

Acoustic Consultant Note



By:	Richard Keeble
Date:	27 April 2015
Subject:	79 Camden Road – Construction Noise Assessment Report

Introduction

Following the demolition of the existing buildings situated at 79 Camden Road, London, a six storey building comprising a mix of private and affordable residential accommodation is proposed.

There are existing residential properties in the vicinity of the site, the nearest residences being approximately 10m from the northern site boundary on Rochester Place, as well as editing suites within 102 St Pancras Way, approximately 4m to the West of the site.

London Borough of Camden (LBC) will require that noise emissions from construction activity at the site will not give rise to unacceptable levels of noise at the façades of these nearby residences.

However, MLM previously specifically requested an assessment of potential noise levels at the 102 St Pancras Way editing suites. Barratt London have therefore commissioned RBA Acoustics to provide additional assessments of internal noise levels based on their anticipated working methods.

This document presents the results of the initial construction noise predictions, both externally and internally for the existing situation and with the incorporation of mitigation options previously discussed. Guidance on best practicable means (BPM) to ensure the noisy works undertaken are mitigated as far as possible are also detailed.

External noise levels as a result of demolition were previously assessed and issued within the Acoustic Consultant Technical Note dated 27th June 2014 and updated 13th October 2014

This report deals solely with the construction phases based on worst-case operation assumptions. A Site Plan illustrating the context of the site and the adjacent 102 St Pancras Way and other residential properties is included as Figure 5366/SP1.

Outline Description of Work

As is our understanding, the development is to be formed from a reinforced concrete (RC) frame, with areas of external façade comprising Metsec framing with outer layers of brick or lightweight cladding.

We therefore understand that the main construction activities will include sheet piling (hydraulically jacked), contiguous and foundation piling (rotary method – arguably quieter than CFA), use of excavators with attachments for ground works, distribution of materials, pile cropping (although less is required than with CFA) and reinforcement cutting, concrete pumping with vibratory equipment, along with the use of tower cranes, lorries, and hand tools for erection and striking of scaffolds and formwork.



This assessment focuses on the predominantly noisy activities, i.e. excavation, piling, concrete pumping, reinforcement cutting, as well as hand tools during formwork assembly and processing of materials. Installation of cladding or internal fit out, for example, have therefore not been assessed.

Assessment Methodology and Criteria

BS 5228:2009 “Code of practice for noise and vibration control on construction and open sites” provides guidance on the prediction of noise and vibration levels from construction and demolition sites, along with details of how to control such emissions.

The contractor intends to undertake noise monitoring to ensure noise levels do not regularly exceed agreed trigger levels (defined as 3dB (A) above predicted levels in the CMR’s) at the nearest residential properties during most work phases following guidance within BS5228:2009 and in accordance with Camden’s Minimum Requirements. Further discussions have taken place with regard to noise levels internal to 102 St Pancras Way, the results of which are outlined in a later section.

Continuous monitoring equipment is currently installed at 2 positions capable of real-time upload of data, as shown on Site Plan 5366/SP1. Log-ins are available to access all data via web portal. Site representatives currently receive trigger alerts as appropriate, this can be extended to include representatives of London Borough of Camden.

Machinery Information

The noisiest construction activities have been identified and we have discussed details of the proposed machinery likely to be used by the contractor. Where noise levels for the specific item has been provided this is detailed. Where noise levels are not provided, these have been approximated using the database of plant included in BS 5228:2009 – Part 1.

Also included is the estimation of the ‘on-time’ of each item of equipment, i.e. the percentage of the day during which the equipment will be in use during the phase of work. Please note – for the purpose of these calculations we have assumed that work will be carried out over the entire day (10 hours – 08:00-18:00) and therefore an on-time of 80% would correspond to 8 hours.

Table 5366/T1 – Assumed Plant Noise Levels

Activity	Plant Item	BS5228 ref.	Sound Pressure Level [L _{Aeq,T}] at 10m	Assumed on-time (%age) 10-hour day
Sheet piling	Sheet steel hydraulic jacking piling rig	C3/18	63	40
Rotary piling (contiguous and foundation)	Crawler mounted rig	C3/21	79	40
	Pile cropper on excavator	C1/4	76	10
Excavation	Tracked Excavator	C2/15	76	40
	Excavator with selector grab or	C2/29	79	40

Activity	Plant Item	BS5228 ref.	Sound Pressure Level (L _{Aeq,T}) at 10m	Assumed on-time (%age) 10-hour day
	bucket			
	Dump truck	C2/33	81	40
Basement/Ground Slabs/Capping Beams	concrete mixer truck	C4/20	80	40
	concrete pump	C3/25	78	40
	poker vibrator	C4/34	69	40
RC Frame (general)	angle grinder (cutting reinforcement steels)	C4/93	80	20
	handheld hammer (formwork assembly)	D2/15	84	20
	concrete mixer truck	C4/20	80	40
	concrete pump	C3/25	78	60
	poker vibrator	C4/34	69	25
	Tower Crane	C4/48	76	60

Construction Noise Assessment

Noise levels have been predicted using the methodology set out in BS 5228.

The approach taken is to determine the activity L_{Aeq} noise level (at a standard distance) of the equipment and then calculate the noise level at the point of interest by applying corrections to account for:

- The number of plant items
- The periods of operation of processes and plant;
- Screening from existing buildings or hoarding (2.4m height assumed around entire site), and Monarflex MonarSound sheeting. Site cabins of some 5m height have been installed along Rochester Place which will also provide significant screening to properties on Rochester Mews;
- The distances from sources to receiver; and
- Reflection from the façade.

The close proximity of 102 SPW to the site means that there is minimal attenuation to noise levels provided by natural distance losses when works are undertaken at the extreme site boundaries.

A number of mitigation measures have previously been presented:

- Measure 1 – Monarflex MonarSound to scaffolding during demolition and construction.

- Measure 2 – Mitigation of noise on site, e.g. switching off engines, non-percussive tools, hydraulic construction, etc.
- Measure 3 – box out windows to Ground floor of 102 SPW with a box formed from layers of dense, weather proof board (e.g. 12mm CPB) and absorbent material in the void.
- Measure 4 – install secondary glazing (10mm toughened glass) internally to 102 SPW forming a void of 100mm to First and Second floors.
- Measure 5 – box out windows to Editing Suites.

Based on the proposed works, associated on-times and mitigation measures, the following Tables show the cumulative resultant internal noise levels due to construction works at 102 St Pancras Way, incorporating the above remedial options.

Table 5366/T2 – Predicted Construction Noise Levels at 102 St Pancras Way

Worst case Construction Activity	Predicted Cumulative External Noise Level ($L_{Aeq,T}$) [Includes Measures 1 + 2]	Predicted Cumulative Internal Noise Level – Existing Double Glazing ($L_{Aeq,T}$)	Predicted Cumulative Internal Noise Level – Measure 3 Boxing Out Windows ($L_{Aeq,T}$)	Predicted Cumulative Internal Noise Level – Measure 4 Secondary Glazing 100mm Void ($L_{Aeq,T}$)
Sheet piling (1m from boundary)	69	39	9	24
Rotary piling (2m from boundary)	80	50	20	35
Excavation (2m from boundary)	82	52	22	37
Slab pouring (4m from boundary)	73	43	13	28
General RC Frame (4m from boundary)	81	51	21	37

Further to the above, the following external noise levels at properties on Rochester Mews are also presented, for 10- hour working day as well as worst-case hour:

Table 5366/T3 – Predicted Construction Noise Levels at nearest sensitive properties

Construction Activity	Predicted Cumulative External Noise Level ($L_{Aeq,10h}$) 102 St Pancras Way		Predicted Cumulative External Noise Level ($L_{Aeq,10h}$) Rochester Mews/Rochester Place	
	Worst-case (near boundary)	Typical	Worst-case (near boundary)	Typical
Sheet piling	69	45	51	43
Rotary piling	80	66	67	62
Excavation	82	68	70	65
Slab pouring	73	66	70	64
General RC Frame	81	71	74	69

Discussion

In accordance with Camden’s Minimum Requirements, where the measured noise levels are more than 3dB(A) above the predicted noise levels or in the event of a complaint of noise an investigation shall be carried out to ascertain the cause of the exceedance or the complaint and to check that Best Practicable Means are being used to control the noise in accordance with the steps set out in the application for ‘prior consent’. Noise levels shall be reduced further if it is reasonably practicable to do so.

As can be seen from Table 5366/T2 above, the predicted construction noise levels from worst-case works being undertaken close to the extreme site boundary with 102 SPW could result in internal noise levels which are likely to be unacceptable with the existing building fabric. However, incorporation of the above mitigation measures, particularly Measures 1+2+3, should result in internal noise levels being reduced to levels which most would consider acceptable.

It should be noted that the worst case predicted noise levels are likely to be occurring for a relatively short time period, as calculated at the minimum distance from the relevant boundary, and typical works occurring at greater distance will generally result in lower noise levels, i.e. when rotary piling continues around the site, the noise levels at the relevant property will be significantly lower than when at the boundary.

Therefore, following discussions with Mr Paul Newman of LBC and in accordance with the above and Camden’s Minimum Requirements for Building / Construction / Demolition Sites, as well as the further external noise levels stated within Table 5366/T3, the following target trigger noise levels are proposed at the relevant receptor, based on the typical predicted noise levels, for a trial period until the end of July 2015:

Table 5366/T4 – Trigger levels

Position	External Noise Level Trigger ($L_{Aeq,T}$)	
	$L_{Aeq,1h}$	$L_{Aeq,10h}$
Relevant receptor	75	72

The hourly trigger will be used as an indicative trigger to ensure that the overall 10-hour criterion is achieved. Any exceedances will immediately be investigated by BL, with liaison with ourselves, and assuming BPM is being undertaken, working practices will be investigated. If works are being undertaken within BPM but exceedances appear to be unavoidable, further investigations will be undertaken into working methods and to whether the trigger and target noise levels need reassessment. Complaints and exceedances will trigger the investigation procedure. Measurement data will be available as required.

Construction Vibration Prediction

There are two types of vibration impact that need consideration: the effects on people or equipment within buildings and the effect on buildings (or other structures) themselves.

The level at which vibration is perceptible / annoying to occupants is much lower than that required to result in cosmetic damage. Typically vibration limits of PPV 2mm/s are considered appropriate for assessing occupant comfort whereas PPV 15mm/s is typically adopted as the limit for cosmetic damage to buildings.

The vibration monitoring equipment is currently set to have an amber alert of 2mm/s and red alert of 5mm/s PPV.

As a result of numerous factors including the geological and geographical differences between construction sites there is no reliable method for predicting vibration levels due to construction or demolition works. Although it is generally accepted that piling may cause some degree of ground vibration, modern rotary and “pressed in” methods are proposed which produce far lower levels of vibration than driven piling, for example. As such these methods are considered to be current Best practicable Means.

It is possible that that vibration levels due to piling work will be perceptible at the receptors located within close proximity to the site, however the levels of vibration are expected to be well below those likely to lead to building damage. In terms of mitigating vibration levels, Best Practicable Means will be adopted. If necessary, greater confidence in the levels of vibration resulting from the worst case construction works could be achieved by undertaking sample vibration monitoring at representative locations so as to ensure the appropriate criteria are not being exceeded.

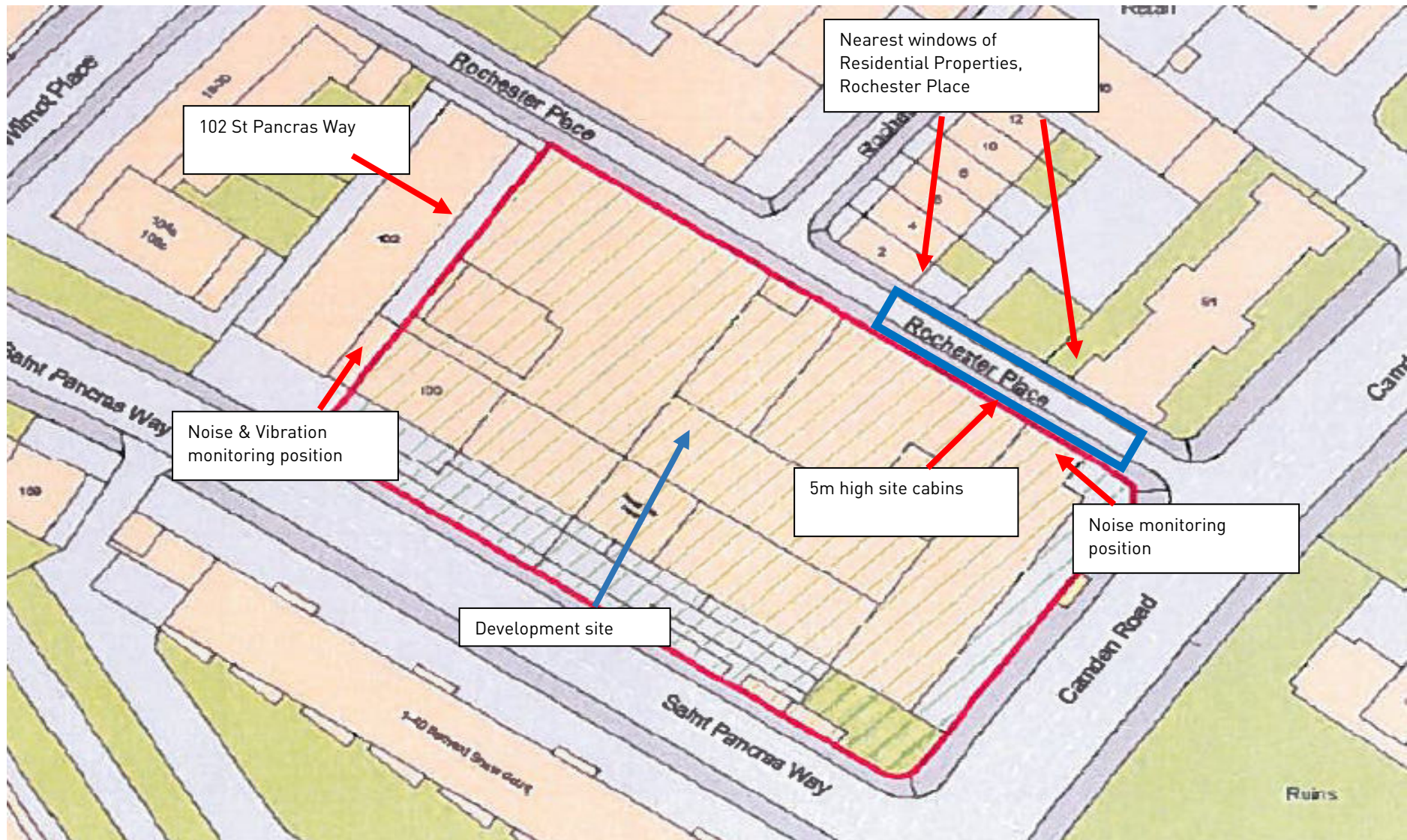
From our experience we are aware of the potential for perceptible levels of vibration within nearby residences to be associated with the movement of loaded skips. We would therefore advise that following delivery, all skips are left static until they are ready for collection.

Mitigation

The contractor will adopt the following measures to mitigate noise and vibration, including:

- Careful selection of site preparation and construction methods and plant used to minimise noise at source as far as reasonably practical;
- Use of electric and electro-hydraulic plant and equipment where practical;
- Switching off engines when not in use;
- Regular maintenance and servicing of plant and equipment;
- The use of acoustic barriers where appropriate;
- Use of non-percussive tools and equipment where practical;
- Off-site steel and services prefabrication to limit the welding and cutting of materials on-site;
- Hydraulic construction to be used in preference to percussive techniques where practical;
- All plant and equipment to be used for the works will be properly maintained, silenced where appropriate and operated to prevent excessive noise and switched off when not in use and where practicable;
- Plant will be certified to meet relevant current legislation and BS5228 standards;
- All trade contractors to be made familiar with current legislation and the guidance in BS5228
- Noise complaints will be reported to the contractor and immediately investigated.

In addition to the above general measures, further mitigation measures can be applied as considered necessary as the project proceeds and as communicated through regular liaison with adjacent neighbours.



79 Camden Rd, London
Site Plan

Site Plan 5366/SP1
24 April 2015