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Parramatta Stadium

11-13 O'Connell Street
PARRAMATTA



**Measurements of noise emanating from
Australasian Supercross Championships 2010 held at Parramatta Stadium on 27 November 2010**

December 2010




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is an independent, accredited acoustical and environmental engineering consultancy :
a member of Consult Australia and Association of Australian Acoustical Consultants (AAAC).



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**This report has been checked and endorsed by
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Appendix 1: Locations of noise measurements along residential boundaries.



GLOSSARY

Sound Frequency:

a number of fluctuations in the air pressure, which are detected by the human ear, per second, [Hz].

Sound Pressure:

fluctuations in the air pressure that are detected by the human ear, [Pa].

Sound Pressure Level (L_p):

a sound pressure measured on a decibel scale, [dB] : $L_p = 10 \log_{10} (p/p_0)^2$,

where:

p - is the sound pressure; and

p_0 - is the reference sound pressure of $20\mu\text{Pa}$.

A-weighted sound pressure level (L_A):

in A-weighted decibels [dB(A)], the sound pressure level, which is corrected to correlate with the human subjective response to different frequencies at low ranges of sound pressure levels (about 40 dB).

Equivalent Sound Pressure Level ($L_{eq, T}$):

the sound pressure level of a steady sound that has the same energy during the measurement time T as a sound under consideration whose level varies with time, (dB).

A-weighted Maximum Sound Pressure Level ($L_{A\text{Max}, T}$):

the A-weighted highest value of sound pressure level that occurs during a specific time interval, as measured with an instrument that performs a running average on $p^2(t)$, the square of the instantaneous sound pressure during the measurement time T , [dB(A)].

Linear Peak Sound Pressure Level ($L_{L\text{Peak}, T}$):

the unweighted largest instantaneous sound pressure magnitude that occurs during the measurement time T , [dB(L)].



EXECUTIVE SUMMARY

This report presents results of noise measurements [A-weighted maximum sound pressure levels ($L_{A\text{Max}}$)] that were carried out by Pollution Control Consultancy and Design (PCCD) during Australasian Supercross Championship 2010 (**Super X 2010**) (a motor sport event) held at Parramatta Stadium in 11-13 O'Connell Street, Parramatta (Appendix 1), on Saturday, 27 November 2010.

The measurements were carried out:

- (1) along residential boundaries marked with red lines in Appendix 1; and
- (2) at Old Government House, including Lachlan's Restaurant, south of Parramatta Stadium, and Parramatta Park Café (Kiosk) / Events Centre (Conference Facilities) north-west of Parramatta Stadium;

and their results show that the $L_{A\text{Max}}$ emanating from Parramatta Stadium during Super X 2010 was below the limits from *Noise Management Plan* of Parramatta Stadium in all locations except in:

- Campbell Street (between O'Connell Street and Pitt Street); and
- Parkside Lane/Lichen Place;

where the $L_{A\text{Max}}$ marginally exceeded the limits by 3 dB and 1 dB, respectively.

We believe that the excessive $L_{A\text{Max}}$ in Campbell Street and Parkside Lane/Lichen Place may be avoided in future by changes to the arrangement of the public address system with a too close location of the microphone of this system to the race track on 27 November 2010.



1. LIMITS ON NOISE DURING SUPERCROSS

In this report, the level of noise emanating from Super X 2010 (a motor sport event) is assessed in terms of limits proposed in Report No EN-OAC-030809AJ of 14 September 2009: *Parramatta Stadium - 11-13 O'Connell Street, PARRAMATTA - NOISE MANAGEMENT PLAN for open air concerts and Australasian Supercross Championship*. These limits are provided in Sections 1.1 and 1.2, below:

1.1. Limits on noise from Supercross - residential premises

The A-weighted maximum sound pressure level ($L_{A_{Max}}$) emanating from Australasian Supercross Championship held at Parramatta Stadium should not exceed:

- 75 dB(A), when measured:
 - (a) at boundaries of the residential premises at the corner of O'Connell and Ross Streets;
 - (b) at boundaries of the residential premises in Ross Street between O'Connell and Trott Streets;
 - (c) on the balcony on the top floor the Convent of Sisters of Mercy in 6 Victoria Street; and
- 65 dB(A), when measured at boundaries of any other residential premises.

1.2. Limit on noise from Supercross - commercial premises

The A-weighted maximum sound pressure level ($L_{A_{Max}}$) emanating from Australasian Supercross Championship held at Parramatta Stadium should not exceed 80 dB(A), when measured at any commercial premises.

2. LOCATION AND TIME OF NOISE MEASUREMENTS

2.1. Location of noise measurements at residential premises

For the purpose of this report, the noise measurements at residential premises were carried along the:

1. southern boundary of residential premises in Fennell Street between Fleet Street and Northcott Lane;
2. western boundary of residential premises in O'Connell Street between Fennell and Gross Streets (boundary off Northcott Lane);
3. western and southern boundary of residential premises at the corner of O'Connell and Ross Streets;
4. southern boundary of residential premises in Ross Street between O'Connell and Trott Streets;
5. balcony on the top floor on the western aspect of the Convent of Sisters of Mercy in Victoria Street (subject to a consent from the Convent);
6. northern boundary of residential premises in Campbell Street between O'Connell and Pitt Streets;
7. north-eastern boundary of residential premises in Parkside Lane and Lichen Place; and
8. south-eastern boundary of the residential premises in Park Avenue between Hainsworth Street and Railway Parade;

as marked with red lines in Appendix 1.

2.2. Location of noise measurements at commercial premises

For the purpose of this report, the noise measurements were carried at the following commercial premises:

1. Old Government House, including Lachlan's Restaurant, south of Parramatta Stadium; and
2. Parramatta Park Café (Kiosk) and Events Centre (Conference Facilities) north-west of Parramatta Stadium; shown on the map in Appendix 1.



2.3. Time of noise measurements

The noise measurements at the residential and commercial premises were carried out on Saturday, 27 November 2010, between:

- 12.00 pm and 6.00 pm (practise and qualifying sessions); and
- 6.40 pm and 9.30 pm (races).

3. INSTRUMENTATION AND CALIBRATION

For the purpose of this report, the measurements of the A-weighted maximum sound pressure level ($L_{A_{Max}}$) were carried out with a NATA-calibrated, class 1, Brüel and Kjær (B&K) modular, precision, real-time sound analyzer type 2260 Investigator, serial number: 244 3406.

The instrument was calibrated acoustically with a NATA-calibrated, B&K sound level calibrator type 4231, serial number: 243 9033, before and after the measurements, when the calibration drifts were lesser than 1 dB and thus, according to Australasian Standard: Acoustics - Description and measurement of environmental noise (AS 1055.1-3 - 1997), the results from the instrument are valid.



4. RESULTS OF NOISE MEASUREMENTS

Table 1 below provides results of measurements of the A-weighted maximum sound pressure levels (L_{AMax}) emanating from Super X 2010 and the public address system used during the event (Parramatta Stadium's permanent public address system).

Table 1

No	Location	Start	Race	Assessment
RESIDENTIAL PREMISES				
1	Fennell Street (between Fleet Street and Northcott Lane)	59	58	6 dB below the limit of 65 dB(A)
2	Northcott Lane	59	59	6 dB below the limit of 65 dB(A)
3	Ross Street (between O'Connell Street and Trott Street)	70	70	5 dB below the limit of 75 dB(A)
4	6 Victoria Street (top floor of Convent of Sisters of Mercy)	70	74	1 dB below the limit of 75 dB(A)
5	1 Macquarie Street (Central Park Apartments)	Audible noise; background noise dominated by road traffic		Too low to measure
6	Campbell Street (between O'Connell Street and Pitt Street)	68	66	3 dB above the limit of 65 dB(A)
7	Parkside Lane/Lichen Place	65	66	1 dB above the limit of 65 dB(A)
8	Park Avenue (between Hainsworth Street and Railway Parade)	62	62	3 dB below the limit of 65 dB(A)
COMMERCIAL PREMISES				
1	Lachlan's Restaurant (Old Government House)	73	73	7 dB below the limit of 80 dB(A)
2	Kiosk (Parramatta Park Café / Conference Centre)	70	69	10 dB below the limit of 80 dB(A)

The results show that the L_{AMax} were below the limits from Sections 1.1 and 1.2 above at all locations, except in:

- Campbell Street (between O'Connell Street and Pitt Street); and
- Parkside Lane/Lichen Place;

where the L_{AMax} exceeded the limit from Section 1.1 by 3 dB and 1 dB, respectively.

In our opinion, the L_{AMax} exceeding the limit from the Noise Management Plan were caused not by direct noise from motorbikes, but by the public address system (predominantly, from loud commentaries of races that had to overcome motorbike noise and partially from motorbike noise amplified by the system).



5. NOISE COMPLAINTS

During Super X 2010 both Parramatta Stadium and Pollution Control Consultancy and Design (PCCD) maintained “hot lines” to allow any persons affected by noise from the event lodging noise complaints that could be followed by immediate noise measurements in areas of concern.

No noise complaints were lodged through the hot lines and/or other means either during Super X 2010 or afterwards.

6. RECOMMENDATION

We recommend that in next years the arrangement of the public address system be changed prior to commencements of motor sport events so the microphone of the system is further from the race track, which will reduce both the loudness of commentaries of races and motorbike noise amplified by the system.





Pollution Control Consultancy and Design

is a member of The Association of Consulting Engineers, Australia (ACEA)
and Association of Australasian Acoustical Consultants (AAAC),

and its principal consultant is a Corporate Member of
The Institution of Engineers, Australia (MIEAust)
and Australasian Acoustical Society (M.A.A.S.).

Pollution Control Consultancy and Design (PCCD) is an independent, accredited, acoustical and environmental engineering practice that was established and is managed by **Alex Jochelson**.

Alex has a Master's Degree in Mechanical Engineering (MEMech) and he is a Corporate Member, Chartered Professional Engineer of The Institution of Engineers, Australia, registered on National Professional Engineers Register under No 371231, in the categories of Environmental and Mechanical Engineering [MIEAust CPEng (Reg)].

Alex's well balanced, extensive, multi-disciplinary experience in environmental engineering includes:-

- (1) four-year industrial experience (environment protection specialist at ferro-chromium smelting plant);
- (2) four-year research and design experience (research engineer at university);
- (3) nine-year operational, industrial pollution control experience at the Environment Protection Authority of New South Wales - EPA (engineer); and
- (4) the current, since January 1995, engineering consulting experience as the principal consultant of Pollution Control Consultancy and Design (PCCD).

Services provided by Pollution Control Consultancy and Design

Pollution Control Consultancy and Design (PCCD) provides a comprehensive range of services covering all major aspects of the environment protection: air, noise and water pollution control. These services include:-

- a) air, noise and water pollution measurement, assessment and engineering control;
- b) environmental reviews and audits;
- c) environmental management programs (EMPs);
- d) pollution reduction programmes (PRPs);
- e) environment protection policy and strategy;
- f) submissions to and negotiations with the Environment Protection Authority, Department of Planning, Department of Mineral Resources, Sydney Water, Liquor Administration Board and Local Councils;
- g) "environment impact statements" and "statements on environmental effects" for development consents;
- h) applications for pollution control approvals and licences;
- i) compliance audits for environment protection approvals and licences, and development consents;
- j) interpretation of technical requirements of environment protection legislation;
- k) expert witness services for Land and Environment Court and local courts;
- l) proposals of environmentally acceptable and safe operational conditions and procedures;
- m) development of operational manuals for pollution control systems;
- n) process and functional design of air, noise and water pollution control systems;
- o) selection of optimal pollution control technology, equipment and systems;
- p) supervision of construction, commissioning, operation and maintenance of pollution control systems; and
- q) troubleshooting existing air, noise and water pollution control systems.



Locations of noise measurements along residential boundaries, as marked with red lines (—) .



NOTES