

Heavy Vehicle Movement Report: Use of The Crescent, Kingsgrove

Project Name: WestConnex New M5

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Document Approval

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00	16/08/17	CDS-JV				
01	28/08/17	CDS-JV				
Signature:						

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Details of Revision Amendments

Document Control

The Project Director is responsible for ensuring that this Plan is reviewed and approved. The Support Services Director (SSD) is responsible for updating this Plan to reflect changes to the Project, legal and other requirements, as required.

Amendments

Any revisions or amendments must be approved by the Project Director before being distributed or implemented.

Revision Details

Revision	Details
00	Prepared for WCX M5 AT/RMS review
01	Updated to address WCX M5 AT and RMS comments. For DP&E review and approval.



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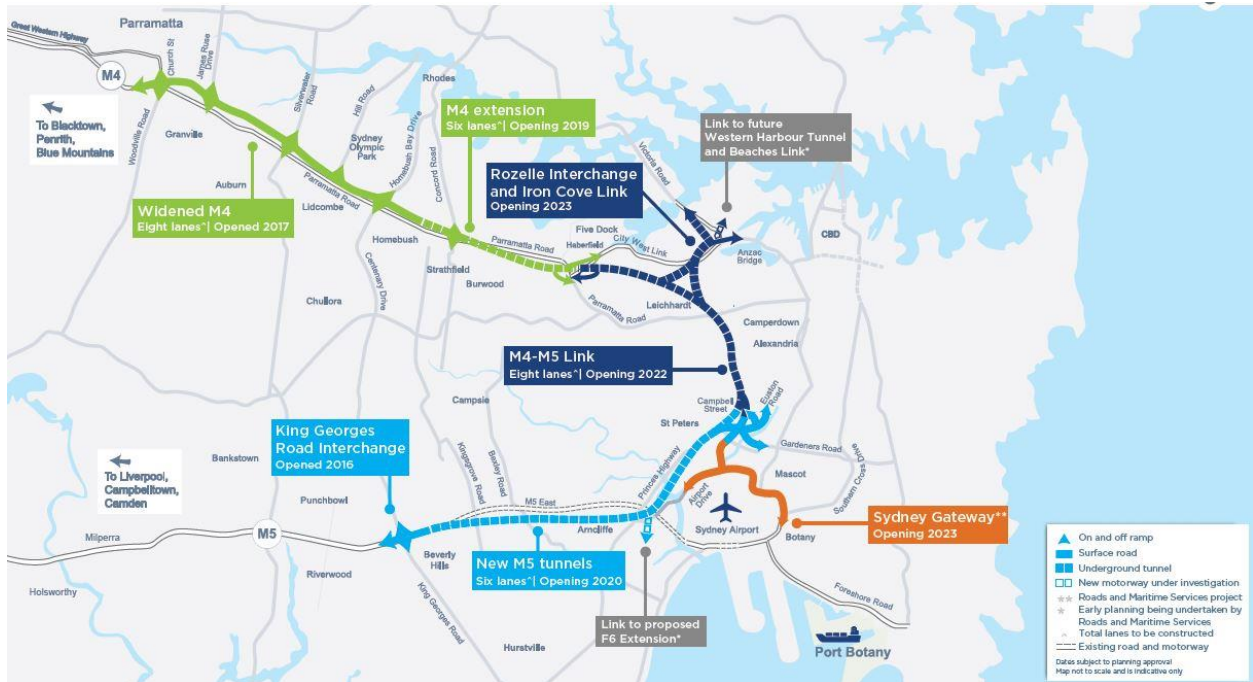
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1. Introduction

1.1 Project description

WestConnex is one of the NSW Government's key infrastructure projects which aims to ease congestion, create jobs and connect communities. It is the largest integrated transport and urban revitalisation project in Australia.

The 33 kilometre project was a key recommendation of the State Infrastructure Strategy released in October 2012. It brings together a number of important road projects which together form a vital link in Sydney's Orbital Network. They include a widening of the M4 east of Parramatta, a duplication of the M5 East and new sections of motorway to provide a connection between the two key corridors.



The New M5 Project (New M5, the project) is designated as State Significant Infrastructure (SSI 6788) and is the Stage 2 component of the WestConnex scheme. The proponent for the project is Roads and Maritime Services (RMS) and the project company (WCX M5 AT). WCX M5 AT has engaged the CPB Samsung Dragados Joint Venture (CDS-JV) to deliver the design and construction of the project. The project was approved by the Minister for Planning on 20 April 2016, subject to conditions.

The Project will run from the existing M5 East corridor at Beverly Hills via tunnel to St Peters, providing improved access to the airport, south Sydney and Port Botany precincts. The Project will substantially improve the east - west corridor access between the Sydney CBD, Port Botany and Sydney Airport precincts and the South West growth areas.

The project comprises the following key features:

- New twin tunnels which are higher, wider and flatter. These will more than double capacity along the M5 East corridor and provide motorway access to north of Sydney Airport
- A new interchange at an industrial site at St Peters, which reduces the impact on nearby, residential areas
- Connections from the interchange to key roads in the area, including Campbell Road/Street, Euston Road and across the canal to Bourke Road
- Widening of Campbell Road/Street and Euston Road through existing road widening reservations
- Western tunnel entry and exit points at Kingsgrove..

1.2 Purpose and scope of this report

The State Significant Infrastructure (SSI) Ministers Conditions of Approval (CoA) for the SSI 6788, Condition D46 states:

“Unless otherwise approved by the Secretary, heavy vehicle movements associated with the construction of the SSI are not permitted to use Wirega Avenue and Garema Circuit at Kingsgrove, or any other local road not identified for use in the documents referred to in conditions A2(b) and A2(c), unless approved by the Secretary. When seeking the Secretary’s approval for use of such local roads, justification must be provided as to why use of the local road(s) is the only feasible and reasonable route along with details on how impacts on surrounding sensitive receivers will be managed.”

CDS-JV has prepared this document to seek approval from the Secretary to use a local road for alternative access to the Kingsgrove (C2) Construction Compound to enable construction of the MOC1 retaining wall, part of the approved SSI. This document details the following:

- A review of the current approved access routes for the C2 Construction Compound
- A review of existing land uses and traffic environment;
- A construction traffic noise assessment for the proposed route, including potential impacts; and
- The mitigation measures that will be employed to manage heavy vehicle movements and traffic noise for sensitive receivers in this area.

A consistency assessment for the use of the alternate route from Commercial Road via Vanessa Street and The Crescent for construction of the MOC1 retaining wall was approved by RMS on 25 August 2017.

1.3 Need for the proposed route

To enable the construction of the retaining wall along the southern side of the MOC1 building at the C2 compound alternate access arrangements are required. Alternate access is required to avoid interaction with the heavy vehicles and construction activities at the C2 compound for the tunnel cut and cover construction to ensure safe access to the MOC1 building site. Approximately 72 heavy vehicle movements are expected per day at the C2 compound.

Deliveries of concrete and other construction materials will be required daily for construction of the MOC1 retaining wall. Alternate access to the site is proposed via Kingsgrove Road, Commercial Road, Vanessa Street and The Crescent. Access from The Crescent to the construction site would be via private property and an upgraded bridge across Wolli Creek. Estimated daily vehicle movements are expected to comprise up to 20 heavy vehicle movements per day and 30 light vehicle movements per day. Construction of the MOC1 retaining wall is expected to commence in the third quarter of 2017. The proposed use of this alternate route would be required for approximately eight months.

2. Kingsgrove heavy vehicle access routes

2.1 Approved heavy vehicle routes

The approved access routes for the Kingsgrove construction compounds (C1-C3) are described in Chapter 9 of the WestConnex New M5 Environmental Impact Statement (EIS)¹ and clarified in Figure 6-2 of the Submissions and Preferred Infrastructure Report (refer Figure 1). These routes are also shown in the approved Construction Traffic and Access Sub-plan and Spoil Management Plan. The use of Wirega Avenue and Garema Circuit has previously been approved under Condition of Approval D46.



Figure 1: Approved heavy vehicles routes for the Kingsgrove construction compounds (from SPIR, Figure 6-2)

Construction heavy vehicle traffic volumes predicted for each of the approved access routes for the Kingsgrove construction compounds are provided in Chapter 9 of the EIS and are summarized in Table 1 below.

Table 1: Heavy vehicle traffic volumes predicted for Kingsgrove construction compounds

Construction compound	Construction route number	Access point	Daily heavy vehicles	AM Peak	PM Peak
Kingsgrove North (C1)*	Route 1	Garema Circuit	672	21	19
	Route 2	Garema Circuit	672	21	19
	Route 3	M5 East Motorway	631	20	18
	Total	All above	1975	62	56

¹ AECOM Australia Pty Ltd 2015 WestConnex The New M5 Project – Environmental Impact Statement



Construction compound	Construction route number	Access point	Daily heavy vehicles	AM Peak	PM Peak
Kingsgrove South (C2)**	Route 3	M5 East Motorway	72	3	3
Commercial Road (C3)	N/A	Commercial Road	192	8	8

* Routes 1 and 2 include construction traffic travelling to C2 compound via Kindalin underpass

** Does not include construction traffic entering via C1 and the Kindalin underpass

2.2 Proposed alternate route

The current approved access routes described in Section 2.1 will provide limited access to the MOC1 construction site, due to the construction of the cut and cover structure at the site and associated spoil truck movements on and off the M5 East Motorway. To enable the construction of the retaining wall along the southern side of the MOC1 building at the C2 compound, alternate access arrangements are required to ensure safe access for construction deliveries to avoid interaction with the construction of the cut and cover structure and associated spoil truck movements.

The alternate proposed route via Kingsgrove Road, Commercial Road, Vanessa Street and The Crescent to access the C2 compound is shown in Figure 2. Access from The Crescent to the construction site would be via private property and an upgraded bridge across Wolli Creek as shown in Figure 2. Estimated daily vehicle movements are expected to comprise up to 20 heavy vehicle movements per day and 30 light vehicle movements per day. Construction of the MOC1 retaining wall is expected to commence in the third quarter of 2017. The proposed use of this alternate route would be required for approximately eight months.

The Crescent is classified as an RMS approved B-double route (refer Figure 9-23 of the EIS). Vanessa Street is classified as a regional road in RMS Schedule of Classified Roads and Unclassified Regional Roads (RMS 2014) as part of regional road no. 7035. The Crescent is not identified on the RMS Schedule and therefore requires the approval of the Secretary, DP&E, as a local road under Condition of Approval (CoA) D46 prior to its use.

The other access route options considered in this location are not approved B-double routes and would also require heavy vehicles to travel through residential areas (eg Pallamanna Parade and Tallawalla Street). There are therefore no other viable alternative options in the area.

The alternate access would be used during standard construction hours only. Any deliveries required to be undertaken outside of these hours would be via the existing access and egress from the M5 Motorway.



Figure 2: Proposed alternate heavy vehicle access route via The Crescent, Kingsgrove

3. Traffic noise assessment

3.1 Identification of sensitive receivers

The proposed traffic route passes through an industrial area to the north and near a residential area to the south. The nearest sensitive receivers are located on the southern side of the Airport & East Hills train line at the ends of Orbel, Morgan, Sutcliffe, and Hobbs Streets and Turon and Northcott Avenues, Kingsgrove.

The nearest sensitive receiver to the proposed traffic route, is a residential receiver located at 8 Orbell St, Kingsgrove. This receiver is located across the train line from the proposed traffic route, approximately 50 m from the heavy vehicle route (refer to Section 3 of Appendix A) and behind an existing noise wall.

3.2 Construction traffic noise assessment

A Construction Traffic Noise Assessment was carried out for the proposed use of The Crescent by heavy vehicles for the project and is provided in Appendix A. The assessment outlines the relevant noise criteria. Under the Road Noise Policy (RNP) for existing residential receivers affected by *additional traffic on existing roads generated by land use developments* (in this case the construction compound) the assessment criteria for the day period is 55 dB(A) $L_{Aeq}(1 \text{ hour})$. Where existing traffic noise levels are above the noise assessment criteria, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding 'without construction'. An increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.

It has been assumed that during standard construction hours, that up to 8 heavy vehicle movements (eg. 4 trucks in and 4 out) could take place during any hour period.

Noise levels have been predicted at the closest (and therefore worst affected) residential receiver to the proposed route at 8 Orbell St, Kingsgrove. Table 2 presents the predicted noise levels at this nearest residential receiver from the proposed heavy vehicle movements, and the resulting overall traffic noise level with consideration of the worst case existing traffic noise levels.

Table 2: Predicted heavy vehicle traffic noise levels

Receiver	Assessment distance (m) (1 m from residential façade)	Proposed additional HV movements $L_{Aeq}(1 \text{ hour})$		With existing traffic noise levels $L_{Aeq}(1 \text{ hour})$		Increase in existing traffic noise level $L_{Aeq}(1 \text{ hour})$
		Predicted noise level*	Assessment limiting level	Assumed existing traffic noise level	Total predicted worst case traffic noise level	
8 Orbell St, Kingsgrove	49	53	53	55	57	2

* Noise level is façade corrected by 2.5 dB(A)

The results indicate that with the implementation of management measures there will be no notable increase in traffic noise (ie. less than a 2dB(A) increase) for sensitive receivers compared to existing levels during the day period.

4. Traffic Management and Mitigation

4.1 Consultation

Consultation has been undertaken with the affected landowner to form an agreement for access to the C2 compound from The Crescent. Consultation has also been undertaken with properties along the proposed route and with Georges River Council (refer Appendix B). Notifications will be provided to adjoining landowners to inform them of the proposed use in accordance with the Community Communication Strategy prior to the use of this route.

Any complaints associated with the use of the proposed route would be managed in accordance with the Community Communication Strategy and the Construction Complaints Management System.

4.2 Noise management and mitigation

Noise management measures are specified in Section 6 of the Construction Traffic Noise Assessment (Appendix A). Vehicles will be managed in accordance with these requirements as well as the requirements of the project Construction Noise and Vibration Management Plan and Construction Traffic and Access Plan.

4.3 Road dilapidation reports

A road condition report will be completed for The Crescent in accordance with Condition of Approval B59 and submitted to Georges River Council prior to use of this road by construction traffic. A subsequent road dilapidation report will be prepared at the completion of construction to assess any damage that may have occurred as a result of the project's use of this road.

5. Conclusion

Use of the alternate route via The Crescent for heavy vehicle access to the C2 compound is considered justified for the following reasons:

- To allow safe access for construction of the MOC1 retaining wall by avoiding interaction with the heavy vehicle movements (including spoil haulage) and other construction activities associated with the cut and cover structure for the mainline tunnels.
- Heavy vehicles can be managed to minimise impacts on identified sensitive receivers near the proposed route and traffic noise impacts are expected to be within the relevant criteria
- No additional trucks are proposed as a result of the alternate route and total truck movements associated with the C2 compound would remain the same.

It is considered that the use of The Crescent as part of the proposed alternate heavy vehicle route is the most feasible and reasonable option to enable safe heavy vehicle access to C2 for construction activities associated with the MOC1 retaining wall. With the implementation of the management measures provided in Section 4 and Appendix A, no major adverse impacts are anticipated to occur.

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Appendix A: Construction Traffic Noise Assessment

14 July 2017

TH014-10 07F01 M5N CNVIS KGR MOC1 Traffic (r0)

CPB Dragados Samsung Joint Venture
[REDACTED]

WESTCONNEX NEW M5 - Construction Traffic Noise Assessment - Kingsgrove Motorway Operations Complex (MOC1)

1 Introduction

This Construction Traffic Noise Assessment has been prepared on behalf of CPB Contractors Dragados Samsung Joint Venture (CDS JV) to support the use of a new heavy vehicle route along Vanessa Street/The Crescent/Commercial Road, Kingsgrove for the construction of the Kingsgrove Motorway Operations Complex (MOC1) located at the C2 compound south of the M5 at Kingsgrove.

2 Description of work, construction hours and traffic

2.1 Description of work

This report assesses the proposed new heavy vehicle route along the local roads of Vanessa Street/The Crescent/Commercial Road, Kingsgrove. Once the heavy vehicles move off these local roads onto Kingsgrove Road, the increase in noise from the additional traffic is considered insignificant and may be perceived as being part of the general road traffic.

The operation of this route is proposed to only occur during standard construction hours.

The following potential vehicle movements are proposed -

- 5-6 concrete agitator deliveries per day
- 2-3 rigid/flat-bed truck deliveries per day
- 1 concrete pump arrival/departure per day
- Associated construction light vehicle movements.

3 Nearest sensitive receivers

The proposed traffic route along Vanessa Street/The Crescent/Commercial Road, Kingsgrove passes adjacent to an industrial area on the north side of the route, with the nearest sensitive receivers located on the southern side of the Airport & East Hill rail line at the ends of Orbel, Morgan, Sutcliffe, Hobbs Streets an, Turon & Northcott Avenues, Kingsgrove.

The nearest sensitive receiver to the proposed traffic route, is a residential receiver located at 8 Orbell St, Kingsgrove. This receiver is located across the rail line from the proposed traffic route, approximately 50 m from the heavy vehicle route.

4 Construction traffic noise objectives

4.1 Relevant requirements

This Construction Traffic Noise Assessment has been prepared specifically to address Condition D46 of the Conditions of Approval in relation to construction traffic noise impacts from local roads associated with the WestConnex New M5 Project.

As outlined for previous assessments of construction traffic for the WestConnex New M5 Project [TH014-05 01F19 WXC_NM5 KGR Traffic (r4), dated 19 January 2017], the Conditions of Approval (more specifically Conditions D26 and D27) do not reference the NSW Road Noise Policy (RNP) (DECCW 2011). Condition D16 references the NSW Interim Construction Noise Guideline (ICNG) (DECCW 2009) in relation to construction noise management levels. Noise from construction traffic on public roads is not assessed under this guideline, although the guideline does reference the Environmental Criteria for Road Traffic Noise (ECRTN) (EPA 1999), which has been superseded by the RNP. As such, the RNP has been used to assess the traffic noise impacts in this assessment.

For existing residential receivers affected by *additional traffic on existing roads generated by land use developments* (in this case the construction compound) the assessment criteria for the day period is 55 dB(A) $L_{Aeq}(1 \text{ hour})$.

Where existing traffic noise levels are above the noise assessment criteria, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding 'without construction'. An increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person.

4.2 Road traffic noise objectives

Due to the nature of the industrial lots adjacent to the proposed truck route, it is assumed that some existing traffic noise would be generated by these sites.

As such, assuming existing traffic noise levels are at least 55 dB(A), if the new traffic noise impacts are limited to 53 dB(A) then the overall traffic noise level will not exceed 57 dB(A), 2 dB above the criteria.

If the existing traffic noise levels are greater than this assumption, the overall traffic noise level increase will remain below 2 dB(A).

If the existing traffic noise levels are less than this assumption, traffic noise levels will comply with the RNP 55 dB(A) $L_{Aeq}(1 \text{ hour})$ requirement.

5 Assessment

5.1 Modelling and assumptions

It has been assumed that during standard construction hours, that up to 8 heavy vehicle movements (eg. 4 trucks in and 4 out) could take place during any hour period.

Noise modelling for these additional heavy vehicle movements has been undertaken using the haul route calculation method outlined in British Standard BS 5228:2009 "Code of practice for noise and vibration control on construction and open sites". Truck noise source levels were assumed to be a sound power level of 108 dB(A), and the trucks are assumed to be travelling at 50 km/hr along these local roads.

5.2 Results

Noise levels have been predicted at the closest residential receiver to the proposed route at 8 Orbell St, Kingsgrove. Table 1 presents the predicted the noise levels at this nearest residential receiver from the proposed heavy vehicle movements, and the resulting overall traffic noise level with consideration of the worst case existing traffic noise levels.

Table 1 - Vanessa Street/The Crescent/Commercial Road, Kingsgrove heavy vehicle predicted noise levels

Receiver details	Assessment distance (m) (1 m from residential façade)	Proposed additional heavy vehicle movements, $L_{Aeq}(1 \text{ hour})$		With existing traffic noise levels, $L_{Aeq}(1 \text{ hour})$		Increase in traffic noise level, $L_{Aeq}(1 \text{ hour})$
		Predicted noise level ¹	Assessment limiting level	Assumed existing traffic noise level	Total predicted worst case traffic noise level	
Residential receiver - 8 Orbell St, Kingsgrove	49	53	53	55	57	2

Notes:

1. Noise level is façade corrected by 2.5 dB(A)

6 Discussion/Recommendations

These predicted traffic noise levels indicate the proposed heavy vehicle route can be managed in such a way as to meet the RNP daytime requirements for traffic noise impacts from additional traffic on existing local roads from traffic generating development.

As such with the incorporation of the following management methods, noise impacts can be controlled to within the requirements of the RNP.

1. Hourly truck movements are managed within the assumed maximum hourly movements of up to 8 heavy vehicle movements per hour.
2. Drivers have undertaken the heavy vehicle code of conduct training (see Construction Traffic Management Plan (M5N-TM-PLN-PWD-0001)).

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Authorised
14.07.2017	First issue	-	0	■	■	■

Important Disclaimer:

The work presented in this document was carried out in accordance with the Renzo Tonin & Associates Quality Assurance System, which is based on Australian Standard / NZS ISO 9001.

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In preparing this report, we have relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, we have not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

We have derived data in this report from information sourced from the Client (if any) and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination and re-evaluation of the data, findings, observations and conclusions expressed in this report.

We have prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

The information contained herein is for the purpose of acoustics only. No claims are made and no liability is accepted in respect of design and construction issues falling outside of the specialist field of acoustics engineering including and not limited to structural integrity, fire rating, architectural buildability and fit-for-purpose, waterproofing and the like. Supplementary professional advice should be sought in respect of these issues.

References

1. WestConnex New M5 Construction Noise and Vibration Management Plan (TH014-05 01F01 WXC_NM5 CNVMP)
2. WestConnex New M5, Construction Traffic Noise Assessment: Wirega Avenue and Garema Circuit, Kingsgrove (TH014-05 01F19 WXC_NM5 KGR Traffic (r4), dated 19 January 2017)
3. Department of Environment and Climate Change 2009 NSW Interim Construction Noise Guideline (ICNG),
4. NSW Department of Environment, Climate Change and Water 2011 Road Noise Policy (RNP)
5. Environment Protection Authority 1999 NSW Environmental Criteria for Rd Traffic Noise (ECRTN)

APPENDIX A Glossary of terminology

The following is a brief description of the technical terms used to describe noise to assist in understanding the technical issues presented.

Adverse weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment period	The period in a day over which assessments are made.
Assessment point	A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level (see below).
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of every day sounds: 0dB The faintest sound we can hear 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 115dB Limit of sound permitted in industry 120dB Deafening
dB(A)	A-weighted decibels. The A-weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz), but is less effective outside these frequencies.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.

L _{Max}	The maximum sound pressure level measured over a given period.
L _{Min}	The minimum sound pressure level measured over a given period.
L ₁	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L ₁₀	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L ₉₀	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
L _{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain L _{eq} sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.
Adverse weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment period	The period in a day over which assessments are made.
Assessment point	A point at which noise measurements are taken or estimated. A point at which noise measurements are taken or estimated.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level (see below).

Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of every day sounds: 0dB The faintest sound we can hear 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 115dB Limit of sound permitted in industry 120dB Deafening
dB(A)	A-weighted decibels. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz), but is less effective outside these frequencies.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
L _{Max}	The maximum sound pressure level measured over a given period.
L _{Min}	The minimum sound pressure level measured over a given period.
L ₁	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L ₁₀	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L ₉₀	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
L _{eq}	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain L _{eq} sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.

Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.

HV Movement Report: The Crescent, Kingsgrove

Appendix B: Consultation

