REPORT TITLE:

Talacre Community Sports Centre, Dalby St, Kentish Town, London, NW5 3AF:

Environmental noise assessment

CLIENT DETAILS:

Space + Place

DATE:

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REPORT REFERENCE:

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PREPARED BY:

Joan-Carles Blanco BSc (Hons), MIOA

CHECKED/AUTHORISED BY:

Martin Jones BSc (Hons), MIOA

Southern Office
Oyster House, Severalls Lane
Colchester, Essex CO4 9PD
t: 0845 241 0142

Northern Office
The Core, Bath Lane, Newcastle Helix
Newcastle upon Tyne, NE4 5TF
t: 0845 872 3540

info@paceconsult.co.uk
www.paceconsult.co.uk

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Document Status and Revision Schedule

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-	Checked and Authorised	8/12/23	JCB	MJ

1 Summary

A noise assessment was commissioned by Space + Place in support of the planning application for the refurbishment works to be completed at Talacre Community Sports Centre, Dalby St, Kentish Town, London, NW5 3AF:

The assessment has considered the most relevant guidelines and standards, including BS 4142: 2014+A1:2019 , *Method for Rating and assessing industrial and commercial sound Industrial Noise,* WHO, and Guidelines for environmental noise impact assessment (IEMA).

The noise impact of the proposed works at Talacre Community Sports Centre based on the sound reduction provided by the recommended building envelope will have a negligible noise effect at the nearest residential dwellings.

The noise intrusion due to external noise sources based on the recommended building envelope is compliant with the internal noise levels recommended by the relevant acoustic guidelines.

In order to minimize the impact of plant noise from the proposed works at the nearest residential dwellings, a noise limited criteria is recommended based on the typical measured background.

2 Introduction

This report provides a noise assessment of the proposed refurbishment/extension works to be completed at Talacre Community Sports Centre, Dalby St, Kentish Town, London, NW5 3AF:

The figure below includes the location of the leisure centre, and the extent of the proposed works.

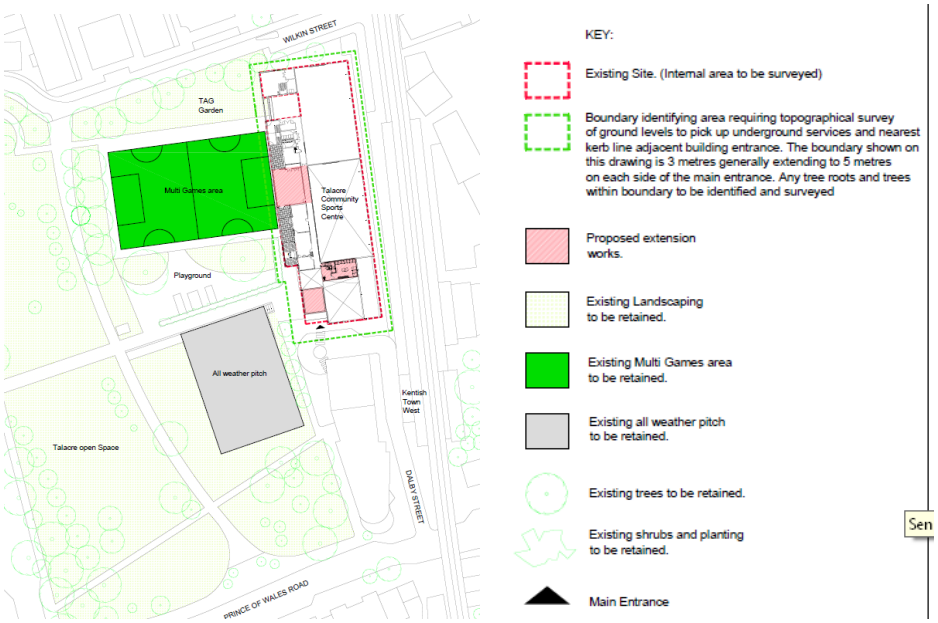

Figure 1. Leisure centre location, nd extent of the proposed works.

2.1 Site Description

There is a proposal to extent and refurbishing part of the existing Talacre Community Centre.

The proposed extension and new rooms are affected mainly by railway noise (overground), noise from the nearby beer brewery, sporadic aircraft noise, and noise from the users of the multi games area.

3 Environmental Methodology

3.1 Perception

Noise is defined as unwanted sound. Human ears can respond to sound over the frequency range of about 20 Hz to 20 kHz and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude and is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates to the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear. To help understand the range of noise levels which may be encountered, an indication of the level of some common sounds on the dB(A) scale is given in the table below.

Table 1. Common Sounds on the dB(A) Scale

dB(A)	Description
140	Threshold of pain
120	Jet take off at 50 metres
100	Maximum noise levels on an underground platform
80	Kerbside of a busy urban street
60	Busy general office
40	Residential area at night
20	Background in a TV and recording studio
0	Threshold of hearing

Furthermore, the perception of noise may be determined by several other factors, both acoustic and non-acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time.

In addition, the time of day and other acoustic features such as tonality may be important, as may the disposition of the affected individual receptor. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that corresponds to the response of the human ear is the A-weighting scale. This is widely used for environmental noise

measurement, and the levels are denoted as dB(A) or LAeq, LA90, etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) of a steady source is generally regarded as the minimum difference needed to perceive a change.

3.2 Legislation and Policy

3.2.1 National Planning Policy Framework and the Noise Policy Statement for England

The National Planning Policy Framework (NPPF) sets out the general requirements for gaining planning permission. Comments regarding noise found within the document are as follows. The planning system should prevent 'both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or NOISE pollution'. It adds to this by saying that 'planning policies and decisions should aim to avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development'.

The NPPF references the Noise Policy Statement for England (NPSE) which in turn references two concepts used by the World Health Organisation (WHO) which can be used to ascertain relevant noise levels for individual sites. The concepts are LOAEL (Lowest Observed Adverse Effect Level) and SOAEL (Significant Observed Adverse Effect Level). The NPPF then gives three aims to adhere to:

Aim 1 – Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
Aim 2 – Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy of sustainable development.
Aim 3 – Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

To avoid 'significant adverse impacts on health and quality of life', by creating a situation where the impact of noise lies below the SOAEL the guidance contained within BS8233:2014 and WHO guidelines will be adhered to.

3.2.2 BS4142:2014 + A1:2019.

This standard sets out a methodology for the assessment of whether noise from factories, industrial premises or fixed installations and sources of an industrial/commercial nature.

The procedure contained in BS4142 for assessing the impact is to compare the measured or predicted noise level from the source in question, the 'specific noise level', at the assessment position with the correct background noise level for the worst case time of operation.

Where the noise contains a 'distinguishable, discreet, continuous note (whine, hiss, screech, hum etc.) or if there are distinct impulses in the noise (bangs, clicks or clatters), or if the noise is irregular enough to attract attention' then a range of correction factors can be added to the specific noise level as appropriate to obtain the 'rating level'.

As this is a prescriptive report prior to plant installation, overall rating noise levels will be specified for the new installation. Compliance with the rating value will be necessary to provide evidence that significant adverse impact has been avoided as required by the NPSE.

To assess the impact, the measured background noise level is subtracted from the rating noise level. BS4142 states:

The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessment and arriving at decisions, therefore, it is essential to place the sound in context.

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (See Clause 8) from the rating level (see Clause 9) and consider the following.

a) Typically the greater the difference, the greater the magnitude of the impact.

b) A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around 5dB is likely to be an indication of an adverse impact, depending on the context.

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.

1) The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

2) The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time

periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.
3) The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as;
i) Façade sound insulation treatment
ii) Ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and Acoustic screening.

3.2.3 Guidelines for Environmental Noise Impact Assessment.

The guidelines provide specific support on how noise impact assessment fits within the Environmental Impact Assessment (EIA) process. They cover:

• How to scope a noise assessment;

• issues to be considered when defining the baseline noise environment.

• prediction of changes in noise levels as a result of implementing development proposals; and

• definition and evaluation of the significance of the effect of changes in noise levels (for use only where the assessment is undertaken within an EIA).

This guideline includes an assessment table which shows how the impact arising from a change in sound levels could be evaluated. This example table is included below.

Long-term Impact Classification	Short-term Impact Classification	Sound level change dB L_{pAeqT} (positive or negative) T = either 16hr day or 8hr night
Negligible	Negligible	≥ 0 dB and < 1 dB
	Minor	≥ 1 dB and < 3 dB
Minor	Moderate	≥ 3 dB and < 5 dB
Moderate	Major	≥ 5 dB and < 10 dB
Major		≥ 10 dB

Figure 2. IEMA assessment table.

3.2.4 World Health Organisation (WHO) 'Guidelines for Community Noise'

This document states that, in dwellings, the critical effects of noise are on sleep, annoyance and speech interference. According to this document, to protect the majority of people from being seriously annoyed during the daytime, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB L_{Aeq} for a steady, continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound pressure level should not exceed 50 dB L_{Aeq}. To avoid any possibility of sleep disturbance, indoor guideline values for bedrooms are 30 dB L_{Aeq} for continuous noise and 45 dB L_{Amax} for single sound events. These indoor noise levels correspond to sound

pressure levels at the outside façades of the living spaces of 45 dB L_{Aeq} and 60 dB L_{Amax}. These values have been obtained by assuming that the noise reduction from outside to inside with the window partly open is 15 dB.

4 Noise Survey

4.1 Baseline Noise Level Survey Details

Noise measurements were undertaken in free-field conditions between Wednesday 6th and Thursday 7th December 2023. The sound level meter was positioned 1.5 m above the sport centre roof (tripod mounted), and 3 metres from any reflective surface. The figure below includes the measurement location.

Noise measurements were made with a calibrated precision grade sound level meter which achieves the requirements of BS EN 61672. The survey was carried out in accordance with the principles of BS 7445 Parts 1-3, '*Description and Measurement of Environmental Noise'*, British Standard BS4142: 2014+A1:2019 : *Methods for rating and assessing industrial and commercial sound.*

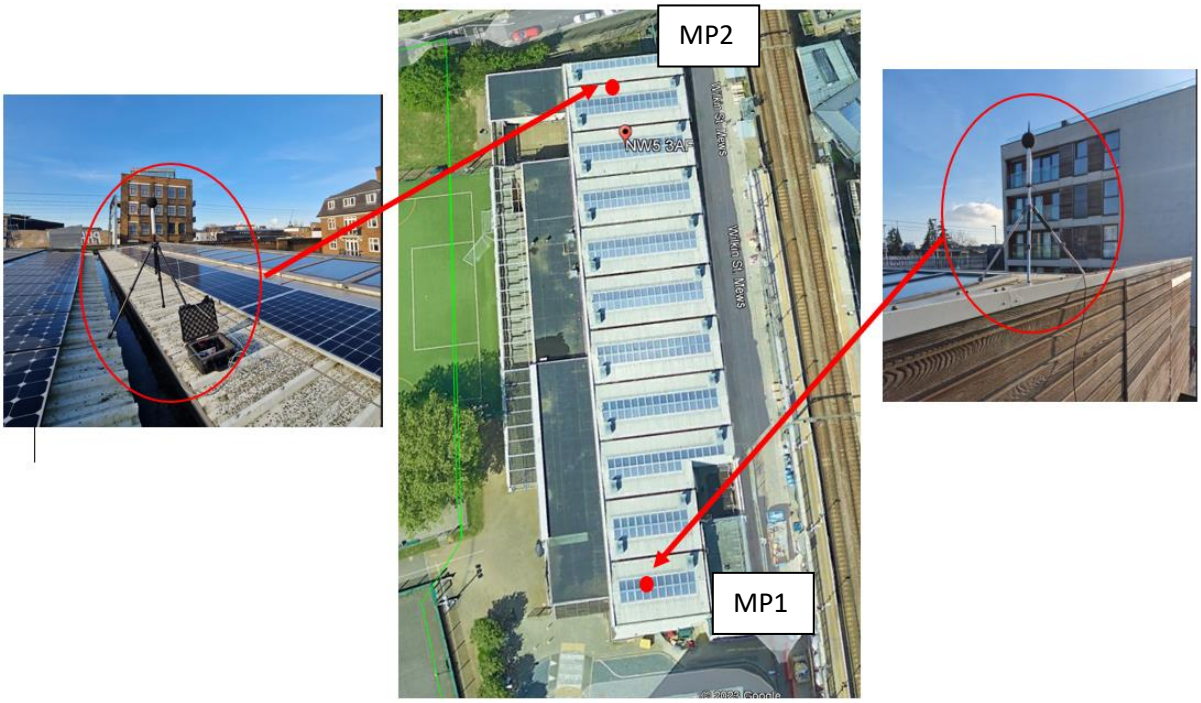

Figure 3. Noise measurement location.

The measurement locations are considered representative of the noise levels affecting the proposed works, and background levels affecting the nearest residential dwellings which

have the potential to be affected by the noise emission of the Talacre Community Sports Centre proposed operation.

4.2 Equipment

- Svantek 971 precision grade sound level meters. Serial number 34927 and 34937.
- Environmental wind shield.
- Calibrator - Norsonic serial number 32199

The sound level meter was calibrated before and after the survey. No significant drift was noted between the two reference checks.

4.3 Weather

In order to evaluate the weather conditions, three weather check measurements were undertaken on site (beginning, between, and at the end of the measurement period). During the weather checks, it was noted that the climatic conditions were stable during the measurement period. During the visits the sky was cloudy.

Table 2: Weather condition.

Time	^{o}C	Wind speed m/s	Relative Humidity %	Wind directions
Wednesday 12:00	6	1.1	75	NE
Wednesday 21:00	3	0.9	80	N
Thursday 11:00	5	0.8	82	E

The weather conditions were measured using a Pocket weather tracker KESTREL 4500.

As the weather condition did not show significant variations it was concluded that three weather checks were sufficient.

5 Environmental Noise Survey Results.

Summarised survey results are given below.

Table 3: Measured sound levels. MP1			
Time	$L_{Amax\ (fast)}$ 95th Percentile dB	L_{Aeq} dB Log average	$L_{A90,15\ m}$ dB Mode
Day 07:00 / 23:00	76	57	49
Night 23:00 /07:00	80	57	42

Centre frequencies are included in the table below.

Table 4: Measured sound levels centre frequencies (L_{Aeq} dB). MP1								
Time	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	dBA
Day 07:00 / 23:00	61	57	55	52	52	49	48	57
Night 23:00 /07:00	62	60	57	53	53	49	43	57

Table 5: Measured sound levels. MP2			
Time	$L_{Amax\ (fast)}$ 95th Percentile dB	L_{Aeq} dB Log average	$L_{A90,15\ m}$ dB Mode
Day 07:00 / 23:00	76	57	47
Night 23:00 /07:00	79	58	40

Table 6: Measured sound levels centre frequencies (L_{Aeq} dB). MP2								
Time	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	dBA
Day 07:00 / 23:00	60	57	54	52	51	49	52	57
Night 23:00 /07:00	62	61	58	54	53	50	44	58

The figure overleaf includes the measured noise levels during the entire noise survey.

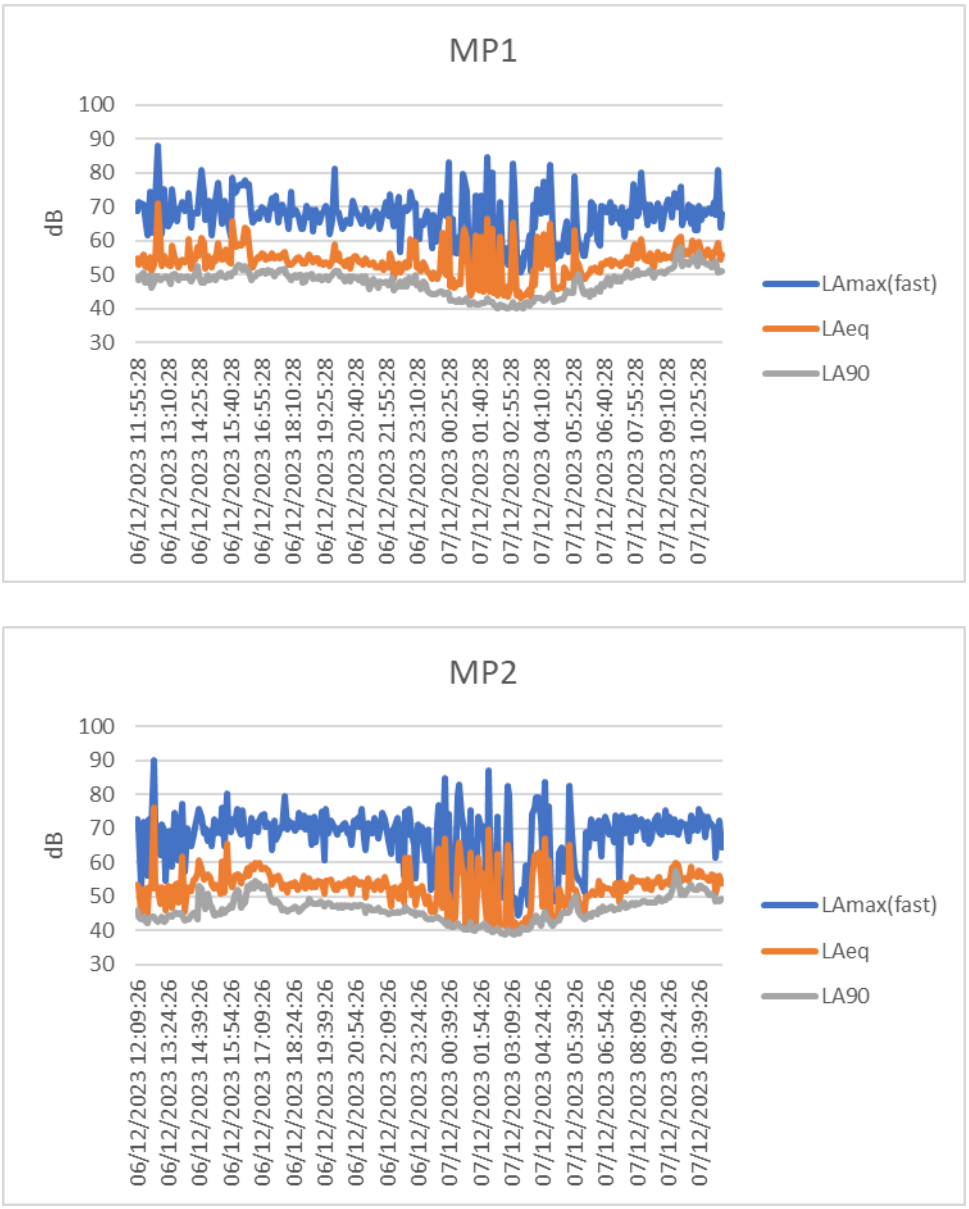

Figure 4. Noise measurements results.

6 Noise from mechanical plant

The noise impact of items of plant and fixed installation has been determined in accordance with BS4142: 2014.

Noise levels generated by mechanical plant and experienced by local receptors depends upon several variables, the most significant of which are:

- the noise generated by plant on site, generally expressed as sound power levels (SWL);
- the distance between the noise source and the receptor;
- the attenuation due to ground absorption, atmospheric and barrier effects; and

- the periods of operation of the plant on the site, known as its “on-time”.

The proposed plant should be assessed in accordance with the guidance contained within British Standard BS4142: 2014.

Based on the above criteria, the plant limit is set in the below table.

Table 7: Summary of the recommended Noise Rating Level dB	
Period	Recommended Rating Noise Level $L_{Ar,\ T}$ (dB) (-10 dB below the typical background)
Day Time 07:00 / 23:00	37
Night Time 23:00/07:00	30

Note: *Where the noise contains a ‘distinguishable, discreet, continuous note (whine, hiss, screech, hum etc.) or if there are distinct impulses in the noise (bangs, clicks, clatters or humps), or if the noise is irregular enough to attract attention’ then a correction of up to 6 dB is added to the specific noise level to obtain the ‘rating level’.*

There are several measures that can be introduced to control noise from the mechanical and fixed plant installation associated with the proposed development. Consideration should be given to reducing noise at point of generation (e.g. by selecting quiet plant) or containment of noise generated (e.g. by insulating buildings which house machinery and/or providing purpose-built barriers around the site).

Generally, measures should be proportionate and reasonable and may include practical engineering solutions, site layout and procedural matters. In general plant noise levels should be limited such that any noise impact would be negligible.

6 Leisure Centre building envelope.

In order to mitigate the operational noise impact from the building affecting the nearest residential dwellings, the following building envelope sound reduction is recommended.

External walls.

Kingspan cladding and internal linning or block work with a minimum sound reduction of R_w 60 dB.

frequency (Hz)	R(dB)	R(dB)
50	38	
63	42	41
80	44	
100	46	
125	48	48
160	49	
200	48	
250	50	50
315	51	
400	50	
500	53	53
630	57	
800	60	
1000	63	63
1250	67	
1600	70	
2000	73	72
2500	77	
3150	81	
4000	84	83
5000	88	

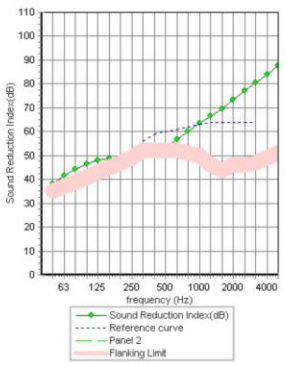

Figure 5. Calculated sound reduction. Recommneded external wall.

Glazing

The recommneded sound reduction of the glazing is included below.

Table 5. Sound reduction glazing.							
Item	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	Rw dB
Double glazing 6/6/6	20	18	28	38	34	38	31

Roof

Heavy roof structure with a minimum sound rating of R_w 52 dB

frequency (Hz)	R(dB)	R(dB)
50	17	
63	13	16
80	19	
100	26	
125	31	29
160	36	
200	41	
250	45	44
315	49	
400	52	
500	53	53
630	54	
800	52	
1000	50	52
1250	56	
1600	56	
2000	57	57
2500	60	
3150	63	
4000	66	66
5000	69	

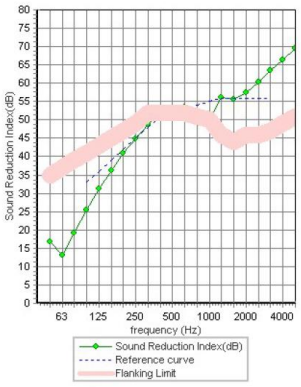

Figure 6. Calculated sound reduction. Recommneded roof.

7 Internal noise levels.

The recommended internal noise levels are included in the table below.

Table 8: Recommended internal noise levels from mechanical services.	
ID	$L_{Aeq,30\ min}$ dB
Changing Room	50
Multi use Studio	40
Foyer, Cafe	45
Gymnasium	40
Office	40
Classroom	35

8 Conclusion

The current design information for the proposed works at Talacre Community Sports Centre, Dalby St, Kentish Town, London, NW5 3AF has been reviewed in the context of fit for purpose design criteria taken from current guidance sources.

Building envelope construction has been recommended against appropriate design guidance. The findings of the noise impact assessment indicate that comfortable compliance with the best practice design criteria is achievable across the scheme, following the preliminary construction advice as set out by this report.

Plant noise limiting criteria has been proposed based on the lowest measured background sound levels which are representative of the levels at the nearest residential dwellings.