

Our Ref: QA22058

26 October 2023

Teamsport
c/o Oliver Wheeler
Savills
33 Margaret Street
London
W1G 0JD

Dear Oliver

NOISE ASSESSMENT, PROPOSED INDOOR KARTING CENTRE, BRENT CROSS SHOPPING CENTRE CAR PARK

A new indoor karting facility is proposed within the current Level 4 East, Red Car Park at Brent Cross Shopping Centre.

The existing multi-storey car park extends up to Level 5 and is naturally ventilated with the majority of the perimeter open to atmosphere. The car park is located on the northern side of the shopping centre towards the Hendon Way (A41). The nearest noise sensitive receptors are the houses located between the car park and the A41. The cabins/workshops on the tarmac area adjacent to the nearest noise sensitive receptors are currently used by a vehicle paint chip repair service.



Site Location (Imagery 2023 Bluesky, Getmapping plc)

The proposal is to run up to 24 battery powered karts simultaneously. With no exhaust fumes, there will be no requirement for large ventilation fans typically associated with indoor karting facilities. The proposed operational hours are 9am to 11pm, Sunday to Thursday and 9am to 1am on Friday-Saturday.

Indoor Electric Karting Noise Level Survey

A series of noise level measurements were undertaken by an acoustic consultancy company in 2013 within an existing Team Sport karting site near Tower Bridge to establish the internal operational noise levels of their fully electric indoor karting facility.

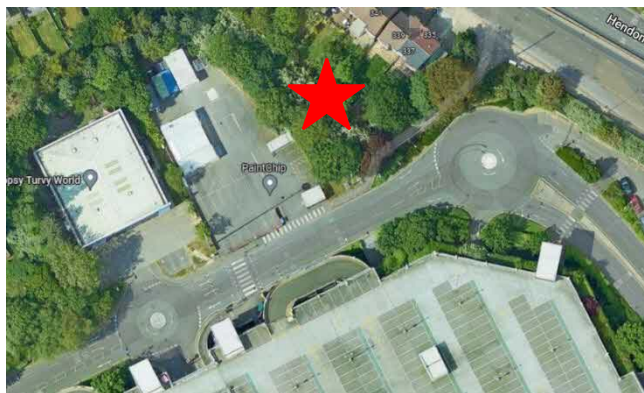
The karts were operated in race conditions around a split level track. Noise level measurements were undertaken with the background music turned on and off. With the music turned on, the dominant noise was subjectively evenly split between the music and kart tyre squeal around the track area. The measurement results are detailed in the following table:

			Sound Pressure Level dB								
			63	125	250	500	1000	2000	4000	8000	dBA
1	Within upper floor of karting facility with 8 karts driving around split level track MUSIC ON	Leq, 2min	72.5	74.4	71.4	70.8	68.6	67.5	68.5	67.9	75.6
2	Within upper floor of karting facility with 8 karts driving around split level track MUSIC OFF	Leq, 2min	71.4	74.6	71.3	68.9	66.4	66.5	65.7	64.9	74.2

Background Noise Level Survey

Quantum Acoustics have undertaken an unmanned environmental background noise level survey to the rear of the nearest noise sensitive receptors.

The survey was undertaken from 12:30 on Thursday 8 December 2022 to 12:15 on Friday 9 December 2022. The weather conditions during the survey period were calm and dry. The microphone was attached to a tree (free field conditions) close to the back gardens of the nearest residential buildings. This location is considered representative of the nearest residential facades. The measurement location is indicated on the following site plan.



Site Plan Showing Measurement Position (Imagery 2023 Bluesky, Getmapping plc)

The dominant noise at the survey location whilst we were on site was noted to be road traffic noise and intermittent noise from the vehicle paint chip repair service. The 15 minute interval L_{90} , L_{eq} and

L_{max} dBA noise survey results are presented in the attached graph. The lowest measured background noise level (L_{90}) within the proposed operational hours of the indoor karting facility were:

9am – 11pm = 49dBA.

9am – 1am = 46dBA

External Noise Emission Criteria

We have contacted London Borough of Barnet to establish the standard conditions applied to developments which may impact noise levels in the surrounding areas. The response we have received is as follows:

If there is plant or noisy machinery:

The level of noise emitted from the (specify machinery) plant hereby approved shall be at least 5dB(A) below the background level, as measured from any point 1 metre outside the window of any room of a neighbouring residential property.

If the noise emitted has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/or distinct impulse (bangs, clicks, clatters, thumps), then it shall be at least 10dB(A) below the background level, as measured from any point 1 metre outside the window of any room of a neighbouring residential property

And;

a) No development other than demolition works shall commence on site in connection with the development hereby approved until a report has been carried out by a competent acoustic consultant that assesses the likely noise impacts from the development of the ventilation/extraction plant, and mitigation measures for the development to reduce these noise impacts to acceptable levels, and has been submitted to and approved in writing by the Local Planning Authority.

The report shall include all calculations and baseline data, and be set out so that the Local Planning Authority can fully audit the report and critically analyse the content and recommendations

b) The measures approved under this condition shall be implemented in their entirety prior to the commencement of the use/first occupation of the development and retained as such thereafter.

If the proposed development is close to sensitive receptors, or if it is a development which is likely to be noisier than what was there previously:

a) No development shall take place until details of mitigation measures to show how the development will be constructed/adapted so as to provide sufficient air borne and structure borne sound insulation against internally/externally generated noise and vibration has been submitted to and approved in writing by the Local Planning Authority.

This sound insulation shall ensure that the levels of noise generated from the ^IN; as measured within habitable rooms of the development shall be no higher than 35dB(A) from 7am to 11pm and 30dB(A) in bedrooms from 11pm to 7am

The report shall include all calculations and baseline data, and be set out so that the Local Planning Authority can fully audit the report and critically analyse the content and recommendations

b) The mitigation measures as approved under this condition shall be implemented in their entirety prior to the commencement of the use or first occupation of the development and retained as such thereafter.

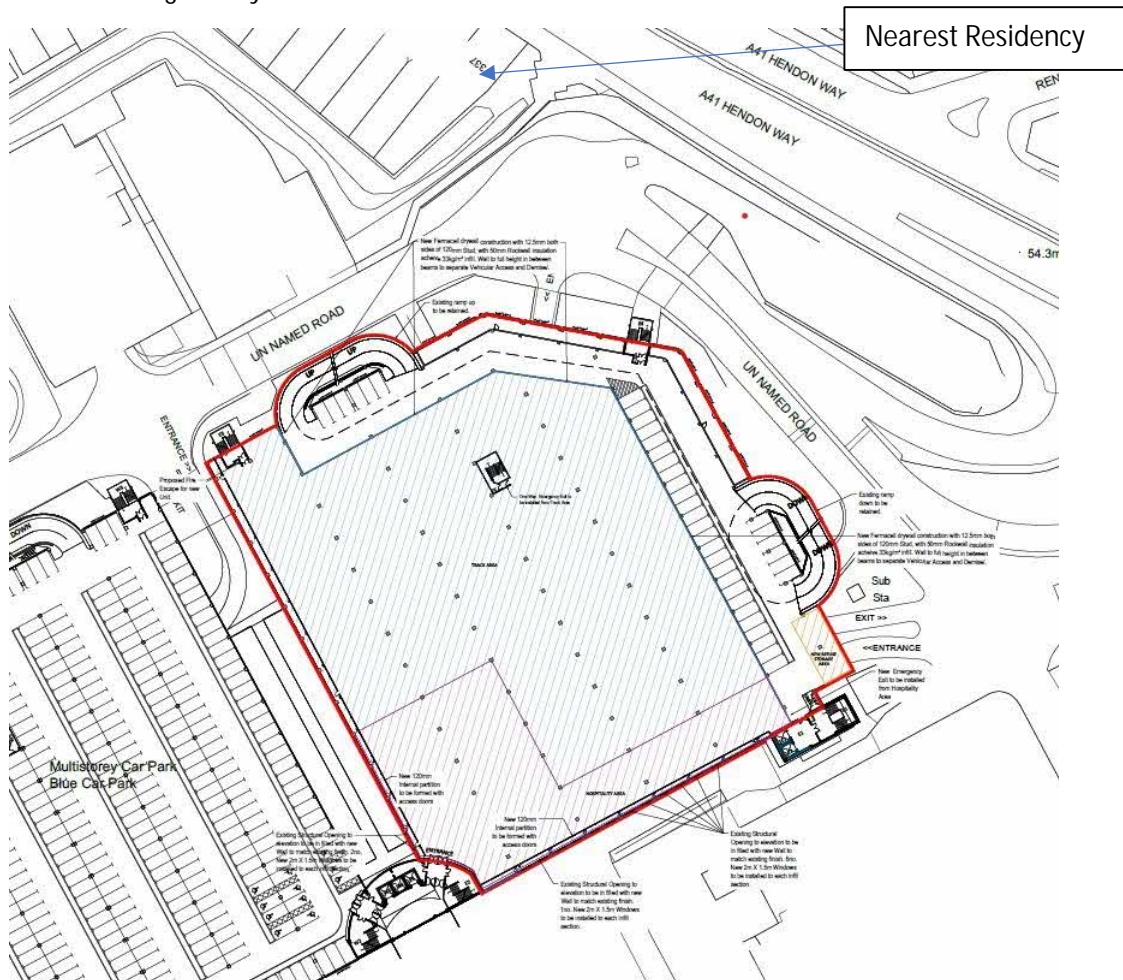
We propose the following noise emission limits at 1m from the nearest residential premises based upon the requirements of the local authority and the results of the environmental noise survey.

Sunday - Thursday (9am – 11pm) = 39dBA.

Friday – Saturday (9am – 1am) = 36dBA

Internal Noise Breakout Through External Building Fabric

The nearest residential receptors are located approximately 45m to the north of the proposed indoor karting facility.



The blue line on the above proposed site plan along with the southern and western car park elevations (fully enclosing proposed indoor karting facility) indicate a new full height partition consisting of 1x12.5mm Fermacell boarding on both sides of a 125mm (minimum) metal stud with 50mm mineral wool insulation in the cavity.

We have used the following equation for the inside to outside sound reduction:

$$L_{p(out)} = L_{p(inside)} - 14 - R - 20\log_{10}r + 10\log_{10}A$$

where:

R = sound reduction of partition (1x12.5mm Fermacell each side of 125mm stud with 50mm mineral wool insulation in cavity sound reduction data used)

r = distance from new plasterboard partition to window (45 meters in calculation)

A = area of radiating partition (80m width x 3m height)

	Sound Pressure Level dB								dBA
	63	125	250	500	1000	2000	4000	8000	
Internal Noise Level - Lp (inside)	72.5	74.4	71.4	70.8	68.6	67.5	68.5	67.9	75.6
Number Of Karts Correction (8 to 24)	5	5	5	5	5	5	5	5	
-14	-14	-14	-14	-14	-14	-14	-14	-14	
-R	-14	-27	-42	-51	-55	-55	-47	-47	
-20log ₁₀ r(45m)	-33.1	-33.1	-33.1	-33.1	-33.1	-33.1	-33.1	-33.1	
+10log ₁₀ A	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	
Directivity 0°	5	5.5	6	6	6	6	6	6	
Result	44.6	34.0	16.5	6.9	0.7	0	8.6	8.0	22.0

The calculated operational noise level emission at the nearest residential window has been calculated to be 22dBA which is more than 14dBA below the proposed lowest noise emission limit.

Mechanical Plant Noise

All ventilation fans will be designed to comply with London Borough of Barnet noise level emission requirements which are:

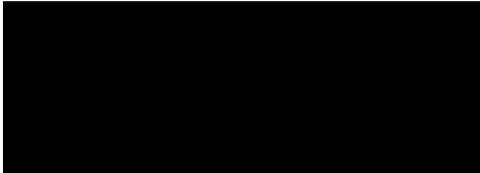
The level of noise emitted from the (specify machinery) plant hereby approved shall be at least 5dB(A) below the background level, as measured from any point 1 metre outside the window of any room of a neighbouring residential property.

If the noise emitted has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/or distinct impulse (bangs, clicks, clatters, thumps), then it shall be at least 10dB(A) below the background level, as measured from any point 1 metre outside the window of any room of a neighbouring residential property

Conclusion

This noise impact assessment demonstrates that the proposed use of the Level 4 East, Red Car Park at Brent Cross Shopping Centre can operate without adverse impact to the nearest residencies on Hendon Way.

We trust the above to be clear and of assistance, however should you have any further queries please do not hesitate to contact us.



John Ridpath
BSc(Hons), MIOA
For QUANTUM ACOUSTICS