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Department of Planning
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Submission: Abercrombie Street Precinct, University of Sydney (MP 07_0158)

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Preamble

The Darlington Campus of the University of Sydney (USYD) comes face to face with residential Darlington. Since the 1970's the University has demolished approximately one half of the Victorian era buildings in the suburb, including a magnificent Neo Gothic school complex and town hall. If these and other buildings had survived they would now be heritage protected.

In place of these buildings the University has constructed large imposing concrete and brick buildings which challenge the scale and heritage architecture of the surrounding suburb and which generate significant levels of community noise through their mechanical services.

The University, in its 2020 Master Plan, states -

“At that time the suburb of Darlington was resumed and bulldozed to create the campus. The only remnants of the original suburb are the Old School and the streets, including the original sandstone kerbing. In the Abercrombie precinct there is one remaining cast iron fence and gatepost of the original suburb.

This precinct is characterised by ruthless concrete and brick buildings of harsh linear form and the result is a cold and unforgiving urban environment. The precinct pays little, if any, attention to the neighbouring suburb, with a bleak interface to Shepherd St and Abercrombie St.”

The Camperdown campus, which has large areas of green space, is largely isolated from residential areas except for a very minimal contact at Forest Lodge and hence the activities of the University on this campus have minimal impact on residents.

The Darlington campus by stark contrast abuts residential Darlington and has a significant environmental impact, particularly in relation to noise. The University, in my opinion, immediately needs to institute a policy that would lead to the creation of “green buffer zones” between all developments on the Darlington campus and residential buildings.

Site selection

I contend that the site selection methodology and criteria are flawed.

The University has not demonstrated that it has undertaken a rigorous and transparent site selection process.

The University has not demonstrated that all other available sites have been examined and provided reasons for their rejection.

The proposed site is patently inappropriate for this development because it gives little regard to the amenity of residents, who live only metres from the development.

The University's site selection methodology should be predicated on a policy that all University developments on the Darlington campus, because of their very close proximity to residential buildings, should include a buffer zone, preferably a green zone, which would minimise the impact of the development on residents.

Green Site Swap

There are several green spaces of large area on the main Camperdown campus. I contend that a green swap should take place where the proposed Abercrombie St Development would be built on an existing green space on the Camperdown campus and the Abercrombie St/ Codrington St site would become a green zone.

This would give the proponent the development it wants but ensure that residents are protected from the adverse outcomes such as increased traffic, mechanical services noise and the further degradation of the heritage streetscape.

In addition, there would be no net loss of green space.

Noise impact on the local community

The buildings that the University is proposing to construct would, despite the use of some natural ventilation, be largely sealed to the outside world (like most of the buildings on the Darlington campus). As such, they would require mechanical ventilation or other climate control systems, such as chilled beam air conditioning in order to regulate temperature and humidity in the buildings.

Many of the existing buildings run noisy mechanical ventilation equipment 24 hours a day all year long in close proximity to resident's homes. In 2008, after dismissing resident's complaints about a very noisy mechanical ventilation system on the Mechanical Engineering building, the University was served with a Noise Abatement Order by the City of Sydney and forced to shut the ventilation system down.

I have been told by an employee of the University that it is unknown if certain equipment complies with noise legislation because plant equipment is generally installed and maintained by outside contractors.

The evidence that this proposal could result in plant equipment noise in close proximity to residential buildings can be found in the proponents **Environmental Assessment, Appendix G_Green Building Design Report**, which states -

“Classrooms

However, single sided ventilation will not effectively serve the spaces or the increased requirements for fresh air. Instead, **an active heating and cooling strategy is proposed throughout the year.**”

“Auditoriums

An active mechanical approach is required to ensure comfort cooling, humidity control and fresh air requirements are met throughout the year. To reduce energy use, complimentary

Additional cooling will be required from mechanical plant to deal with peak summer conditions in Sydney.”

“Offices

Mixed-mode ventilation is required to respond to peak conditions in the summer and winter seasons.

It is likely that natural ventilation will not always provide sufficient comfort, or is considered too noisy at times, so a mixed-mode approach is proposed. **This would enable the choice between natural ventilation and mechanically assisted ventilation** in each individual cellular office, according to external conditions.”

“In addition to the passive and active design measures, **energy efficient chillers and plant proposed in the building**, two primary low carbon energy supplies are currently being investigated for the development. The two energy supply approaches considered to be appropriate for the Abercrombie Redevelopment Project are: - **Ground source heat pumps....**”

Low Frequency Noise impact (LFN)

It is well recognised in the scientific literature that mechanical cooling and heating systems and associated plant equipment, such as pumps are a significant source of Low frequency noise (LFN), which has the potential to disturb sleep even at low levels.

Leventhall, H G states -

1. Abstract

Low frequency noise, the frequency range from about 10Hz to 200Hz, has been recognised as a special environmental noise problem, particularly to sensitive people in their homes. Conventional methods of assessing annoyance, typically based on A-weighted equivalent level, are inadequate for low frequency noise and lead to incorrect decisions by regulatory authorities. There have been a large number of laboratory measurements of annoyance by low frequency noise, each with different spectra and levels, making comparisons difficult, but the main conclusions are that annoyance of low frequencies increases rapidly with level. Additionally the A-weighted level underestimates the effects of low frequency noises. There is a possibility of learned aversion to low frequency noise, leading to annoyance and stress which may receive unsympathetic treatment from regulatory authorities. In particular, problems of the Hum often remain unresolved. An approximate estimate is that about 2.5% of the population may have a low frequency threshold which is at least 12dB more sensitive than the average threshold, corresponding to nearly 1,000,000 persons in the 50-59 year old age group in the EU-15 countries. This is the group which generates many complaints. Low frequency noise specific criteria have been introduced in some countries, but do not deal adequately with fluctuations.

Low Frequency Noise and the World Health Organisation

Australia is a member state of the World Health Organisation, is a signatory to the World Health Organisation charters and has a delegate to the World Health Assembly, WHO's supreme decision-making body.

The University and the Department of Planning, by default, are obliged to consider and take into account public health evidence, advice and recommendations made by WHO in relation to LFN when considering the Development Application.

In Guidelines for Community Noise (1999) the World Health Organisation (WHO) states –

3.9. Effects of Combined Noise Sources

The evidence on low-frequency noise is sufficiently strong to warrant immediate concern.

Various industrial sources emit continuous low-frequency noise (compressors, pumps, diesel engines, fans, public works.)

Low-frequency noise may also produce vibrations and rattles as secondary effects.

Health effects due to low frequency components in noise are estimated to be more severe than for community noises in general (Berglund et al. 1996). Since A-weighting underestimates the sound pressure level of noise with low-frequency components, a better assessment of health effects would be to use C weighting. A-weighted sound level measurements reflect the technology and industrial environment of the 1930's!

It's time to update the noise pollution standards and references that are used today in a manner that reflects contemporary industrial technology and current research.

The **World Health Organization** recognizes the special place of low frequency noise as an environmental problem. Its publication on Community Noise (Berglund et al., 2000) makes a number of references to low frequency noise, some of which are as follows

"It should be noted that low frequency noise, for example, from ventilation systems can disturb rest and sleep even at low sound levels"

"For noise with a large proportion of low frequency sounds a still lower guideline (than 30dBA) is recommended"

"When prominent low frequency components are present, noise measures based on A-weighting are inappropriate"

"Since A-weighting underestimates the sound pressure level of noise with low frequency components, a better assessment of health effects would be to use C-weighting"

"It should be noted that a large proportion of low frequency components in a

noise may increase considerably the adverse effects on health"

"The evidence on low frequency noise is sufficiently strong to warrant immediate concern"

Environmental Assessment of Noise

I contend that the Environmental Assessment, Appendix L - Noise Assessment is flawed because -

a. The Noise Survey is predicated on A weighted noise measurements which underplay LFN. A survey of existing C weighted noise should be undertaken to compare it to the C weighted noise that would be generated by the development. A noise survey of both A and C weighting should be undertaken during the sensitive late night hours when LFN is more noticeable. (see WHO recommendations above)

b. The Survey of Baseline Noise Measurements taken are artificially high because they include the noise generated by other plant equipment already running on the campus. I contend that a more accurate and fairer measurement of baseline noise would be to shut down all plant equipment on the Darlington campus for a short period and then take baseline measurements in both A and C weighting.

The true impact on residents of the proposed development would be the totality of all noise currently generated on the campus plus the noise from the development itself.

It should be noted that LFN generated by this development would be a potential problem for all residents of Darlington because LFN "travels long distances unimpeded by masonry or glass".

University of Sydney Environment Policy

The University's Environment Policy states –

1. Policy Statement

"The University of Sydney is committed to environmental best practice, and to the continual improvement of its environmental performance, recognising its obligations both locally and globally

The University is committed to implementing the requirements of all applicable Commonwealth, State and local environmental legislation and regulations and, where possible, exceeding any relevant minimum requirements."

The University's proposal to construct this development on the Abercrombie St site is a breach of its Environment Policy because it does not exceed any relevant minimum environmental requirements in relation to noise impact, where this is clearly possible.

If the development were built on the main campus the University would exceed the minimum environmental legislation because the residents would be spared the adverse environmental effects of the development.

It also breaches its policy by not considering sites isolated from residential Darlington which would recognise "its obligations both locally and globally".

Summary:

I contend that the proponent, the University of Sydney:

- has not undertaken a rigorous and transparent site selection process and considered other sites on the main Camperdown campus;
- that the Environmental Assessment, in relation to noise, is flawed because the noise survey methodology does not take into account the large component of low frequency noise which is likely to result;
- has not taken into account the scientific research on the adverse health impacts of LFN cause by plant equipment;
- and the NSW Department of Planning are obliged to consider and act upon the public health implications based on evidence and recommendations of WHO.

I am requesting that for the reasons outline above that the application in its current form be rejected.

Sincerely yours

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1. Low frequency noise and annoyance. Noise Health 2004; 6:59-72 HG Leventhall

Noise and Vibration Consultant, Ashted, Surrey, United Kingdom
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Available from: <http://www.noiseandhealth.org/text.asp?2004/6/23/59/31663>