

Environmental Noise Assessment Report

Huddle Park Development Proposal

Preliminary Report 2

Issued on 4/03/13

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EXECUTIVE SUMMARY

A residential development is proposed at a site bordered on the South and East by Club Street, and on the North and West by the remainder of the existing Huddle Park Golf Course site.

The site has two very different ambient noise regimes. The first regime is that close to the South and East boundary which is dominated by heavy and continuous traffic on Club Street, and the second the rest of the site which is bordered by open green spaces or suburban roads, and which has the characteristics of a quiet suburban environment. The investigation's purpose was to assess the noise impact on the development of the existing ambient noise climate, and the development's impact on the surroundings. This was achieved by measuring the existing ambient noise levels at the site at 4 positions around or at the boundary of the proposed development. These measurements are described in Section 3.5.

All calculations and measurements were carried out in accordance with the relevant SANS Standard Codes of Practice (Refs. 1 & 2), and as required by the regulations of the DEPARTMENT OF ENVIRONMENTAL AFFAIRS.

The expected response from the proposed community to the noise impact, i.e. the ambient noise of the area, is based on the relevant SANS document, (Ref. 1), and expressed in terms of the effects of impact, on a scale of 'NONE' to 'VERY HIGH'. This report is an overall assessment designed to predict the collective response of a noise-exposed population and therefore the impact the ambient noise is likely to have on them, and is based on measured and/or predicted equivalent continuous noise levels according to the relevant SANS code of practice, (Ref. 1).

The impact of the development on the existing noise climate, is assessed as NONE to VERY LOW both at daytime and nighttime.

The impact of the existing noise climate on the development is assessed as NONE at distances beyond 100m from Club Street to MODERATE at 40m from Club Street both at daytime and nighttime.

A continuous boundary wall or linked facade acting as a noise barrier along Club Street and the placement of the noisiest activities and noise insensitive land uses on this eastern boundary is recommended to achieve these conditions.

1. PURPOSE OF THE INVESTIGATION AND TERMS OF REFERENCE

A residential development is proposed at a site bordered on the South and East by Club Street, and on the North and West by the remainder of the existing Huddle Park Golf Course site.

The site has two very different ambient noise regimes. The first regime is that close to the South and East boundary which is dominated by heavy and continuous traffic on Club Street, and the second the rest of the site which is bordered by open green spaces, which has the characteristics of a semi-rural environment.

The investigation's purpose was to assess the noise impact on the development of the existing ambient noise climate, and the development's impact on the surroundings. This was achieved by measuring the existing ambient noise levels at the site and comparing these to the noise levels expected to be generated by the proposed development, and using the required national standards to assess the impact of the development and the effect on the development of the existing noise climate.

2. INVESTIGATIVE METHODOLOGY

2.1 Introduction

In order to be able to assess both the quantitative and geographical extent of any potential impact, it is necessary to have measured baseline data in the form of existing ambient noise levels at the site. These measurements are described in Section 3.5. These can then be compared to tables of acceptability of SANS 10103. The extent of community response can then be assessed according to national and international standards which take into account sociological factors as well as the noise climate.

2.2 Ambient Noise Levels at the Proposed Site

The existing ambient noise levels were measured on different times of the day on 4 and 6 December 2012. Measurements were made of the equivalent continuous A-weighted sound pressure level, $L_{Aeq,I}$ using the 'I' (Impulse) dynamic response characteristic as recommended in SANS 10103:2008 (ref. 1) and a number of other parameters, of which the L_{90} is reported as the generally accepted parameter for describing the background noise level in the absence of specific intrusive noise.

2.3 Assessing the Noise Impact

The recommended noise levels in a suburban residential area are described in Table 2 of SANS 10103 (ref. 1), and Table 5 of the same document.

NB: Day-time : 06:00 to 22:00, Night-time : 22:00 to 06:00

The worst case criterion appropriate for this assessment is for Rural districts as shown in **bold script** in the table below.

Type of district	Equivalent continuous rating level ($L_{Req,T}$) for noise dB(A)					
	Outdoors			Indoors, with open windows		
	Day-night $L_{R,dn}^{1)}$	Day-time $L_{Req,d}^{2)}$	Night-time $L_{Req,n}^{2)}$	Day-night $L_{R,dn}^{1)}$	Day-time $L_{Req,d}^{2)}$	Night-time $L_{Req,n}^{2)}$
a) Rural districts	45	45	35	35	35	25
b) Suburban districts with little road traffic	50	50	40	40	40	30
c) Urban districts	55	55	45	45	45	35
d) Urban districts with one or more of the following: workshops; business premises; and main roads	60	60	50	50	50	40
e) Central business districts	65	65	55	55	55	45
f) Industrial districts	70	70	60	60	60	50

Table 1: Acceptable rating levels for noise in districts (Ref.1)

1	2	3
Excess $\Delta L_{Req,T}^a$ dBA	Estimated community/group response	
	Category	Description
0 – 10	Little	Sporadic complaints
5 – 15	Medium	Widespread complaints
10 – 20	Strong	Threats of community/group action
>15	Very strong	Vigorous community/group action

a) $L_{Req,T}$ should be calculated from the appropriate of the following:

- 1) $L_{Req,T} = L_{Req,T}$ of ambient noise under investigation MINUS $L_{Req,T}$ of the residual noise (determined in the absence of the specific noise under investigation).
- 2) $L_{Req,T} = L_{Req,T}$ of ambient noise under investigation MINUS the maximum rating level for the ambient noise given in table 1.
- 3) $L_{Req,T} = L_{Req,T}$ of ambient noise under investigation MINUS the acceptable rating level for the applicable district as determined from table 2.
- 4) $\Delta L_{Req,T}$ = Expected increase in $L_{Req,T}$ of ambient noise in an area because of a proposed development under investigation.

NOTE Overlapping ranges for the excess values are given because a spread in the community reaction may be anticipated

Table2: Table 5 of SANS 10103-2008, – Categories of Community/Group Response

The expected response from the local community to the noise impact, i.e. the exceedance of the noise over the acceptable rating level for the appropriate district, is primarily based on Table 5 of SANS 10103 (ref. 1), but expressed in terms of the effects of impact, on a scale of ‘none’ to ‘very high’.

INCREASE dB	RESPONSE INTENSITY	REMARKS	NOISE IMPACT
0	None	Change not discernible by a person	None
3	None too little	Change just discernible	Very low
3 ≤ 5	Little	Change easily discernible	Low
5 ≤ 7	Little	Sporadic complaints	Moderate
7	Little	Defined by National Noise Regulations as being ‘disturbing’	Moderate
7 ≤ 10	Little - medium	Sporadic complaints	High
10 ≤ 15	Medium	Change of 10dB perceived as ‘twice as loud’ leading to widespread complaints	Very high
15 ≤ 20	Strong	Threats of community/group action	Very high

Table 3: Response intensity and noise impact for various increases over the ambient noise

3. AMBIENT NOISE MEASUREMENTS AT THE SITE

3.1 Introduction

Noise measurements according to SANS Code of Practice 10103:2008 (Ref. 1) were carried out at the above. Ambient noise measurements were made at four points on or near the property boundary during two days. These points are defined in Section 3.5.

3.2 Equipment Used

01dB Type SdB01+ Precision Integrating Sound Level Meter, serial number 10180, fitted with 01dB Microphone Type MCE210, serial number 001194, and windscreen. Field calibration using and Bruel and Kjaer Type 4230 Sound Level Calibrator, serial number 522170.

3.3 Calibration Certificates

All equipment with valid calibration certificates, from the testing laboratories of De Beer Calibration Services. The calibration certificates are available for viewing if required.

3.4 Procedures Used

Measurements were carried out in accordance with SOUTH AFRICAN NATIONAL STANDARD - Code of practice, SANS 10103:2008, *The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication.*

and as required by the regulations of the DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM. NO. R. 154. *Noise Control Regulations in Terms of Section 25 of the Environmental Conservation Act, 1989 (Act No. 73 of 1989).* Govt. Gaz. No. 13717, 10 January 1992, i.e. Gauteng province, Department of Agriculture, Conservation and Environment, Notice 5479 of 1999. *Noise control regulations, 1999*, Provincial gazette extraordinary, 20 august 1999.

3.5 Measurements at the Proposed Site

Measurements were carried out at four locations on the property as described under each noise measurement location below. These locations were chosen for the following reasons:

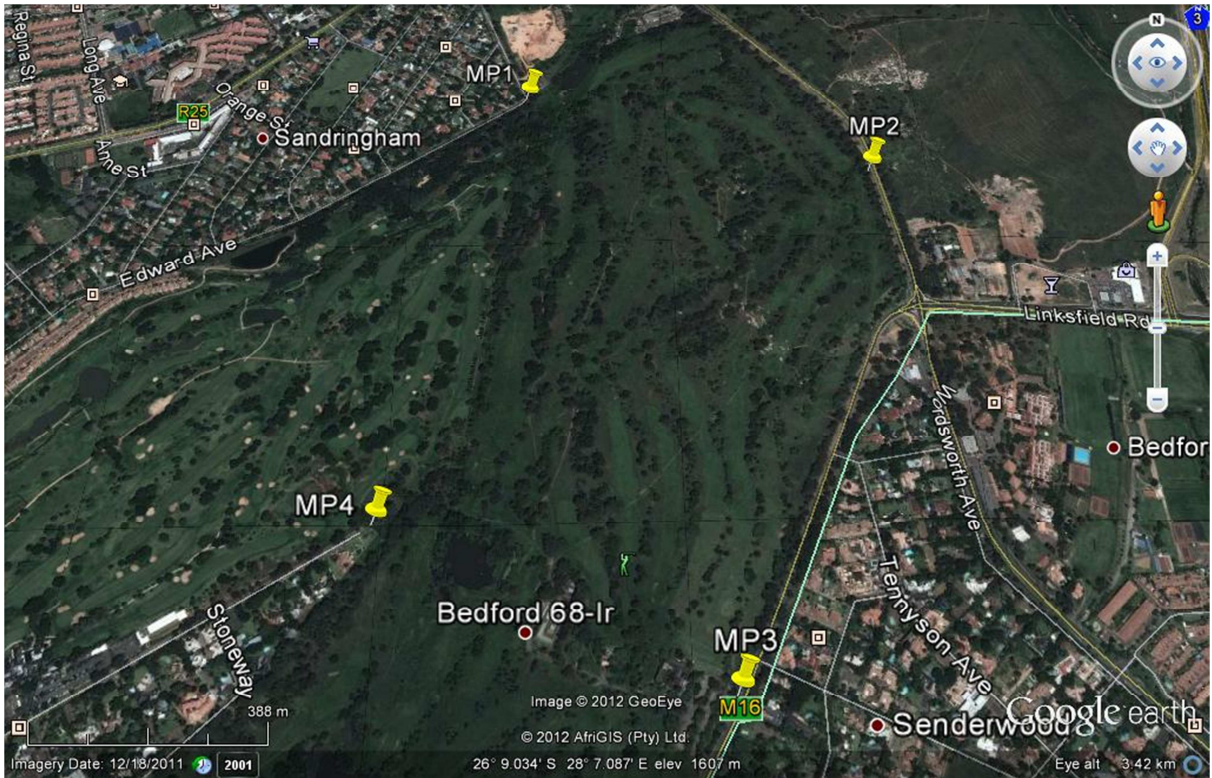
- 1) Easily definable and with easy future access in case of need for comparison measurements after completion of the project.
- 2) Well distributed round the boundaries of the site for representative coverage.
- 3) Representative of the two important background noise regimes, the nearest existing residential areas adjacent to open green spaces, and the Club Street road reserve boundary of the proposed development.

Note 1: All noise levels in this report are A-weighted noise levels expressed in dB(A).

Note 2: $L_{Aeq,I}$ is the A-weighted equivalent sound level using the 'I' (Impulse) dynamic response characteristic as recommended in SANS 10103:2008 (ref. 1)

Note 3: The noise level exceeded for 90% of the time (L_{90}) is taken as an expression of the background noise in the absence of intrusive noisy events, primarily road traffic and random domestic noise events such as garden activities, barking dogs, pedestrians, and local traffic.

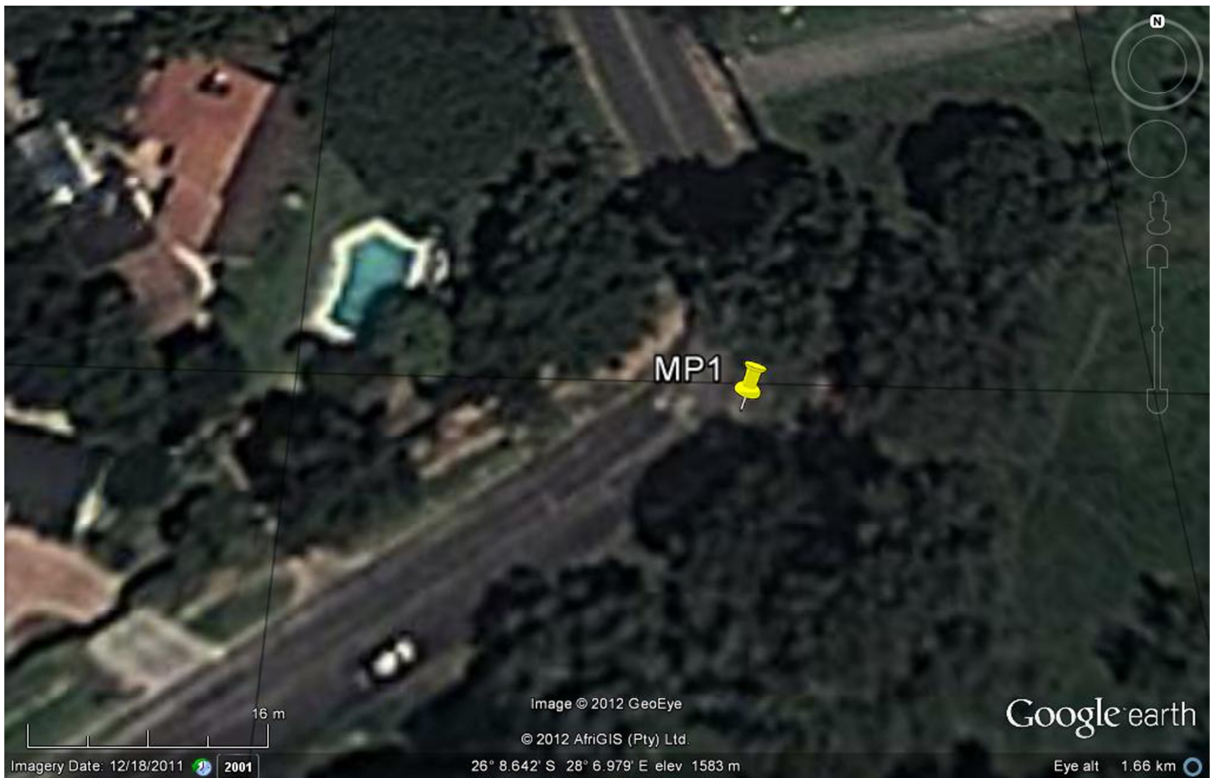
Note 4: In the Comments column of the noise tables, C - Car, Minibus or LDV, HGV – Heavy Goods Vehicle or Bus, A/c – Commercial airliner, La/c – light aircraft, H – Helicopter, cN - noise level calculated from traffic count, for the measurement period, usually (but at least) 10 Minutes.



GoogleEarth view of the site showing the noise measurement positions

Location 1

At a position on the outside corner of Margaret Rose and Edward Streets, 15m from the road centreline, at the intersection of the palisade fence overlooking the golf course as shown in the following photographs. This is the closest the adjacent residential area approaches the proposed development. GPS Co-ordinates; S26° 08.643', E28° 06.985'.



Location of Measurement Position MP1 in relation to local features



View towards the proposed site



View along Edward street

Measurement Table

Day/Date	Time	Temp °C	RH %	W _{max} m/s	L _{Aeq,I} dB(A)	L ₉₀ dB(A)	Comment
Thur 6/12/12	09:13-09:23	20.1	45	1.9	51.3	45	C=14
Thur 6/12/12	09:25-09:35	23.6	44	1.6	53.2	47	C=26
Thur 6/12/12	12:36-12:46	24.3	41	4.9	53.9	44	C=18, H=1
Thur 6/12/12	12:47-12:57	24.5	41	4.9	51.0	43	C=16
Thur 6/12/12	15:30-15:40	22.4	49	1.1	50.9	43	C=12
Thur 6/12/12	15:41-15:51	22.2	50	1.2	52.5	44	C=10
Thur 6/12/12	17:35-17:45	22.4	50	0.8	56.3	47	C=30
Thur 6/12/12	17:46-17:56	21.6	51	0.8	53.9	49	C=22
Thur 6/12/12	17:58-18:08	21.6	51	0.8	50.4	44	C=6

Measurement Table from Previous Study

Day/Date	Time	Temp °C	RH %	W _{max} m/s	L _{Aeq,I} dB(A)	L ₉₀ dB(A)	Comment
Tue 04/10/05	09:17 -09:27	26	23	2.8	55.3	49	A/c-2, C=9, HGV=0
Tue 04/10/05	09:28 -09:38	-	-	-	55.0	49	A/c-1, C=9, HGV=0
Tue 04/10/05	09:39 -09:49	-	-	-	55.3	47	A/c-1, C=9, HGV=0
Tue 04/10/05	09:52 -10:02	-	-	-	55.1	47	A/c-1, C=6, HGV=0
Tue 04/10/05	10:03 -10:13	-	-	-	53.4	48	A/c-1, C=7, HGV=0
Tue 11/10/05	13:21-13:31	30.5	16	2.7	58.9	41	1 overflight, C=11
Tue 11/10/05	13:33-13:43	30.5	16	3.5	56.6	44	2 overflights, C=19
Fri 14/10/05	15:35-15:45	25	37	1.0	54.3	46	
Tue 11/10/05	16:00-16:10	30.5	14	1.6	48.8	40	C=10
Tue 11/10/05	16:14-16:23	30.5	14	0.8	50.8	41	1 overflight, C=18

Observations: These values are typical of a suburban area with occasional intrusive noise from road traffic which dominates the L_{Aeq,I} value, and distant noise from domestic activity, aircraft, and natural sounds which make up the background noise.

Location 2

At a position at the boundary fence with the golf course in line with the marker stone, 15m from the centreline of Club Street as shown in the following photographs. GPS Co-ordinates; S26° 08.763', E28° 07.422'.



Location of Measurement Position MP2 in relation to local features



View into Proposed Site from Club Street



View South along Club Street

Measurement Table

Day/Date	Time	Temp °C	RH %	W _{max} m/s	L _{Aeq,L} dB(A)	L ₉₀ dB(A)	Comment
Thur 6/12/12	11:00-11:10	22.4	48	1.1	66.9	56	No count
Thur 6/12/12	11:11-11:21	22.4	48	1.1	64.5	56	C=242. HGV=2
Thur 6/12/12	13:08-13:18	23.0	47	2.1	64.9	55	No count
Thur 6/12/12	13:20-13:30	22.4	48	2.1	65.1	55	No count
Thur 6/12/12	16:00-16:10	22.1	49	0.9	67.2	60	C=226. HGV=6
Thur 6/12/12	16:11-16:21	22.1	49	0.9	67.0	55	C=285
Thur 6/12/12	18:25-18:35	20.1	51	0.7	66.8	58	C=364, HGV=4
Thur 6/12/12	18:36-18:46	20.1	51	0.7	67.6	58	C=350, HGV=3

Measurement Table from Previous Study

Day/Date	Time	Temp °C	RH %	W _{max} m/s	L _{Aeq,I} dB(A)	L ₉₀ dB(A)	Comment
Tue 04/10/05	10:24-10:34	26	23	2.7	65.6	55	C=186, HGV=3
Tue 04/10/05	10:35-10:45	26	23	2.7	66.2	56	C=218
Tue 04/10/05	10:47-10:57	26	23	2.7	63.9	54	C=213
Tue 04/10/05	10:59-11:09	26	23	2.7	65.0	55	C=220
Tue 04/10/05	11:10-11:20	26	23	2.7	63.4	53	C=180
Mon 10/10/05	11:57-12:07	-	-	4.3	66.7	51	C=216
Mon 10/10/05	12:09-12:19	29	23	4.8	65.6	53	C=203
Tue 11/10/05	13:17-13:27	31	15	1.2	66.4	54	C=265, HGV=7
Fri 07/10/05	14:10-14:20	24	42	-	67.8	61	C=228
Fri 14/10/05	15:03-15:13	25	37	1.2	66.5	57	-

Observations: These values are typical of an area dominated by heavily trafficked roads in a developed suburban area which dominates the L_{Aeq,I} value, occasional intrusive noise from aircraft, and distant noise from domestic activity, birds, and insects forming the background noise.

Location 3

At the telegraph pole at the boundary fence with the golf course, 12m from the centreline of Club Street just south of Shelley Avenue as shown in the following photographs. GPS Coordinates; S26° 09.593', E28° 07.029'.



Location of Measurement Position MP3 in relation to local features



View Northeast along Club Street



View into Site from Club Street



View Southwest along Club Street



View south across Club Street

Measurement Table

Day/Date	Time	Temp °C	RH %	W _{max} m/s	L _{Aeq,I} dB(A)	L ₉₀ dB(A)	Comment
Thur 6/12/12	10:02-10:12	20.6	53	1.0	69.4	58	C=260, HGV=5
Thur 6/12/12	10:14-10:24	20.6	53	1.0	69.9	58	C=224, HGV=2
Thur 6/12/12	10:25-10:35	20.6	53	1.0	70.6	57	C=237
Thur 6/12/12	11:40-11:50	22.4	48	1.6	67.5	53	C=184, HGV=6
Thur 6/12/12	11:51-12:01	22.4	48	1.6	68.4	51	C=130
Tues4/12/12	14:30-14:40	24.3	54	3.0	69.3	58	C=192, HGV=4
Tues4/12/12	14:41-14:51	24.3	54	3.0	67.1	58	No count
Thur 6/12/12	15:00-15:10	23.4	46	1.9	69.2	53	C=142, HGV=2
Thur 6/12/12	15:11-15:21	23.4	46	1.9	69.8	58	C=194, HGV=8

Observations: These values are typical of an area dominated by heavily trafficked roads in a developed suburban area which dominates the L_{Aeq,I} value, occasional intrusive noise from aircraft, and distant noise from domestic activity, birds, and insects forming the background noise.

Location 4

At the boundary fence with the golf course, on the centerline of Fairway Street as shown in the following photographs. This is the closest the adjacent residential area approaches the proposed development. GPS Co-ordinates; S26° 09.142', E28° 06.829'.



Location of Measurement Position MP4 in relation to local features



View into the site from Fairway street

Measurement Table

Day/Date	Time	Temp °C	RH %	W_{max} m/s	$L_{Aeq,1}$ dB(A)	L_{90} dB(A)	Comment
Thur 6/12/12	14:20-14:30	23.2	42	<0.5	45.8	42	
Thur 6/12/12	14:31-14:41	23.2	42	<0.5	45.3	41	
Thur 6/12/12	14:42-14:52	23.2	42	<0.5	45.2	42	
Thur 6/12/12	16:45-16:55	21.2	52	<0.5	47.3	40	
Thur 6/12/12	16:56-17:06	21.1	53	<0.5	48.2	40	
Thur 6/12/12	17:07-17:17	21.1	53	<0.5	49.4	40	

Measurement Table from Previous Study

Day/Date	Time	Temp °C	RH %	W _{max} m/s	L _{Aeq,I} dB(A)	L ₉₀ dB(A)	Comment
Tue 11/10/05	11:50-12:00	29	18	1.9	47.2	41	2 A/c, remote tractor
Tue 11/10/05	12:02-12:12	29	18	2.3	45.9	40	
Tue 11/10/05	13:58-14:08	31	18	1.6	48.4	43	remote tractor
Tue 11/10/05	14:10-14:20	29	18	2.3	48.6	43	1 A/c, remote tractor
Tue 04/10/05	15:39 -15:49	31	18	2.4	48.1	44	
Tue 04/10/05	15:50 -16:00	-	-	-	52.2	43	Domestic noise
Fri 14/10/05	15:55-16:05	25	38	1.0	49.8	41	
Tue 04/10/05	16:01 -16:11	-	-	2.4	51.7	42	Helicopter overflight
Tue 04/10/05	16:12 -16:22	-	-	2.4	50.0	44	2 overflights
Tue 04/10/05	16:23 -16:33	-	-	2.0	49.6	43	1 overflight

Observations: These values are typical of a quiet suburban area with occasional intrusive noise from road traffic which dominates the L_{Aeq,I} value, and distant noise from domestic activity and natural sounds which make up the background noise.

4. IMPACT ASSESSMENT

4.1 General

The impact on the site of external noise is almost entirely from the traffic on Club Street to the south and east, which dominates the noise climate of the area. The assessment has therefore naturally been concentrated on this noise source. There are no significant industrial or other noise sources in the area.

4.2 Continuous Equivalent Noise Levels and Individual Noise Events

This report is an overall assessment designed to predict the collective response of a noise-exposed population and therefore the impact the existing environmental noise is likely to have on them, and is based on measured and predicted equivalent continuous noise levels according to SANS 10103. It will be possible to detect and distinguish individual noise events, even if the noise impact is assessed as NONE, or VERY LOW, i.e. where a person with normal hearing will not be able to detect the predicted increase in ambient noise level over the acceptable rating value for the applicable district, or the actual measured pre-development noise level, but where an individual intrusive noise may nevertheless be audible to and distinguishable by that person.

4.3. Predicted General Impact of Noise from the Development

The ambient noise measurements carried out at site, see section 3.5, show that the existing noise levels along Club Street are already greater than the suggested daytime values for residential districts in suburban areas with little road traffic, according to the relevant section (Table 2) of the recommendations of SANS 10103:2008. The measured existing L_{Aeq,I} values do not fall below the daytime recommended value of 50 dB(A) at any point on the site's boundary with Club Street.

Type of Residential District	Daytime	Night-time
Suburban districts with little road traffic	50	40

Typical noise levels at the boundary from a residential development such as this are unlikely to exceed the recommended daytime value of 50 dB(A), which is less than the current value due to current road traffic on Club Street. Reference to Table 5, application 4, of SANS 10103:2008, Table 2 above, also indicates that no reaction would be registered. The daytime

impact of the proposed development on the neighbouring residential areas is likely to be NONE or VERY LOW. The nighttime impact in the absence of specifically noisy activities is likely to be VERY LOW.

Note that all assessments are based on comparison with measured and predicted values. The current assessment is to give guidelines to the developer as to where problems might arise from noise and how to avoid them in the planning stage, where this is possible.

4.4. Effect on the Development of Other Noise Sources

There are no significant noise sources in the area apart from the traffic noise from Club Street. At no position on the extent of the site, and at no time at which noise measurements were made, was any other fixed source of noise even audible. The only intrusive noise not due to road traffic was due to occasional remote aircraft/helicopter flyovers and domestic noise from the existing residential area itself.

4.5. Predicted General Impact of Noise on the Development

The development will experience significant noise exposure from Club Street in excess of the planning noise criterion of 50 dB(A), especially close to the South and Eastern boundaries. The impact of the existing noise climate on the development, assuming a conservative 8 dB attenuation from a boundary wall, is assessed as NONE (a noise level of 50dB(A), equal to the noise criterion) at distances beyond 100m from Club Street to MODERATE (a noise level of 56dB(A), equal to 6 dB above the noise criterion) at 40m from Club Street both at daytime and nighttime. Consideration should be given at the planning stage to minimize the problem, to protect what is proposed for this side of the site.

4.6. Mitigation Measures

A boundary wall or linked facade acting as a noise barrier along the South and Eastern boundaries should be considered part of the plan. This will protect the site from Club Street, and the secondary screening effect of the wall and buildings on site should actually improve the noise climate at the existing residential area beyond Athelie Street.

Any noise-sensitive land uses should not, if feasible, be placed on the South and Eastern boundaries, i.e those with Club Street. These areas should be reserved for less noise-sensitive uses if feasible. It is understood that no commercial noise-generating activities are planned for the site.

Sensitive room uses such as bedrooms and lounges with large areas of glass and openable windows and doors should face towards the interior of the site, and non-sensitive rooms such as kitchens, bathrooms and utility rooms with smaller windows should, where possible, be located on noise-exposed facades to protect the remainder of the building.

5. REFERENCES

1. SOUTH AFRICAN STANDARD - Code of practice, SANS 10103:2008, *The measurement and rating of environmental noise with respect to annoyance and to speech communication.*
2. SOUTH AFRICAN STANDARD - Code of practice, SANS 10210:2008, *Calculating and predicting traffic noise.*
3. SOUTH AFRICAN STANDARD - Code of practice, SABS 10357: 2008, *The calculation of sound propagation by the Concawe method.*
4. SOUTH AFRICAN STANDARD - Code of practice, SABS 10328:2008, *Methods for environmental noise impact assessments.*
5. DEPARTMENT OF ENVIRONMENTAL AFFAIRS. NO. R. 154. *Noise Control Regulations in Terms of Section 25 of the Environmental Conservation Act, 1989 (Act No. 73 of 1989).* Govt. Gazette. No. 13717, 10 January 1992.
6. Fuggle, R. F. and Rabie, M. A. et al., *Environmental Management in South Africa.* Juta & Co, Ltd., 1992
7. Gauteng province, Department of Agriculture, Conservation and Environment, Notice 5479 of 1999. *Noise control regulations, 1999,* Provincial gazette extraordinary, 20 august 1999.