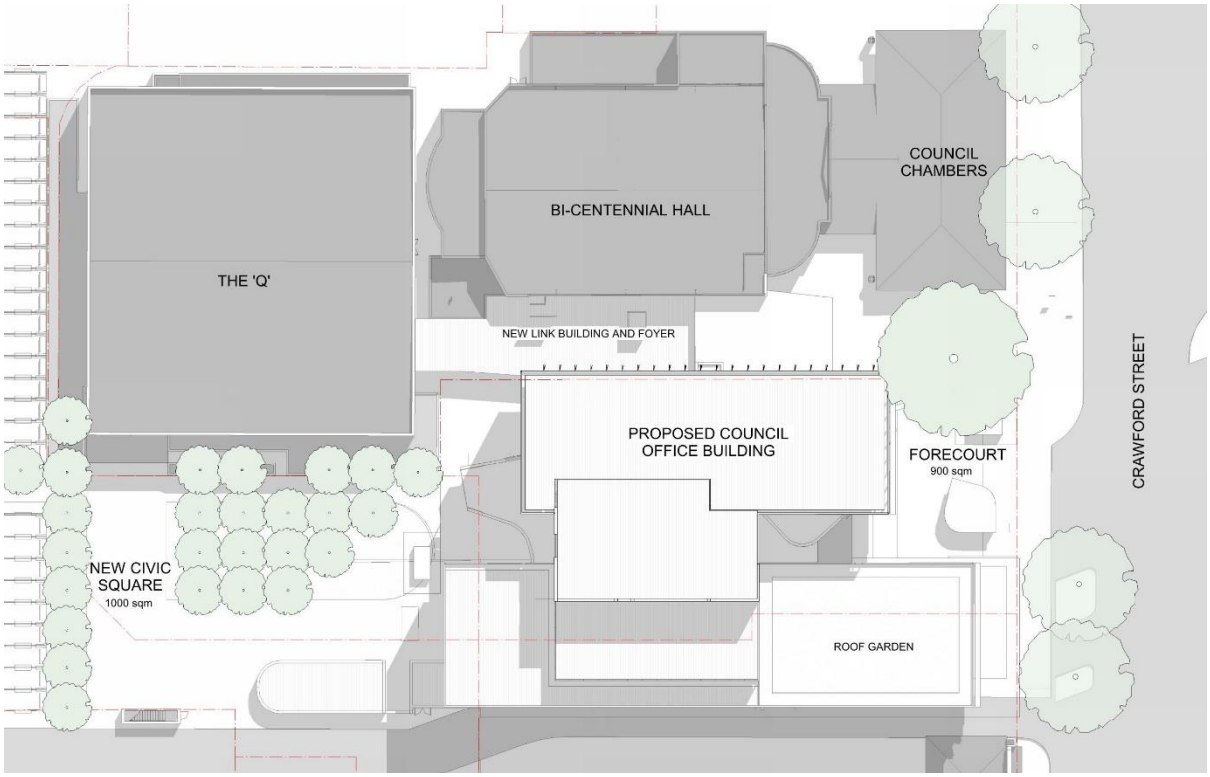
COX ARCHITECTURE

QPRC HEADQUARTERS 257 CRAWFORD STREET QUEANBEYAN

NOISE IMPACT ASSESSMENT FOR DEVELOPMENT APPLICATION SUBMISSION

AUGUST 2019



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QPRC Headquarters 257 Crawford Street Queanbeyan
Noise Impact Assessment for Development Application submission

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REV	DATE	DETAILS
0	05/08/2019	Noise impact assessment report for DA
1	06/08/2019	Revision to reflect latest design

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Reviewed by:	Zhang Lai	05/08/2019	
Approved by:	Zhang Lai	05/08/2019	

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EXECUTIVE SUMMARY

WSP Australia Pty Ltd (WSP) has been engaged to conduct a noise impact assessment as part of the Development Application for the proposed commercial development at 257 Crawford Street, Queanbeyan NSW.

Measurements of the prevailing noise conditions were undertaken to determine the applicable industrial noise limits as outlined in the NSW Noise Policy for Industry at nearby noise sensitive receivers and potential traffic noise intrusion assessments.

Various noise sensitive receivers near the proposed development have been identified, including residential, educational, places of worship, and a mixture of commercial receivers. Applicable acoustic assessment criteria have been determined based on the applicable NSW policies and Australian standard, including:

- QPRC Queanbeyan Development Control Plan 2012 (QDCP)
- Queanbeyan Local Environmental Plan 2012 (QLEP)
- NSW Noise Policy for Industry 2017 (NSW NPfI)
- NSW Road Noise Policy 2011 (NSW RNP)
- Australian/New Zealand Standard AS 2107:2016 – Acoustics – Recommended design sound levels and reverberation times for building interiors.

In regard to environmental noise emissions, the following have been reviewed:

- Proposed building services – preliminary design available; subject to further assessment during detailed design
- Activities associated with the proposed office building (car park, waste collection, retail on ground level) – minor noise impact expected and generally compatible with surrounding land uses
- Notable increase in road traffic noise not expected

In regard to noise intrusion, recommended preliminary façade constructions have been provided to demonstrate that the nominated targets can be achieved with commercially available products (assuming open plan offices). Further detailed modelling is recommended to confirm the façade requirements during the detailed design stages.

It is concluded that the proposed development can be designed to have limited acoustic impact and meet the applicable environmental noise emission criteria at the nearest sensitive receivers.

1 PROJECT BACKGROUND

WSP Australia Pty Ltd (WSP) has been engaged by Cox Architecture to conduct a noise impact assessment as part of the Development Application for the proposed new Queanbeyan-Palerang Regional Council (QPRC) Headquarters at 257 Crawford Street, Queanbeyan NSW.

1.1 PROJECT BACKGROUND

The Project is the design of a new commercial building (including basement) to be primarily occupied by QPRC as outlined below:

- A seven-level 7,000 - 7,500sqm gross floor area (GFA) building comprising 6,000sqm office, meeting rooms, public space and smart hub/co-work space (which accommodates 200 staff, plus 10% growth) and includes additional lettable office space
- Basement level car parking for approximately 100 vehicles
- A new on-grade car park to replace the existing on-grade car park
- Consideration given to a roof-top recreation space

It is understood that the QPRC Council Chambers is currently being retained in the 253 Crawford Street heritage building. Allowance has however been made in the new building for possible future inclusion.

1.2 DESIGN STANDARDS

This report has been written with reference to the following documents, which set out acoustic criteria for commercial developments within the QPRC local government area (LGA) and the State of New South Wales (NSW):

- QPRC Queanbeyan Development Control Plan 2012 (QDCP)
- Queanbeyan Local Environmental Plan 2012 (QLEP)
- NSW Noise Policy for Industry 2017 (NSW NPfI)
- NSW Road Noise Policy 2011 (NSW RNP)

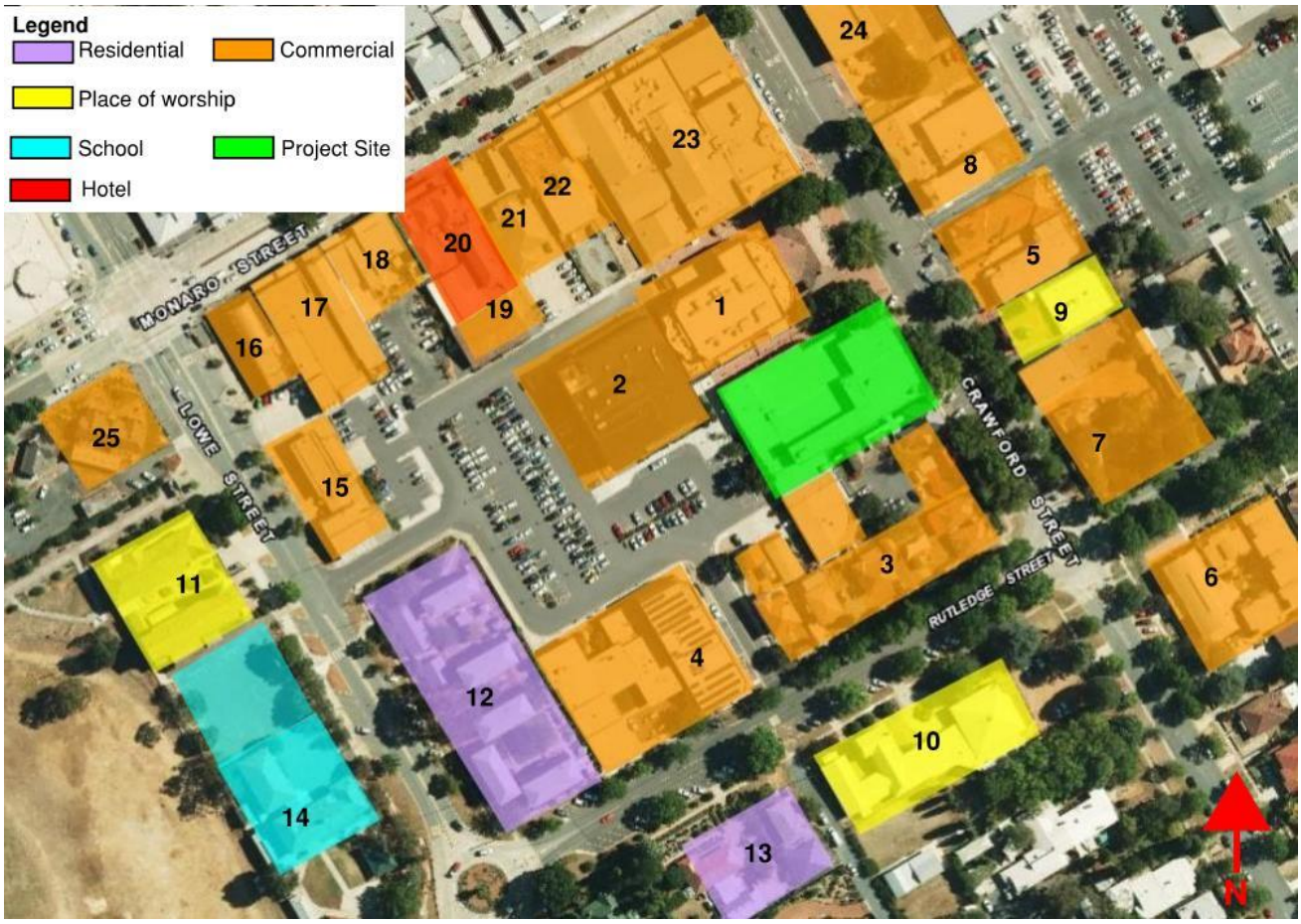
Furthermore, the following Standards and Industry guidelines are referenced in this report:

- Australian/New Zealand Standard AS 2107:2016 – Acoustics – Recommended design sound levels and reverberation times for building interiors.

1.3 SITE LOCATION AND IDENTIFIED RECEIVERS

The new QPRC Headquarters development is bounded by Crawford street to the east and Rutledge street to the south. The site is predominantly surrounded by commercial building, as shown in Figure 1.1.

Table 1.1 outlines the identified noise sensitive receivers which have the potential to be affected by noise emissions from the proposed development. Approximate distances from the proposed development have also been provided.



Source: NSW SIX Maps, accessed 22/07/2019

Figure 1.1 Location map of identified receivers in relation to proposed development

Table 1.1 Identified nearest noise sensitive receivers

LOCATION NUMBER	RECEIVER/LOCATION	TYPE OF RECEIVER (AS PER NSW NPfI)	APPROXIMATE DISTANCE FROM PROJECT SITE (m)
1	253 Crawford Street, Queanbeyan Bicentennial Hall and Council Chambers	Commercial	10
2	Queanbeyan Performing Arts Centre	Commercial	7
3	14 Rutledge Street[1]	Commercial	Adjacent to project site
4	6 Rutledge Street, Queanbeyan City Library	Commercial	46
5	262 Crawford Street, RB Smith Community Centre	Commercial	37
6	284 Crawford Street, Saint Benedict's Community Centre	Commercial	100
7	276 Crawford Street, Queanbeyan Physiotherapy Centre	Commercial	37
8	258 Crawford Street	Commercial	42
9	266 Crawford Street, Macedonian Orthodox Church	Place of worship	33

LOCATION NUMBER	RECEIVER/LOCATION	TYPE OF RECEIVER (AS PER NSW NPfI)	APPROXIMATE DISTANCE FROM PROJECT SITE (m)
10	13 Rutledge Street, Queanbeyan Uniting Church	Place of worship	100
11	47 Lowe Street, Saint Raphael's Catholic Church	Place of worship	180
12	62 Lowe Street	Residential	106
13	9 Rutledge Street	Residential	109
14	Saint Gregory's Primary School, Lowe Street	School classroom	180
15	44-46 Lowe Street, BP Petrol Station	Commercial	140
16	2 Monaro Street	Commercial	165
17	10 Monaro Street	Commercial	125
18	28 Monaro Street	Commercial	124
19	40 Monaro Street, Bottlemart	Commercial	76
20	40 Monaro Street, Walsh's Hotel	Hotel	88
21	52 Monaro Street	Commercial	78
22	58 Monaro Street	Commercial	75
23	72-74 Monaro Street, Cassidy's Arcade	Commercial	50
24	98 Monaro Street	Commercial	90
25	1 Farrer Place, Queanbeyan Visitor Information Centre	Commercial	200

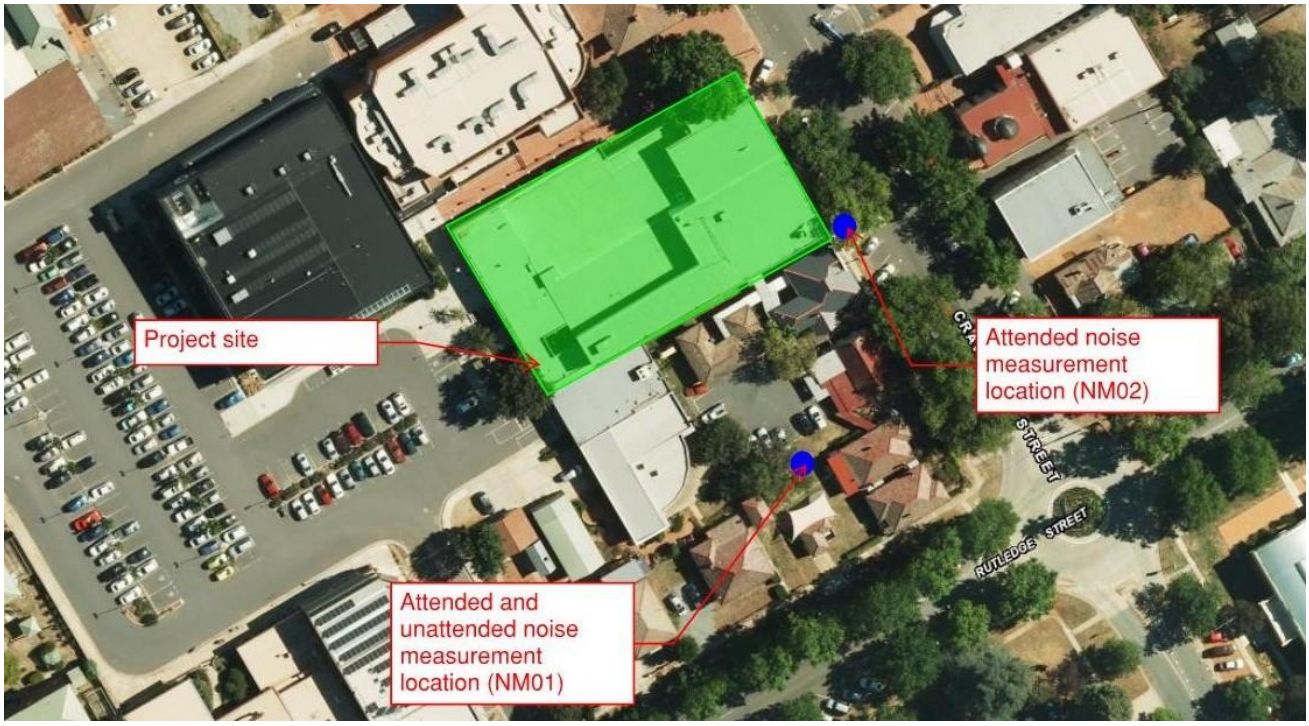
(1) Possible future development

2 EXISTING ENVIRONMENT

This section provides a summary of the relevant baseline noise data, including the location, dates and measured noise levels. To establish the acoustic performance for both noise ingress and noise egress, the prevailing external noise environment has been established with the completion of attended and unattended noise measurements.

2.1 MONITORING LOCATIONS

The noise monitoring locations, shown in Figure 2.1, were selected to characterise the existing ambient noise environment of the area surrounding the proposed development site and to determine road traffic noise potentially impacting on the proposed development.



Source: NSW SIX Maps, accessed 22/07/2019

Figure 2.1 Noise measurement locations

2.2 WEATHER CONDITIONS

During the surveys, the weather was recorded from Canberra Airport BOM Weather Station 70351, located approx. 6 km north from the project site.

In accordance with the NSW NPfI, any noise monitoring results during adverse weather conditions have been excluded from the dataset. Adverse weather conditions are defined in the NSW NPfI during periods with:

- Wind speeds higher than 5 m/s; and/or,
- Any rain in the 15 minute period

2.3 INSTRUMENTATION AND QUALITY CONTROL

The noise monitoring equipment was fitted with windshields and were field calibrated before and after monitoring. No significant drifts in calibration (± 0.5 dB) were noted.

All equipment was last calibrated by a NATA-approved laboratory less than two years ago and have current calibration certificates as required in AS1055:2018. Details of all equipment used to conduct the noise survey are presented in Table 2.1. Copies of the calibration certificates can be provided upon request.

Table 2.1 Noise monitoring equipment

MANUFACTURER AND MODEL NO.	SURVEY METHOD	SERIAL NO.	CALIBRATION DUE DATE
EL-316	Unattended logging (NM01)	16-207-008	31/05/2021
Rion NC-74	Calibrator	34315156	10/04/2020
Norsonic 140	Attended measurements (NM02)	1406503	24/01/2020

2.4 UNATTENDED NOISE LOGGING

Unattended noise monitoring was conducted from Thursday 27 June to Wednesday 10 July 2019. The results of this noise monitoring are detailed in the following.

The Rating Background Noise Level (RBL) is the background noise level used for assessment purposes at the nearest potentially affected receiver. The RBL is defined as the 90th percentile of the daily background noise levels during each assessment period. A summary of the measured RBL levels and $L_{Aeq;\ 15\ minute}$ noise levels at the survey locations are presented in Table 2.2.

Table 2.2 Summary of unattended noise measurement results

LOCATION ID	TIME PERIOD[1]	dBA $L_{eq\ (15\ minute)}$	RBL dBA $L_{90\ (15\ MINUTE)}$
14 Rutledge Street, unattended noise measurement location (NM01)	Day	60	49
	Evening	55	45
	Night	50	44

(1) Day: the periods from 7.00 am to 6.00 pm Monday to Saturday; or 8.00 am to 6.00 pm on Sundays and public holidays; Evening: the period from 6.00 pm to 10.00 pm; Night: the remaining periods.

2.5 OPERATOR ATTENDED NOISE SURVEY

WSP carried out operator attended measurements to characterise the noise environment and identify the contributors to the acoustic environment. Operator attended measurements were conducted at NM01 on Thursday 27 June 2019 and Wednesday 10th July 2019. Noise measurement of traffic noise were conducted at street level adjacent to the project site at 257 Crawford Street (NM02) on Tuesday 23 July 2019. The results of the attended noise surveys and observations are detailed in Table 2.3 below.

Table 2.3 Summary of attended noise monitoring results

LOCATION	TIME	dBA $L_{90\ T}$	dBA $L_{eq\ T}$	OBSERVATIONS
Attended noise measurement location (NM01) (14 Rutledge Street)	27 June 2019 04:19pm to 04:34pm 15 min	49	55	The noise environment was dominated by traffic on Crawford Street and Rutledge Street (approx. 55 to 60 dBA). Ambient noise from birdsong and vehicles using adjacent carpark
Attended noise measurement location (NM01) (14 Rutledge Street)	10 July 2019 09:15am to 09:30am 15 min	46	57	The noise environment was dominated by vehicle traffic on Crawford Street and Rutledge Street (approx. 55 to 58 dBA) Noise contribution from birdsong
Attended noise measurement location (NM02) (257 Crawford Street)	23 July 2019 07:54am to 08:09am 15 min	56	67	The noise environment was dominated by passing cars, trucks and buses on Crawford Street Minor noise contribution from traffic on Rutledge Street and Monaro Street. Free-flow traffic (approx. 68 to 74 dBA) Loud traffic (bus, truck, etc.) approx..75 to 77dBA

3 PROJECT CRITERIA

Noise criteria applicable to the project are derived from various Australian Standards, local and state policies and industry guidelines.

3.1 LOCAL POLICIES

Section 2.3.6 of the QPRC QDCP – Part 2 (All Zones) outlines the following noise and vibration control requirements for new developments:

To ensure development is designed so noise and vibration from new businesses, light industrial and leisure/cultural/entertainment venues and other noise generating activities do not unacceptably affect the amenity of nearby residential and other noise or vibration sensitive uses

Based on the QLEP (reproduced in Figure 3.1) the proposed development is currently located in Commercial Core (B3) zone which has the objective to provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community. Surrounding land use zones include:

- Low Density Residential (R2)
- Public Recreation (RE1)

Figure 3.1 Queanbeyan Local Environmental Plan 2012 excerpt indicating site location and surrounding land uses

3.2 ENVIRONMENTAL NOISE EMISSIONS

Noise emissions from the proposed development to surrounding noise sensitive areas are required to comply with the requirements of the NSW NPfI.

The assessment procedure for industrial noise sources has three components:

- Controlling intrusive noise impacts in the short term for residences
- Maintaining noise level amenity for particular land uses for residences and other land uses
- Assessment of sleep disturbance for residences

In assessing the noise impact of industrial sources, all three components must be taken into account for residential receivers. In most cases, only one will become the limiting criterion and form the project trigger levels for the industrial source under assessment.

3.2.1 PROJECT INTRUSIVENESS NOISE LEVEL

The project intrusiveness noise level for residential receivers prescribed in the NSW NPfI may be summarised as:

$$\mathbf{L_{Aeq;\ 15\text{-}minute} \leq Rating\ Background\ Level\ (L_{A90}) + 5\ dB(A)}$$

Based on the RBL as outlined in Section 2.4, the project intrusiveness noise level has been established for the proposed development in accordance with the NSW NPfI and is presented in Table 3.1.

Table 3.1 Established Project Intrusiveness Noise Level, residential receivers only

RECEIVER LOCATION	TIME PERIOD	RBL dBA	PROJECT INTRUSIVENESS NOISE LEVEL (RBL + 5dB) dBA $L_{eq\ 15\text{-}min}$
62 Lowe Street 9 Rutledge Street	Day	49	**54**
	Evening	45	**50**
	Night	44	**49**

3.2.2 PROJECT AMENITY NOISE LEVELS

To limit continuing increases in noise levels, the maximum amenity noise level within an area from industrial noise sources should not normally exceed the amenity noise levels prescribed in the NSW NPfI.

The recommended amenity noise levels represent the objective for **total** industrial noise at a receiver location, whereas the **project amenity noise level** represents the objective for noise from a **single** industrial development at a receiver location as follows:

Project amenity noise level = recommended amenity noise level (Table 2.2 of NSW NPfI) minus 5 dB(A)

The amenity criterion has been established at the identified receivers based on the results of the attended and unattended noise survey. The established amenity criteria applicable to the proposed development are presented in Table 3.2.

It is noted that the project has been identified as being in an area of with high traffic noise. Based upon our observations, traffic has been identified as the dominant noise source at the site and it is unlikely that traffic noise levels will decrease in the future. It is also noted that for some receivers, the existing traffic noise is 10dB or more above the recommended amenity noise level for the area. Therefore, project amenity noise levels can be set at 15dB below existing traffic noise levels (as per Section 2.4.1 of the NSW NPfI).

Table 3.2 Established Project Amenity Noise Level

LOCATION	TYPE OF RECEIVER	RECOMMENDED AMENITY NOISE LEVEL (ANL) dBA $L_{eq\ period}$	PROJECT AMENITY NOISE LEVEL (ANL -5dB) dBA $L_{eq\ period}$	PROJECT ADJUSTED ANL dBA $L_{eq\ period}$		
				Day[1]	Evening[1]	Night[1]
General Commercial	Commercial	65	60	**60**	**60**	**60**
Saint Gregory's Primary School, Lowe Street	School classroom (external)	50[2,3]	45	*(60-15)*[4] **45**	-	-
Saint Gregory's Primary School, Lowe Street (playground)	Active recreation area	55	50	**50**	-	-
266 Crawford Street, Macedonian Orthodox Church	Place of worship (external)	50[2]	45	*(60-15)*[4] **45**	**45**	**45**
62 Lowe Street 9 Rutledge Street	Residential (urban)	Day: 60 Evening: 50 Night: 45	Day: 55 Evening: 45 Night: 40	**55**	**45**	**40**
40 Monaro Street, Walsh's Hotel	Hotel[5]	Day: 65 Evening: 55 Night: 50	Day: 60 Evening: 50 Night: 45	**60**	**50**	**45**

(1) day: the period from 7:00 am to 6:00 pm Monday to Saturday; or 8:00 am to 6:00 pm on Sundays and public holidays; evening: the period from 6:00 pm to 10:00pm; night: the remaining periods.

(2) A 10dB internal to external correction has been applied, in accordance with Section 2.6 of the NSW NPfI.

(3) The existing school and childcare are affected by existing industrial noise sources. Therefore, the recommended amenity noise level has been increased to 50 dBA $L_{eq(1hr)}$, as per the last note of Table 2.2 of the NSW NPfI.

(4) Traffic has been identified as the dominant noise source at the site. In this case, the project adjusted amenity noise level can be set 15 dB below the existing ambient traffic noise level (as per Section 2.4.1 of the NSW NPfI)

(5) The recommended amenity noise level has been set at 5 dBA above the recommended amenity noise level for a residence in the relevant noise amenity area as per Table 2.2 of the NSW NPfI

3.2.3 MAXIMUM NOISE LEVEL EVENT ASSESSMENT

The potential for sleep disturbance from maximum noise level events from premises during the night-time period needs to be considered. Sleep disturbance is considered to be both awakenings and disturbance to sleep stages.

Where the development night-time noise levels at a residential location exceed the following, a detailed maximum noise level event assessment should be undertaken.

- $L_{Aeq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater.

3.2.4 PROJECT NOISE TRIGGER LEVEL

In assessing the noise impact of the proposed development on surrounding residential receivers, both the intrusiveness and amenity criterion must be considered. In most cases, only one criterion will become the limiting criterion and form the project noise trigger levels (PNTL) for the industrial source under assessment.

It is noted that, in order to standardise the time periods for the intrusiveness and amenity noise levels, the following conversion between $L_{eq,\ period}$ and $L_{eq,\ 15\ minute}$ has been applied (as per Section 2.2 of the NSW NPfI):

$$L_{Aeq,15min} = L_{Aeq,\ period} + 3\ dB$$

The PNTL is the lowest value of intrusiveness or project amenity noise level after conversion to $L_{Aeq,15min}$.

As required in Section 2.2 of the NSW NPfI, all project noise trigger levels and limits are expressed as $L_{Aeq,15min}$, unless otherwise expressed. A summary of all relevant criteria is presented in Table 3.3.

Table 3.3 Summary of Project Noise Trigger Levels (PNTL)

RECEIVER LOCATION	ASSESSMENT/ RECEIVER TYPE	PROJECT NOISE TRIGGER LEVELS dBA $L_{eq\ 15\text{-}min}$		
		DAY[1]	EVENING[1]	NIGHT[1]
62 Lowe Street 9 Rutledge Street (residential)	*Intrusiveness*	*54*	*50*	*49*
	Amenity	*58*	*48*	*43*
	PNTL	**54**	**48**	**43**
General Commercial	Commercial	**63**	**63**	**63**
Saint Gregory's Primary School, Lowe Street[2]	School classroom (external)	**48**	-	-
	Playground (active recreation area)	**53**	-	-
266 Crawford Street, Macedonian Orthodox Church	Place of worship (external)	**48**	**48**	**48**
40 Monaro Street, Walsh's Hotel	Hotel	**63**	**53**	**48**

(1) day: the period from 7:00 am to 6:00 pm Monday to Saturday; or 8:00 am to 6:00 pm on Sundays and public holidays; evening: the period from 6:00 pm to 10:00pm; night: the remaining periods.

(2) It is assumed that the school will generally not likely be in use for teaching in the evening and night periods.

3.3 ROAD TRAFFIC NOISE

To assess the effect of the proposed development in terms of the increase of traffic on the nearby residences, the NSW RNP provides objective criteria. The relevant criteria have been drawn out of the policy and detailed below.

The road policy is used in this assessment to address noise associated with potential traffic increases on the surrounding road network due to the proposed development. Noise generated by additional traffic on the road is to be assessed against façade corrected noise levels when measured in front of a building façade. The external criteria are assessed at 1 metre from the affected residential building façades and at a height of 1.5 metres from the floor. The internal criteria are assessed at the centre of the habitable room most exposed to traffic noise, with operable windows open to provide sufficient ventilation. This criterion is outlined in Table 3.4 and Table 3.5.

Table 3.4 Noise assessment criteria - residential land uses (Source: NSW RNP Section 2.3.1)

PROJECT TYPE/LAND USE	ASSESSMENT CRITERIA	
	DAY (7am-10pm)	NIGHT (10pm-7am)
Land use development with potential to create additional traffic on arterial/ sub-arterial/ collector roads	60 dBA $L_{eq\ (15\ hour)}$ (external)	55 dBA $L_{eq\ (9\ hour)}$ (external)

Table 3.5 Noise assessment criteria – non-residential land uses (Source: NSW RNP Section 2.3.1)

PROJECT TYPE/LAND USE	ASSESSMENT CRITERIA	
	DAY (7am-10pm)	NIGHT (10pm-7am)
SCHOOL CLASSROOMS	40 dBA $L_{eq\ (1\ HOUR)}$ (internal)	-
SCHOOL PLAYGROUND - OPEN SPACE (PASSIVE USE)	55 dBA $L_{EQ\ (15\ HOUR)}$ (external)	-
PLACES OF WORSHIP	40 dBA $L_{eq\ (1\ HOUR)}$ (internal)	40 dBA $L_{Aeq\ (1\ HOUR)}$ (internal)

It is noted that the prevailing noise levels as outlined in Table 2.2 were dominated by traffic noise and are above the day period assessment criteria.

Where existing traffic noise levels are above the noise assessment criteria, the NSW RNP aims to protect against excessive decreases in amenity as the result of a project. Where road traffic noise increases by more than 2dB as a result of a land use development, mitigation should be considered to control excessive increase in noise level. An increase of up to 2dB represents a minor impact that is considered barely perceptible to the average person.

Therefore, a 2dB increase in traffic noise levels has been used as an initial screening assessment criterion for receivers which are currently experiencing traffic noise levels greater than the assessment criteria in Table 3.4 and Table 3.5.

3.4 EXTERNAL NOISE INTRUSION

Recommended ambient noise levels for office spaces are provided in AS/NZS 2107:2016. This Standard recommends internal noise levels for building interiors based on building type and room usage.

3.4.1 PROJECT SPECIFIC EXTERNAL NOISE INTRUSION TARGETS

As there are no statutory requirements for commercial developments, guidance for external noise intrusion targets are taken from AS/NZS 2107:2016[1].

The proposed design targets for external noise intrusion into the various the spaces are summarised in Table 3.6. Internal noise levels due to external noise intrusion should be assessed at a minimum 3 metre distance from the façade.

Table 3.6 Recommended maximum external noise intrusion levels

OCCUPANCY	DESIGN SOUND LEVEL dBA $L_{eq;1\ hour}$
General Office Areas	≤ 45
Lobbies and Corridors	≤ 50
Public Spaces	≤ 45

[1] *AS/NZ 2017:2016 – Acoustics – Recommended design sound levels and reverberation times for building interiors*

4 ENVIRONMENTAL NOISE EMISSION ASSESSMENT

The following sections outline a preliminary review of potential environmental noise emissions to nearby noise sensitive receivers which have currently been identified to include:

- noise from building services equipment
- noise from operation and activities associated with the commercial accommodation and communal spaces
- noise from increased road traffic generation.

4.1 BUILDING SERVICES

Building service equipment for the development consists pad mounted transformer within the substation dedicated to the proposed development as well as plantrooms containing mechanical services equipment such as air handling units on the roof of both proposed buildings. It is also planned that the roof of the proposed north building will have boiler, chiller plant and three cooling towers installed. However, the development is in the early design stages and detailed design and selection of building services equipment has not yet been undertaken. Therefore, a detailed noise emission assessment from building services is not possible at this stage. However, all external plant will be required to be assessed during the detailed design stages to ensure compliance with the applicable acoustic criteria as outlined in Section 3.2. The assessment will include typical day, evening, and night-time operation, and emergency operations. Where necessary, acoustic mitigation measures will be applied to the design. These may include:

- Selection of quieter equipment
- Selection of equipment location
- Acoustic louvres
- Acoustic attenuators
- Acoustic barriers

4.2 OPERATION AND ACTIVITIES

4.2.1 CARPARK AND ASSOCIATED ACCESS

Car parking for the proposed council office building will be located within the basement as well as a modified existing on-grade carpark. It is noted that the proposed basement carpark is serviced by mechanical lifts. As the carpark and services are internal to the proposed building, airborne noise emission issues associated with this activity is unlikely and has not been considered further in this report.

It is also understood that the proposed basement carpark will be accessed via a ramp developed on an existing Council-operated on-grade carpark as shown in Figure 4.1. The noise characteristics associated with the use of the car park access ramp as well as the modified on-grade carpark is expected to be similar to the operation of the existing carpark and therefore additional noise impact is expected to be minor in nature.

Figure 4.1 Aerial view of location of proposed basement carpark access ramp

4.2.2 WASTE COLLECTION

NSW Environmental Protection Authority (EPA) has published *Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities* which incorporates best practice measures that can be implemented to minimise the noise associated with waste collection, such as reversing alarms and bins being emptied into the collection vehicles.

Noise associated with waste collection activities at the proposed development is not considered to be significant, as the location of proposed bin collection point is far enough away from neighbours, tenants and public areas to reduce the impact of noise during bin use and collection. Garbage collection is also already occurring at all neighbouring premises and not unique to the proposed development. Furthermore, the proposed bin collection point is accessed via a service lane between Crawford Street and Rutledge Street that allows the collection vehicles to move in one forward direction, eliminating the need for collection vehicles to reverse. Collections are also expected to occur at a general maximum frequency of once a week and the duration of impact to an individual noise sensitive receivers is typically short.

Additional noise impact associated with the garbage collection servicing the proposed development is therefore expected to be similar to the existing situation and minor.

4.2.3 RETAIL

It is noted that retail activities consisting of a proposed café within the foyer on the ground floor of the proposed office building and a kiosk external to the building. Associated noise generated from these activities are expected to include possible low level music and general retail noise, neither which are considered to have significant environmental noise impact. Such activities are also compatible and consistent with the existing land uses in the surrounding premises and therefore not expected to cause significant unfavourable noise impact. In addition, it is also expected that any issues with noise from these activities will be managed by the building owner (QPRC).

4.3 INCREASED ROAD TRAFFIC GENERATION

Increases to road traffic noise due to the development are subject to the NSW RNP as detailed in Section 3.3.

The future traffic flows have been reviewed based on the assumption that the traffic generation from the development will be approximately 1.1 two-way vehicle movements per hour, per 100 m^2 Net Lettable Area. Based on discussion with the project traffic consultant, it is understood that existing traffic flow in the collector roads surrounding the subject project site is in the order of at least 8000 vehicles per day, where 10% of the vehicle movements are assumed to occur during peak hours. The calculated increase in traffic flow from the development is summarised in Table 4.1.

Table 4.1 Summary of traffic flow increase in peak hour periods

TIME PERIOD	EXISTING TRAFFIC FLOWS (VEHICLES / HOUR)	INCREASED TRAFFIC FLOW (VEHICLES / HOUR)	PERCENTAGE INCREASE
Peak hours	800	**167**	20%

An increase of more than 2 dB requires an increase in traffic flows of more than 60% (assuming similar traffic composition). As the number of predicted new vehicle movements is significantly less than this threshold, it is anticipated that traffic noise in the surrounding roads will not increase by more than 2 dB and therefore additional road noise impact is expected to be minor.

5 NOISE INTRUSION ASSESSMENT

WSP has undertaken a preliminary assessment for noise intrusion impacting on the proposed development. The following section outline the preliminary results of this assessment.

5.1 ROAD TRAFFIC (AIRBORNE) NOISE

Detailed design of the glazing will be conducted during design development and detailed design stages of the project to identify any special requirements for the internal spaces that will be located along the building perimeter. Internal acoustic amenity requirements are as outlined in Section 3.4.

For the purpose of this high level acoustic assessment, the assessment considers open plan office space to be located on the building perimeter facing Crawford Street. Acoustic calculations have been performed based on the external and building dimensions shown in the current architectural design drawings. The minimum overall façade performance as outlined in Table 5.1 is expected to be required.

Table 5.1 Preliminary minimum façade sound insulation performance (subject to further detailed assessment)

Space type	Overall performance	Octave Band Centre Frequency						
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Office-open space	33 dB Rw	17	20	19	29	38	36	45

The overall facade performance is the composite performance of both the vision plus framing and non-vision element.

The proposed glazing façade configuration comprises of ≥6 mm float glass | ≥12 mm air gap | ≥6 mm float glass, and is expected to meet the nominated performance spec above. Such system is understood to be consistent with currently proposed façade glazing for the proposed building.

It should however be noted that, further detailed modelling and assessment is required to confirm the suitability of these preliminary glazing requirements and other (potentially more acoustic-sensitive) space types as more detailed design for the proposed development becomes developed.

From an acoustic perspective, glazing recommendations may also be refined for the different facades of the building. For example, the Eastern façade on Crawford Street will be exposed to higher noise levels compared to the Western façade facing the Queanbeyan Performing Arts Centre and carpark.

5.2 MECHANICAL SERVICES NOISE

As the proposed development is in the early design stages, detailed design of building services equipment has not been undertaken. Therefore, a detailed assessment is not possible during this stage. However, all external mechanical plant will be assessed during the detailed design stages to ensure compliance with the applicable acoustic criteria as outlined in Section 3.4.

6 CONCLUSIONS

A noise impact assessment has been undertaken for the proposed commercial development at 257 Crawford Street, Queanbeyan NSW.

Noise design objectives were set in accordance with criteria set out in NSW Noise Policy for Industry, NSW Road Noise Policy, QPRC Queanbeyan Development Control Plan 2012 and Queanbeyan Local Environmental Plan 2012, following an assessment of existing ambient and background noise levels for the area. Additional guidance has also been sought from AS/NZS 2107:2016 to assist with the preliminary assessment of noise intrusion into the proposed development.

In regard to environmental noise emissions, the noise assessment findings are summarised in Table 6.1.

Table 6.1 Environmental noise emission assessment findings

ITEM	LEVEL OF ACOUSTIC RISK	COMMENT
Building services (mechanical and electrical)	Minor to moderate	Subject to further assessment during detailed design
Car park and associated access road	Minor	Carpark to be accessed via existing Council-operated surface car park, additional noise impact expected to be minimal
Waste collection	Minor	Proposed siting allows collection vehicles to move in one forward direction, which is acoustically favourable. This activity also generally occurs at all neighbouring premises and not unique to the proposed development.
Retail	Minor	Proposed café and retail tenancy expected to emit low level of noise and generally compatible with existing land uses in the surrounding lands.

Environmental noise emission associated with the proposed development is expected to be minor. Compliance with the relevant noise trigger levels is expected to be achievable with due acoustic considerations during the detailed design process.

In regard to potential noise intrusion into the internal areas of the proposed development, typical glazing constructions to meet the relevant acoustic guideline levels (assuming open plan offices) have been provided. These will however be subjected to further review and refinement during the detailed design phase.

Overall, it is concluded that the proposed development can be designed to have limited acoustic impacts and meet the applicable environmental noise emission criteria at the nearest sensitive receivers.

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