustic Report (provided with the planning application) now proving our previous desk top exercise derived predictions were conservative predictions and therefore now providing demonstrable evidence that the construction of the development can be carried out (with construction industry normal mitigation measures) within the parameters and safeguards of Condition 15(a).

Column Coring

1.5 Based on the results summarised in Section 5, BV consider that any coring of columns as a construction activity can be undertaken during the phase of demolition and construction phase, as planned without restriction or further mitigation and are expected to meet the noise and vibration limits defined in Condition 15(a)(ii).

Saw Cutting of Structural Slab

1.6 Based on the outcome of the measurements detailed in Section 5, it is expected this construction activity can be undertaken without restriction at basement and ground floor level with limits of Condition 15(a)(ii) still expected to be achieved within music studios. At first floor level, measurements indicate increased levels of vibration and this indicates that saw cutting can be unrestricted up to 4m from the nearest studio. It is possible that limits are still met, however there is an increased risk of exceeding them, therefore alternative or

mitigated techniques to reduce vibration may be required and/or close liaison with adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact.

Stitch Drilling of Structural Slab

1.7 Based on the outcome of the measurements detailed in Section 5, it is expected this construction activity can be undertaken without restriction at basement level and, as discussed, this is expected to translate to ground floor level, with limits of Condition 15(a)(ii) still expected to be achieved within music studios. At first floor level, measurements indicate increased levels of vibration and this indicates that stitch drilling the slab can be unrestricted up to 4m from the nearest studio. It is possible that limits are still met, however there is an increased risk of exceeding them, therefore alternative or mitigated techniques to reduce vibration may be required and/or close liaison with adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact.

Brock Percussive Drilling the Structural Slab

1.8 Based on the outcome of the measurements detailed in Section 5, it is expected that brock percussive drilling the slab is an activity that will produce high levels of noise and vibration, and there is a significant risk that this demolition technique will exceed the limits defined in Condition 15(a)(ii) within the music studios. Given the nature of the equipment used and aim of the activity, it could prove challenging to provide effective mitigation, particularly in context of vibration. As such, it is recommended an alternative technique is identified that can achieve the same demolition outcome and/or close liaison with adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact.

Brock Munching on Structural Slab

1.9 Based on the outcome of the measurements detailed in Section 5 it is expected this construction activity can be unrestricted up to 4m from the nearest studio at roof level with limits of Condition 15(a)(ii) still expected to be achieved in respect of vibration. Within 4m, it is possible that limits are still met, however there is an increased risk of exceeding them, therefore alternative or mitigated techniques to reduce vibration may be required and/or close liaison with adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact.

1.10 With respect to noise, if activities are to be undertaken as close as 4m to the nearest studio, there is a significant risk that noise limits as defined in Condition 15(a)(ii) could be exceeded. As such further mitigation measures such as acoustic screening would be required to reduce the noise impact, however this typically only reduces noise levels in the region of 10 dB, so there may still be some short fall to achieving criteria within the music studio, in which case an alternative technique may be considered and/or close liaison with adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact.

Cumulative Impacts

1.11 The outcome of the measurements and subsequent assessment of impacts has shown that there are construction and demolition techniques commonly adopted within the construction industry that are expected to meet the limits defined in Condition 15(a)(ii). However, should some of these activities be undertaken simultaneously, there is a risk of exceeding limits within the most sensitive parts of 120-124 Curtain Road. Nonetheless, it should be noted

that noise and vibration monitoring will be carried out in accordance with an agreed Demolition and Construction Management Plan in order to provide live monitoring and should limits be exceeded, activities can be ceased until a suitable alternative approach can be implemented.

2 Introduction

2.1 Curtain Road Properties Ltd has appointed BV to undertake an assessment of potential noise and vibration associated with the construction works to be undertaken for a conversion of an existing warehouse at 118 Curtain Road, Shoreditch, into an office.

2.2 To be in accordance with the Noise and Vibration Testing Statement related to Condition 15(a) contained within Hackney Borough Council Decision Notice (ref: 2018/03663) dated 24th May 2019, this report has taken into consideration the following aspects:

- Performance prediction of the wall construction based on the discussion between BV experts and the project design team exercise led by Skidmore Owings and Merrill (SOM) Structural Engineers;
- Methodology of the on-site survey related to both noise and vibration;
- Assessment of the noise and vibration levels into the warehouse during the operational activities of the construction equipment on the test samples;
- Analysis of the measured data and conclusions based on calculations and structure-borne transmissibility;
- Mitigation measures have been introduced based on the noise and vibration levels produced by the construction equipment and on the limits set by the criteria;
- Noise management plan during works that includes the description of the proposed noise and vibration monitoring is attached to this report.

2.3 This report sets out to address the recommendations for the control of the noise and vibration levels during the construction activities, to satisfy the conditions stated within Condition 15 of the HBC Decision Notice.

2.4 The construction site is bounded by Curtain Road on the west, by Dereham Street on the south, by an existing residential back garden on the east and by existing commercial activities on the north. As per site conditions, the nearest sensitive receptors are localised on the north side, where the Condition 15 of the HBC Decision Notice are mainly focused. Note, noise and vibration limits are also defined within the CMP that would apply to those neighbours not directly adjoining and are consistent with construction noise and vibration limits generally adopted for construction and demolition works.

2.5 The acoustic terminology used in this report is explained in Appendix One.

3 Assessment Criteria

3.1 The basis of this assessment are the noise and vibration limits defined in Condition 15(a) contained within Hackney Borough Council Decision Notice (ref: 2018/03663) dated 24th May 2019.

Condition 15(a)(ii) contained within Hackney Borough Council Decision Notice (ref: 2018/03663) dated 24th May 2019

3.2 The Statement related to planning application approval reference 2018/0363 at 118 Curtain Road, London EC2A 3PJ, within the London Borough of Hackney, seeks to address Condition 15(a) to the following:

"i. Details as to how the construction of the development can be carried out without exceeding the following noise and vibration levels at a location (or locations) to be agreed by the Local Planning Authority: 1. NR 15 Leq,15min; 2. 25 dB LAmax; 3. 0.5 mm/s PPV."

"ii. Details of on-site testing which demonstrates that the construction of the development can be carried out without exceeding the noise and vibration levels set out at part i above."

"iii. Details of noise and vibration monitoring to be carried out in accordance with the methodology set out in the Acoustic Report by Bureau Veritas dated November 2018. This monitoring data must be made available to the Local Authority when it is requested.

"iv. A liaison strategy between the applicant and adjacent businesses and property occupiers including a commitment to liaise with neighbours when particularly noisy periods of construction are likely to occur.

3.3 CRP instructed its professional team to identify and review the demolition and construction activities which will likely be required to develop 118 Curtain Road. The objective of this exercise was to inform which phases and activities of the development are likely to have the greatest potential noise and vibration impact, highlighting these for further review. The team sought to:

- Investigate the design in order to identify the key demolition and construction activities
- Define these activities with regard to location, duration, likely equipment/methodology
- Explore the potential noise and vibration impact of each activity
- Identify the activities for on-site testing and define their monitoring strategy

3.4 The project design team has explored the likely demolition and construction techniques and activities required to develop 118 Curtain Road. This exercise was led by Skidmore Owings and Merrill (SOM), Structural Engineers for the project, in collaboration with wider design team members, and noise and vibration experts, Bureau Veritas. Further input has also been sought from a number of contractors and specialists to help verify the assumptions made and provide additional comment and expertise. The critical construction activities are identified as below, along with the relative anticipated potential noise and vibration generated:

Construction Activity		Predicted Noise/Vibration Generated
		Very Low Low Medium High Very High
Roof Demolition		
Localised Floorslab and Wall Demolition		
Removal of Windows		
Soft Strip of Existing Removal of partitions, doors, finishes, redundant M&E equipment, fixtures and fittings etc.		
Column Strengthening:	> Core holes for any necessary steel bracing	
	> Insert any required steel columns/beams	
	> Any localised scabbling and concrete repair (mortaring/concrete grouting)	
New floors steel Frame Construction		
New Floorslab Construction		
Installation of Windows		
Internal Fit-out Installation of partitions, doors, M&E equipment, finishes etc.		

Fig 1.0

3.5 The matrix above suggests that it is the view of the project design team that the activities with most potential for noise and vibration are those through the demolition and facilitating works phase, notably; the demolition of the roof slab, localised demolition of the floor slabs, and coring holes through existing columns for any necessary steel braces to be fitted for column strengthening. It should be noted however, that what this exercise does not attempt to forecast is the actual noise and vibration levels on receptors, the purpose of this exercise is to identify what practical tests will be necessary to undertake in order to obtain initial empirical data on the noise and vibration generated and the impact this may have on receptors.

4 Noise and Vibration Testing Methodology

4.1 In accordance with the construction techniques and activities required to develop 118 Curtain Road explored as part of a project design team exercise led by Skidmore Owings and Merrill (SOM) Structural Engineers, the following activities have been selected for the on-site tests as the most representative to induce highest levels of structure-borne noise and vibration transmission:

- Boring holes for column strengthening;
- Saw cutting of existing concrete slab;
- Stitch drilling to structural slab;
- Brock percussive drilling to structural slab;
- Munching structural slab.

4.2 Short term measurements (less than 2 minutes) were considered enough to determine if the stipulated limits in Condition 15(a)(ii) are achievable within the music studios of Strongrooms.

4.3 The following construction activities have been tested considering those listed above. The selection of test samples is the following:

- Boring holes for coring columns located inside the Ground West, the Ground East and the Ground lift core;
- Boring holes for coring columns located inside Basement West, Basement East and the Basement lift core;
- Boring holes for coring columns located inside the First Floor West, First Floor East, and the First Floor lift core;
- Saw cutting at ground floor of the concrete slab inside the East Stairwell;
- Saw cutting of the structural slab inside the Basement East;
- Saw cutting of the structural slab inside the First Floor East;
- Percussive drilling to the structural slab inside the Basement East;
- Percussive drilling to the structural slab inside the First floor East;
- Brock chipping of the structural slab inside Ground West;
- Brock chipping of the structural slab inside Ground lift core;
- Munching on the structural slab at the roof level.

4.4 In order to provide a complete and consistent picture of the transmission loss characteristics of the building, for each test the noise and vibration monitors were placed at the following positions:

- At the source location (as close as was safely possible);
- At 2 and 4 m from the source.

4.5 Furthermore, background noise and vibration measurements were undertaken through 118 Curtain Road in locations reflective of those where construction testing activities were performed.

4.6 All measurements have been taken by considering these distances. In respect of vibration levels, Peak Particle Velocity (PPV) in mm/s was monitored. In respect of noise monitoring, overall A-weighted L_{eq} and L_{max} sound pressure levels along with linear octave band sound

pressure levels were recorded. The noise survey was performed with the meters' time averaging constant set to 'Fast'.

4.7 The instrumentation used to measure noise and vibration during the survey is listed in Tables 4.1. All the instrumentation is controlled within the Bureau Veritas ISO 9001 accredited management system and has been verified to traceable standards within the last 2 years. A calibration check was performed on the sound level meters before and after use and no drift in calibration was noted.

Table 4.1: Attended survey instrumentation details

Item	Type	Serial number
RION Sound Level Meter	NL 52	01054193
B&K Sound Level Meter	2260	2124597
Instantel Vibration Monitor	Minimate Plus	BE9537
Benstone Vibration Analyser	Impaq Elite	7000035

4.8 The construction equipment used during the tests are listed in Table 4.2.

Table 4.2: Attended construction equipment details

Item	Type	System pressure	Max Noise Level
Hydraulic braker	Brokk 90	16.5 MPa	L_W 86 dB(A)
Diamond core drilling system	Hilti DD350	6 bar (max)	L_p 95 dB(A)
Diamond Blade Floor Saw	Tyrolit Hydrostress	-	L_W 96 dB(A)

4.9 Photos of each test are included in Appendix Three, while details of octave band spectra are indicated in Appendix Four.

5 Results & Discussions

5.1 Attended noise and vibration measurements were undertaken on site on 14th and 15th of July 2021. The outcomes have been grouped based on the construction work activity, including the following:

- Boring holes at structural columns;
- Saw cutting of existing concrete slab;
- Stitch drilling to structural slab;
- Brock percussive drilling to structural slab;
- Munching of structural slab.

Separating Construction between 118 Curtain Road and Music Studios

5.2 Before proceeding with the discussion of each test, a description of what is believed to be the overall separating construction between 118 Curtain Road and 120-124 Curtain Road. Based on the outcome of discussions between SOM Structural Engineers and BV within the referenced workshop, it was concluded that the most likely wall construction is a twin leaf brick wall, cavity tied/bridged. Furthermore, it is necessary to consider the further benefit offered by the specific use of that property as a music studio, known to be an isolated 'box in box' construction (which was noted during a walk around between the operators of Strongroom, Vanguardia, HBC/GSA and BV in February 2019). Although the exact 'box in box' construction is unknown, it is considered based on our experience of similar studio construction likely to at the very least consist of 2 No. 15mm dense plasterboard with 1 No. 18mm particle board (or similar) with mineral wool between the existing party wall and 'box in box' construction to help provide mechanical separation. Therefore, for completeness, the overall construction is assumed to be the following or equivalent in minimum performance to the following:

- Twin leaf brick cavity tied party wall;
- Cavity containing mineral wool;
- 'Box in box' construction of at least 2 No. 15mm dense plasterboard and 1 No. 18 mm particle board;

5.3 Bureau Veritas has used the Insul software to estimate the sound insulation performance of the wall construction separating 118 Curtain Road and the music studios within 120-124 Curtain Road (i.e. the Weighted Sound Reduction Index, R_w). Please note we are not able to confirm the exact construction separating 118 Curtain Road and 120-124 Curtain Road, however it is considered this is a reasonable and justifiable estimate based on information available and our experience of similar buildings and studio construction.

5.4 The sound insulation performance of such wall expected in-situ is detailed in Table 5.1. The performance of the wall construction in terms of octave frequency bands is given in Table 5.2.

Table 5.1: Predicting overall performance of wall construction between Studios and 118 Curtain Road

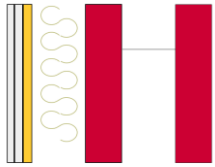
Configuration	Partition Description	Total Thickness (mm)	Estimated Weighted Sound Reduction Index
	- 2 layers of 15 mm dense plasterboard - 1 layer of 18 mm particle board; - 100 mm cavity (no connections) filled with 50 mm mineral wool - 70 mm single leaf brickwork; - 100 mm cavity (tied) - 70 mm single leaf brickwork	~400	R_w 87 (dB)

Table 5.2: Predicting octave frequency band performance of wall construction between Studios and 118 Curtain Road.

Estimated Weighted Sound Reduction Index	Frequency Octave Bands (Hz)						
	63	125	250	500	1k	2k	4k
R_w 87 (dB)	41	63	80	83	112	121	133

5.5 When estimating acoustic performance of constructions, it is important to note that the sound insulation achieved under laboratory conditions tends to be significantly higher than what is achieved on-site. This is largely due to site issues such as workmanship and unforeseen complications during installation. As a general rule, it should be assumed that constructions on-site will achieve around 5 to 7 dB lower than under laboratory conditions. As such, the performance of the construction wall considered during the calculations of the noise levels at the studios has been lowered to R_w 80 dB.

5.6 Please note, it is difficult to accurately predict vibration transmission loss from 118 Curtain Road to studios within 120-124 Curtain Road without undertaking detailed tests in the studios. Vibration transmission from 118 Curtain Road to the studios is therefore considered on a qualitative basis. As such, given the studios are of a 'box in box' construction and therefore isolated from surrounding structures, vibration transmission (in context of structure borne re-radiated noise) is very inefficient and it is anticipated that only those activities where very high vibration is measured has the potential to exceed limits and measured data has been considered in that context accordingly.

RAG Scale for Resulting Data

5.7 The results indicated in the following paragraphs need to be explained in terms of RAG scale as it has been introduced to help clarify the outcome of noise and vibration testing. In addition, given the performance predictions of the construction wall between 118 Curtain Road and the studios, calculations of levels inside the nearest sensitive receptor have been undertaken only in terms of noise, as summarised in Appendix Five. In context of vibration it is less straight forward, however the likely impact has been rated based on the dissipation of excitation transmissibility from the source to 2m and 4m distance and consideration of the interaction of intervening structures and isolation provide by the 'box in box' construction of the studios.

5.8 Specifically, the noise data gathered from the measurements have been grouped as follows:

- GREEN: Noise levels calculated inside the music studios to be below the threshold set by the criteria (L_{Aeq} < NR 15; L_{AMax} < 25 dB). These results have been highlighted in green, meaning that the noise levels are unlikely to create disturbance;
- AMBER: Noise levels calculated inside the music studios to be up to 4 dB above the higher range limit (L_{Aeq} ~ NR 15; L_{AMax} ~ 25 dB), These results have been highlighted as amber, meaning that the noise levels fluctuate around the threshold and might create disturbance. The uncertainties are due to the unknown precise performance of the wall construction between properties;
- RED: Noise levels calculated inside the music studios to be more than 10 dB above the higher range limit L_{Aeq} > NR 15; L_{AMax} > 25 dB). These results have been highlighted as red, meaning that the nuisance is most likely to be creating disturbance. As such, alternative techniques and/or methodology are recommended.

5.9 Likewise, the vibration data gathered from the measurements have been grouped in three categories as follows.

- GREEN: Vibration levels found to be below 1 mm/s within 118 Curtain Road are considered likely to meet the threshold set by the criteria within the studios (< 0.5 mm/s PPV). These results have been highlighted in green as it is considered vibration levels are unlikely to exceed the limit based on measured levels and accounting for expected further transmission loss between 118 Curtain Road and the studios;
- AMBER: Vibration levels found within 118 Curtain Road of between 1 mm/s and to 2.5 mm/s PPV (thus exceeding the criteria of 0.5 mm/s PPV by up to 2 mm/s PPV) have been highlighted in amber. Although measured vibration levels do exceed the limit, it is still considered likely that limits within the studio will be met accounting for expected further transmission loss between 118 Curtain Road and the studios, albeit there is acknowledgement that these activities are at higher risk of meeting or exceeding the limit.
- RED: Vibration levels found to be greater than 2.5 mm/s PPV (thus exceeding the criteria of 0.5 mm/s PPV by 2 mm/s PPV or higher). These results have been highlighted in red, meaning that the vibration from construction activities has the greatest chance of exceeding limits and therefore alternative techniques and/or methodology are recommended.

5.10 A graphical representation of the colour scale for each floor is given in Appendix Six, for both noise and vibration.

Boring Holes at Columns

5.11 Drilling holes into structural columns has been undertaken at the selected test samples, as summarised in Table 5.3.

Table 5.3: Coring columns details selected for drilling

Ref. No.	Item	Floor Level	Location
1	Coring Column	Ground	West
2	Coring Column	Ground	Lift Core
3	Coring Column	Ground	East
4	Coring Column	Basement	Lift Core
5	Coring Column	Basement	East
6	Coring Column	Basement	West
7	Coring Column	First	West

Ref. No.	Item	Floor Level	Location
8	Coring Column	First	Lift Core
9	Coring Column	First	East

5.12 For tests No. 1 to 9, the results are indicated in Table 5.4.

Table 5.4: Noise & Vibration results related to drilling core columns

Ref. No.	Test Type (Vibration/Noise)	Levels at Different Distance						Background Levels	
		Source		2m		4m			
		L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}
1	PPV (mm/s)	0.353		0.457		0.639		0.276	
	N (dB)	89	95	87	88	83	88	55	64
2	PPV (mm/s)	0.462		0.441		0.511		0.393	
	N (dB)	94	95	94	95	93	94	51	66
3	PPV (mm/s)	0.350		0.564		0.455		0.393	
	N (dB)	91	93	88	88	86	87	51	66
4	PPV (mm/s)	0.512		0.637		0.499		0.391	
	N (dB)	92	94	89	90	88	89	46	57
5	PPV (mm/s)	0.354		0.657		0.480		0.288	
	N (dB)	89	91	86	87	85	86	46	57
6	PPV (mm/s)	0.437		0.429		0.439		0.391	
	N (dB)	93	105	89	90	87	89	50	57
7	PPV (mm/s)	0.721		0.609		0.528		0.366	
	N (dB)	83	93	89	90	89	91	51	60
8	PPV (mm/s)	0.938		0.395		0.496		0.335	
	N (dB)	85	95	90	91	89	91	39	44
9	PPV (mm/s)	0.437		0.398		0.516		0.335	
	N (dB)	87	95	86	89	85	87	39	44

5.13 Based on the results of vibration levels, the tests of coring columns show that at 2 m and 4 m distant from the source the excitation levels fluctuate around the threshold set by the criteria (0.5 mm/s PPV), while at source location the vibration levels were found to be slightly above the maximum threshold at highest. However, as vibration monitoring has been undertaken of these activities within 118 Curtain Road, it is reasonable to consider that the limit of vibration, as defined in Condition 15(a)(ii) of 0.5 mm/s PPV within the most sensitive parts of 120-124 Curtain Road will be achieved for coring due to separating distances, building constructions and the 'box in box' studio construction, irrespective of location within 118 Curtain Road.

5.14 In terms of noise, all the levels of both L_{Aeq} and L_{AFMax} are expected to be below the criteria (NR 15 $L_{eq,15min}$, 25 dB L_{Amax}) inside the studios. Spectra of the noise levels estimated in the receiving room and resulted from calculations are given in Appendix Five and acoustic maps of noise and vibration contour levels are given in Appendix Six.

5.15 Based on the results summarised in Table 5.4, BV consider that any coring of columns as a construction activity can be undertaken during the phase of demolition and construction phase, as planned without restriction or further mitigation to meet the noise and vibration limits defined in Condition 15(a)(ii).

Saw Cutting of Slab

5.16 Saw cutting the structural slab has been undertaken at the selected test samples, as summarised in Table 5.5.

Table 5.5: Structural slab details selected for saw cutting

Ref. No.	Item	Floor Level	Location
10	Structural Slab	Ground	Stairwell*
11	Structural Slab	Basement	East
12	Structural Slab	First	East

*Test undertaken in stairwell as slab on ground floor in main room covered in flooring believed to contain asbestos.

5.17 For tests No. 10 to 12, the results are indicated in Table 5.6.

Table 5.6: Noise & Vibration results related to the saw cutting slab

Ref. No.	Test Type (Vibration/Noise)	Levels at Different Distance						Background Levels	
		Source		2m		4m			
		L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}
10	PPV (mm/s)	0.722		0.791		0.471		0.292	
	N (dB)	106	111	-	-	109	111	39	54
11	PPV (mm/s)	0.295		0.621		0.495		0.288	
	N (dB)	92	105	104	107	103	106	51	66
12	PPV (mm/s)	15.4		0.734		1.192		0.335	
	N (dB)	102	105	102	105	100	103	39	44

5.18 In terms of saw cutting the structural slab, results indicate that vibration levels exceeded the maximum threshold for test No. 12 (first floor) significantly at the source location, and moderately at 2 and 4 m distant. This would indicate that whilst the input is significant at source, transmission via the slab is inefficient. It is notable in its difference compared with ground and basement slabs, where vibration levels from this activity are of minimal concern based on measured levels. It is considered this reflects that the slab at first floor is of limited thickness and mass (believed to be no more than 150 mm thick) and is therefore more responsive to high impact vibration sources.

5.19 In context of how this translates to the limits defined within Condition 15(a)(ii), vibration levels measured of saw cutting at basement and ground floor level fluctuate around the threshold set by the criteria (0.5 mm/s PPV), therefore it is reasonable to consider that the limit will be achieved within the most sensitive parts of 120-124 Curtain Road, due to separating distances, building constructions and the 'box in box' studio construction, irrespective of location of saw cutting within basement or ground floor.

5.20 At first floor level, measured vibration levels indicate there is a notable increase in measured vibration levels as discussed, however providing the location of saw cutting is not within 4m of the nearest point of a studio within 120-124 Curtain Road, it is reasonable to consider that the vibration limit will be achieved within the studio, particularly in context of the measured vibration transmission loss in the slab. Within 4m of the nearest studio, it is possible that limits are still met, however there is an increased risk of exceeding them, therefore alternative or mitigated techniques to reduce vibration may be required within discreet areas of the site and/or close liaison with the adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact.

5.21 In terms of noise, L_{eq} levels have been calculated to be exceeding the threshold set by the criteria (NR 15 $L_{eq,15min}$) for tests No. 10 and 12 while the L_{Amax} levels have been calculated to be slightly below the maximum range limit (25 dB L_{Amax}). Notably however, at position 10 and 12, the L_{eq} NR is calculated to be 19 and 16 respectively, so the criteria are only marginally exceeded. Spectra of the noise levels estimated in the receiving room and resulted from calculations are given in Appendix Five and acoustic maps of noise and vibration contour levels are given in Appendix Six.

5.22 Based on the outcome of the measurements detailed in Table 5.6, it is expected this construction activity can be undertaken without restriction at basement and ground floor level with limits of Condition 15(a)(ii) still expected to be achieved within the studios at 120-124 Curtain Road. At first floor level, measurements indicate increased levels of vibration and this indicates that saw cutting can be unrestricted up to 4m from the nearest studio. As discussed, it is possible that limits are still met, however there is an increased risk of exceeding them, therefore alternative or mitigated techniques to reduce vibration may be required within discreet areas of the site and/or close liaison with the adjacent business and property occupier at 102-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact.

5.23 The noise impact of this activity is in general expected to be minimal and meet limits within the studios at 120-124 Curtain Road. Nonetheless, it remains good practice to erect temporary barriers around areas where saw cutting is undertaken in order to further reduce noise levels.

Stitch Drilling to Structural Slab

5.24 Stitch drilling to the structural slab has been undertaken at the selected test samples, as summarised in Table 5.7.

Table 5.7: Structural slab details selected for Stitch drilling

Ref. No.	Item	Floor Level	Location
13	Structural Slab	Basement	East
14	Structural Slab	First	East

5.25 For tests No. 13 and 14, the results are indicated in Table 5.8.

Table 5.8: Noise & Vibration results related to the hand drilling slab

Ref. No.	Test Type (Vibration/Noise)	Levels at Different Distance						Background Levels	
		Source		2m		4m			
		L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}
13	PPV (mm/s)	6.861		0.661		0.247		0.288	
	N (dB)	88	91	99	104	98	103	46	57
14	PPV (mm/s)	16.7		4.474		1.817		0.335	
	N (dB)	103	109	102	109	98	106	39	43

5.26 The outcome of the measurements of stitch drilling of slabs is similar to saw cutting. At basement level (note – drilling not advised at ground floor due to floor finish potential containing asbestos), measured vibration and noise levels have been found to be low impact, except for the vibration at source which highlights that the input is significant, but that vibration transmission is inefficient. However, at first floor level, vibration levels are significantly higher and this is attributed to the slab being more responsive to the input due to limited thickness and mass.

5.27 In context of how this translates to the limits defined within Condition 15(a)(ii), vibration levels measured of percussive slab drilling at basement fluctuate around the threshold set by the

criteria at 2m and beyond (0.5 mm/s PPV), therefore it is reasonable to consider that the limit will be achieved within the studios at 120-124 Curtain Road, due to separating distances, building constructions and the 'box in box' studio construction, irrespective of location of stitch drilling slab within the basement. Although it was not possible to undertake percussive slab drilling tests at ground floor level, given that the outcome of the tests at basement level mirror those of saw cutting, it is considered a similar outcome at ground floor would have been observed.

5.28 At first floor level, measured vibration levels indicate there is a notable increase in measured vibration levels as discussed, however providing the location of stitch drilling slab is not within 4m of the nearest point of a studio at 120-124 Curtain Road, it is reasonable to consider that the vibration limit will be achieved within the studio, particularly in context of the measured vibration transmission loss in the slab. Within 4m of the nearest studio, it is possible that limits are still met, however there is an increased risk of exceeding them, therefore alternative or mitigated techniques to reduce vibration may be required within discreet areas of the site and/or close liaison with the adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact.

5.29 In terms of noise, all the levels of both L_{eq} and L_{AFMax} are expected to be below the criteria (NR 15 $L_{eq,15min}$, 25 dB L_{Amax}) inside the studios. Spectra of the noise levels estimated in the receiving room and resulted from calculations are given in Appendix Five and acoustic maps of noise and vibration contour levels are given in Appendix Six.

5.30 Based on the outcome of the measurements detailed in Table 5.8, it is expected this construction activity can be undertaken without restriction at basement level and, as discussed, this is expected to translate to ground floor level, with limits of Condition 15(a)(ii) still expected to be achieved within music studios. At first floor level, measurements indicate increased levels of vibration and this indicates that stitch drilling can be unrestricted up to 4m from the nearest studio. As discussed, it is possible that limits are still met, however there is an increased risk of exceeding them, therefore alternative or mitigated techniques to reduce vibration may be required within discreet areas of the site and/or close liaison with the adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact.

Brock Percussive Drilling - structural slab

5.31 Brock percussive drilling the structural slab has been undertaken at the selected test samples, as summarised in Table 5.9.

Table 5.9: Structural slab details selected for brock chipping

Ref. No.	Item	Floor Level	Location
15	Structural Slab	Ground	West
16	Structural Slab	Ground	Lift Core

5.32 For tests No. 15 and 16, the results are indicated in Table 5.10.

Table 5.10: Noise & Vibration results related to the brock percussive drilling the slab

Ref. No.	Test Type (Vibration/Noise)	Levels at Different Distance						Background Levels	
		Source		2m		4m			
		L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}
15	PPV (mm/s)	>32		5.484		8.686		0.276	
	N (dB)	109	114	108	112	108	111	55	64
16	PPV (mm/s)	>32		8.444		27.486		0.276	

	N (dB)	106	114	104	114	109	112	55	64

5.33 Tests No. 15 and 16 indicate that the brock percussive drilling the slab is an activity that produces high levels of noise and vibration, and there is a significant risk that this demolition technique will exceed the limits defined in Condition 15(a)(ii) within the music studios. Given the nature of the equipment used and aim of the activity, it could prove challenging to provide effective mitigation, particularly in context of vibration. As such, it is recommended an alternative technique is implemented that can achieve the same demolition outcome and/or close liaison with the adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact.

5.34 Spectra of the noise levels estimated in the receiving room and resulted from calculations are given in Appendix Five and acoustic maps of noise and vibration contour levels are given in Appendix Six.

Brock Munching - Structural Slab

5.35 Munching the structural slab has been undertaken at the selected test sample, as summarised in Table 5.11.

Table 5.11: Structural slab details selected for munching

Ref. No.	Item	Floor Level	Location
17	Structural Slab	Roof	East

5.36 For test No. 17, the results are indicated in Table 5.12.

Table 5.12: Noise & Vibration results related to the munching slab

Ref. No.	Test Type (Vibration/Noise)	Levels at Different Distance						Background Levels	
		Source		2m		4m			
		L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}	L_{Aeq}	L_{AFMax}
17	PPV (mm/s)	29.9		2.144		1.221		0.356	
	N (dB)	-	-	-	-	109	112	56	67

5.37 Based on the results of vibration levels, munching the roof slab shows that at the all locations the excitation levels are found to be above the maximum range limit set by the criteria (0.5 mm/s PPV). However, there is a significant reduction in vibration levels from source to 2m and 4m which highlights that vibration transmission is inefficient.

5.38 In context of how this translates to the limits defined within Condition 15(a)(ii), measured vibration levels indicate that providing the location of slab munching is not within 4m of the nearest point of a studio, it is reasonable to consider that the vibration limit will be achieved within the studio, particularly in context of the measured vibration transmission loss in the roof slab. Within 4m of the nearest studio at 120-124 Curtain Road, it is possible that limits are still met, however there is an increased risk of exceeding them, therefore alternative or mitigated techniques to reduce vibration may be required and/or close liaison with adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact. In terms of noise, the levels inside the studios have been calculated to be above the maximum threshold set by the criteria, NR 32 L_{eq} @ 63 Hz and 38.9 dB L_{Amax}, when based on noise levels measured at 4m from the munching activity. Therefore, where munching and if activities are to be undertaken as close as 4m to the nearest studio at 120-124 Curtain Road, there is a significant risk that noise limits as defined in Condition 15(a)(ii) could be exceeded. As such further mitigation measures such as acoustic screening would be required to reduce the noise impact, however this typically only reduces noise levels in the region of 10 dB, so there may still be some short fall to achieving criteria within the music studio, in

which case an alternative technique may be considered and/or close liaison with adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact. Spectra of the noise levels estimated in the receiving room and resulted from calculations are given in Appendix Five.

5.39 Based on the outcome of the measurements detailed in Table 5.12, it is expected this construction activity can be unrestricted up to 4m from the nearest studio at roof level with limits of Condition 15(a)(ii) still expected to be achieved. Within 4m, as discussed, it is possible that limits are still met, however there is an increased risk of exceeding them, therefore alternative or mitigated techniques to reduce vibration may be required considered and/or close liaison with adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact

6 Summary of the Outcomes

6.1 The testing builds on the assumptions in Bureau Veritas November 2018 Acoustic Report (provided with the planning application) now proving our previous desk top exercise derived predictions were conservative predictions and therefore now providing demonstrable evidence that the construction of the development can be carried out (with construction industry normal mitigation measures) within the parameters and safeguards of Condition 15(a).

Column Coring

6.2 Based on the results summarised in Section 5, BV consider that any coring of columns as a construction activity can be undertaken during the phase of demolition and construction phase, as planned without restriction or further mitigation to meet the noise and vibration limits defined in Condition 15(a)(ii).

Saw Cutting of Structural Slab

6.3 Based on the outcome of the measurements detailed in Section 5, it is expected this construction activity can be undertaken without restriction at basement and ground floor level with limits of Condition 15(a)(ii) still expected to be achieved within music studios. At first floor level, measurements indicate increased levels of vibration and this indicates that saw cutting can be unrestricted up to 4m from the nearest studio. As discussed, it is possible that limits are still met, however there is an increased risk of exceeding them, therefore alternative or mitigated techniques to reduce vibration may be required and/or close liaison with adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact.

Stitch Drilling of Structural Slab

6.4 Based on the outcome of the measurements detailed in Section 5, it is expected this construction activity can be undertaken without restriction at basement level and, as discussed, this is expected to translate to ground floor level, with limits of Condition 15(a)(ii) still expected to be achieved within music studios. At first floor level, measurements indicate increased levels of vibration and this indicates that stitch drilling the slab can be unrestricted up to 4m from the nearest studio. As discussed, it is possible that limits are still met, however there is an increased risk of exceeding them, therefore alternative or mitigated techniques to reduce vibration may be required and/or close liaison with adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact

Brock Percussive Drilling the Structural Slab

6.5 Based on the outcome of the measurements detailed in Section 5, it is expected that brock percussive drilling the slab is an activity that will produce high levels of noise and vibration, and there is a significant risk that this demolition technique will exceed the limits defined in Condition 15(a)(ii) within the music studios. Given the nature of the equipment used and aim of the activity, it could prove challenging to provide effective mitigation, particularly in context of vibration. As such, it is recommended an alternative technique is identified that can achieve the same demolition outcome and/or close liaison with adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact

Brock Munching on Structural Slab

6.6 Based on the outcome of the measurements detailed in Section 5 it is expected this construction activity can be unrestricted up to 4m from the nearest studio at roof level with limits of Condition

15(a)(ii) still expected to be achieved in respect of vibration. Within 4m, as discussed, it is possible that limits are still met, however there is an increased risk of exceeding them, therefore alternative or mitigated techniques to reduce vibration may be required and/or close liaison with adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact

6.7 With respect to noise, if activities are to be undertaken as close as 4m to the nearest studio, there is a significant risk that noise limits as defined in Condition 15(a)(ii) could be exceeded. As such further mitigation measures such as acoustic screening would be required to reduce the noise impact, however this typically only reduces noise levels in the region of 10 dB, so there may still be some short fall to achieving criteria within the music studio, in which case an alternative technique may be considered and/or close liaison with adjacent business and property occupier at 120-124 Curtain Road is required to advise of when this method of works can occur to minimise potential impact

Cumulative Impacts

6.8 The assessment has focussed on the individual impacts of each activity in context of Condition 15(a)(ii), however it is important to consider the cumulative impact of two or more activities, should they coincide.

6.9 The outcome of the measurements and subsequent assessment of impacts has shown that there are construction and demolition techniques commonly adopted within the construction industry that are expected to meet the limits defined in Condition 15(a)(ii). However, should some of these activities be undertaken simultaneously, there is a risk of exceeding limits within the most sensitive parts of 120-124 Curtain Road. Nonetheless, it should be noted that noise and vibration monitoring will be carried out in accordance with an agreed Demolition and Construction Management Plan in order to provide live monitoring and should limits be exceeded, activities can be ceased until a suitable alternative approach can be implemented.

7 Recommendations and Mitigation

Mitigation

Structure-borne Noise and Vibration

7.1 In general terms, the way to control vibration transmission – whether it manifests as structural vibration or reradiated noise – is to limit the effectiveness of the transfer of energy from the source to the receiver. Therefore, in context of 118 Curtain Road conversion project, mitigation measures to be considered during the construction should be applied to the following activities:

- **Saw Cutting**.
    - *Noise* - Use low noise versions of proposed equipment. Provide portable, temporary, enclosures to achieve significant noise reduction; however, adequate ventilation is necessary. Alternatively, use acoustic screens and/or barriers.
- **Stitch drill**.
    - *Noise* - Ensure that equipment has noise control measures incorporated such as mufflers or silencers. Provide portable, temporary, enclosures to achieve significant noise reduction; however, adequate ventilation is necessary. Alternatively, use acoustic screens and/or barriers.
- **Broking Percussive Drilling.**
    - *Vibration* - Consider use of alternative plant or techniques. Where large areas of concrete require removal, such as the roof slab, consider the use of equipment that breaks concrete through flexing rather than breaking.
    - *Noise* - Use acoustic screens and/or barriers to be installed close to the noise source. Whereas it is no possible, consider the use of acoustic screen/barriers at the external construction wall placed between the warehouse and the studios.
- **Munching**.
    - *Noise* - Use acoustic screens and/or barriers whereas the construction activities would otherwise have direct line of sight to the studios.

Construction Noise and Vibration Monitoring

7.2 The control of the noise and vibration levels can be achieved by monitoring the construction activity on site, especially for those activities producing high L_{Aeq} and L_{AMax} levels of noise and PPV (mm/s) for vibration. In order to have a control of the vibration and noise levels during the construction activities, the monitoring stations would be installed at appropriate locations for unattended survey. Locations should include within 118 Curtain Road (limits defined in paragraph 7.4) and within studios of 120-124 Curtain Road (with agreement of owners).

7.3 Procedure regarding the calibration will follow the techniques traceable to national standards. the monitoring service include weekly visits to the stations for downloading, swapping out of batteries and general maintenance. The monitoring stations will be capable of being accessed remotely to view live noise levels and download electronically. Alerts in forms of email and text message should be sent to the consultant managing the equipment and to relevant site personnel, such as the site manager, when the levels of noise and/or vibration exceed the

triggers set to the monitors, and construction works should then cease until a suitable method can be identified to continue the task until an alternative methodology can be identified to continue the task and minimise disruption on adjacent businesses and property occupiers. The equipment would be installed and monitored by a fully qualified acoustic consultant using appropriate grade sound level meter(s) and seismic monitoring (vibration) systems at strategic measurement locations.

7.4 Based on pre-commencement noise and vibration testing, it is recommended the following noise and vibration limits are not exceeded on the 118 Curtain Road side of the party wall separating 118 Curtain Road and 120-124 Curtain Road, and monitoring equipment should be set up for the duration of the redevelopment of 118 Curtain Road. Should these limits be achieved, it is expected that noise and vibration limits as defined in Condition 15(a)(ii) will be satisfied with studios contained in 120-124 Curtain Road.

- Vibration: 1 mm/s PPV;
- Noise: 100 dB L_{Aeq} (acknowledging that the specific criteria relates to NR 15, it is expected this will still be met for an overall noise level of 100 dB L_{Aeq} within 118 Curtain Road based on pre-commencement testing) and 110 dB L_{Amax}.

Appendix One – Glossary of Acoustic Terminology

Decibel (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 is it high pitched, low pitched or with no distinct tonal character. These measurements are usually undertaken in octave or 1/3 octave frequency bands. If these values are logarithmically summed 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.

dBA 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 1/3 octave band values, before logarithmically summing them. As a result the single dB(A) value provides a good representation of how loud a sound is.

NR The Noise Rating (NR) curves are a series of internationally agreed spectra of equal perceived loudness. They are the recognised method of expressing noise from continuous building services plant in buildings.

L_{max} The Lmax is the highest short-term noise level sample that occurred during a measurement period. When the 'fast' time weighting is used (i.e. L_{Fmax}), the sample time is 125 milliseconds.

RT The Reverberation Time (RT) is the length of time in seconds it would take for a sound to decay by 60 dB and is it therefore a measure of the 'echo' within a room. The reverberation time is often referred to as the T_{60} however it is often impractical to measure such a 60 dB noise level decay and so the reverberation time is often based on the T_{20} and T_{30} which related to the decay over 20 dB and 30 dB normalised to a decay of 60 dB. Measurements of the reverberation time are usually undertaken in accordance with BS EN 354.

D The sound insulation performance of a construction is a function of the difference in noise level either side of the construction in the presence of a loud noise source to one side. D, is therefore simply the level difference between the two rooms of interest.

D_{nT} The standardised level difference. D is corrected to allow for the reverberation time in the receiving room. Measurements are made in accordance with BS EN ISO 140-4.

$D_{nT,w}$ The weighted standardised level difference. A single value of the DnT derived from the third octave values using the method described in BS EN ISO 717-1.

R R is the *sound reduction index* of a material or construction measured under laboratory conditions in accordance with BS EN ISO 140-3. R takes account of the area of the construction under test as well as the absorption in the receiving room. Taking these into account allows the R for different constructions to be compared on a like for like basis.

R_w R_w is 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.

Appendix Two – Noise and Vibration Testing Statement (ref: 6479815/cs/L02, 22nd June 2021

Acoustics and Vibration Group

Our ref: 6479815/cs/L02
22nd June 2021

118 CURTAIN ROAD, LONDON EC2A 3PJ

Noise and Vibration Testing Statement related to Condition 15(a)(ii) contained within Hackney Borough Council Decision Notice (ref: 2018/03663) dated 24th May 2019.

1. Background and Statement Objective

1.1 This Statement has been prepared on-behalf of Curtain Road Properties Limited (CRP) and relates to planning application approval reference 2018/0363 at 118 Curtain Road, London EC2A 3PJ, within the London Borough of Hackney.

1.2 This Statement seeks to address condition 15 of planning approval ref. 2018/0363, requiring that a demolition and construction method statement is provided. In particular it is stated at part (a)(ii) of condition 15 that the statement must also include:

"ii. Details of on-site testing which demonstrates that the construction of the development can be carried out without exceeding the noise and vibration levels set out at part i above."

1.3 The Gillieron Scott (GSAD) acoustic consultant Peer Review report (dated 08/02/19) addressed to the Local Planning Authority, stated at page 9;

"In lieu of predictions or evidence to show that the construction/demolition is possible without breach of the agreed noise limits, GSAD suggest the only way to reduce uncertainty would be for 118 Curtain Road to carry out site measurements prior to the commencement on site.".

1.4 The previous Bureau Veritas Acoustic Report reference 6479815 dated 15 November 2018 ('BV Report') submitted is the approved planning document referred to within condition 15 of the planning approval. Section 5 of the BV Report provides predicted noise and vibration impacts. The methodology for airborne and structure-borne reradiated noise predictions used by Bureau Veritas can be summarised as follows;

Airborne Noise Predictions
The calculation method contained in ISO 9613-2 has been used as the basis for predictions of noise impact from construction activities.

Structure-borne Reradiated Noise Predictions
Structure-borne reradiated noise predictions are based around the methodology set out in the ANC Guidelines Measurement and Assessment of Groundborne Noise and Vibration.

Structural Vibration Predictions
Comment is made on potential structural vibration impacts based on proposed construction equipment and techniques, but as with structure-borne reradiated noise, the comments and estimations are indicative at best.

1.5 This Statement provides an overview by Bureau Veritas and the project design team to define the testing requirements to address condition 15 part (a)(ii).

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The purpose of the on-site testing referred at part (a)(ii) of condition 15 is to reduce uncertainty around the reasonable assumptions adopted in the BV Report. It should be noted that the objective of the tests proposed is to provide CRP with a more in-depth understanding of the potential noise and vibration impact of the construction activities with due regard to the strategy to satisfy the whole of Condition 15.

2. Condition 15 Part (a)

2.1 As determined by LBH and included within the Decision Notice, the following Condition is stipulated in respect of noise and vibration:

2.2 **Condition 15 (the "Condition):** Notwithstanding the documents hereby approved, no development shall take place until a detailed Demolition and Construction Management Plan covering the matters set out below only has been submitted to and approved in writing by the Local Planning Authority. The development shall only be carried out in accordance with the details and measures approved as part of the demolition and construction management plan, which shall be maintained throughout the entire construction period. The plan must include:

a) A demolition and construction method statement covering all phases of the development to include details of noise control measures and measures to preserve air quality (including a risk assessment of the demolition and construction phase);

The statement must also include:

i. Details as to how the construction of the development can be carried out without exceeding the following noise and vibration levels at a location (or locations) to be agreed by the Local Planning Authority: 1. NR 15 Leq,15min; 2. 25 dB LAmax; 3. 0.5 mm/s PPV.

ii. Details of on-site testing which demonstrates that the construction of the development can be carried out without exceeding the noise and vibration levels set out at part i above.

iii. Details of noise and vibration monitoring to be carried out in accordance with the methodology set out in the Acoustic Report by Bureau Veritas dated November 2018. This monitoring data must be made available to the Local Authority when it is requested.

iv. A liaison strategy between the applicant and adjacent businesses and property occupiers including a commitment to liaise with neighbours when particularly noisy periods of construction are likely to occur.

3. Scoping of On-site Testing Activities with reference to Condition 15 (a)(ii)

3.1 CRP instructed Bureau Veritas (noise and vibration consultant) and its professional team to identify and review the demolition and construction activities which will likely be required to develop 118 Curtain Road. The objective of this exercise was to identify the tests required to address part (a)(ii) of condition 15 above, and further inform the noise prediction analyses of Bureau Veritas as noted within the BV Report planning document.

3.2 The team sought to:

- Investigate the design in order to identify the key demolition and construction activities
- Define these activities with regard to location, duration, likely equipment/methodology
- Explore the potential noise and vibration impact of the activities
- Identify the activities for on-site testing and define their monitoring methodology

3.3 The project design team has explored the likely demolition and construction techniques and activities required to develop 118 Curtain Road. This exercise was led by Skidmore Owings and Merrill (SOM), Structural Engineers for the project, in collaboration with wider design team members, and noise and

vibration experts, Bureau Veritas. Further input has also been sought from a number of contractors and specialists to help verify and provide additional comment and expertise. The following activities were considered to represent those that could induce highest levels of structure-borne noise transmission:

- Roof/floor slab demolition;
- Saw cutting/localised demolition for lift and risers.

3.4 The team have identified tests and equipment noted below as high impact activities and thus the most appropriate for the on-site testing.

- Saw cutting of existing concrete;
- Percussive drilling;
- Boring holes for column strengthening.

3.5 In order to emulate the activities required to form openings in the floor slab, and with due regard to doing so with as little noise and vibration impact as possible, it proposed to conduct a series of stitch-drill tests. This technique usually involves drilling the perimeter of an opening with overlapping holes to create sufficient separation of the slab before breaking this into smaller pieces for removal (*see image below).*

3.6 The same technique above can also be applied to test the core drilling on any columns which may require strengthening.

4. Noise and Vibration Testing Methodology

4.1 It is proposed that noise and vibration measurements are undertaken on the series of activities identified above.

4.2 It is anticipated that noise and vibration transmission of these activities within 118 Curtain Road, and to neighbouring occupiers, will be consistent without significant variation in level. Therefore, it is proposed that only relatively short term measurements (less than 2 minutes) will be required to establish more detailed test data to help determine if stipulated limits in condition 15 are achievable. Conducting the testing using short-term measurements would also benefit neighbouring occupiers with noise sensitive activities by minimising any potential disruption during this period.

4.3 The estimated noise impact of construction for all phases of the works are set out in detail within the tables at section 5.11 of the BV Report.

4.4 In order to provide a more complete and consistent picture of transmission throughout 118 Curtain Road and to provide indicative information of transmission loss characteristics of the building, it is proposed that monitoring is carried out as per the below:

- 1m from source
- At the boundary between 118 Curtain Road and 120-124 Curtain Road

- On the party wall between 118 Curtain Road and 120-124 Curtain Road (vibration only).
- Within the basement of 118 Curtain Road

4.5 All tests will include noise and vibration (excluding that identified as vibration only). Other than measurements at 1m from the source, as source location is expected to be variable, all measurements are expected to be taken at exactly the same position in order to provide a controlled test sample. The exact test locations will be recorded on-site prior to commencing with each test.

4.6 Noise and vibration monitoring equipment used during the tests will be of high specification, capable of accurately measuring low levels of noise and vibration (acknowledging the noise/vibration floor due to electronics). Equipment will have valid external calibration certificates and calibrated to recognised UK and international standards.

Consideration will be given to the cumulative effect of multiple activities being undertaken simultaneously, should the Contractor indicate this to be likely following the results.

Yours sincerely,

Craig Scott
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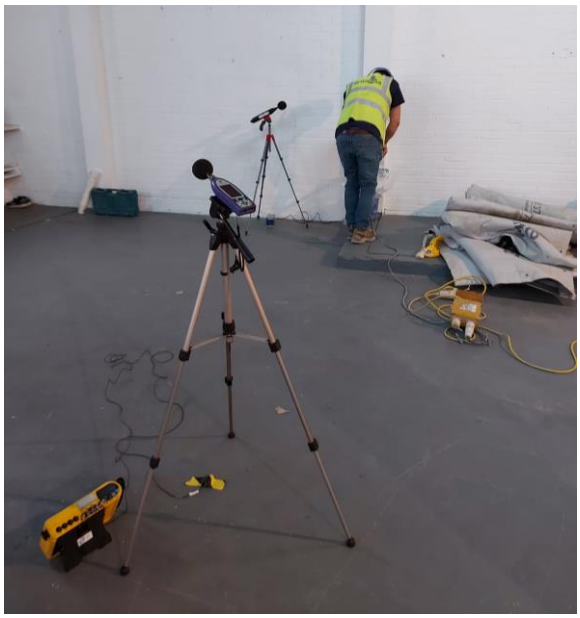
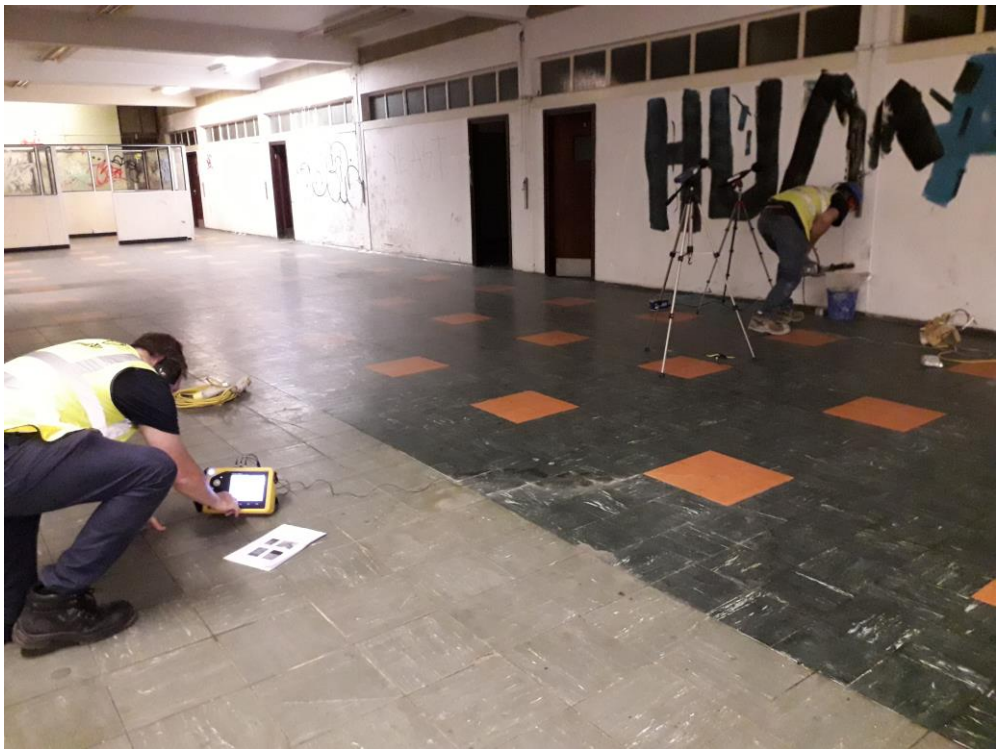
Appendix Three – Photos of the Tests

A3.1: Test No. 1 – Boring Holes to Coring Column, Lobby, Ground Floor.

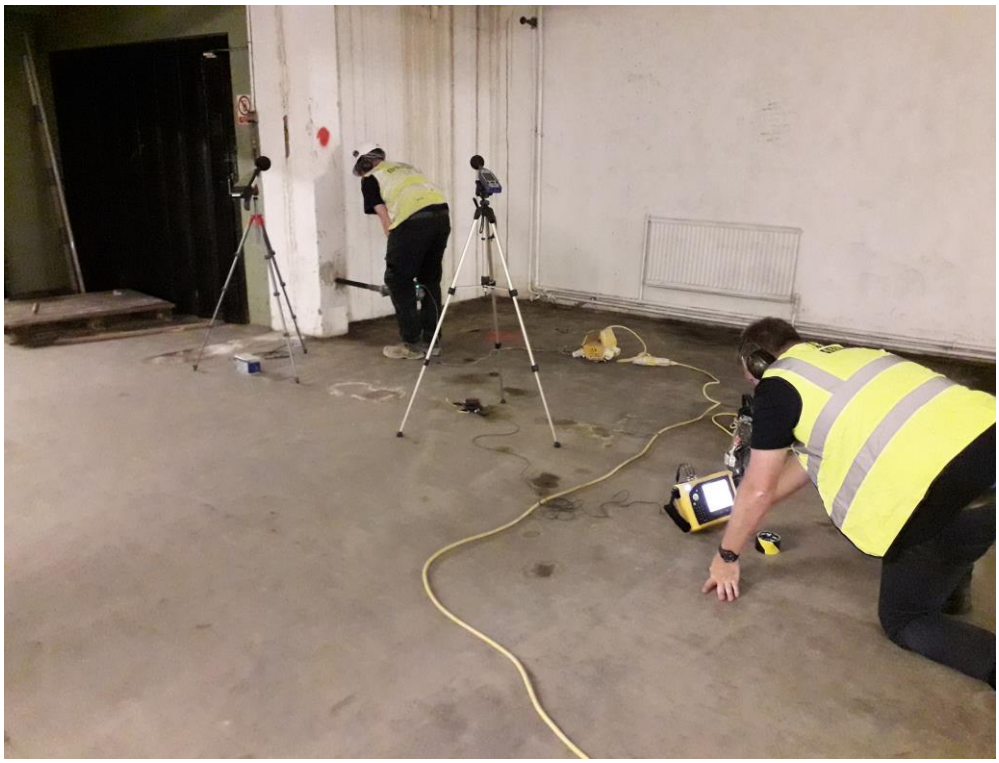


A3.2: Test No. 2 – Boring Holes to Coring Column, Lift Shaft, Ground Floor.

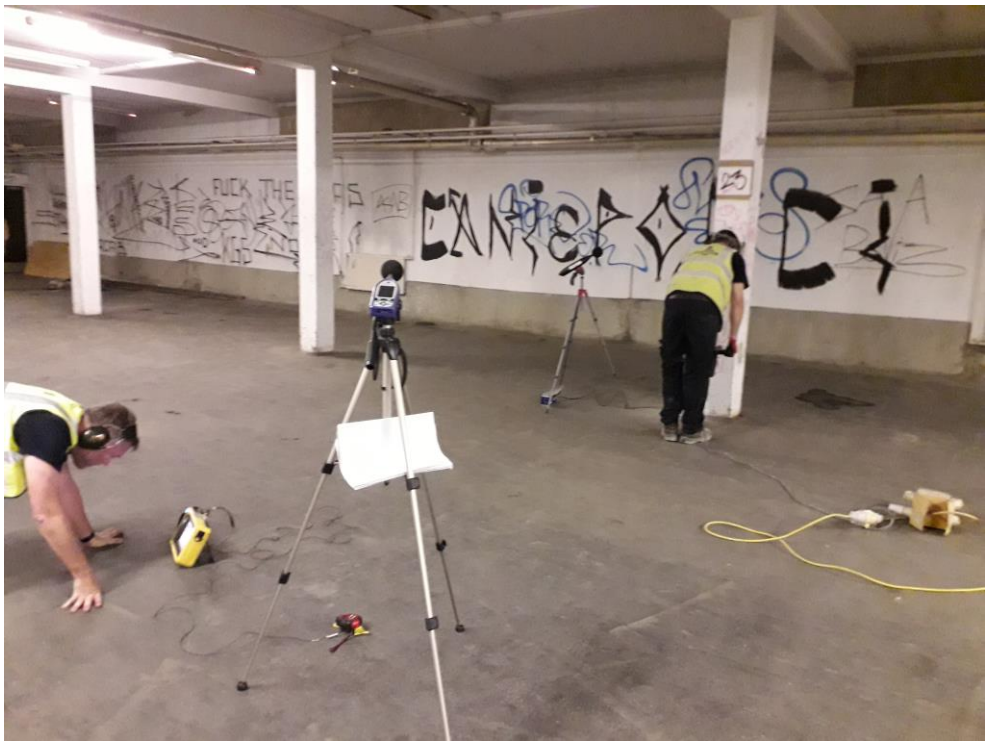
A3.3: Test No. 3 – Boring Holes to Coring Column, Main Room, Ground Floor.



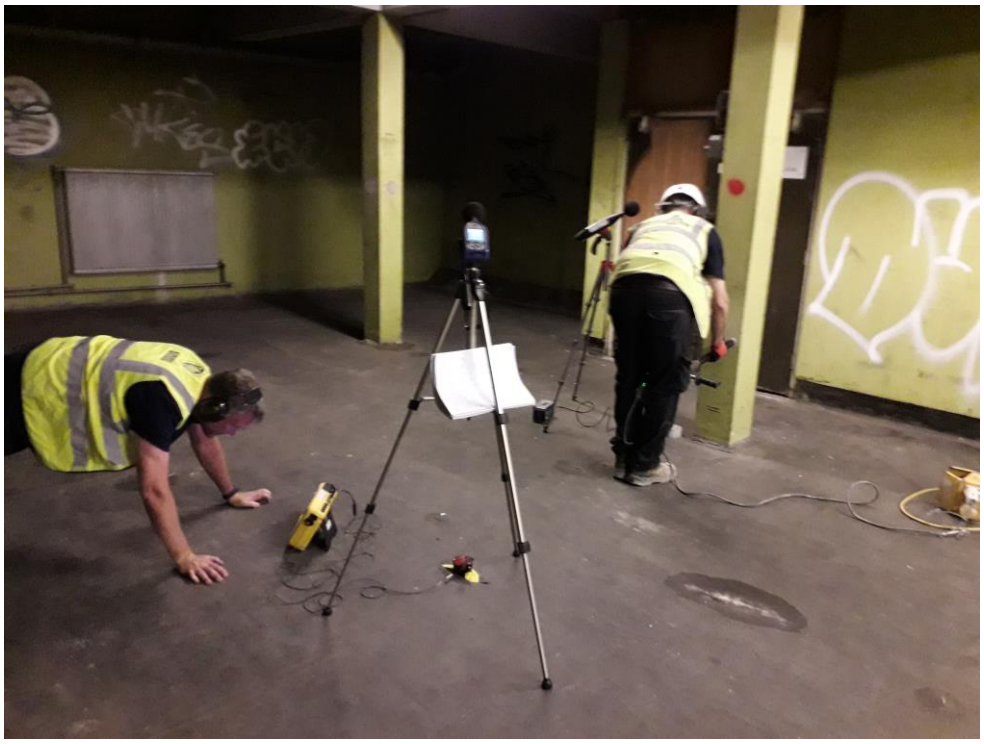
A3.4: Test No. 4 – Boring Holes to Coring Column, Lift Shaft, Basement.



A3.5: Test No. 5 – Boring Holes to Coring Column, Main Room, Basement.



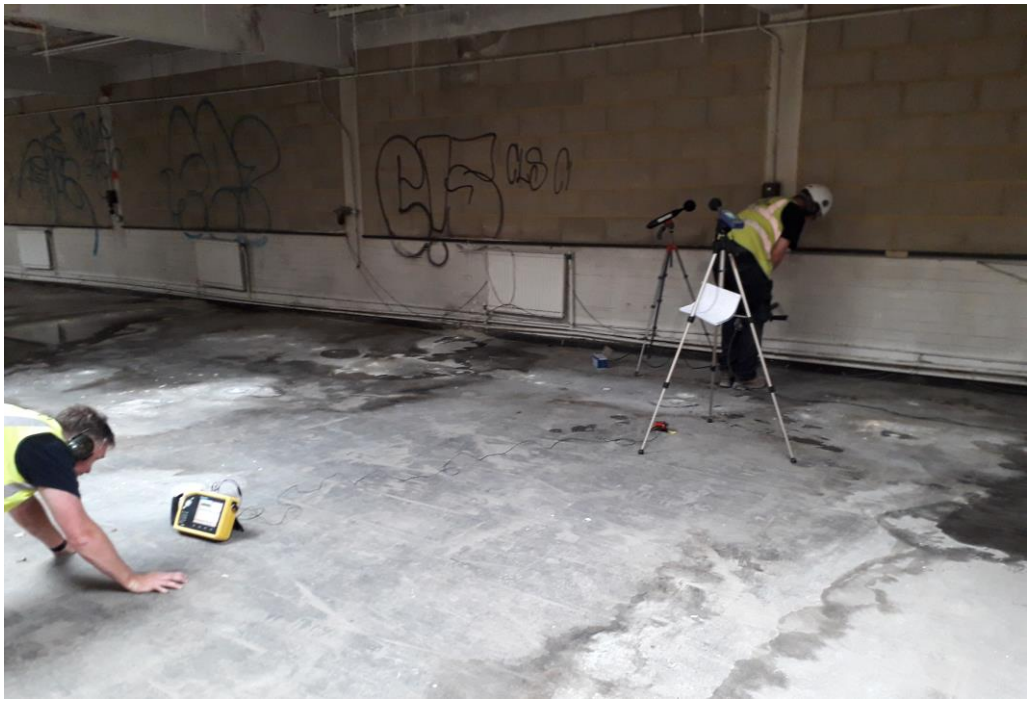
A3.6: Test No. 6 – Boring Holes to Coring Column, Front Room, Basement.



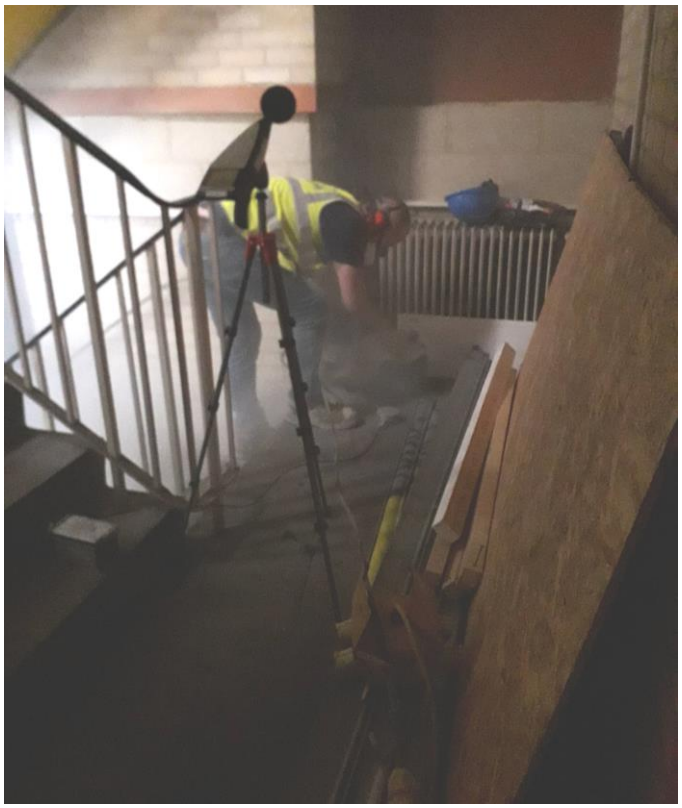
A3.7: Test No. 7 – Boring Holes to Coring Column, Front Room, First Floor.

A3.8: Test No. 8 – Boring Holes to Coring Column, Lift Shaft, First Floor.

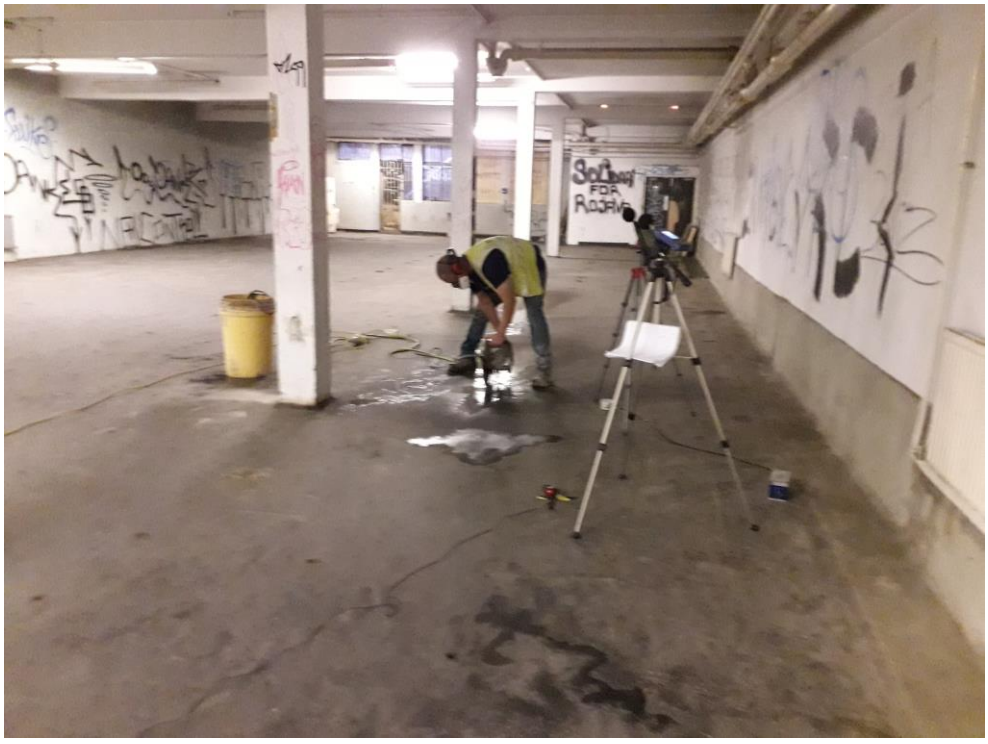
A3.9: Test No. 9 – Boring Holes to Coring Column, Main Room, First Floor.



A3.10: Test No. 10 – Saw cutting Slab, Stairwell, Ground Floor.

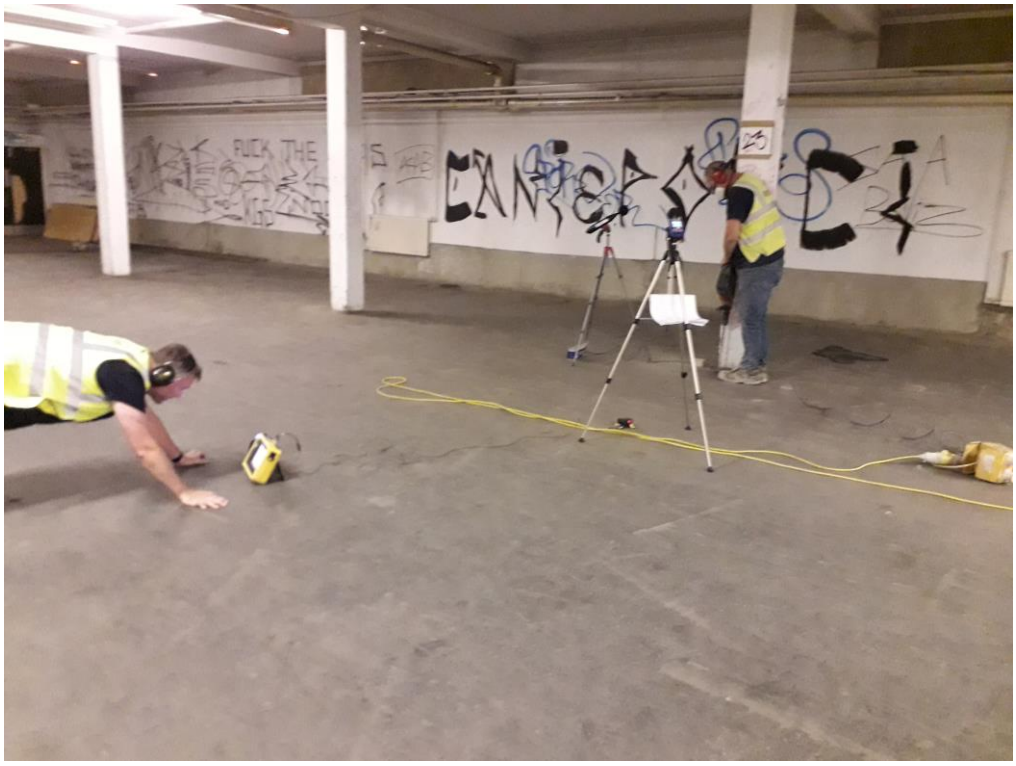


A3.11: Test No. 11 – Saw cutting Slab, Main Room, Basement.

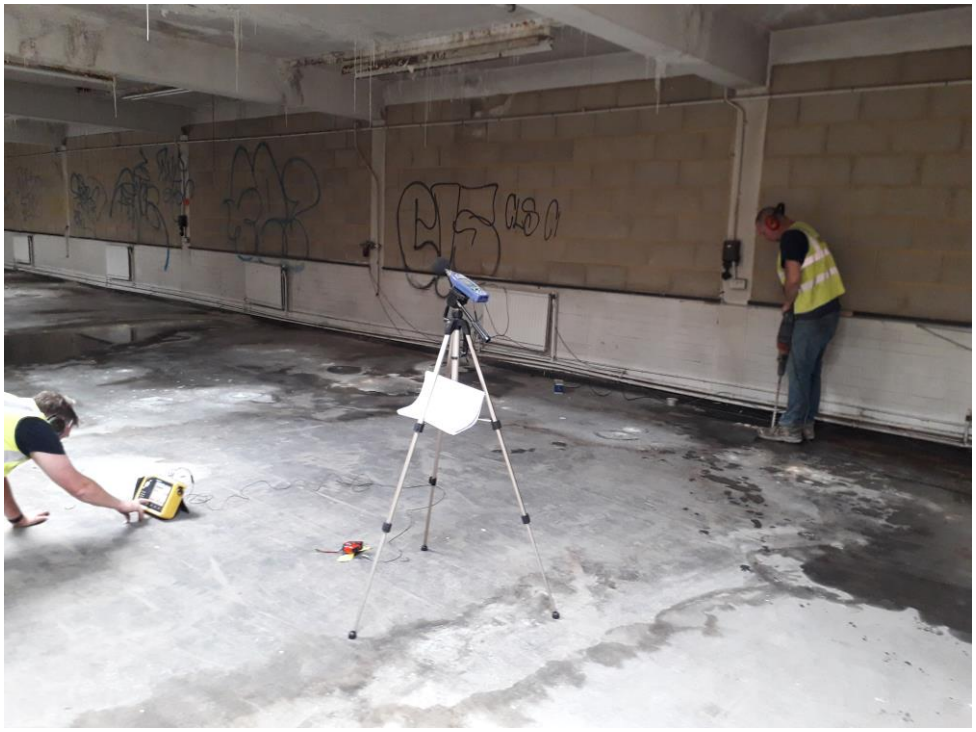


A3.12: Test No. 12 – Saw cutting Slab, Main Room, First Floor.

A3.13: Test No. 13 – Percussive Drilling to Slab, Main Room, Basement.

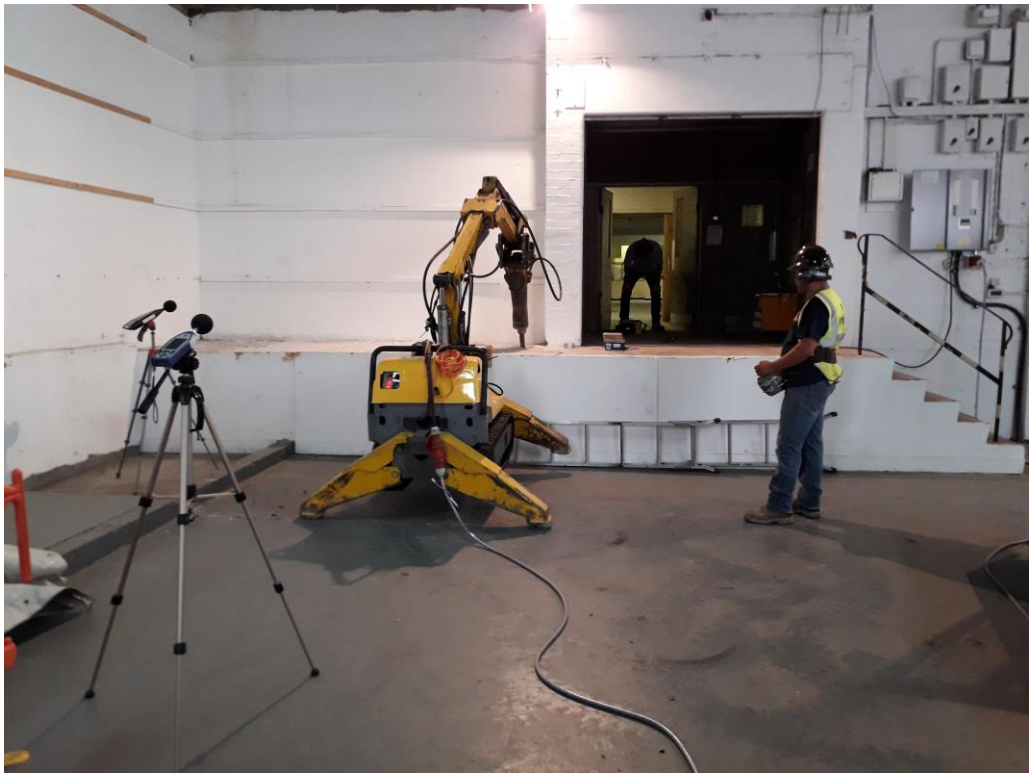


A3.14: Test No. 14 – Percussive Drilling to Slab, Main Room, First Floor.



A3.15: Test No. 15 – Brock Chipping on Slab, Lobby, Ground Floor.

A3.16: Test No. 16 – Brock Chipping on Slab, Shaft Stairs, Ground Floor.



A3.17: Test No. 17 – Munching on Slab, Roof.

Appendix Four – Octave Frequency Bands of the Noise Measurements

A4.1: Measured Noise Levels at the Source Location

Test No.	Overall Level L_{Aeq} (dB)	L_{eq} Noise Levels (dB) @ One Octave Frequency Bands (Hz)							
		63	125	250	500	1k	2k	4k	8k
1	88.6	69.8	69.6	69.5	74.0	80.1	82.4	83.1	81.9
2	93.7	62.7	70.9	74.3	76.1	83.9	86.6	89.3	87.0
3	91.4	56.7	67.2	72.9	74.4	80.8	85.6	86.3	84.6
4	92.2	57.8	65.1	70.1	78.1	83.7	84.3	87.0	86.3
5	89	55.3	58.8	65.5	73.6	79.8	82.9	84.1	81.4
6	92.6	56.7	64.4	73.7	80.7	81.0	82.8	88.5	87.3
7	83.1	61.7	68.1	68.2	70.6	74.1	76.7	78.2	75.4
8	85.4	61.7	67.9	68.2	71.8	76.3	78.8	80.6	78.2
9	86.7	61.7	67.9	68.3	72.2	77.2	79.8	82.0	79.9
10	105.8	69.9	73.5	81.6	96.1	94.4	98.0	100.8	101.1
11	92.0	58.0	64.7	73.0	80.1	81.2	82.9	88.0	86.7
12	101.7	61.8	69.3	84.8	95.5	90.9	94.3	96.4	95.3
13	88.2	56.4	59.6	66.7	73.3	79.4	81.8	83.4	80.7
14	102.8	69.7	79.3	87.8	89.0	87.8	86.4	98.2	100.6
15	109.8	90.7	97.1	103.0	100.4	104.2	103.9	100.7	96.4
16	105.4	87.6	90.2	99.1	99.5	101.0	99.3	95.1	90.7
17 (4m)	92.8	77.1	83.0	84.0	85.5	86.3	87.4	85.5	80.4

Appendix Five – NR Calculations

For the NR calculations the equation (1) has been taken as a reference to calculate the noise levels in the studios:

$$L_2 = L_1 - R_W + 10\text{Log}(S/A) \qquad (1)$$

Where:
L_1 is the noise at the source;
L_2 is the noise level in the receiving room;
R_W is the weighted sound reduction index;
S is the total surface area of receiving room;
A is the total absorbing area inside the receiving room.

Based on the plan layout of the studios, the dimension of the room considered as the worst scenario are those related to the studio 11 located on the first floor, equal to 6 × 4 × 3 m [L × W × H]. The studio 11 has been selected to be the most sensitive space given its structure to be 'box in a box'.

The absorption inside the receiving room has been calculated to have an averaged reverberation time across all the frequency bands equal to 0.2 s.

Note also that the calculations assume a diffuse sound field within 118 Curtain Road and therefore measured noise levels are considered to representative of those incident upon the separating construction between 118 Curtain Road and the music studios. This is therefore considered a 'worst case' assessment of noise transfer.

The R_W performance, as predicted with Insul, has been lowered by 7 dB at each octave frequency band to be closer to the reality where the workmanship can influence the overall performance. As such, the spectrum of the construction wall between the warehouse and the studios considered for the calculation is summarised in Table A4.1.

Table A4.1: Octave frequency band performance of the wall construction between Studios and warehouse.

Weighted Sound Reduction Index	Frequency Octave Bands (Hz)						
	63	125	250	500	1k	2k	4k
R_w 87 (dB) – Estimation with Insul	41	63	80	83	112	121	133
R_w 80 (dB) – Normalised to site performance	34	56	73	76	105	114	126

On this basis, it can be expected that R_W, S and A are constant values to be substituted in equation (1) for all the test samples and that the only variable is L_1. As such, the overall L_2 (both L_{Aeq} and L_{AMax}) noise levels and the octave frequency bands calculated in the receiving room are given in Table A4.2 for each test. The L_1 noise levels are taken from Table A3.1.

Table A5.2: Level max (L_{AMax}), overall (L_{Aeq}) and octave frequency band (L_{eq}) noise levels calculated in the receiving room (L_2).

Test No.	NR Levels	Overall Levels (L_{Aeq}, L_{AMax}) (dB)	L_{eq} Noise Levels (dB) @ One Octave Frequency Bands (Hz)							
			63	125	250	500	1k	2k	4k	8k
1	NR 0	L_{Aeq} = 11.4	37.1	15.7	-1.4	-2.2	-28.2	-35.6	-46.9	-50.0
	-	L_{AMax} = 17.8	43.5	22.1	5.0	4.2	-21.8	-29.2	-40.5	-43.6
2	NR 0	L_{Aeq} = 6.8	30.3	17.4	3.7	0.2	-24.1	-31.1	-40.3	-44.6
	-	L_{AMax} = 7.8	31.3	18.4	4.7	1.2	-23.1	-30.1	-39.3	-43.6
3	NR 0	L_{Aeq} = 1.8	23.6	12.9	1.6	-2.2	-27.9	-32.8	-44.0	-47.7
	-	L_{AMax} = 3.8	25.6	14.9	3.6	-0.2	-25.9	-30.8	-42.0	-45.7
4	NR 0	L_{Aeq} = 2.9	25.1	11.2	-0.9	1.9	-24.6	-33.7	-42.9	-45.6
	-	L_{AMax} = 4.9	27.1	13.2	1.1	3.9	-22.6	-31.7	-40.9	-43.6
5	NR 0	L_{Aeq} = - 0.9	22.7	4.9	-5.5	-2.6	-28.6	-35.2	-45.8	-50.6
	-	L_{AMax} = 1.1	24.7	6.9	-3.5	-0.6	-26.6	-33.2	-43.8	-48.6
6	NR 0	L_{Aeq} = 4.6	24.6	11.0	3.3	5.1	-26.8	-34.6	-40.9	-44.0
	-	L_{AMax} = 16.6	36.6	23.0	15.3	17.1	-14.8	-22.6	-28.9	-32.0
7	NR 0	L_{Aeq} = 10.3	34.9	20.1	3.1	0.3	-28.3	-35.4	-45.9	-50.6
	-	L_{AMax} = 14.3	38.9	24.1	7.1	4.3	-24.3	-31.4	-41.9	-46.6
8	NR 0	L_{Aeq} = 8.0	32.6	17.6	0.9	-0.9	-28.4	-35.7	-45.7	-50.1
	-	L_{AMax} = 14.0	38.6	23.6	6.9	5.1	-22.4	-29.7	-39.7	-44.1
9	NR 0	L_{Aeq} = 4.8	29.4	14.3	-2.3	-3.7	-30.8	-37.9	-47.6	-51.7
	-	L_{AMax} = 12.8	37.4	22.3	5.7	4.3	-22.8	-29.9	-39.6	-43.7
10	NR 19 @500 Hz	L_{Aeq} = 21.2	40.4	22.8	13.9	23.1	-10.7	-16.9	-26.0	-27.7
	-	L_{AMax} = 23.2	42.4	24.8	15.9	25.1	-8.7	-14.9	-24.0	-25.7
11	NR11 @500 Hz	L_{Aeq} = 15.9	37.3	22.7	14.0	15.8	-15.2	-23.2	-30.0	-33.3
	-	L_{AMax} = 18.8	40.3	25.7	17.0	18.8	-12.2	-20.2	-27.0	-30.3
12	NR16 @500 Hz	L_{Aeq} = 17.1	29.4	15.7	14.2	19.7	-17.1	-23.4	-33.2	-36.3

Test No.	NR Levels	Overall Levels (L_{Aeq}, L_{AMax}) (dB)	L_{eq} Noise Levels (dB) @ One Octave Frequency Bands (Hz)							
			63	125	250	500	1k	2k	4k	8k
	-	L_{AMax} = 20.1	32.4	18.7	17.2	22.7	-14.1	-20.4	-30.2	-33.3
13	NR 0	L_{Aeq} = 10.6	34.5	16.5	6.6	7.9	-18.1	-25.5	-35.8	-40.5
	-	L_{AMax} = 15.6	39.5	21.5	11.6	12.9	-13.1	-20.5	-30.8	-35.5
14	NR 8 @500 Hz	L_{Aeq} = 15.8	37.3	25.6	17.0	13.0	-20.2	-31.4	-31.5	-31.1
	-	L_{AMax} = 21.8	43.3	31.6	23.0	19.0	-14.2	-25.4	-25.5	-25.1
15	NR 32 @31.5 Hz	L_{Aeq} = 33.5	57.7	42.9	31.8	24.0	-4.4	-14.4	-29.6	-35.8
	-	L_{AMax} = 38.5	62.7	47.9	36.8	29.0	0.6	-9.4	-24.6	-30.8
16	NR 29 @63 Hz	L_{Aeq} = 33.8	58.6	40.0	31.8	26.9	-3.7	-15.1	-31.2	-37.6
	-	L_{AMax} = 38.8	63.6	45.0	36.8	31.9	1.3	-10.1	-26.2	-32.6
17	NR 32 @63 Hz	L_{Aeq} = 35.9	60.7	45.3	29.2	25.5	-5.8	-14.4	-28.2	-35.3
	-	L_{AMax} = 38.9	63.7	48.3	32.2	28.5	-2.8	-11.4	-25.2	-32.3

Appendix Six – Acoustic Maps

NOISE

Legend

- GREEN: Noise levels calculated inside the music studios to be below the threshold set by the criteria (L_{Aeq} < NR 15; L_{AMax} < 25 dB).
- AMBER: Noise levels calculated inside the music studios to be up to 4 dB above the higher range limit (L_{Aeq} ~ NR 15; L_{AMax} ~ 25 dB).
- RED: Noise levels calculated inside the music studios to be more than 10 dB above the higher range limit L_{Aeq} > NR 15; L_{AMax} > 25 dB).

Figure A6.1: Boring Holes – Ground Floor

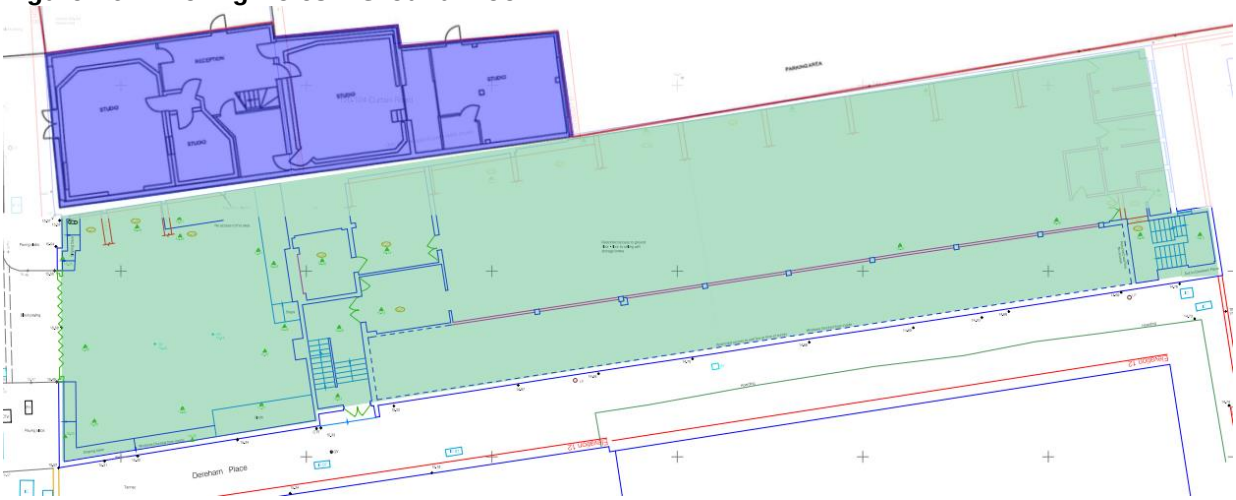


Figure A6.2: Boring Holes – Basement

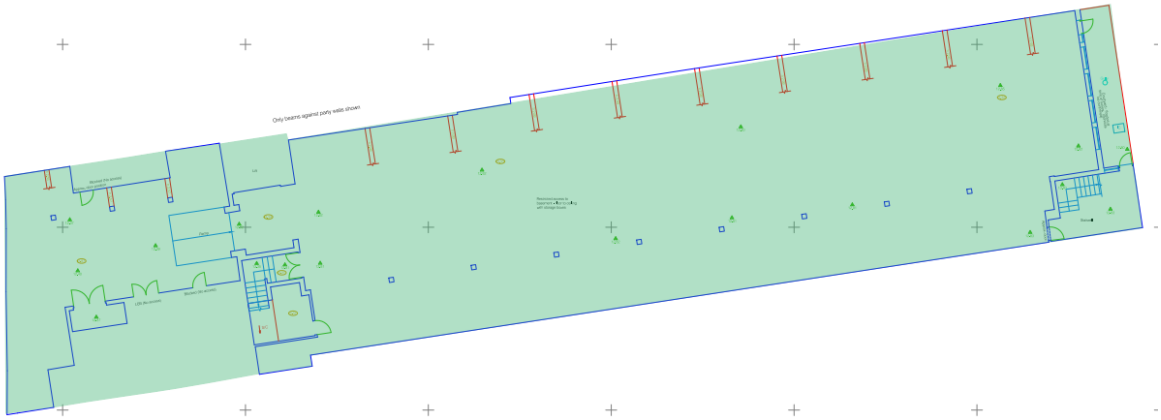


Figure A6.3: Boring Holes – First Floor

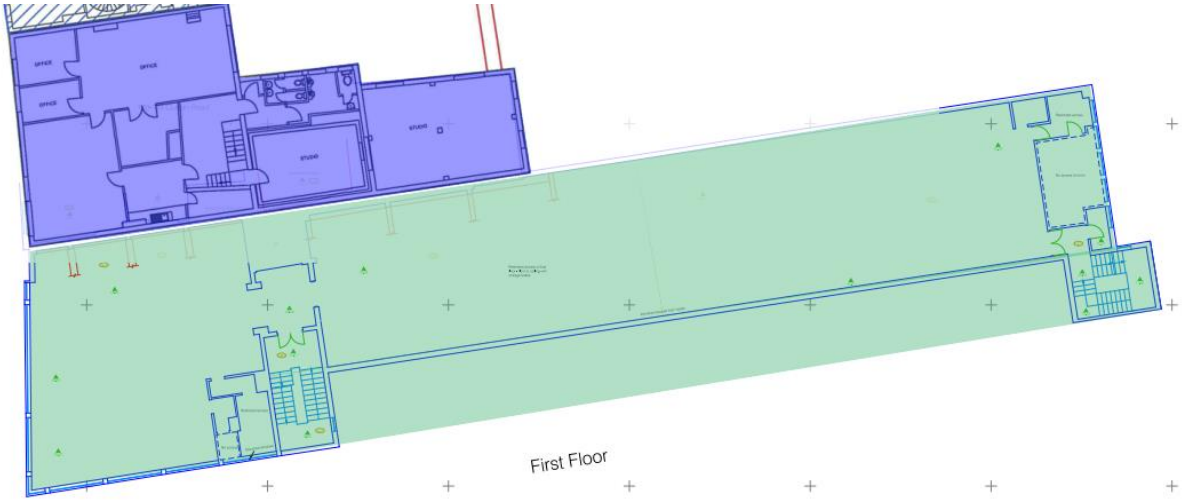


Figure A6.4: Saw Cutting - Ground Floor

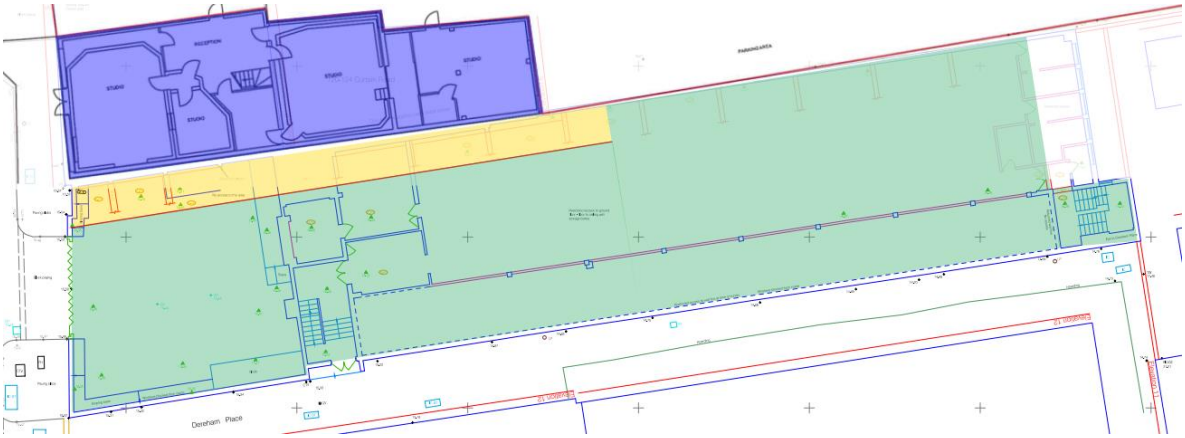


Figure A6.5: Saw Cutting – Basement

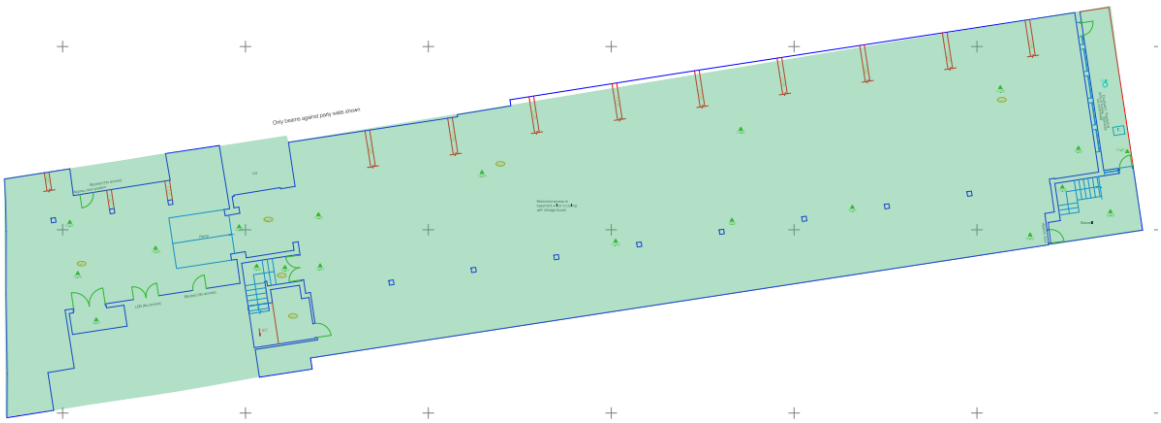


Figure A6.6: Saw Cutting – First Floor

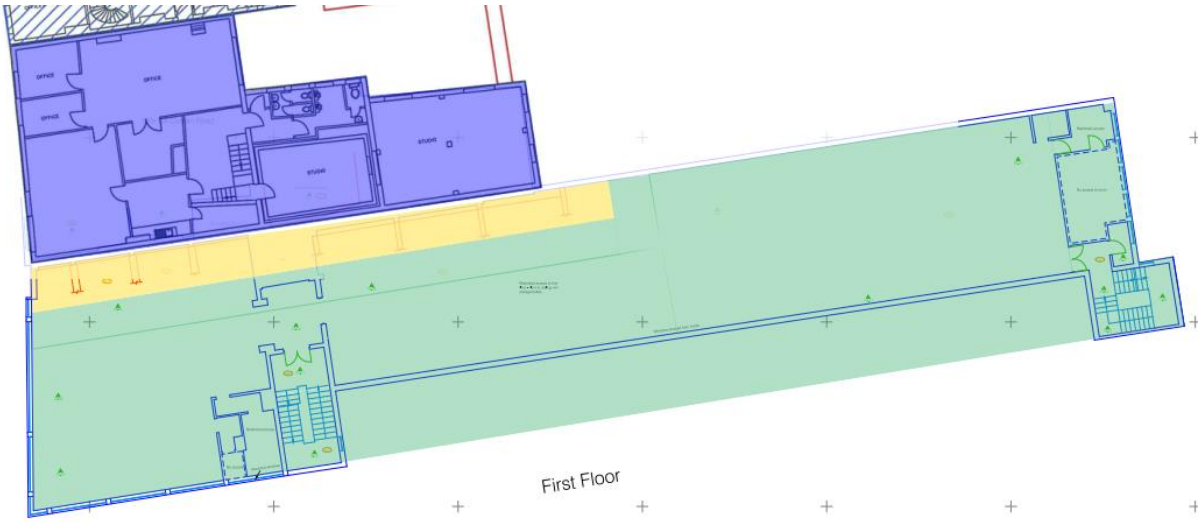


Figure A6.7: Stitch Drilling – Basement

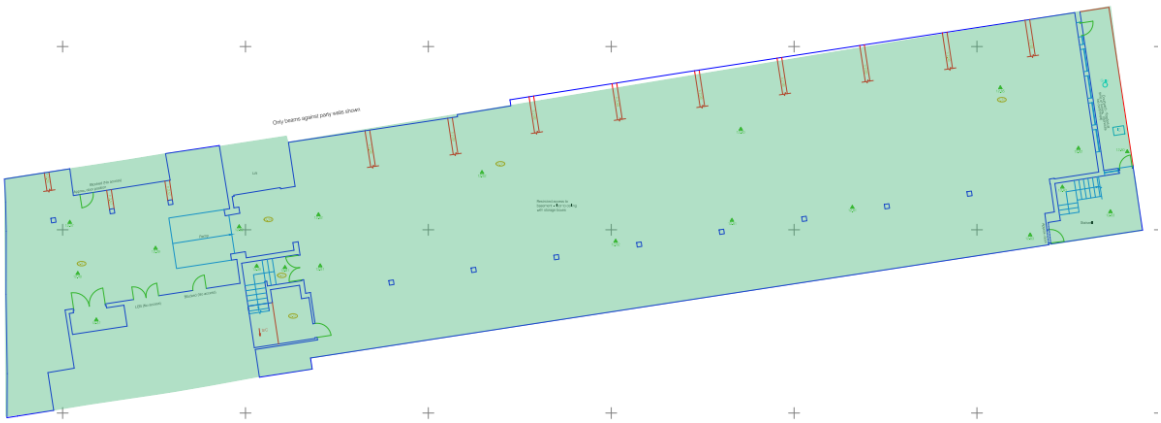


Figure A6.8: Stitch Drilling – First Floor

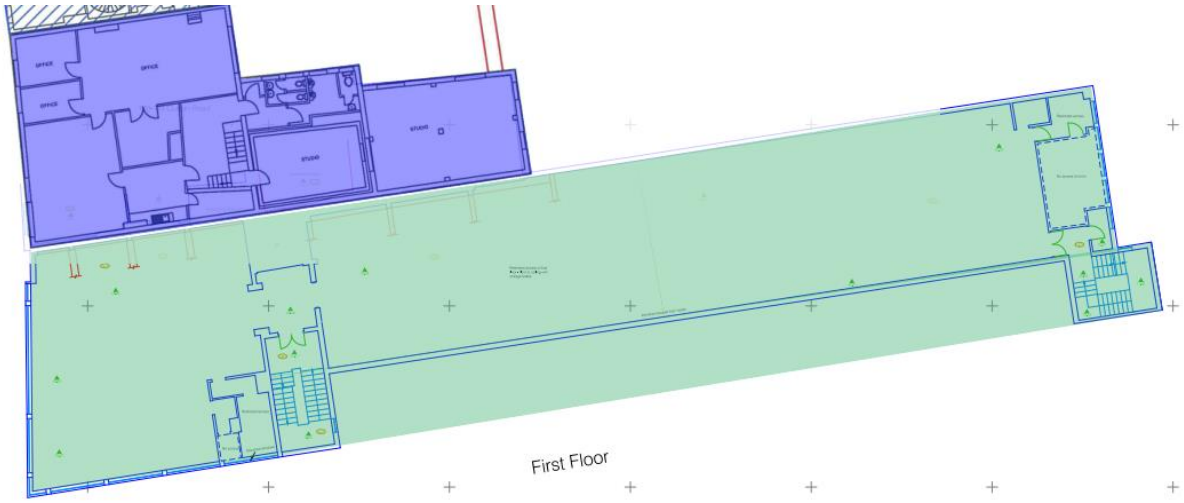
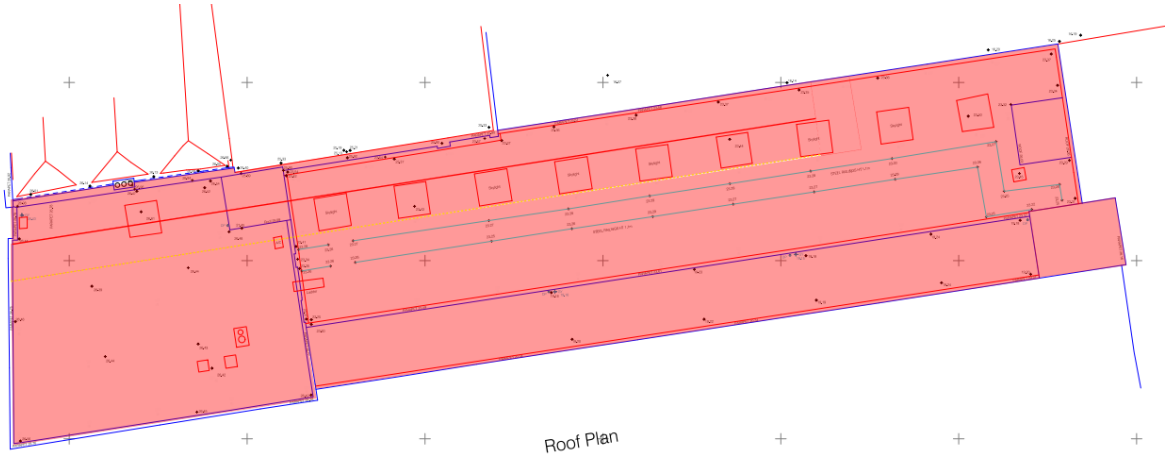


Figure A6.9: Brock Percussive Drill – Ground Floor

Figure A6.10: Munching – Roof



VIBRATION

Legend

- GREEN: Vibration levels found to be below 1 mm/s within 118 Curtain Road are considered likely to meet the threshold set by the criteria within the studios (< 0.5 mm/s PPV). These results have been highlighted in green.
- AMBER: Vibration levels found within 118 Curtain Road of between 1 mm/s and to 2.5 mm/s PPV (thus exceeding the criteria of 0.5 mm/s PPV by up to 2 mm/s PPV) have been highlighted in amber.
- RED: Vibration levels found to be greater than 2.5 mm/s PPV (thus exceeding the criteria of 0.5 mm/s PPV by 2 mm/s PPV or higher). These results have been highlighted in red.

Figure A6.11: Boring Holes – Ground Floor

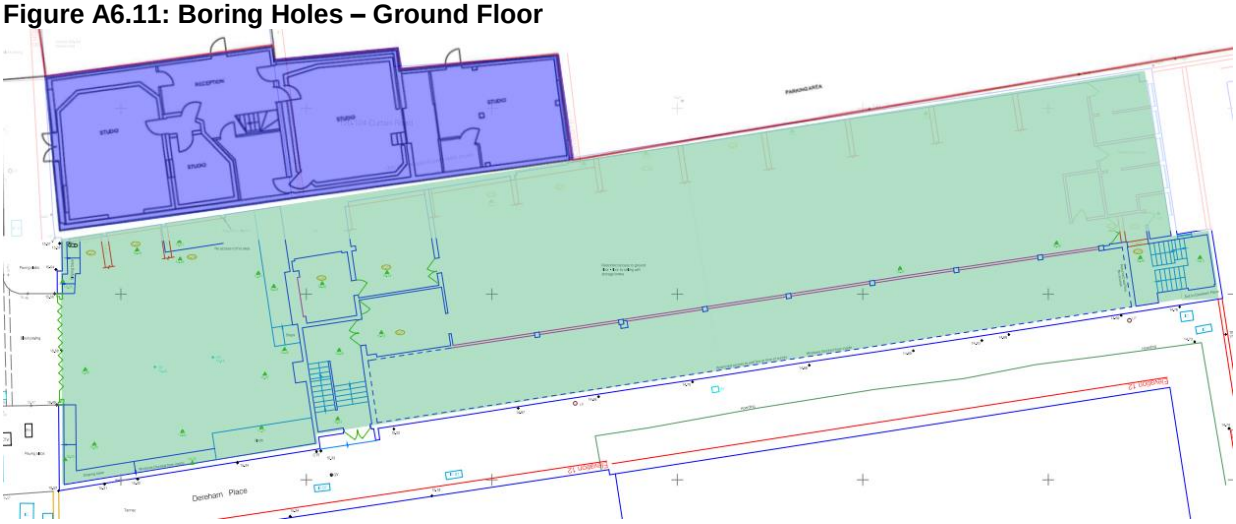


Figure A6.12: Boring Holes – Basement

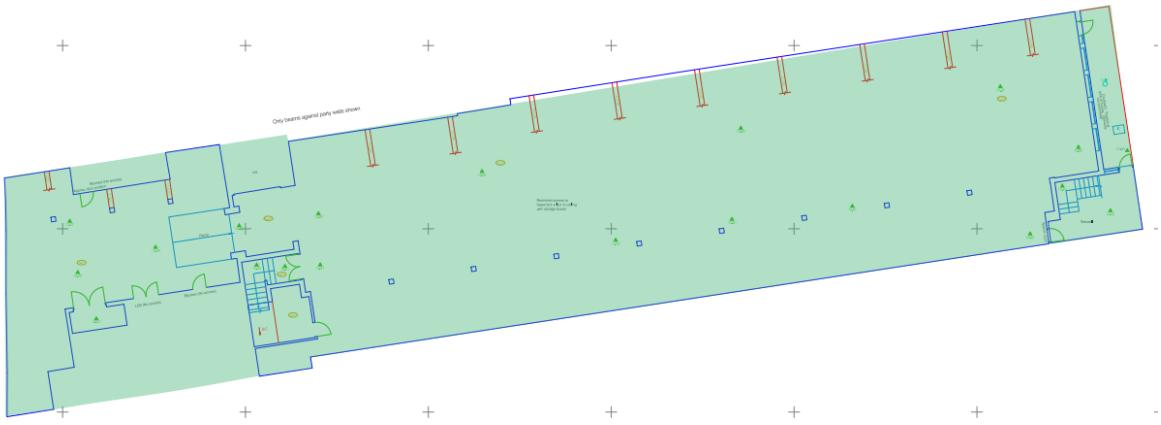


Figure A6.13: Boring Holes – First Floor

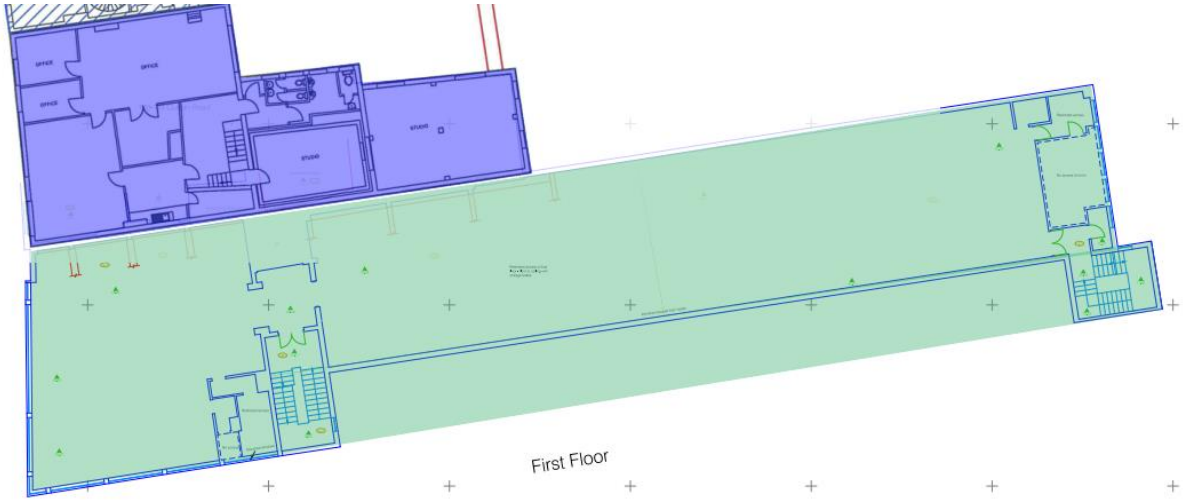


Figure A6.14: Saw Cutting - Ground Floor

Figure A6.15: Saw Cutting – Basement

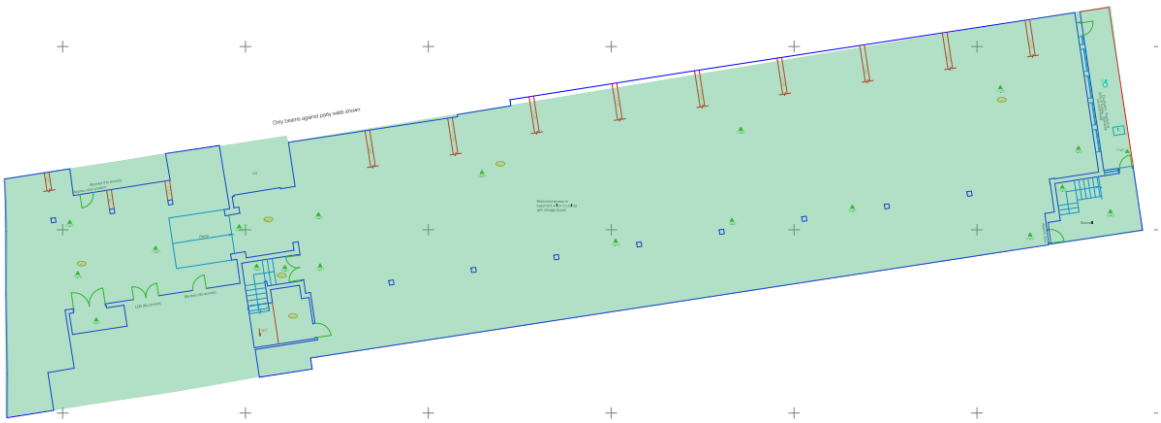


Figure A6.16: Saw Cutting – First Floor

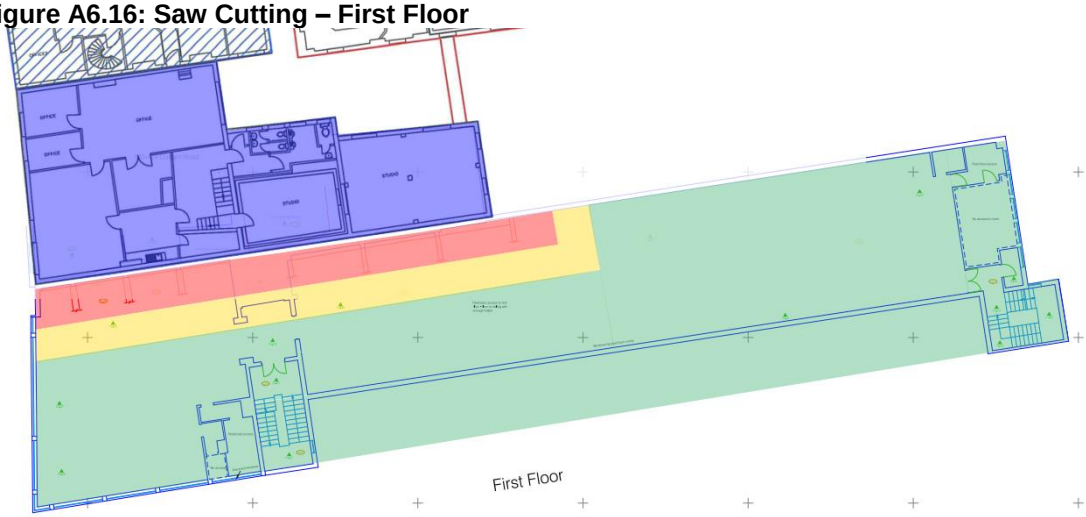


Figure A6.17: Stitch Drilling – Basement

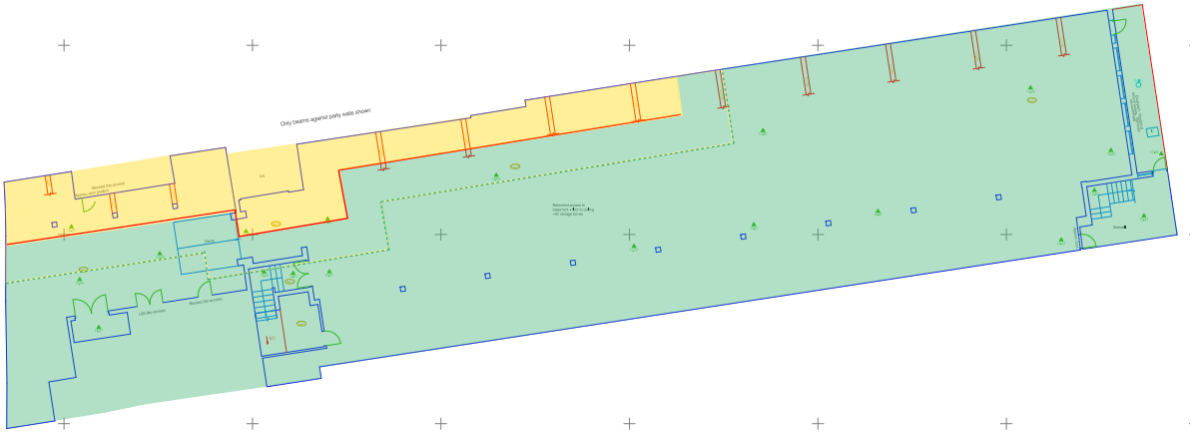


Figure A6.18: Stitch Drilling – First Floor

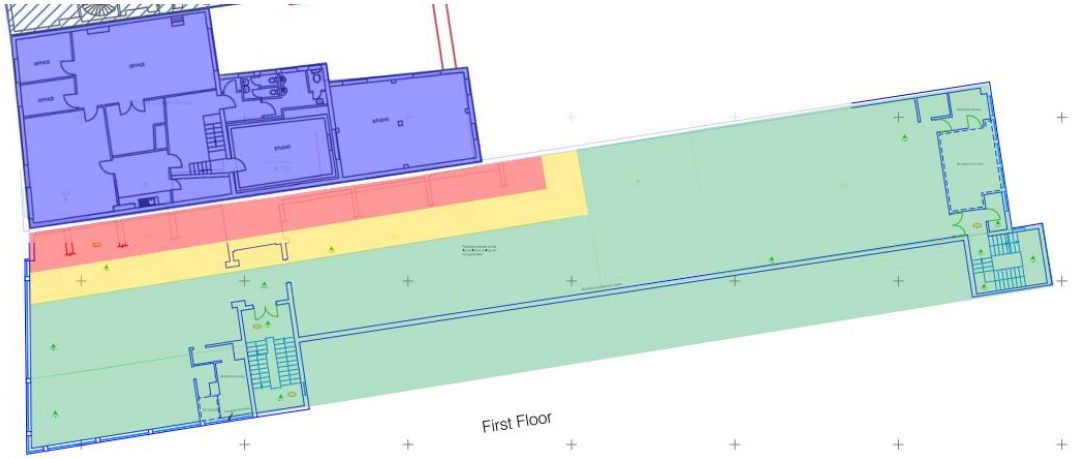
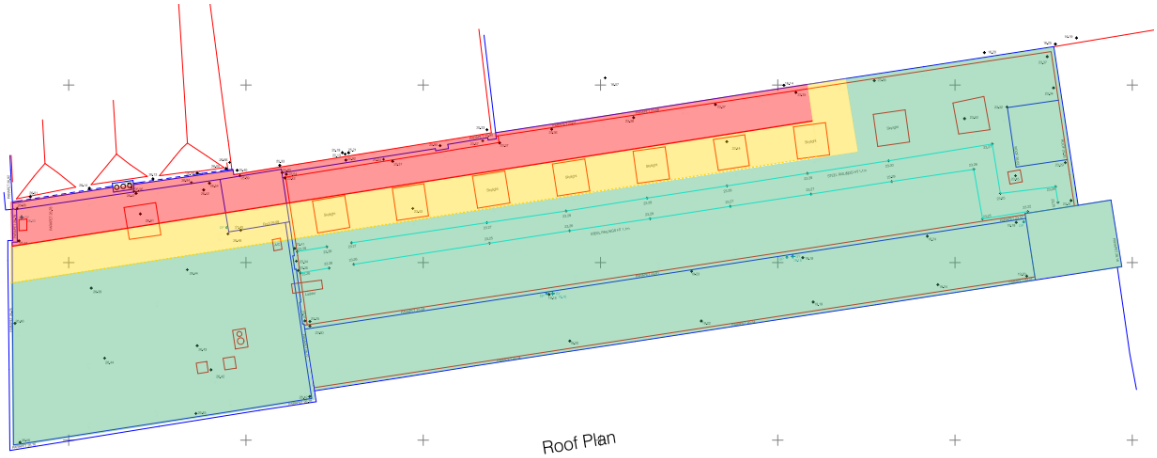


Figure A6.19: Brock Percussive Drill – Ground Floor

Figure A6.20: Munching – Roof



Appendix E

Dust Management Plan

construction impacts associated with the proposed development would result in the generation of dust and PM10. However, it is considered that employment of construction best practice should ensure that no problematic dust or PM10 concentrations occur during the construction process.

The IAQM guidance outlines a number of site-specific mitigation measures based on the assessed site risk. The measures are grouped into those which are highly recommended and those which are desirable to be implemented.

As the site is classed as Medium Risk the following mitigation measures shall be implemented:

- **Communication:** Implement a robust stakeholder communication strategy throughout the works; including display of key site contact (construction manager) and any individual accountable for air quality at the site boundary (environment manager), display head office information.
- **Management:** Manage and record all dust and air quality complaints, identify cause and take action to reduce emissions in a timely manner, and record the measures taken. Record any exceptional incidences that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
- **Monitoring:** Carry out regular site inspections to monitor compliance with this DMP, record inspection results, and make an inspection log available to the local authority when asked. If required, 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. Real time dust monitoring stations will be positioned at the boundary of the site at appropriate locations, which shall measure PM10 levels. The monitors will have a PM10 Action Level of 255µg/m. Reports will be issued on a regular basis to the client and if requested to the council.
- **Preparing and Maintaining:** Plan site layout/works so that machinery and dust causing activities are located away from receptors, as far as is possible. Soft strip inside the building before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust). Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. Fully enclose specific operations where there is a high potential for dust production and the site is actives for an extensive period. Keep site fencing, barriers and scaffolding clean using wet methods. 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, seed or fence stockpiles to prevent wind whipping.
- **Operating vehicle/machinery and sustainable travel:** All on-road vehicles to comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable. All vehicles to switch off engines when stationary - no idling vehicles. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- **Operations:** Use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction where possible. Utilise the water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. Use enclosed chutes and conveyors and covered skips. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever

appropriate. 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.

In the event that excessive levels of dust occur, an exceedance procedure will be followed:

Step 1: Site Manager or Environment Manager to be notified electronically.

Step 2: Works in the area to be checked to identify which activity is causing the exceedance.

Step 3: Once identified, the activity shall halt and not resume until approved by the Environment Manager following appropriate mitigation measures to avoid further exceedances (e.g. dampening down, barriers/enclosures, dust suppression etc.), and monitor the works upon re-commencement for minimum 30 minutes.

Step 4: All operatives involved in the activity shall be re-briefed with a toll-box talk on working methods

Step 5: If for any reason further exceedances occur works will cease and work methodology and technique will be re-evaluated.

Appendix F

Draft Site Waste Management Plan

1. Project Summary

Site Address	118 Curtain Road, London EC2A 3PJ
Project Value	Circa £15m
Projected Project Start Date	January 2022
Planned Project Completion Date	January 2024
Gross Internal Floor Area (sqft)	c49,000

2. Description of Works

Change of use from storage and distribution (Use Class B8) to offices (Use Class B1), including the conversion and extension of the building with the erection of three additional storeys to provide B1 office floorspace, together with the provision of associated secure cycle parking facilities and refuse and recycling storage.

The works include demolition of the existing building's roof areas and localised internal slab demolition.

3. Responsibilities

Client	Curtain Road Properties Limited
Principal Contractor	Tbc
SWMP produced by	Creative Property UK LLP (Client Representative)

4. Materials Resource Efficiency & Waste Minimisation

Decisions taken at pre-construction stage on waste minimisation:

Decisions Taken	**Action Owner**	**Intended Result (weight or volume)**
Removal and re-use of all redundant textiles stock from former use prior to vacant possession.	Client	720 Tonne
Retain existing building and extend rather than proposals for full demolition and new-build.	Lead Designer/ Architect/ Principal Designer	2,500m^3
Specification/finishes to favour water based paints over chemical based paints.	Lead Designer/ Architect/ Principal Designer	tbd
Timber reuse of site, or donation to wood recycling scheme.	Principal Contractor	2 Tonne
Return of all reusable pallets and cable drums for all project trades	All Trades	3 Tonne

5. Waste Management

Waste type	**Quantity (m3 or tonnes)**							
	Re-use on-site	Re-use Off-site	Recycling on-site	Recycling off-site	Other form of recovery on-site	Other form of recovery off-site	Sent to landfill	Other disposal
Estimates								

Inert								
Non-hazardous								
Hazardous								
Totals (m^3 or tonnes)								
Actual								
Inert								
Non-hazardous								
Hazardous								
Totals (m^3 or tonnes)								
Difference between estimates and actual								

Waste Records

[To be populated during the construction work]

Date removed	Waste type	Identity of the person removing the waste	Site waste is being taken to and whether licensed or exempt	Waste carrier and registration number*	Confirmation of delivery*

** Evidence of waste carrier registration and waste transfer or hazardous waste consignment notes for each removal of waste should be provided either as part of the plan, or filed and cross referenced.*

Post-Construction

[To be populated within three months of the construction work being completed]

Issue	Details
Explanation of any deviation from the planned arrangements	
Waste forecasts – exceeded	
Waste forecasts – not met	
Cost savings achieved	

Confirmation: This plan has been monitored on a regular basis to ensure that work is progressing according to the plan and has been updated to record details of the actual waste management actions and waste transfers that have taken place.

Signature: _____

Name: _____

Company: _____

Date: _____

Resource Management Plan (RMP)

Requirement	Explanation
Where a Resource Management Plan (RMP) has been developed covering the non-hazardous waste related to on-site construction and dedicated offsite manufacture or fabrication (including demolition and excavation waste) generated by the building's design and construction	This RMP has been produced to integrate the standard SWMP with the BREEAM criteria of Wst 01. The majority of the requirements will be covered by the Site Waste Management Plan (SWMP) with some additional commentary required the uplift in detail required for a RMP verses a standard SWMP.
A target benchmark for resource efficiency is defined in tonnes of waste per 100m²	Section 5 Waste Management section of this document will detail the project estimate/targets
Percentages of non-hazardous construction (on-site and off-site manufacture/ fabrication in a dedicated facility), demolition and excavation waste generated by the project have been diverted from landfill:	Section 5 Waste Management section of this document will specify the project estimate/targets. Initially these are estimated at: >90% of construction waste to be diverted from landfill >90% of demolition waste to be diverted from landfill
Procedures and commitments for minimising non-hazardous waste in line with the target benchmark	Section 4 of this document details the procedures and commitments e.g. reuse of plasterboard and plywood offcuts on site

Procedures for minimising hazardous waste	Section 4 of this document details the procedures and commitments e.g. use of water-based paints in place of solvent based paints
A waste minimisation target and details of waste minimisation actions to be undertaken	Section 5 of this document details the waste minimisation target and Section 4 details the actions to be undertaken
Procedures for estimating, monitoring, measuring and reporting hazardous and non-hazardous site waste. If waste data is obtained from licensed external waste contractors, the data needs to be reliable and verifiable, e.g. by using data from EA/SEPA/EA Wales/NIEA Waste Return Forms	Main Contractor to compare against historic project data to estimate the amount of hazardous and non-hazardous waste. Monitoring Waste segregation on site is inspected daily by the Main Contractor's construction manager. All waste movements are accompanied by a Waste Transfer/Consignment Note, which is kept on site and then archived for a minimum of 2/3 years. Each time waste is removed from site in a skip or compactor the waste transfer station validate the weight of waste deposited. Contractor to receive summary waste data reports each month from the waste contractors and periodically audit the waste return forms from the Environment Agency.
Procedures for sorting, reusing and recycling construction waste into defined waste groups, either on-site or through a licensed external contractor	Procedure for sites with external storage space: skips labelled with the specific waste streams. Subcontractors are required to dispose of their waste materials in the specific skip allocated to that material type. A re-use compound will be established for offcuts of timber, metal and plasterboard. Difficult to segregate waste can be placed in a mixed skip, in this case the licenced waste contractor will use a materials recovery facility to achieve a diversion from landfill rate in excess of 90%. Procedure for sites that only have internal storage: 660 litre wheeled bins are labelled with the specific waste streams. Subcontractors are required to dispose of their waste materials in the specific labelled wheeled bin allocated to that material type. A re-use storage area will be established for offcuts of timber, metal and plasterboard. Difficult to segregate waste can be placed in a mixed wheeled bin, in this case the licenced waste contractor will use a materials recovery facility to achieve a diversion from landfill rate in excess of 90%.
Procedures for reviewing and updating the plan	Reviews are undertaken at regular intervals (circa six months) and recorded in the Ongoing Review schedule in section 7 of the ISG SWMP.
The name or job title of the individual responsible for implementing the above	Section 2 of this document notes the name of the person responsible for implementing all criteria in the Resource Management Plan
Identification of overall recycling rate for all key materials	Reuse targets for any localised demolition or slab/roof removal: % divert Landfill = %
Identification of reuse targets where appropriate	Reuse targets for demolition arisings: % waste
Identification of overall landfill diversion rate for all key materials.	Diversion from landfill target rates for demolition arisings:

	% divert Landfill
Best practice requirements are incorporated	Design out waste: where appropriate utilise modular systems that are assembled under factory conditions to avoid waste as part of design. Reduce waste generated on-site: All subcontractors are required to confirm their works are set out to minimise wastage from standardised material sizes. Re-use areas are designated on site to allow materials to be re-used across trades. Develop and implement procedures to sort and reuse/recycle construction and demolition waste on-site and off-site Procedures for sites with external storage space: Skips are labelled with the specific waste streams. Subcontractors are required to dispose of their waste materials in the specific skip allocated to that material type. A re-use compound will be established for offcuts of timber, metal and plasterboard. Difficult to segregate waste can be placed in a mixed skip, in this case the licenced waste contractor will use a materials recovery facility to achieve a diversion from landfill. Procedures for sites with that only have internal storage: 660 litre wheeled bins are labelled with the specific waste streams. Subcontractors are required to dispose of their waste materials in the specific labelled wheeled bin allocated to that material type. A re-use storage area will be established for offcuts of timber, metal and plasterboard. Difficult to segregate waste can be placed in a mixed wheeled bin, in this case the licenced waste contractor will use a materials recovery facility to achieve a diversion from landfill.