Philip Acoustics Ltd.

Consultants in Noise & Vibration
Building Regulations Certification Sound Insulation Testing

REPORT TITLE: NOISE SURVEY & ASSESSMENT FOR A PROPOSED SIDE EXTENSION STORE/WORKSHOP AT 20A OTTERFIELD ROAD, YIEWSLEY UB7 8PE

REPORT REF: 20121-002

ISSUED TO: Towers Associates
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DATE: March 2021

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1. INTRODUCTION

Towers Associates representing the applicant (Mr Finlayson) has submitted a planning application to the Local Planning Authority (London Borough of Hillingdon) for the construction of a single storey side extension store/workshop at 20A Otterfield Road, Yiewsley UB7 8PE.

The planning application is London Borough of Hillingdon reference 24045/APP/2020/2771.

The proposed store/workshop is associated with the applicant's long established existing garage premises (servicing and repair of motor vehicles) and is specifically for the servicing of Electric/Hybrid vehicles only, which is required to be conducted in a separate area from other fuel type vehicles.

London Borough of Hillingdon has refused the application. Reason for refusal is reproduced below and includes reference to noise:

> 1 · The proposed development, by reason of its siting along the shared boundary with residential properties, would be detrimental to the amenities of adjoining occupiers, by reason of noise and disturbance. The development, would, therefore, be contrary to Policy EM8 of the Hillingdon Local Plan: Part One - Strategic Policies (November 2012) and Policy DMHB 11 of the Hillingdon Local Plan: Part Two - Development Management Policies (2020)

The associated Delegated Decision Officer's report summary includes the statement *"….as it would cause unacceptable disturbance and loss of amenity to nearby properties by reason of noise".*

However, the Delegated Decision Officer's report and thus reason for refusal is not with reference to, or consideration of, any technical noise assessment of the proposed development, either undertaken on behalf of the applicant or on behalf of the London Borough of Hillingdon.

Philip Acoustics has therefore been commissioned to conduct a noise assessment for the proposed development, to be submitted with a further application. This report presents results of the noise assessment and includes:

- Development description;
- Noise assessment methodology (BS4142);
- Noise & observations surveys for background levels & source levels data;
- Noise modelling using DataKustik Cadna-A proprietary software;
- BS4142 assessment of noise from the proposed workshop to adjacent residential properties;
- Recommendation for noise mitigation measures.

As foreword to this report it is important to note that although the application site as existing includes a workshop building with vehicle servicing and repair activity, no allowance or reference (other than context) is made within this assessment report for activity and any consequent potential noise from the application site as currently permitted. The noise assessment is only with reference to the proposed single storey side extension store/workshop and with reference to relevant British Standard BS4142.

2. DEVELOPMENT DESCRIPTION

20A Otterfield Road is “set back” behind residential dwellings along Otterfield Road, occupied by the applicant’s long established small independent garage/workshop business; M. Finlayson providing vehicle servicing and repairs principally for local residents. The premises is categorised as Use Class B1(c) light industrial. The business does not undertake MOTs or paintwork/bodywork repairs to vehicles.

The existing building at the site comprises a workshop area (two vehicle capacity), office plus various storage areas and has an access driveway set between residential dwellings at 18 & 20 Otterfield Road.

Proposed location for the single storey side extension store/workshop is to the rear yard area of the existing building, currently unused external space.

The rear yard’s perimeter is secured by substantial / solid maintained timber fencing at circa 2.3 to 2.5m height. The rear yard also includes gated access from Spinney Close, the gate is an automated solid construction heavy duty (high security) sliding panel type virtually silent in operation and circa 2.5m height.

The immediate vicinity all around the site is principally of residential dwellings. Nearest dwellings to the proposed side extension store/workshop are adjacent within Spinney Close and on Yew Avenue.

A site location plan, proposed block plan and proposed building layout (plan and elevations) for the single storey side extension store/workshop are provided in Appendix A. Specification details for the proposed store/workshop building envelope construction are provided in Section 4.3 of the report.

Figure 1 below shows a site location aerial image for the application property (to be viewed in conjunction with the details in Appendix A). Figure 1 is annotated to identify the existing building, location of the proposed side extension store/workshop and nearest adjacent residential properties.

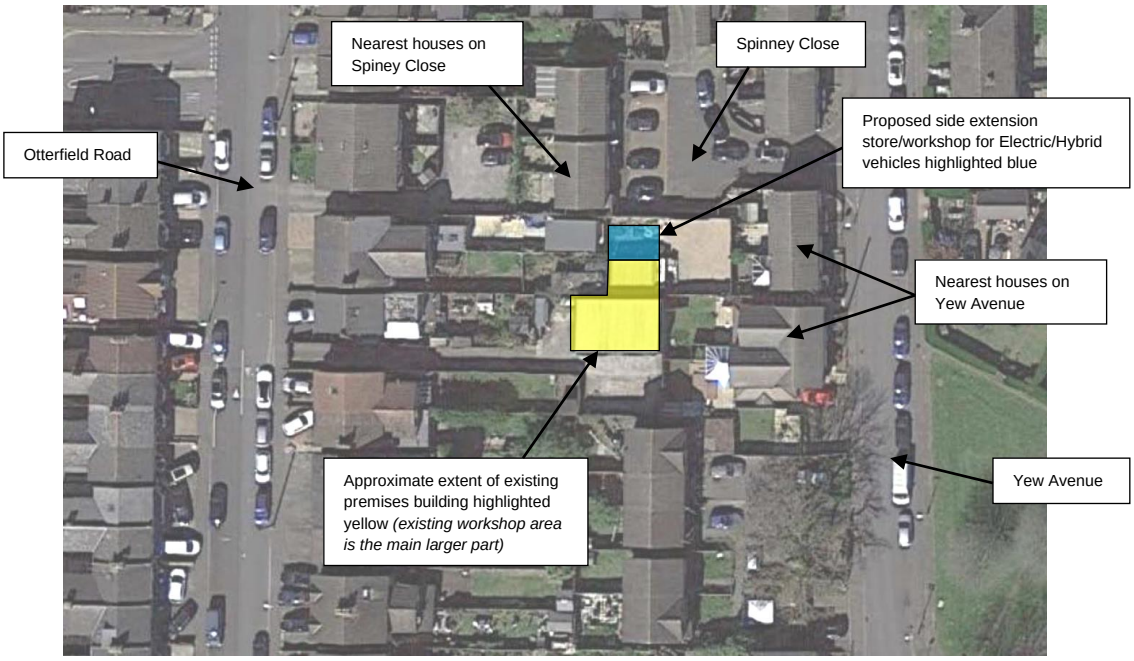


Figure 1: Annotated site location aerial image

The author has sought operational details from the applicant in respect to the proposed workshop to assist in conducting the noise assessment, these are detailed below:

Work Undertaken

In terms of work to be undertaken within the proposed workshop, this will be nominally the same servicing and repair activity as occurs currently within the existing workshop, albeit specifically for Electric/Hybrid vehicles only and with capacity for only one vehicle at a time. Work on vehicles will only be undertaken within the proposed workshop, not externally in the yard / car parking area adjacent.

Doors

The existing workshop at the application site has two vertical opening main doors to allow vehicle access, these are kept closed at all times (even in hot weather) during servicing and repair activity, opened only to facilitate vehicles in and out of the workshop.

The proposed workshop's vertical opening main door to allow vehicle access will be operated in the same way, i.e. kept close at all times and opened only to facilitate vehicles in and out of the workshop. The proposed workshop's fire exit door is emergency use only and is to be kept closed at all times.

Plant / Equipment

The proposed workshop will not have any new or additional mechanical services plant or equipment such as an air compressor, air conditioning or ventilation systems etc.

Hours Of Operation

Hours of opening as stated in the previous (refused) planning application are 07:30 to 18:00 Monday to Friday and 07:30 to 13:00 Saturdays, closed Sundays & Bank Holidays.

The applicant has advised that actual opening hours for the business generally tend to be slightly less than the full range of times as indicted above. Notwithstanding this, for the purpose of this noise assessment it is cautiously taken that the hours of opening will be as per the full range stated in the previous application.

3. NOISE ASSESSMENT METHODOLOGY: BS4142

The noise assessment is conducted in accordance with the provisions of relevant British Standard BS4142.

Current edition of the Standard is BS4142:2014+A1:2019 "*Methods for rating and assessing industrial and commercial sound*". All reference within the report to BS4142 relates to this current edition of the standard. Also and as an aid to clarity, this report retains use of the well-established term *"noise"* as opposed to the replacement term *"sound"* of the current edition BS4142.

BS4142 provides a well-established methodology to assess the likely effect (impact) to people regarding noise of an "industrial or commercial" nature. Consequently, in requesting noise assessments for proposed new, change of use or altered/extended commercial premises, including garage workshops and similar, many Local Planning Authorities refer to BS4142.

For the scenario of a proposed side extension additional workshop area, the BS4142 assessment method requires that source noise data for activity within the workshop, plus noise breakout of that activity from the workshop, is determined and existing background noise levels be measured. The assessment is then carried out by comparing the overall workshop activity noise breakout Rating Level with background noise levels, at assessment positions (to outside nearest residential properties).

The (workshop activity noise breakout) Rating Level is the Specific Noise Level plus with any corrections applied to account for subjective characteristics of the noise such as tonality and intermittency etc. as may be perceived at the assessment positions that might mean it is more noticeable and potentially have more impact.

The BS4142 assessment method then provides guidance on the likely noise impact (effect) to people depending on the magnitude of the excess of the Rating Level over the background noise; the higher the excess the more likely there would be an adverse impact and correspondingly, the lower the excess (or no excess) the less likely there would be an adverse impact.

BS4142 does not provide specific guidance on suitable noise limits / criteria or standards, only guidance on how to determine the likelihood of adverse noise impact.

In terms of likelihood of adverse noise impact, the BS4142 assessment guidance is as follows:

i) Where the (noise) Rating Level is around +10dB or more above the background, this is likely to be an indication of significant adverse impact;

ii) Where the (noise) Rating Level is around +5dB above the background then this is likely to be an indication of adverse impact;

iii) Where the (noise) Rating Level does not exceed the background then this is an indication of low impact.

The above BS4142 guidance is dependent upon context, which for the proposed side extension workshop area to an existing garage business (i.e. with existing workshop) requires consideration of the type and character of the existing noise environment, including the nature of the existing permitted use of the site.

It is important to note the BS4142 assessment methodology does not have a "no impact" indication categorisation. "Indication of low impact" for where the Rating Level does not exceed the background is the lowest / least likely noise impact categorisation of BS4142.

4. NOISE ASSESSMENT

To conduct an assessment for potential noise impact from the proposed side extension workshop in accordance with the procedures of BS4142, and thus determine any noise mitigation or sound insulation upgrade requirements for the workshop building, the following information is required:

- Existing background noise levels representative of at the nearest residential properties during times of use for the proposed workshop;
- Source noise data, i.e. noise of servicing and repair work activity occurring within the proposed workshop;
- Sound insulation of the proposed workshop building external envelope structure, including walls, roof structure and doors (the proposed workshop does not have any glazing/windows/rooflights).

4.1 Background Noise Survey

A noise and observations survey has been carried out to quantify existing background noise levels as representative of at the nearest residential properties. Details of the survey are provided below. Details of instrumentation used for the survey are provided under item F) of the BS4142 assessment in Appendix E.

The background noise survey was carried out over a three-day period from Thursday 11 February 2021 through Saturday 13 February 2021 so as to include times during sample weekdays and a Saturday aligned to hours of opening for the proposed workshop. The weather included dry and calm/light wind conditions during the survey.

The noise survey position was selected to the north boundary of the site and as close as practicably achievable / accessible to, and as representative of, outside nearest residential properties whilst following the guidance of BS4142; 1.2m to 1.5m above ground level and at least 3.5m from vertical reflecting surfaces.

Location for the background noise survey position is indicated on the site location plan in Appendix A.

Noise levels were recorded continually throughout the survey duration in terms of consecutive 1-hour samples of overall $L_{A90,T}$ dB (background level) and $L_{Aeq,T}$ dB (ambient level) values (i.e. T = 1 hour).

Background noise levels are relatively low and principally due to local traffic on surrounding roads/streets, plus with underlying noise from more distant traffic generally, and occasional aircraft.

Raw data results of the background noise survey are provided in graphical format in Appendix B.

It is noted the survey was unavoidably conducted during the Government's imposed restrictions as associated with the Covid-19 Pandemic and therefore with potential consequence of lower-than-normal conditions background noise levels.

Consideration of the noise survey results in respect to this is provided below:

- For date of the survey 11th through 13th February 2021 the Government's Department for Transport statistics show daily overall traffic volume nationally for Great Britain at circa 64% (average over the 3 days) of normal conditions based on traffic volumes in the first week of February 2020;
- Broadly applied, overall traffic volume at circa 64% would equate to a theoretical reduction in underlying noise from traffic generally of around 2dB as compared with normal conditions;

- Under normal conditions for this location and elsewhere within London Borough of Hillingdon, there would be more frequent aircraft as associated with Heathrow airport. However, noise from aircraft being individually short term does not tend to form a significant part of specifically the background noise environment in terms of $L_{A90,T}$ dB values. Therefore, absence of normal conditions more frequent aircraft (i.e. only occasional aircraft currently) is not expected to have significantly altered (reduced) background value results of the survey;
- Based on background value results from noise surveys in similar locations, undertaken previously by the author for other noise assessments prior to the Covid-19 Pandemic it is estimated the day period background noise levels as measured are likely to be around 2 to 3dBA (possibly more) lower than under normal conditions.

Notwithstanding the above consideration, results of the noise survey as measured (i.e. not altered or otherwise corrected), are used to provide background level values for use in the assessment despite being potentially lower than otherwise due to the Government imposed Covid-19 Pandemic restrictions, and thus providing if anything a more robust and cautious noise assessment.

Summary of representative background noise levels for the survey periods aligned with hours of opening for the premises including proposed workshop are shown in Table 1.

Description	**Representative Background Noise Level $L_{A90,1hour}$**	**Comment**
Weekdays Hours of opening: 07:30 to 18:00	42dB	Background noise levels relatively low and steady (non-fluctuating) for hours of opening 07:30 to 18:00.
Saturdays Hours of opening: 07:30 to 13:00	41dB	Background noise levels on Saturday 07:30 to 13:00 slightly lower but generally very similar to those for weekdays.

Table 1: Representative background noise levels

4.2 Source Noise Data Survey

A noise and observations survey has been carried out within the premises current workshop to quantify typical source noise data of vehicle servicing and repair activity by the applicant's business. Details of the survey are provided below. Details of instrumentation used for the noise survey are provided under item F) of the BS4142 assessment in Appendix E.

The survey was carried out mid height and 1m from the internal perimeter of the premise workshop building in proximity of the main access roller shutter door, i.e. so as representative of the noise levels that are incident upon the building structure to then breakout through the structure. Note that noise levels in the centre of the building close up to activity are potentially higher (typically up to 2 to 3dB higher), as compared with the perimeter levels.

The survey was over a three-day period Thursday 11 February 2021 through Saturday 13 February 2021 during which the premises operated / traded as normal with vehicle servicing and repair work being undertaken.

Noise levels were recorded continually throughout the survey duration in terms of consecutive 5-minute samples of overall $L_{Aeq,T}$ dB values (i.e. T = 5 minutes).

Sample octave band values of noise within the workshop building were also measured for information and to assist with calculations of noise breakout.

Raw data results of the source noise level survey within the applicant's existing workshop are provided in graphical format in Appendix C.

Summary results of the source noise level survey are provided in Table 2, the summary results are in terms of the typical average measured $L_{Aeq,1hour}$ dB overall value as well as the highest measured $L_{Aeq,1hour}$ dB overall value plus with as typical associated octave band values.

Description	Overall dBA	Octave Band Centre Frequency Hz (Linear dB)							
		63	125	250	500	1k	2k	4k	8k
Survey typical average $L_{Aeq,1hour}$ dB noise level	60	61	60	56	56	55	54	50	48
Survey highest $L_{Aeq,1hour}$ dB noise level	67	66	65	62	63	62	61	57	55

Table 2: Summary noise levels from vehicle servicing & repair activity in applicant's existing workshop

The measured source noise data levels are typical of those measured previously by the author on numerous occasions at the internal perimeter of other similar size and type vehicle servicing & repair garage and workshop premises (for other noise assessments and similar).

4.3 Building Envelope Sound Insulation

The proposed side extension workshop building envelope structure comprises the following elements:

- External Walls: Dense concrete blockwork;
- Roof: Composite insulated metal profile roofing sheets;
- Glazing (Windows/Rooflights): None;
- External Doors: Vertical opening main door to allow vehicular access, plus fire exit (i.e. emergency use only) standard size personnel access door.

More detailed review and comment on the sound insulation performance for each element of the building envelope for input into the noise breakout calculation model is provided in Sections 4.3.1 to 4.3.3 on the following page.

4.3.1 External Walls

The workshop external walls are to be formed by dense solid concrete blockwork (density ≥ 1850kg/m^3) laid flat to give an overall wall thickness of circa 225mm. Values in Table 3 show typical default minimum sound insulation performance for this type of external wall construction.

Description	Octave Band Centre Frequency Hz							
	63	125	250	500	1k	2k	4k	8k
Dense solid concrete blockwork (density ≥ 1850kg/m^3) external walls thickness circa 225mm, overall performance circa Rw ≥52dB	32	39	43	46	50*	50*	50*	50*

***** *Note: Sound insulation limited to upper values 50dB. Higher values likely at these frequencies but are not stated.*

Table 3: Default minimum external walls sound insulation performance, Sound Reduction Index R dB

4.3.2 Roof

The workshop roof structure is to be formed by composite insulated metal profile roofing sheets Kingspan QuadCore Trapezoidal Roof Panel (RW) KS1000 RW. Values in Table 4 show the sound insulation performance for this roof structure from Kingspan's product datasheet.

Description	Octave Band Centre Frequency Hz							
	63	125	250	500	1k	2k	4k	8k
Roof structure - Kingspan QuadCore Trapezoidal Roof Panel (RW) KS1000 RW, stated overall performance Rw 25dB	20	18	20	24	20	29	39	47

Table 4: Roof sound insulation performance, Sound Reduction Index R dB

4.3.3 External Doors

The workshop is proposed to have two external doors:

- Main door to the front of the workshop to allow vehicular access. This is to be as conventionally a vertical opening door, either a "roller shutter" or "sectional" type composite insulated metal high security door;
- Fire exit door to the side of the workshop, emergency use standard size personnel access escape door. This is to be as conventionally a high security door.

Values in Table 5 show typical default minimum sound insulation performance for these types of external door as used in garage/workshop applications.

Description	Octave Band Centre Frequency Hz							
	63	125	250	500	1k	2k	4k	8k
Main Access Door: Vertical opening composite insulated metal "roller shutter" or "sectional" type door, typical overall performance circa Rw ≥25dB	15	17	23	24	24	28	26	24
Fire Exit Door (emergency use only): High security door, standard fit – no special seals to frame or threshold, typical overall performance circa Rw ≥25dB	17	19	22	26	24	23	20	18

Table 5: External doors sound insulation performance, Sound Reduction Index R dB

4.4 Noise Breakout Calculation Model

Calculation of noise breakout from vehicle servicing and repair activity occurring within the proposed workshop is technically complex and requires not only information on noise levels occurring within the workshop and sound insulation of each element of the workshop building envelope but also distances to the assessment positions (residential dwellings) and effect of layout / orientation and screening of, plus reflections from, buildings and other structures including fences etc in the vicinity.

Noise breakout to the nearest residential properties from vehicle servicing and repair activity occurring within the proposed workshop has therefore been calculated using DataKustik Cadna-A proprietary noise modelling software, which is based on the calculation procedures set out in ISO9613-2.

The noise model is based on the following conditions:

- With the highest $L_{Aeq,1hour}$ dB noise levels due to vehicle servicing and repair activity occurring in the proposed side extension workshop building as detailed in Table 2 of the report. The highest noise levels occurring continually and incident on all parts of the internal workshop envelope (including the workshop's main access door);
- Three iterations of the noise model for differing workshop access door conditions over a 1-hour period:
  a) Door closed;
  b) Door closed, but opened briefly only to allow vehicle access in and/or out;
  c) Door left continually open.
- Noise model output is in terms of $L_{Aeq,1hour}$ dB values at 1.5m and also at 4.5m above ground level, as representative respectively of outside windows to ground floor rooms and also first floor rooms of neighbouring residential dwellings.

Summary results of the Cadna-A noise modelling for vehicle servicing and repair activity occurring in the proposed side extension workshop is shown in Table 6, details results are shown in Appendix D.

Note the noise levels in Table 6 are indicated as ≤ (less than or equal to) values because the noise model results are based on the highest $L_{Aeq,1hour}$ dB noise levels due to vehicle servicing and repair activity occurring in the workshop. For majority of the time noise levels will be lower.

Noise Model Iteration for Workshop Main Access Door	**Noise Level At Assessment Position (Specific Noise level $L_{Aeq,1hour}$ values)**		
	Height ***(above ground level)***	**Nearest Residential Dwellings Spinney Close**	**Nearest Residential Dwellings Yew Avenue**
a) Door closed	1.5m	≤20dB	≤16dB
	4.5m	≤27dB	≤19dB
b) Door closed, opened only to allow vehicle access	1.5m	≤20dB	≤24dB
	4.5m	≤27dB	≤28dB
c) Door left continually open	1.5m	≤25dB	≤35dB
	4.5m	≤34dB	≤42dB

Table 6: Noise from proposed workshop to nearest residential dwellings

As can be seen from results of the Cadna-A noise modelling in Appendix D and in Table 6, noise levels to nearest residential dwellings at 1.5m above ground level are lower than at 4.5m above ground level. This is because of acoustic screening benefit due to the premises existing substantial perimeter security fencing.

Also, with the main access door open, either open briefly only to facilitate vehicle access, or left continually open, noise levels to outside the nearest dwellings on Yew Avenue are higher than to outside the nearest dwellings on Spinney Close. This is because orientation of the main access door opening faces directly towards the dwellings on Yew Avenue, whereas the dwellings on Spinney Close are set back behind the workshop.

4.5 BS4142 Noise Assessment

A noise assessment as per the listings of Clause 12 from BS4142 does not readily lend itself to being directly incorporated within the main body of the noise assessment report. Therefore assessment of noise from vehicle servicing and repair activity occurring in the proposed workshop in accordance with the provisions of BS4142 is included separately within Appendix E.

Summary of the BS4142 noise assessment findings from Appendix E are provided In Table 7:

Noise Model Iteration for Workshop Main Access Door	BS4142 Noise Assessment
a) Door closed	Excess of workshop noise Rating Level over the background noise level is ≤-8dB (i.e. Rating Level ≤8dB below the background noise). BS4142 assessment result = indication of low noise impact
b) Door closed, opened only to allow vehicle access	Excess of workshop noise Rating Level over the background noise level is ≤-7dB (i.e. Rating Level ≤7dB below the background noise). BS4142 assessment result = indication of low noise impact
c) Door left continually open	Excess of workshop noise Rating Level over the background noise level is ≤+7dB (i.e. Rating Level ≤7dB above the background noise). BS4142 assessment result = indication of adverse noise impact

Table 7: BS4142 noise assessment

Notwithstanding any context consideration, which includes that the application premises has existing commercial use with a workshop, the BS4142 assessment indicates that the proposed side extension workshop operated with the main access door kept closed and opened only to facilitate vehicle access, is of low noise impact, i.e. unlikely to be of adverse noise impact to occupants of the nearest residential properties.

However, if the workshop is operated with the main access door left continually open during vehicle servicing and repair activity, then the BS4142 assessment indicates likely adverse noise impact to occupants of the nearest residential properties.

4.6 Noise Mitigation Scheme

It is advised the proposed side extension workshop development's scheme of noise mitigation measures comprises the following operational and physical conditions, in addition to the as proposed building construction details as in Section 4.3 of the report:

Doors

The proposed workshop's vertical opening main door to allow vehicle access to be kept closed at all times during vehicle servicing and repair work, opened only to facilitate vehicles in and out of the workshop. The proposed workshop's fire exit door to be emergency use only and kept normally closed at all times.

No External Working

No vehicle servicing or repair works, or other working, to be conducted externally within the rear yard / parking area as associated with the proposed workshop.

Plant / Equipment

The proposed workshop to not have any new or additional mechanical services plant or equipment such as an air compressor, air conditioning or ventilation systems etc.

Hours Of Operation

Hours of opening not exceeding those as stated in the previous planning application are 07:30 to 18:00 Monday to Friday and 07:30 to 13:00 Saturdays, closed Sundays & Bank Holidays.

5. CONCLUSION

Result of the BS4142 noise assessment shows that the proposed side extension workshop to the applicant's long established existing garage premises for the servicing and repair of motor vehicles at 20A Otterfield Road will not be of adverse noise impact to adjacent residential occupiers.

This assessment finding is on the basis that the proposed workshop is operated as per the existing workshop; specifically that the workshop's vertical opening main access door is kept closed at all times during vehicle servicing and repair work, opened only to facilitate vehicles in and out of the workshop.

Therefore, and notwithstanding location in the vicinity of residential properties, the proposed development would not be detrimental to the amenities of adjoining occupiers by reason of noise and disturbance, and thus not contrary to relevant policies of the Hillingdon Local Plan.

There are no reasons in terms of noise impact for not permitting the proposed development, subject to condition that the development be in accordance with the noise mitigation scheme as detailed in Section 4.6 of this report.

APPENDIX A

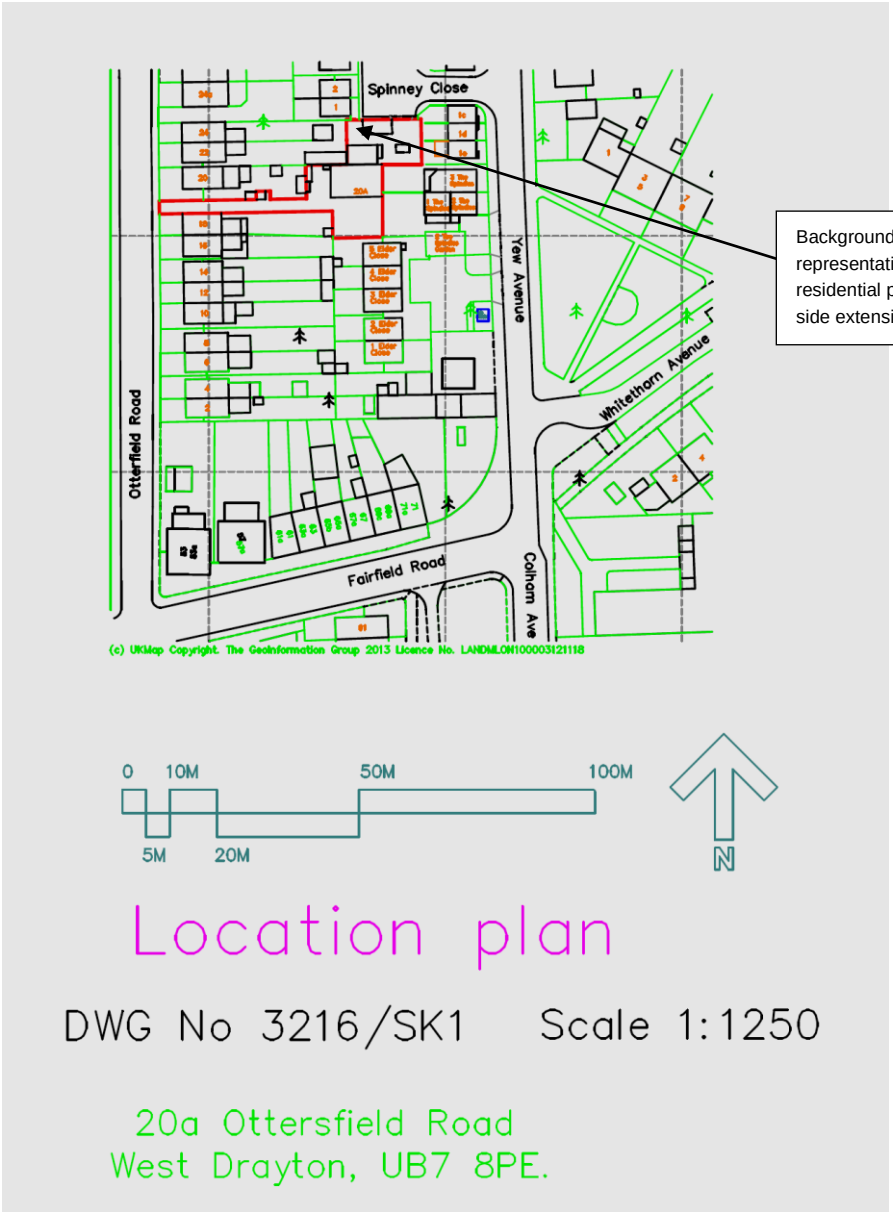
Site Location Plan, Proposed Site Plan & Proposed Building Layout Drawings

Site: 20A Otterfield Road, Yiewsley UB7 8PE

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Date: March 2021

SITE LOCATION PLAN



Site: 20A Otterfield Road, Yiewsley UB7 8PE

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Date: March 2021

PROPOSED SITE PLAN

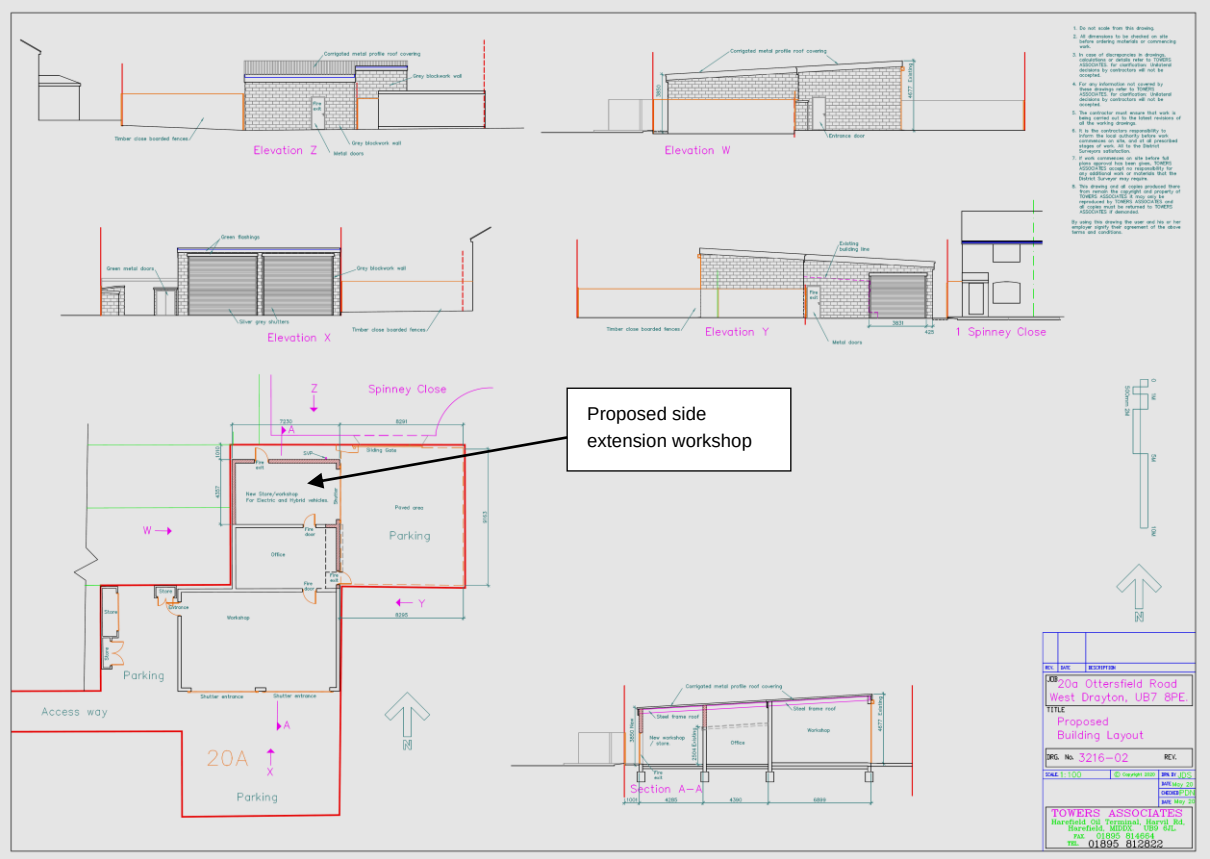


Site: 20A Otterfield Road, Yiewsley UB7 8PE

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Date: March 2021

PROPOSED BUILDING LAYOUT



APPENDIX B

Background Noise Survey Results

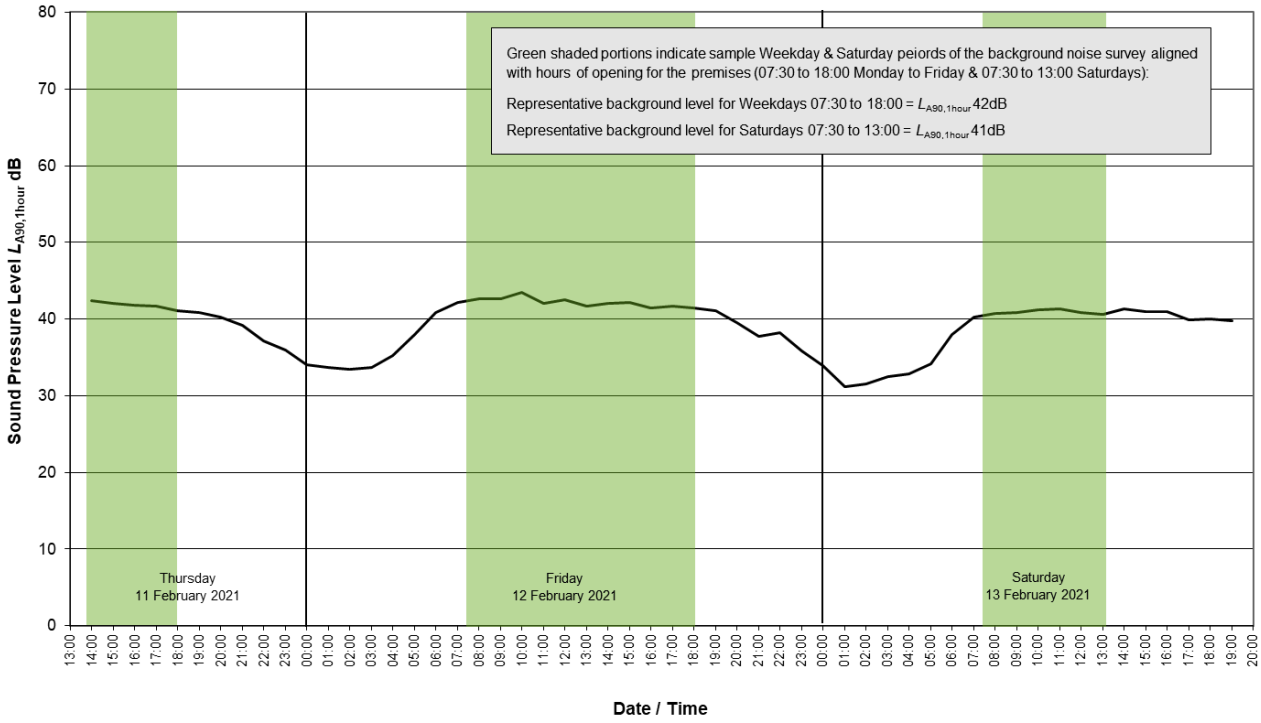
Site: 20A Otterfield Road, Yiewsley UB7 8PE

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Date: March 2021

BACKGROUND NOISE SURVEY RESULTS

Three-Day Background Noise Survey 11 February 2021 – 13 February 2021 :



APPENDIX C

Existing Workshop Source Data Noise Survey Results

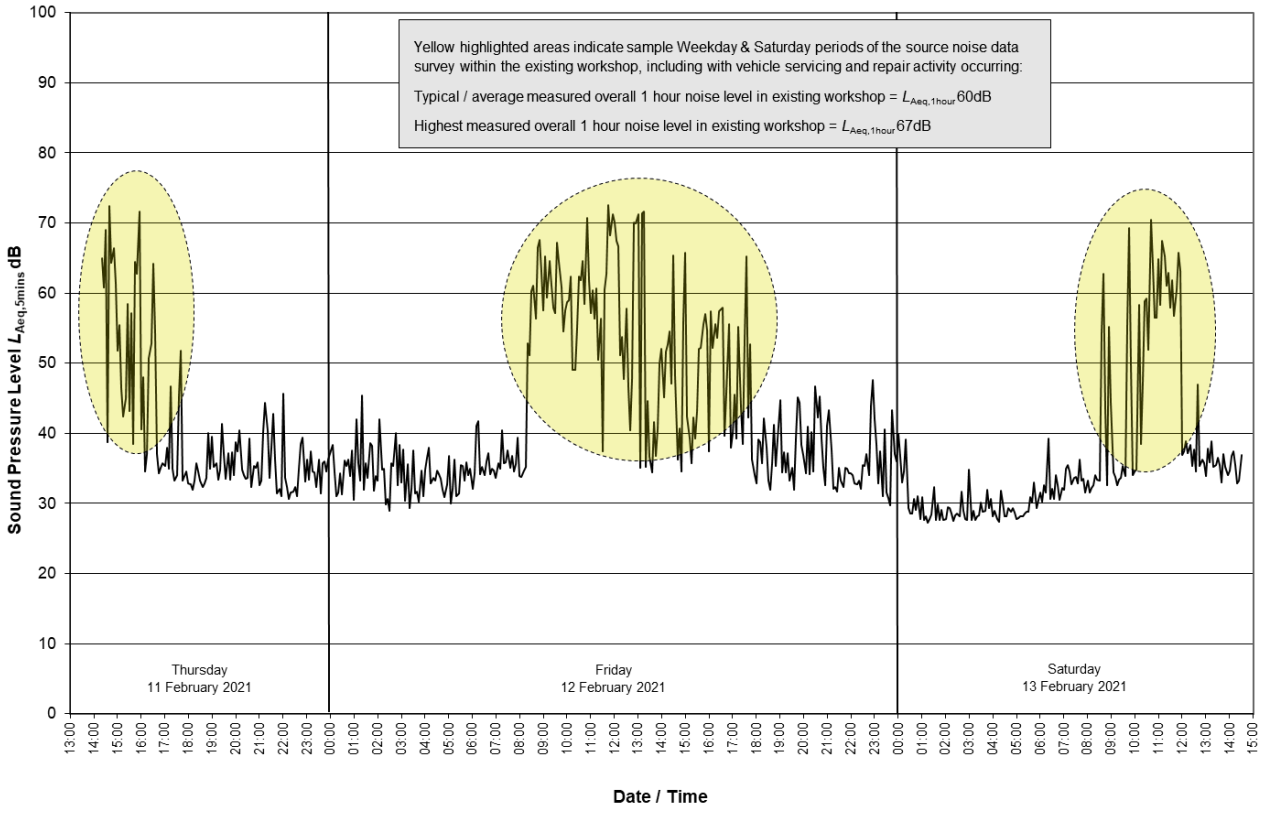
Site: 20A Otterfield Road, Yiewsley UB7 8PE

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Date: March 2021

EXISTING WORKSHOP SOURCE DATA NOISE SURVEY RESULTS

Three-Day Source Noise Data Survey 11 February 2021 – 13 February 2021 :



APPENDIX D

Cadna-A Noise Model For Proposed Workshop Noise Breakout

Site: 20A Otterfield Road, Yiewsley UB7 8PE

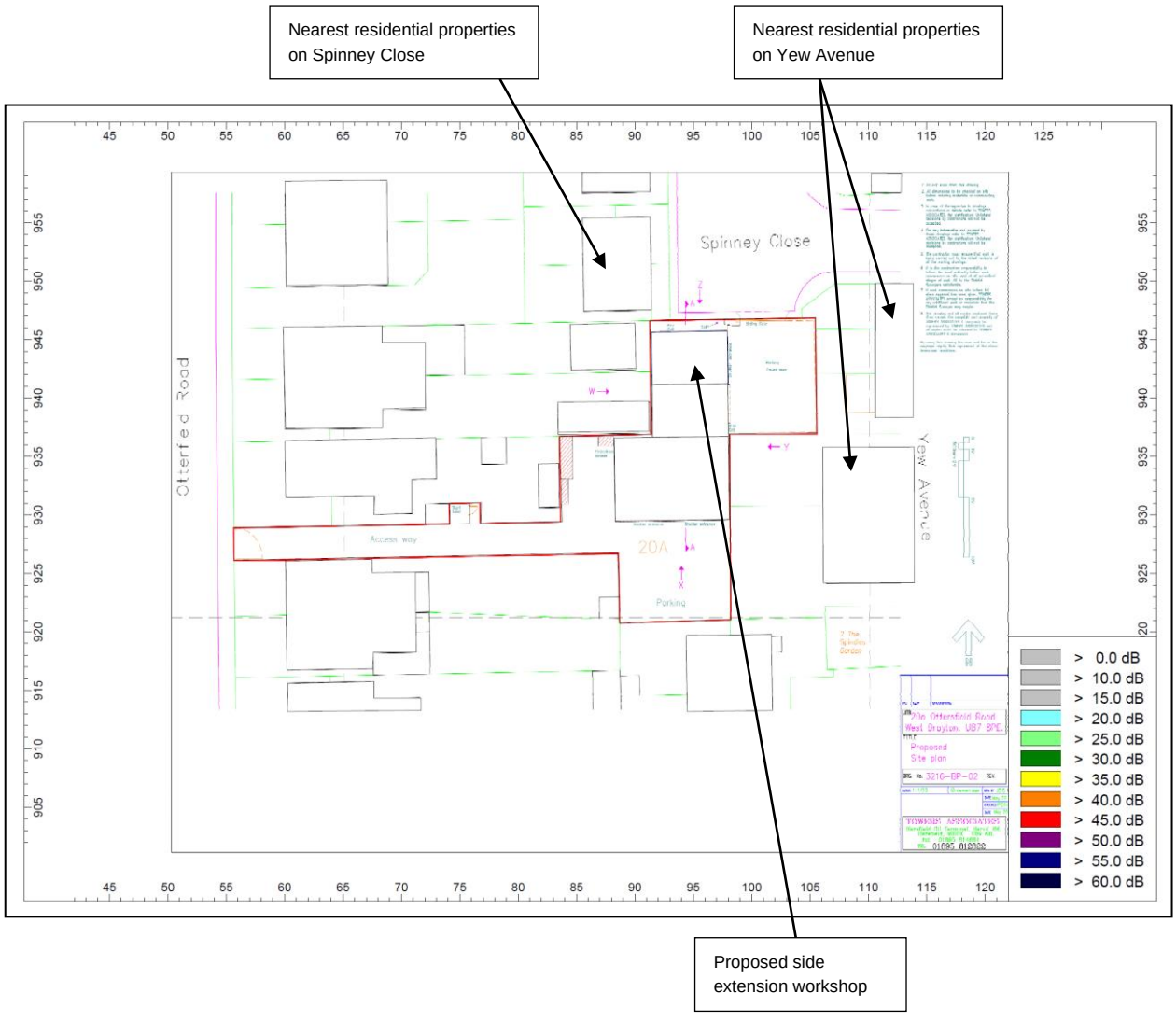
Report: 20121-002 Appendix D *(page 1 of 7)*

Date: March 2021

CADNA-A NOISE MODEL FOR PROPOSED WORKSHOP NOISE BREAKOUT

Noise Model Conditions: Blank noise model map (noise source levels turned off). This graphic is provided to show the layout of buildings for the noise model overlaid onto the site plan bitmap to assist in viewing the noise model contour results on the following pages.

Noise Model Graphics: Bitmap and buildings only, noise contours not displayed (noise source levels turned off).



Site: 20A Otterfield Road, Yiewsley UB7 8PE

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CADNA-A NOISE MODEL FOR PROPOSED WORKSHOP NOISE BREAKOUT

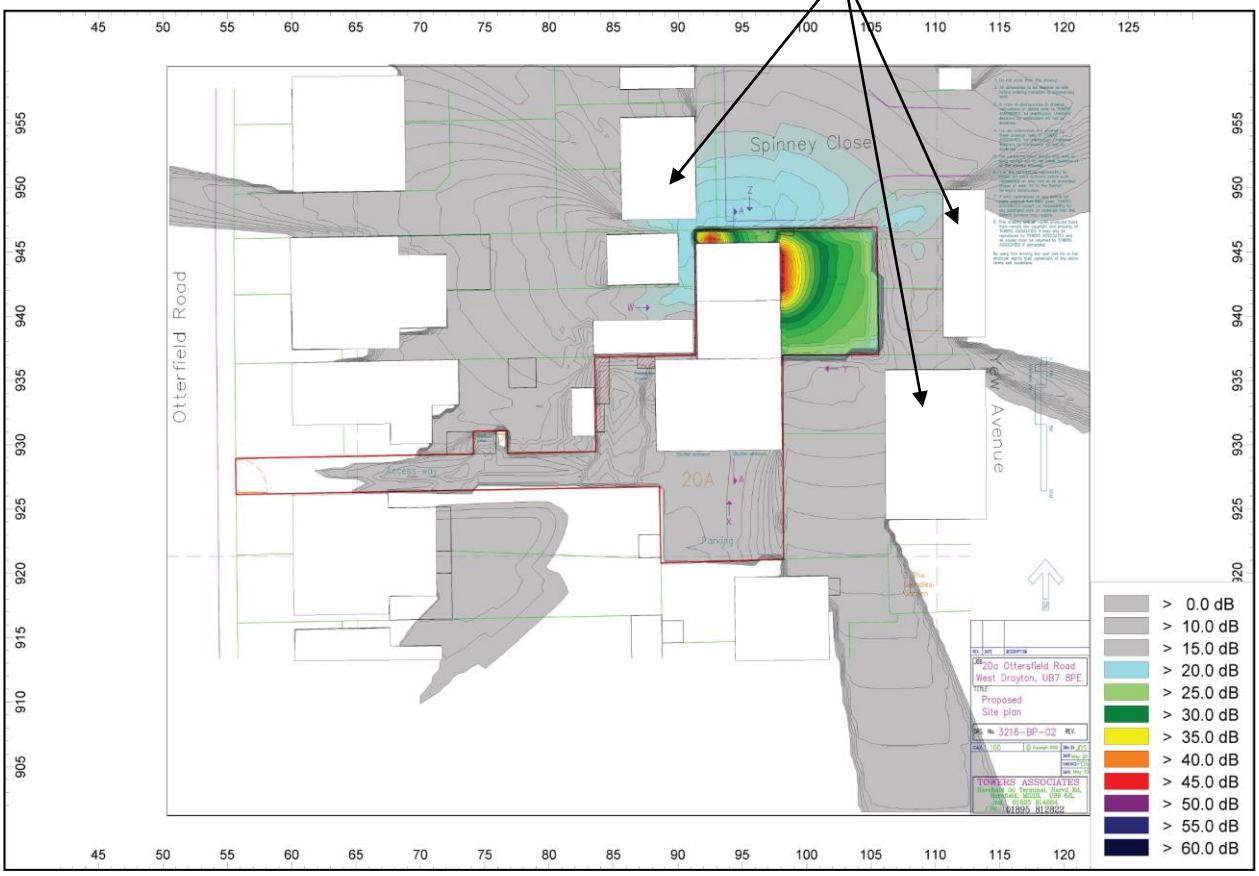
Noise Model Conditions: Workshop main access door closed. $L_{Aeq,1hour}$ dB values 1.5m above ground level.

Noise Model Graphics: Noise contour levels set to normal 1dB equal areas & progressive colours.

Highest overall noise level from proposed workshop to nearest residential properties:

Spinney Close = $L_{Aeq,1hour}$ ≤20dB

Yew Avenue = $L_{Aeq,1hour}$ ≤16dB



Site: 20A Otterfield Road, Yiewsley UB7 8PE

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CADNA-A NOISE MODEL FOR PROPOSED WORKSHOP NOISE BREAKOUT

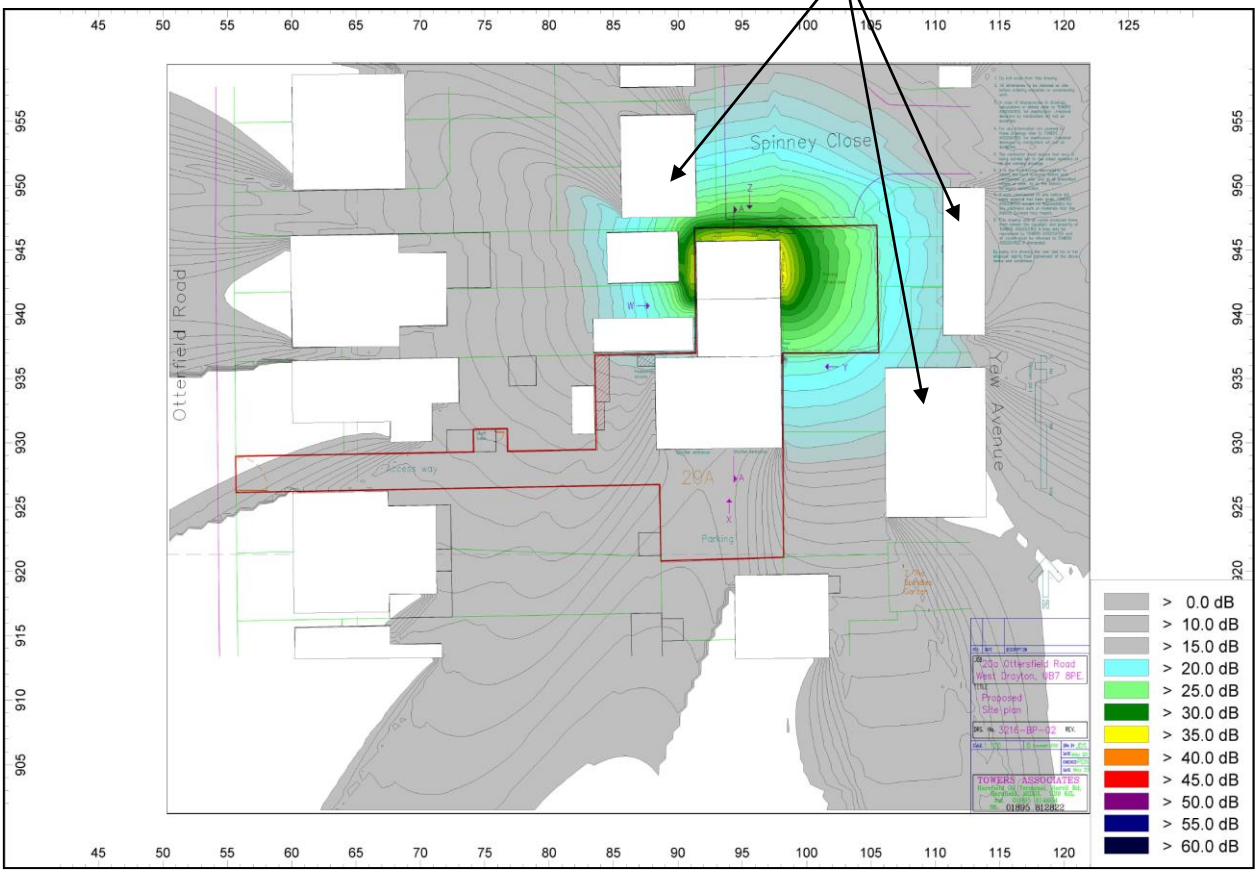
Noise Model Conditions: Workshop main access door closed. $L_{Aeq,1hour}$ dB values 4.5m above ground level.

Noise Model Graphics: Noise contour levels set to normal 1dB equal areas & progressive colours.

Highest overall noise level from proposed workshop to nearest residential properties:

Spinney Close = $L_{Aeq,1hour}$ ≤27dB

Yew Avenue = $L_{Aeq,1hour}$ ≤19dB



Site: 20A Otterfield Road, Yiewsley UB7 8PE

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CADNA-A NOISE MODEL FOR PROPOSED WORKSHOP NOISE BREAKOUT

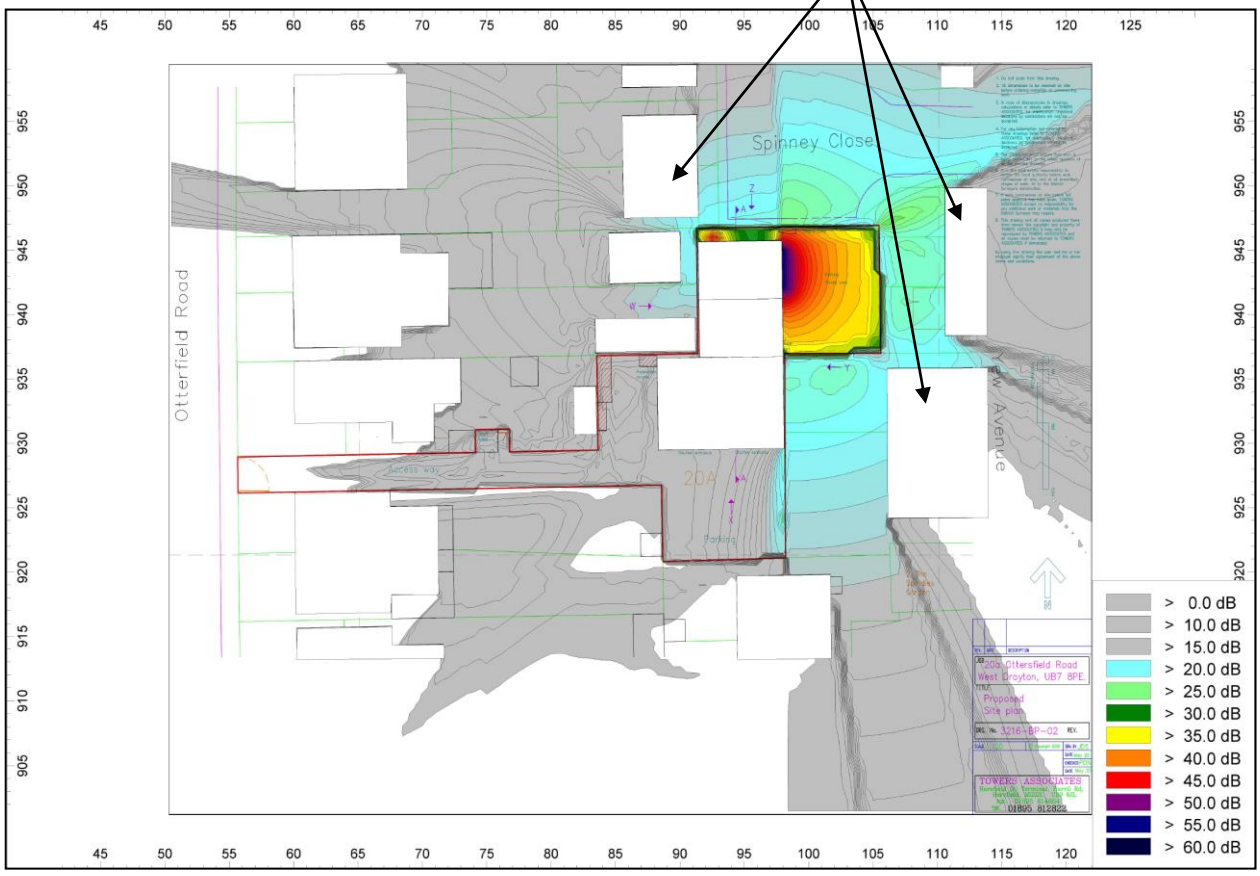
Noise Model Conditions: Workshop main access door closed, opened only to allow vehicle access. $L_{Aeq,1hour}$ dB values 1.5m above ground level.

Noise Model Graphics: Noise contour levels set to normal 1dB equal areas & progressive colours.

Highest overall noise level from proposed workshop to nearest residential properties:

Spinney Close = $L_{Aeq,1hour}$ ≤20dB

Yew Avenue = $L_{Aeq,1hour}$ ≤24dB



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CADNA-A NOISE MODEL FOR PROPOSED WORKSHOP NOISE BREAKOUT

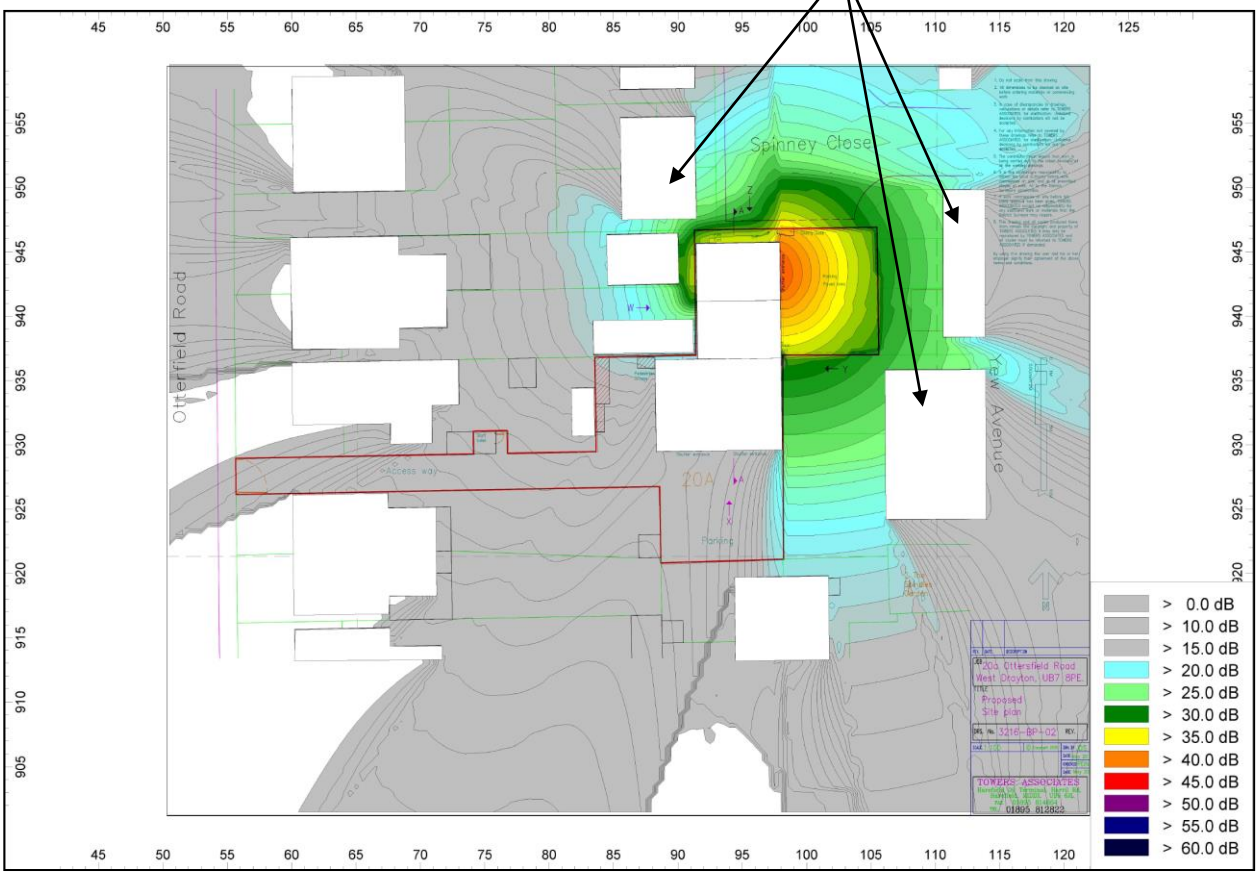
Noise Model Conditions: Workshop main access door closed, opened only to allow vehicle access. $L_{Aeq,1hour}$ dB values 4.5m above ground level.

Noise Model Graphics: Noise contour levels set to normal 1dB equal areas & progressive colours.

Highest overall noise level from proposed workshop to nearest residential properties:

Spinney Close = $L_{Aeq,1hour}$ ≤27dB

Yew Avenue = $L_{Aeq,1hour}$ ≤28dB



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CADNA-A NOISE MODEL FOR PROPOSED WORKSHOP NOISE BREAKOUT

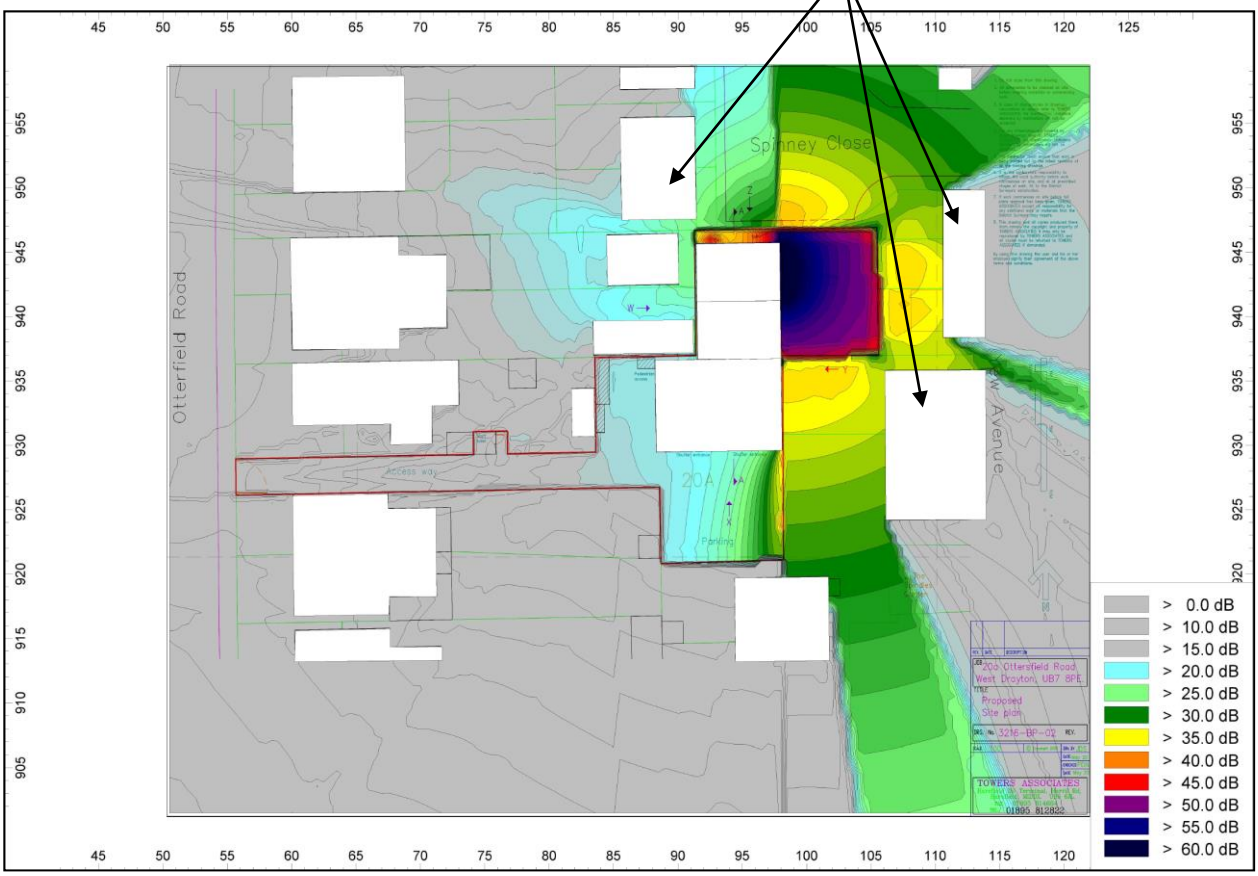
Noise Model Conditions: Workshop main access door continually open. $L_{Aeq,1hour}$ dB values 1.5m above ground level.

Noise Model Graphics: Noise contour levels set to normal 1dB equal areas & progressive colours.

Highest overall noise level from proposed workshop to nearest residential properties:

Spinney Close = $L_{Aeq,1hour}$ ≤25dB

Yew Avenue = $L_{Aeq,1hour}$ ≤35dB



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CADNA-A NOISE MODEL FOR PROPOSED WORKSHOP NOISE BREAKOUT

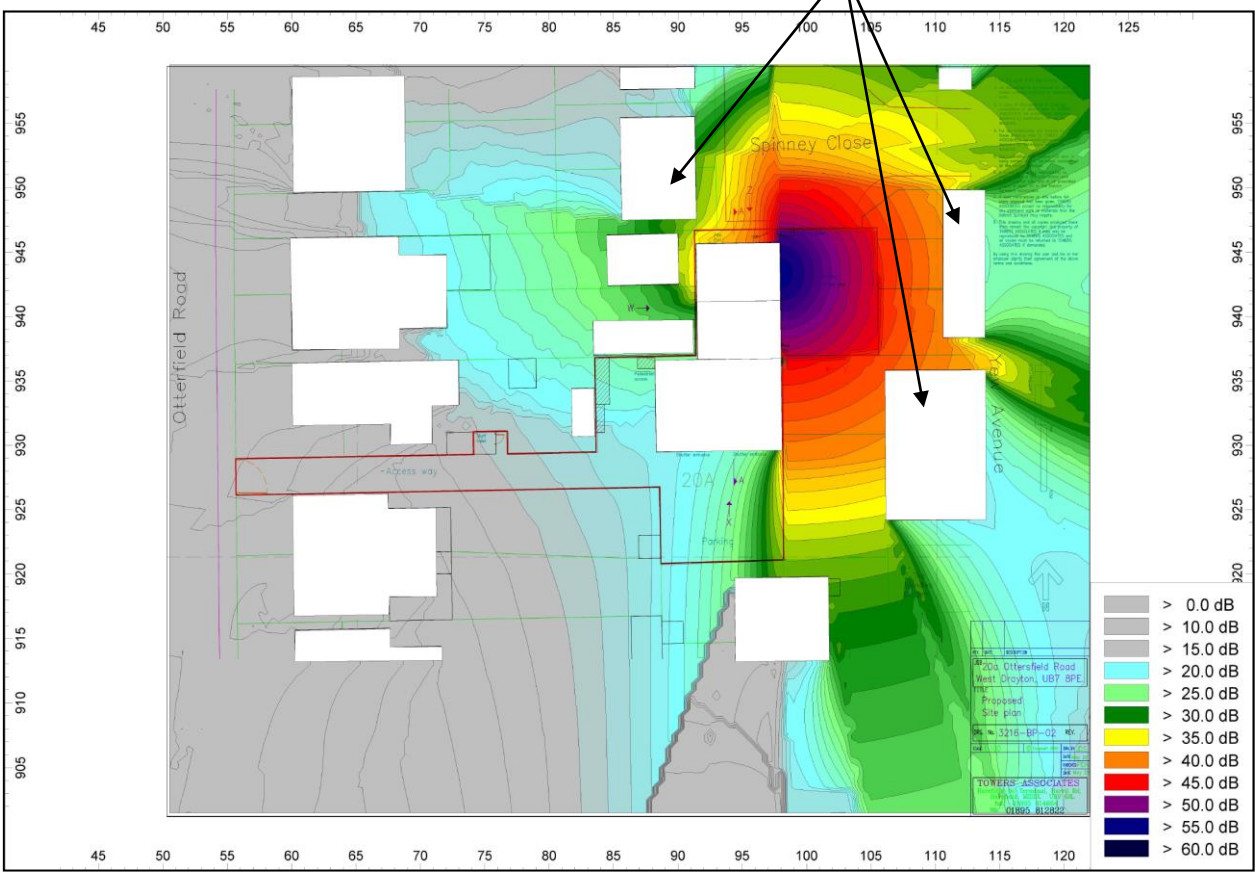
Noise Model Conditions: Workshop main access door continually open. $L_{Aeq,1hour}$ dB values 4.5m above ground level.

Noise Model Graphics: Noise contour levels set to normal 1dB equal areas & progressive colours.

Highest overall noise level from proposed workshop to nearest residential properties:

Spinney Close = $L_{Aeq,1hour}$ ≤34dB

Yew Avenue = $L_{Aeq,1hour}$ ≤42dB



APPENDIX E

BS4142:2014 Noise Assessment For Proposed Workshop

Site: 20A Otterfield Road, Yiewsley UB7 8PE

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Date: March 2021

BS4142:2014 NOISE ASSESSMENT FOR PROPOSED WORKSHOP

Assessment of noise from the proposed side extension workshop at 20A Otterfield Road potentially affecting nearest noise sensitive (residential) properties, carried out in accordance with the provisions of BS4142 is provided below.

Current edition of the Standard is BS4142:2014+A1:2019 "*Methods for rating and assessing industrial and commercial sound"*. All reference within this Appendix and associated report to BS4142 relates to this current edition.

Nearest noise sensitive (residential) properties are on Spinney Close and Yew Avenue. These are the assessment positions.

The assessment is set out as per the listings of Clause 12 from BS4142. The assessment also includes a tabular style assessment as per the examples contained within Annex A (informative) of BS4142.

Note that although the current edition of BS4142 replaces the term *"noise"* with *"sound"*, for the purpose of this assessment the term *"noise"* has been continued to be used in recognition that use of the term *"sound"* would perhaps introduce unnecessary confusion.

A) Qualifications & Experience

This BS4142 assessment is carried out by David Philip. David Philip graduated in 1989 from The University of Salford Department of Applied Acoustics with a BEng Honours degree in Electroacoustics.

David Philip has since 1995 been a fully elected Member of the Institute of Acoustics (MIOA). David Philip has been Managing Director of Philip Acoustics since the firm was formed in 2002. Philip Acoustics has held full membership of the Association of Noise Consultants (ANC) since 2003.

Prior to the formation of Philip Acoustics David Philip held senior acoustic consultant positions at Sound Research Laboratories (London office) and also at Spectrum Acoustic Consultants.

David Philip has some 30+ years' experience as an Acoustic Consultant both in the UK and internationally and is familiar with acoustic issues associated with noise sources including various types of vehicle servicing/repair and maintenance type garage workshops etc.

David Philip is familiar with and has undertaken many noise assessments in accordance with British Standard BS4142 (previous and current editions). David Philip attended the Institute of Acoustics one day launch conference for BS4142:2014 in London on 14 November 2014. David Philip is also familiar with the noise policy of many Local Planning Authorities including London Borough of Hillingdon.

Site: 20A Otterfield Road, Yiewsley UB7 8PE

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B) Source Being Assessed

The commercial / industrial source being assessed (specific noise) is vehicle servicing and repair activity to be conducted within the proposed side extension workshop at 20A Otterfield Road.

C) Subjective Impressions

The applicant's premises at 20A Otterfield Road is a long established small independent garage/workshop business; M. Finlayson, providing vehicle servicing and repairs principally for local residents.

Work / activity at the premises is not especially noisy and doors to the existing workshop are kept closed, opened only to facilitate vehicle access into and out of the workshop. The work does not include MOTs or paintwork/bodywork repairs.

In terms of work to be undertaken within the proposed workshop, this will be nominally the same servicing and repair activity as occurs currently within the existing workshop, albeit specifically for Electric/Hybrid vehicles only and with capacity for only one vehicle at a time.

Background noise levels in the vicinity of the site and to outside the nearest residential properties are relatively low and principally due to local traffic on surrounding roads/streets, plus with underlying noise from more distant traffic generally, and occasional aircraft.

D) Existing Context

The site is an existing commercial use, operated by the applicant as described in item C) above.

Thus, commercial / industrial type activity and potential associated noise in the vicinity already exists.

The proposed side extension workshop does not therefore introduce a noise source to where no commercial / industrial type noise sources currently already exist.

E) Measurement Location (Specific Noise)

The specific noise level of vehicle servicing and repair activity associated with the proposed workshop to outside adjacent nearest residential properties is established by noise modelling using DataKustik Cadna-A proprietary software (see item L).

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F) Noise Measuring System Including Calibrator Used

The table below lists the noise measuring systems used for the background noise survey and source data noise survey:

Equipment Description & Serial Number	Type Number	Manufacturer	Date of Calibration Expiration	Calibration Certificate Number
Background Noise Survey				
Class 1 Sound Level Meter, s/n 00773045	NL-31	Rion	25/02/2022	TCRT20/1111
0.5" Microphone s/n 313002	UC-53A	Rion	25/02/2022	TCRT20/1111
Preamplifier s/n 25056	NH-21	Rion	25/02/2022	TCRT20/1111
Microphone extension cable	EC-04A	Rion	N/A	N/A
Microphone windshield	WS-10	Rion	N/A	N/A
Calibrator s/n 2326801	4231	Bruel & Kjaer	29/08/2022	UCRT20/1829
Environmental case & extension boom	N/A	N/A	N/A	N/A
Source Noise Data Survey				
Class 1 Sound Level Meter, s/n 2311656	2260	Bruel & Kjaer	29/08/2022	UCRT20/1830
0.5" Microphone s/n 143228	377B02	PCB	29/08/2022	UCRT20/1830
Preamplifier *(no identification s/n available)*	ZC0026	Bruel & Kjaer	29/08/2022	UCRT20/1830
Microphone windshield	UA 0237	Bruel & Kjaer	N/A	N/A
Calibrator s/n 2326801	4231	Bruel & Kjaer	29/08/2022	UCRT20/1829
Tripod	N/A	N/A	N/A	N/A

G) Operational Test

Reference level of the Bruel & Kjaer calibrator 4231 s/n 2326801 is 94dB. Verification checks of the measuring systems before and after all measuring periods for the surveys using the calibrator were within +/- 0.2dB of the reference value and thus considered accurate and valid.

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Date: March 2021

H) Weather Conditions

Weather conditions during day periods of the background noise survey (aligned to hours of opening for the premises) were noted and monitored during attended parts with a Speedtech Instruments Skymaster portable weather station model SM-28 serial number 19370. Summary weather conditions during day periods of the survey are listed below and were suitable for the measurement of background noise levels:

- Wind: 1 to 3m/s wind speed recorded at measurement position
- Temperature Inversion: Not applicable
- Precipitation: Nil
- Fog: Nil
- Wet Ground: Nil
- Snow Coverage: Nil
- Temperature: Range 2°C to 4°C
- Cloud Cover: Variable, between approximately 0% to 75%

I) Date & Times Of Measurements

The background noise survey was carried out over a three-day period from Thursday 11 February 2021 through Saturday 13 February 2021 so as to include times during sample weekdays and a Saturday aligned to hours of opening for the proposed workshop (same as existing premises).

J) Measurement Time Intervals

A measurement time interval of 1 hour was used for the background noise survey, set concurrently for the survey duration, to align with the day period BS4142 assessment reference time interval 1 hour.

K) Reference Time Interval

The assessment is for the daytime period and therefore a Reference Time Interval of 1 hour is used.

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Date: March 2021

L) Specific Noise Level

The specific noise level of vehicle servicing and repair activity within the proposed workshop at the assessment positions (to outside nearest residential properties) is as per Table 6 in Section 4.4 of Report 20121-002 and is established by propagation of noise breakout from the proposed workshop, taking account of the workshop building envelope construction, distance, directivity, any screening and noise reflections etc. due to surrounding buildings and structures using DataKustik Cadna-A proprietary noise modelling software.

In order to provide a cautious / robust assessment then the noise model is as "worse-case" based on the highest measured $L_{Aeq,1hour}$ source data noise levels due to vehicle servicing and repair activity within the applicant's existing workshop.

Noise source and breakout conditions for input into the noise model, and modelling results are detailed in Sections 4.2 to 4.4 of Report 20121-002. The noise modelling includes three iterations for differing workshop main access door conditions:

a) Door kept closed during vehicle servicing and repair activity;

b) Door kept closed during vehicle servicing and repair activity, but opened briefly only to allow vehicle access in and/or out;

c) Door left continually open during vehicle servicing and repair activity.

For purpose of the BS4142 noise assessment, then for each of the three iterations as above, the highest calculated Specific Noise Level noise level $L_{Aeq,1hour}$ value is used as "worse-case".

There is uncertainty by need to establish the specific noise level at the assessment location by propagation using noise modelling. However the modelling is undertaken cautiously / robustly and therefore it is expected that any uncertainty is small and errs on the side of caution, i.e. uncertainty is that noise of vehicle servicing and repair activity from the proposed workshop to the assessment positions is more likely to be lower (as opposed to higher) than that calculated by the modelling and used in the assessment.

M) Background Noise Level

BS4142 specifically advises it is not the case that lowest measured background noise levels be used, rather that the representative or most commonly occurring background noise level be used.

Notwithstanding this, measured background noise levels during the day periods of the survey (aligned to hours of opening for the premises) are relatively stable non-fluctuating and thus the representative background noise level used for the assessment is also the typical minimum background noise level which occurred on the Saturday of the survey 07:30 to 13:00 = $L_{A90,1hour}$ 41dB.

N) Rating Level

The Rating Level is the Specific Noise Level plus any corrections added to account for acoustic features of the specific noise. Commentary on acoustic features and associated corrections is provided below:

Impulsivity

Impulsivity (not to be confused with intermittency) is defined in BS4142 as "the sudden onset of a noise is an impulse". Table E.1 of BS4142 provides as example acoustic feature corrections as may be applicable to certain types of noise source categorised as having impulsivity, these are using pneumatic tools, compressed air release, metal hammering and use of a wood axe. These examples show that impulsivity relates to noise sources that have a rapid and sudden onset of a high noise level.

Under these definitions, occasionally some noise generated by vehicle servicing and repair activity could therefore potentially be impulsive. Based on the noise modelling results and from observation of vehicle servicing and repair activity within the applicant's existing workshop it is considered that potential for occasional impulsivity noise would be in the region of being just perceptible at the assessment positions. Therefore in accordance with BS4142 a +3dB penalty acoustic feature correction is applied in the assessment for potential impulsivity.

Intermittency

Vehicle servicing and repair activity is unavoidably intermittent, including periods when nil / negligible noise is generated. Therefore in accordance with BS4142 a +3dB penalty acoustic feature correction is applied in the assessment for intermittency.

Tonality

Noise of vehicle servicing and repair activity does not include tonal characteristics. No acoustic feature correction need be applied in the assessment for tonality.

Other Characteristics *(neither tonal nor impulsive though otherwise readily distinctive against the residual acoustic environment)*

Acoustic feature corrections for both impulsivity and intermittency are applied in the assessment. These feature corrections are considered to cautiously / robustly take account of the noise characteristics from vehicle servicing and repair activity. No acoustic feature correction need be applied for other characteristics.

O) Excess Of Rating Level Over Background Noise Level

A tabular style assessment as per the examples contained within Annex A (informative) of BS4142 is provided on the following pages, one tabular assessment for each of the three iterations for varying workshop main access door conditions.

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Date: March 2021

Tabular BS4142 Assessment:

WORKSHOP MAIN ACCESS DOOR CLOSED

Results		Relevant Clause	Commentary
Assessment made during the daytime (within range 7am to 11pm), so the reference time interval is 1 hour		**7.2**	
Specific noise level at Assessment Position	$L_{Aeq,1hour}$ = ≤27dB	**7.3.6**	Highest noise level to all adjacent residential properties (assessment positions). Specific noise level established by noise model propagation calculation to assessment positions, see Section L) of assessment
Acoustic feature correction	+6dB	**9.2**	Acoustic feature corrections +3dB for potential impulsivity and +3dB for intermittency cautiously applied, see Section N) of assessment
Rating level	(≤27 + 6)dB = ≤33dB	**9.2**	
Background noise level	$L_{A90,T}$ = 41dB	**8**	Representative minimum background noise level for the range of hours of operation (07:30 to 18:00 Monday to Friday & 07:30 to 13:00 Saturdays)
Excess of rating level over background noise level	(≤33 – 41)dB = ≤-8dB	**11**	Rating Level ≤8dB <u>below</u> the background noise
After taking context into account, assessment indicates there is unlikely to be an adverse noise impact		**11**	The excess of rating level over the background is ≤-8dB, i.e. the Rating Level is ≤8dB <u>below</u> the background noise. Notwithstanding any context considerations, the BS4142 assessment result = indication of low noise impact and thus there is unlikely to be any adverse noise impact.
Uncertainty of the assessment		**10**	See Section Q) of assessment

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Tabular BS4142 Assessment:

WORKSHOP MAIN ACCESS DOOR CLOSED; OPENED ONLY TO ALLOW VEHICLE ACCESS

Results		Relevant Clause	Commentary
Assessment made during the daytime (within range 7am to 11pm), so the reference time interval is 1 hour		**7.2**	
Specific noise level at Assessment Position	$L_{Aeq,1hour}$ = ≤28dB	**7.3.6**	Highest noise level to all adjacent residential properties (assessment positions). Specific noise level established by noise model propagation calculation to assessment positions, see Section L) of assessment
Acoustic feature correction	+6dB	**9.2**	Acoustic feature corrections +3dB for potential impulsivity and +3dB for intermittency cautiously applied, see Section N) of assessment
Rating level	(≤28 + 6)dB = ≤34dB	**9.2**	
Background noise level	$L_{A90,T}$ = 41dB	**8**	Representative minimum background noise level for the range of hours of operation (07:30 to 18:00 Monday to Friday & 07:30 to 13:00 Saturdays)
Excess of rating level over background noise level	(≤34 – 41)dB = ≤-7dB	**11**	Rating Level ≤7dB below the background noise
After taking context into account, assessment indicates there is unlikely to be an adverse noise impact		**11**	The excess of rating level over the background is ≤-7dB, i.e. the Rating Level is ≤7dB below the background noise. Notwithstanding any context considerations, the BS4142 assessment result = indication of low noise impact and thus there is unlikely to be any adverse noise impact.
Uncertainty of the assessment		**10**	See Section Q) of assessment

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Date: March 2021

Tabular BS4142 Assessment:

WORKSHOP MAIN ACCESS DOOR LEFT CONTINUALLY OPEN

Results		Relevant Clause	Commentary
Assessment made during the daytime (within range 7am to 11pm), so the reference time interval is 1 hour		**7.2**	
Specific noise level at Assessment Position	$L_{Aeq,1hour}$ = ≤42dB	**7.3.6**	Highest noise level to all adjacent residential properties (assessment positions). Specific noise level established by noise model propagation calculation to assessment positions, see Section L) of assessment
Acoustic feature correction	+6dB	**9.2**	Acoustic feature corrections +3dB for potential impulsivity and +3dB for intermittency cautiously applied, see Section N) of assessment
Rating level	(≤42 + 6)dB = ≤48dB	**9.2**	
Background noise level	$L_{A90,T}$ = 41dB	**8**	Representative minimum background noise level for the range of hours of operation (07:30 to 18:00 Monday to Friday & 07:30 to 13:00 Saturdays)
Excess of rating level over background noise level	(≤48 – 41)dB = ≤7dB	**11**	Rating Level ≤7dB above the background noise
After taking context into account, assessment indicates adverse noise impact		**11**	The excess of rating level over the background is ≤7dB, i.e. the Rating Level is ≤7dB above the background noise. Notwithstanding any context considerations, the BS4142 assessment result = indication of adverse noise impact.
Uncertainty of the assessment		**10**	See Section Q) of assessment

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Date: March 2021

P) Assessment Conclusions After taking Context Into Account

Notwithstanding any context consideration that the application premises includes an existing garage workshop undertaking vehicle servicing and repairs, BS4142 noise assessment for the proposed side extension workshop at 20A Otterfield Road indicates the following:

Workshop Main Access Door Closed

The BS4142 assessment indicates there is unlikely to be adverse noise impact to adjacent residential occupiers.

Workshop Main Access Door Closed; Opened Only To Allow Vehicle Access

The BS4142 assessment indicates there is unlikely to be adverse noise impact to adjacent residential occupiers.

Workshop Main Access Door Left Continually Open

The BS4142 assessment indicates likely adverse noise impact to adjacent residential occupiers.

Q) Uncertainty

There is some uncertainty by need to establish specific noise levels at the assessment positions (nearest residential dwellings) by propagation using noise modelling.

However, the modelling and assessment is undertaken cautiously / robustly based on measured highest $L_{Aeq,1hour}$ noise levels due to vehicle servicing and repair activity occurring in the workshop building.

There is also uncertainty by using background noise levels as measured during the Government's restrictions as associated with the Covid-19 Pandemic.

However, the background noise levels as used in the assessment (i.e. as measured during Covid-19 Pandemic restrictions) will likely be lower than normal conditions, and thus if anything result in a more cautious / robust assessment.

Therefore it is expected that any uncertainty is small and errs on the side of caution, i.e. uncertainty is that noise due to vehicle servicing and repair activity occurring in the proposed side extension workshop to nearby residential dwellings is more likely to be lower (as opposed to higher) than that calculated by the modelling and used in the assessment.