Appendix 9

Noise Survey

Noise Survey

Objective

11) The objective of the noise survey was to collect noise data for karts and other possible noise sources, if any, at the proposed karting track.

Date and Time

12) Site inspection was conducted on 19 January 2002 commencing from 1000 hours and finishing at 1230 hours.

Instrumentation

13) The instruments used by Westwood Hong & Associates Ltd for the survey are listed in Table A9-1.

MANUFACTURER	ТҮРЕ
Ono Sokki	Type I Precision Integrating Sound Level Meters
Bruel and Kjaer	Noise Calibrator Type 4231

 Table A9-1 Instruments used for the noise survey

14) The sound level meters were calibrated before use in accordance with the manufacturer's recommendations and further checks on completion of the survey confirmed that there had been no significant drift of calibration.

Identified Noise Sources

15) The identified noise sources are kart movement and PA system.

Information on Karts

16) The engine of a kart works with an efficient 4-stroke cylinder having a max capacity of 60 c.c. only. The small engine is similar to that of a low-power motorcycle. The maximum speed of kart is 24kph.

Results of Noise Measurements

- 17) The measured noise levels included braking noise, skidding noise and tyre noise. Results obtained are summarised as:
 - at 3m from a kart running on levelled course in maximum speed (without facade effect): the Leq noise levels were in the range of 77 80dB(A) Leq.
 - at 3m from a kart running up the section with a gentle slope in maximum speed (without facade effect): the Leq noise levels were in the range of 79 82dB(A) Leq.
 - at 3m from the PA system (without facade effect): the Leq noise levels were in the range of 75 80dB(A) Leq.
- Background noise levels at the karting track due to community activities were in the range of 60
 62 dB(A) Leq recorded immediately before the starting of karting noise measurements.

Appendix 10

Noise Prediction

Noise Prediction

Ambient Noise Condition

1) The existing ambient noise climate of the representative NSRs is dominated by traffic noise from Tsing Fat Street and Castle Peak Road. The adjoining flea market is located within an enclosed building such that the noise from the activities within flea market is insignificant.

Industrial Noise Criterion

- 2) In accordance with the "Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites", an Area Sensitivity Rating (ASR) of "A" should be used. The Acceptable Noise Level is 60dB(A) for the periods of day (0700 to 1900 hours) and evening (1900 to 2300 hours).
- 3) As per the "Technical Memorandum on Environmental Impact Assessment Process", noise standard should also be referred to the prevailing background noise levels of the NSRs.

Noise Sensitive Receivers (NSRs)

- 4) The residential development (Nam Fung Siu Lam Project (NF1)) located to the north of the Project will be a potential NSR but as the occupation of the NF1 development will take place beyond the period of the EP, there is no need to be included in this noise assessment
- 5) The nearest Noise Sensitive Receivers (NSRs) that may be affected by the proposed karting track are summarised in the following Table A10-1 and shown in Figure A10-1. Villa Sapphire is protected by a 7-storey high building, which is now being occupied by a flea market.

NSRs	Description	Storey	Distance to site boundary (approximately)		
SL1	Siu Lam Sun Tsuen	3-S	200m		
VS1	Villa Sapphire	16-S	300m		

Table A10-1 Noise Sensitive Receivers (N	NSRs)
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Operation of Karting Track

6) The proposed karting track will operate from Monday to Sunday with opening hours from 9 am to 11 pm. A maximum of 10 karts are allowed within the track as per the requirements of Electrical & Mechanical Services Department.

Noise Mitigation Measures

7) 2.2m high profiled steel walls are erected along site boundaries to minimize the noise impact from the karting track. The karting track will be completely screened off by the 7-storey high Lok On Pai Transshipment Centre and the barrier wall from the NSRs.

Methodology

- 8) The prediction of noise impact due to kart movement has been conducted based on BS 5228: Part 1:1984.
- 9) A computer model has been set up to evaluate the barrier effects provided by 2.2m high profiled steel walls and flea market(Figure A10-2).

Predicted Noise Levels

10) The predicted facade noise levels at identified NSRs will be in the range of 34 - 40dB(A) due to the karting activities and 29 - 32dB(A) due to PA system. The predicted cumulative noise levels will be in range of 35 - 41dB(A), which comply with the noise limit of 60dB(A). Details of calculation are given in the Appendix 10.1





Appendix 10.1

Details of Noise Prediction

Westwood Hong & Associates Ltd.

Predicted Noise Levels due to Kart Movements

Job Title.:Karting Track at Tuen MunJob No.:21564Date:4/4/02

	N	SRs
Floor	SL 1	VS 1
1	40.0	34.2
2	40.0	34.2
3	40.0	34.2
4		34.2
5		34.2
6		34.2
7		34.2
8		34.2
9		34.2
10		34.1
11		34.1
12		34.1
13		34.1
14		34.1
15		34.1
16		34.1
Max	40.0	34.2
ANL-5 Criteria	60	60

Compliance	Yes	Yes
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mobile-Kart-3 Summary

Westwood Hong & Associates Ltd.

Calculation of Noise Levels due to Kart Movements

Job Title.:Karting Track at Tuen MunJob No.:21564Date:3/7/02

NSR	SL 1	Xr :	818011.9														·
Floor	1 /F	Yr:	825086 9														
		Hr:	9.2														
PREDICT	ON OF NOISE FRO	M MOBILE PI	LANTS (as p	er BS52	228 Part 1)	-								· · · · · · · · · · · · · · · · · · ·			
						Segn	nent locati	on & di	istance			С	orrection	າຣ			CNL
No	Description	Lwa	Traffic flow	Spd	View angle	Xs	Ys	Hs	Lsr	Ctf	CLsr	Catm	Cspd	Cva	Csri	Cfac	dB(A)
4		0.0	200	24	~ ~	0.4.70.00	001000	0.0	050 C							:	
	Kart Movement	96	300	24	3.8	817983	824829	0.5	259.5	25	-24.1	0.0	-14	-17	-8-3	: 3	27.8
2	Kart Movement	96	300	24	0.0	817992	824832	0.5	255.8	25	-24.1	0.0	0	0	0.0	3	0.0
3	Kart Movement	96	300	24	5.3	817981	824846	0.5	243.1	25	-23.9	0.0	-14	-15	-8.5	3	29.3
4	Kart Movement	96	300	24	0.0	817974	824863	0.5	227.5	25	-23,6	0.0	0	0	0.0	. 3	0.0
5	Kart Movement	96	300	24	3.7	817982	824867	0.5	221.8	25	-23.5	0.0	-14	-17	-9.8	3	26.8
6	Kart Movement	96	300	24	2.8	817994	824859	0.5	229.1	25	-23.6	0.0	-14	-18	-12.8	3	22.5
7	Kart Movement	96	300	24	1.1	818002	824842	05	245.0	25	-23.9	0.0	-14	-22	-30/2	; 3	0.7
8	Kart Movement	96	300	24	1.5	818007	824829	0.5	258.6	25	-24.1	0.0	-14	-21	-24.1	3	8.0
9	Kart Movement	96	300	24	1.9	818014	824827	0.5	259.7	25	-24.1	0.0	-14	-20	-23 0	3	10.1
10	Kart Movement	96	300	24	0.0	818019	824836	0.5	251.2	25	-24.0	0.0	0	0	0.0	3	0.0
11	Kart Movement	96	300	24	1.5	818016	824849	0.5	237.8	25	-23.8	0.0	-14	-21	-28.7	3	3.7
12	Kart Movement	96	300	24	6.3	818001	824866	0.5	221.5	25	-23.5	0.0	-14	-15	-15.1	3	23.9
13	Kart Movement	96	300	24	- 2.4	817985	824879	0.5	209.4	25	-23.2	0.0	-14	-19	-10.5	3	24.5
14	Kart Movement	96	300	24	4.6	817974	824889	0.5	201.3	25	-23.0	0.0	-14	-16	-11.0	3	27.0
15	Kart Movement	97	300	24	5.7	817958	824899	0.5	195.4	25	-22.9	0.0	-14 [·]	-15 •	-10-7	3	29.4
16	Kart Movement	97	300	24	5.9	817939	824904	0.5	197.6	25	-23.0	0.0	-14	-15	-40 (1	3	30.2
17	Kart Movement	97	300	24	2.6	817922	824902	0.5	205.5	25	-23.1	0.0	-14	-18	-10.8	3	25.6
18	Kart Movement	96	300	24	0.0	817911	824895	0.5	216.8	25	-23.4	0.0	0	0	0.0	3	0.0
19	Kart Movement	96	300	24	0.0	817902	824881	0.5	233.8	25	-23.7	0.0	0	0	0.0	3	0.0
20	Kart Movement	96	300	24	0.0	817896	824867	0.5	248.5	25	-24.0	0.0	0	0	0.0	3	0.0
21	Kart Movement	96	300	24	1.0	817895	824857	0.5	258.5	25	-24.1	0.0	-14	-23	10.8	3	19.5
22	Kart Movement	96	300	24	2.0	817895	824842	0.5	271.9	25	-24.3	0.0	-14	-20	-10.5	3	22.6
23	Kart Movement	96	300	24	17	817898	824826	05	284.6	25	-24.5	0.0	-14	-20	-10-3	3	21.9
24	Kart Movement	96	300	24	6.9	817918	824820	0.5	283.4	25	-24.5	0.0	-14	-14	-9.3	3	29.0
25	Kart Movement	96	300	24	1.2	817939	824822	0.5	274.8	25	-24.4	0.0	-14	-22	-9.5	3	21.3
26	Kart Movement	96	300	24	3.0	817937	824829	0.5	269.1	25	-24.3	0.0	-14	-18	-9.2	3	25.7
27	Kart Movement	96	300	24	4.6	817919	824833	0.5	270.8	25	-24.3	0.0	-14	-16	-9.4	3	27.3
28	Kart Movement	96	300	24	2.9	817908	824849	0.5	259.7	25	-24.1	0.0	-14	-18	-113	3	23.1
29	Kart Movement	96	300	24	2.3	817913	824865	0.5	242.9	25	-23.9	0.0	-14	-19	-112	3	23.0
30	Kart Movement	96	300	24	5.0	817926	824854	0.5	248.4	25	-24.0	0.0	-14	-16	-10.2	3	27.3
31	Kart Movement	96	300	24	9.6	817954	824837	0.5	257.0	25	-24 1	0.0	-14	-13	.si 1	ž	31.0
	1	I – –						2.0	_01.0		F. I	0.0	T-1	- h . /	Sı	ib-total	40 0
																	70.0

Definition of terms:

Ref	- Reference from EPD's TM or BS5228	CLsr the correction for slant distance between the source and the NSR, dB(A)
Lwa	 the sound power level of the plant, dB(A) 	Ctf - the correction for traffic flow, dB(A)
Xr, Yr, Hr	- the coordinates of the NSR, m	Cspd - the correction for speed of traffic, dB(A)
Xs, Ys, Hs	 the coordinates of the source, m 	Cval - the correction for view angle, dB(A)
Lsr	 the slant distance between the source and NSR, m 	Cnoll- the correction for noll of plant items, dB(A)
Traffic flow	- the traffic flow, vehicles/hour	Con - the sound reduction provided by plants not operating fully, dB(A)
Spd	 the speed of traffic, km/hour 	Catm - the air absorption using CONCAWE methodology for distance greater than 300m
View angle	 the view angle to the segment 	Csri - the sound reduction provided by barriers
No.	 the number of items of plant operating simultaneously 	Cfac - the facade correction, dB(A)
% on	 the percentage of time with plant operating 	CNL - the corrected noise level, dB(A)(30 minutes)

Remark:

1) The sound power level of a kart moving on leveled course is 96dB(A) in average.

2) The sound power level of a kart moving up the slope is 97dB(A) in average.

mobile-Kart-3, Calculation1

Westwood Hong & Associates Ltd

Predicted Noise Levels due to the PA system in Karting Track

Job Title: Karting Track at Tuen Mun

Job No.: 21564

Date: 21/1/02

Noise source location:Karting TrackNearest NSR:SL 1 - Siu Lam San Tsuen

		Sound Power Level	No. of sources	Lsr		CNL			
Item	Activities	SWL, (dB(A))	per 30 min.	(m)	Cno	CLsr	Csri	Cfad	(dB(A))
1*	PA system	95	1	246	0.0	-55.8	-10.0	3.0	32

	·			00.0	10.0	0.0	04
		1	1				
		F	F				

Noise source location:Karting TrackNearest NSR:VS1 - Villa Sapphine

		Sound Power Level	No. of sources	Lsr		CNL			
Item	Activities	SWL, (dB(A))	per 30 min.	(m)	Cno	CLsr	Csri	Cfad	(dB(A))
1*	PA system	95	1	340	0.0	-58.6	-10.0	3.0	29.4

- 1 PA system is located in a area surrounded by 2.2m high profiled steel wall within the karting track
- Lsr Distance between noise source and the NSR, m
- Cno correction for no. of sources within the track area, dB(A)
- CLsr the correction for distance between the source and the NSR, dB(A)
- Csri noise attenuation of -10dB(A) as no direct line of sight from the NSRs due to the screening by 7-storey high building and 2 2m metal wall (as per GW-TM for noise source screened by barrier)
- Cfad facade correction

*

CNL - the corrected noise level (30 minutes), dB(A)

kart-1, SLM 1