

Ref: AS7013.140321.L1

21 March 2014

Ian McFaul
Linden Homes (Southern)
Linden House
14 Bartram Road
Totton
Southampton
SO40 9PP

Dear Ian

AS7013 HAVANT RETAIL PARK

External Building Fabric

CSA have undertaken a review of the external building fabric requirements for the above site to ensure that internal noise levels would achieve the WHO criteria for internal noise levels during the day and night-times, shown below.

Criterion	Environment	Design range $L_{Aeq,T}$ dB
Maintain speech intelligibility and avoid moderate annoyance, daytime and evening	Living Rooms	35
Prevent sleep disturbance, night time	Bedrooms	30

Table 1 – Internal noise criteria

[dB ref. 20μPa]

This guidance also states that individual noise events should not normally exceed 45 dB $L_{Amax,fast}$ within bedrooms at night.

Environmental noise surveys have been undertaken on site in 2012 and 2013, the results of which are summarised in our report ref. AS7013.130404.NIA.1.1. This survey work has been used to calibrate a noise map of sound pressure levels across the site, which was appended to the above referenced report. These noise data have been used as the basis for the external building fabric appraisal.

To simplify this exercise, the site has been split into four acoustic 'zones', shown overleaf. The apartment building on the western boundary, which overlooks the motorway slip road, provides high levels of acoustic protection to other dwellings on the site.

It has been assumed that all non-glazed elements, i.e. masonry walls/facings and the roof systems will provide the following minimum sound insulation performances, when tested in accordance with BS EN ISO 10140-2:2010. It is expected that this would be achievable with a standard cavity masonry or timber frame external wall construction.

Head Office:
Westgate House
39-41 Romsey Road
Winchester
Hampshire
SO22 5BE

Tel: 01962 872130
mail@clarkesaunders.com

London Office:
16 Lower Marsh
London
SE1 7RJ

Tel: 0203 479 7867
london@clarkesaunders.com

Exeter Office:
1 Emperor Way
Exeter
Devon
EX1 3QS

Tel: 01392 342978
exeter@clarkesaunders.com

www.clarkesaunders.com

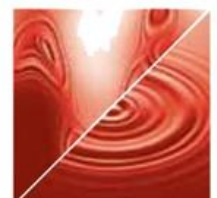
Registered in England Company No.
3758093

Registered Office:
Avebury House, St Peter St, Winchester

Clarke Saunders Associates is the
trading name of Alan Saunders
Associates Ltd.

Directors:
Alan Saunders
BSc (Hons) CSci CPhys FIOA
Ed Clarke
BEng (Hons) MIOA
Matt Sugden
BEng (Hons) MIOA

**MEMBERS OF THE ASSOCIATION
OF NOISE CONSULTANTS**



Frequency (Hz)	Sound reduction performance, R_w dB
Non glazed element	54

Table 2 – Minimum sound reduction indices of solid constructions

The minimum sound insulation specification for the glazed elements of the residential dwellings is given in the table below. This has been calculated using the available noise data and the noise contour model in order to achieve the design criteria set out above.

In order that windows may remain closed to maintain the internal noise levels, it is expected that an alternative means of ventilation will be required. If trickle vents are used the performance shown in Table 3 will be required. The figures stated are for a single vent per room. If multiple vents are required, then the performance requirement shown in Table 3 will increase by a value equal to $+10\log(N)$, with N being the total number of vents serving the room. It should be noted that there is no reason why windows could not be opened as a matter of personal preference or for purge ventilation.

Zone	Room Type	Glazing R_w dB	Ventilator $D_{n,e,w}$ dB
1	Living Room	36	48
	Bedroom	35	48
2	Living Room	30	30
	Bedroom	30	33
3	Living Room	Standard Thermal Double Glazing	30
	Bedroom		34
4	Living Room		-
	Bedroom		-

Table 3 – Glazing and ventilator performances

Where no performance has been given for the glazing or the ventilator, standard thermal double glazing and any normal 'non-acoustic' trickle vent would provide sufficient attenuation to achieve the internal noise levels.

Full spectral sound reduction performance values are also shown in the attached glazing specification document, which would ensure that a good internal acoustic is achieved (i.e. controlled traffic 'rumble'). It would also be prudent to avoid symmetrical glazing configurations, especially 6/12/6, which can exacerbate the characteristics of motorway noise in particular.

It is important that the quoted minimum sound reduction specification is met by the panels and windows, including frames, seals, etc. Glass performance alone is not an acceptable means of demonstrating compliance with the specification for window performance.

The four acoustic zones where the relevant specifications apply are shown in Figure 1.

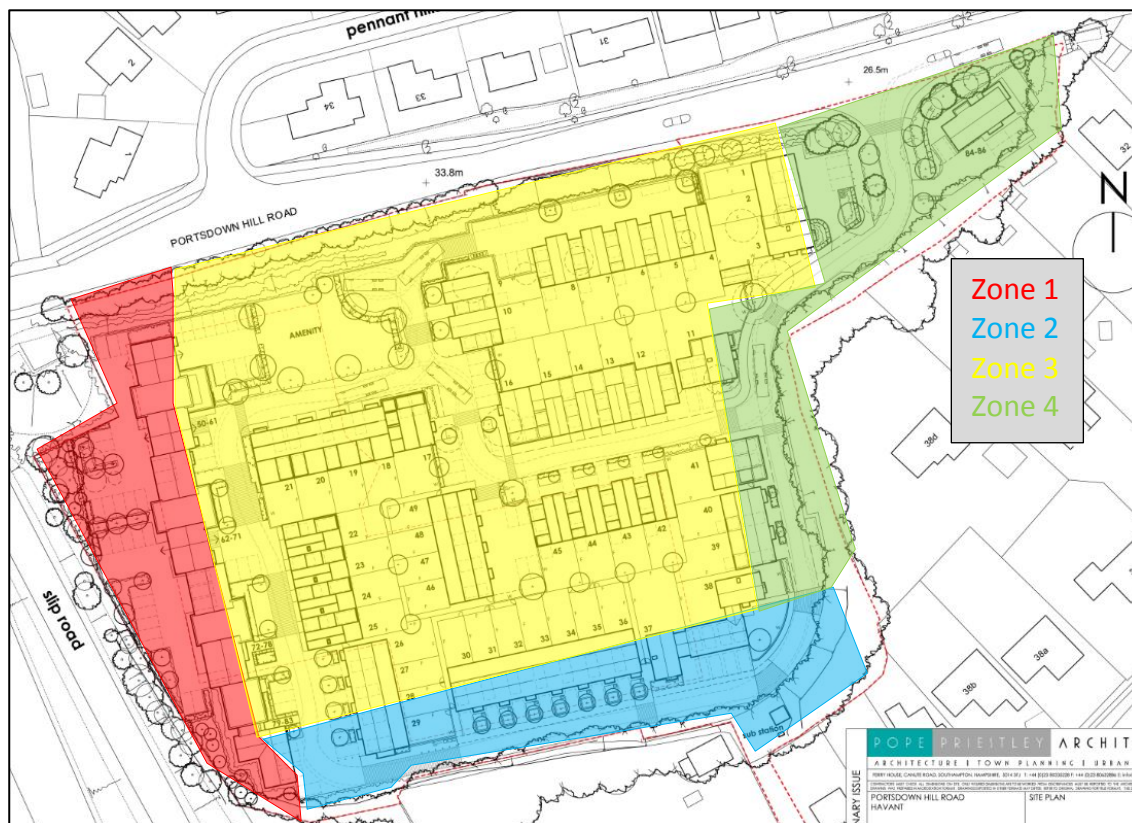


Figure 1 – Acoustic 'zones'

Boundary Fence (West)

There is a requirement for a fence to run along the western boundary of the site to provide acoustic screening to the west elevation of the apartment building at ground floor level of the dwellings in Zone 1.

The fencing should be a minimum of 2.5m high and should be homogeneous, continuous and imperforate, with a minimum mass per unit area of 10kg/m^2 .

To this end a close boarded timber fence is likely to be adequate to achieve these requirements.

We trust the above to be of assistance. Please do not hesitate to contact us with any queries you may have.

Yours sincerely
for CLARKE SAUNDERS ASSOCIATES

Jamie Duncan
Jamie Duncan (Mar 21, 2014)

Jamie Duncan
email: jduncan@clarkesaunders.com