CONSTRUCTION MANAGEMENT PLAN

BLOCK 1 SECTION 131 CAMPBELL

AUTHORISATION FOR ISSUE
This edition of the CMP
Revision 1, is approved and authorized for issue by Michael Gilmour

Michael Gilmour
Project Manager
Chase

14/11/2017
Date

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Contents

Site Compound / Worker Amenities & Construction Fencing

Site Compound

The site compound including the Site Amenities and Site Offices for Section 131 Project will be located adjacent to Block 1 Section 131 within the Koben and Section 131.

Site Fencing

Site fencing of the site will be done in two stages:
Stage 1 – Temporary fence around the site during the piling, shoring & bulk excavation works.
Stage 2 – Solid hoarding around the site during the balance of construction.

Materials & Machinery Storage

As the building includes a basement to boundary, the machinery and storage required for the initial construction will be contained within the site. If there is a requirement for any additional storage then the verges will be utilised.

Machinery that will be used on Section 131 will be as follows;

- 40-60t piling rig;
- Excavators and other heavy plant for excavation;
- Tip trucks to remove spoil from site;
- Rigid and semi-trailer delivery trucks;
- Tower Crane. There will be a JASO J560 Tower Crane with an approximate jib of 55.0m located centrally on the project;
- Manitou MT 523
- Hyster H3.00.DX Combined Gas/Unleaded Forklift
- 1no. Chase 6.0m x 3.0m Storage/Tool Container

Site Amenities

The proposed location of the site amenities will be adjacent to Block 1 Section 131.

Site shed amenities will include the following;

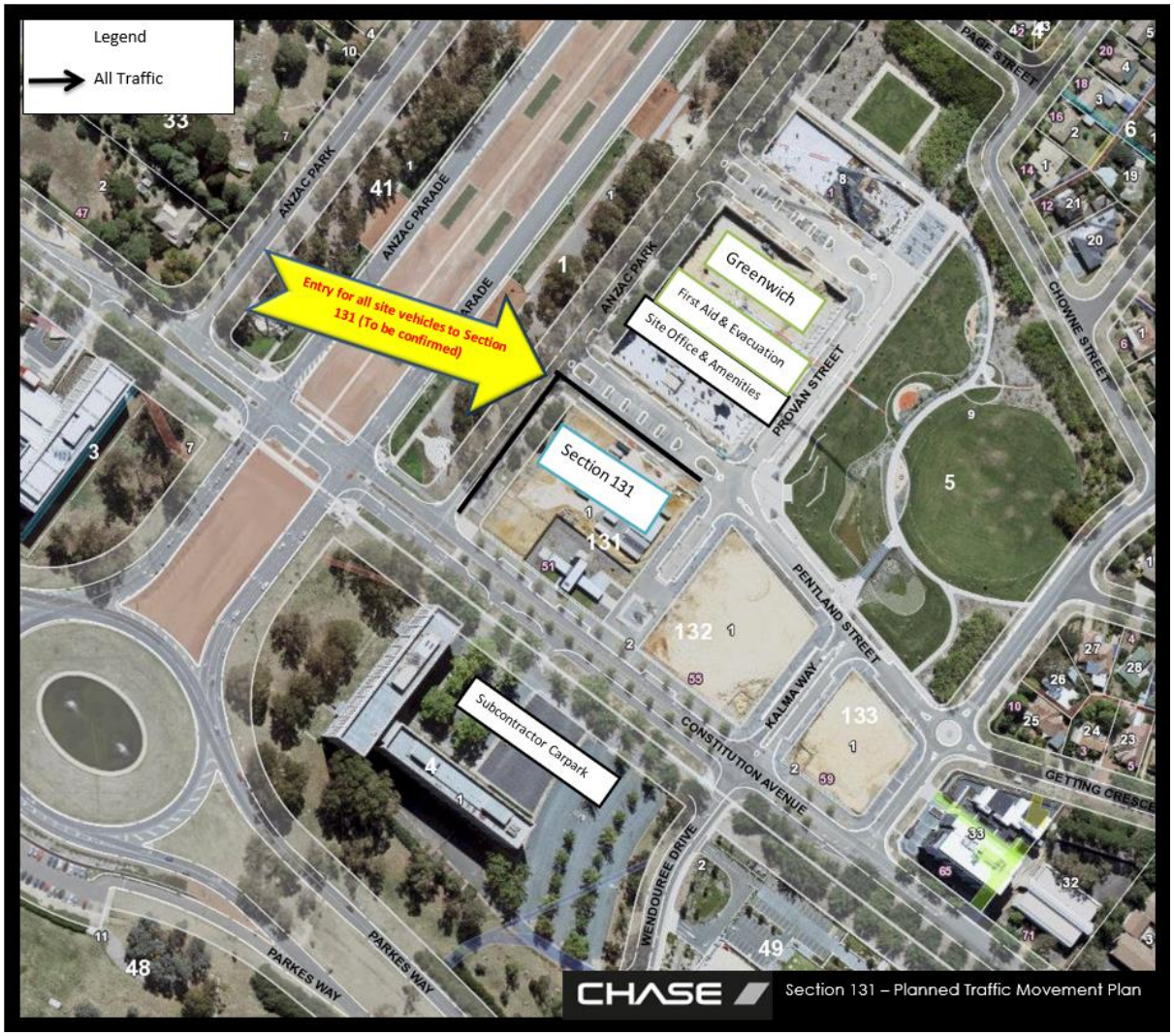
- 2no. 12.0m x 9.0m Site Office including meeting;
- 2no. 12.0m x 3.0m Subcontractor Lunch Rooms;
- 3no. 6.0m x 3.0m Toilet Blocks.

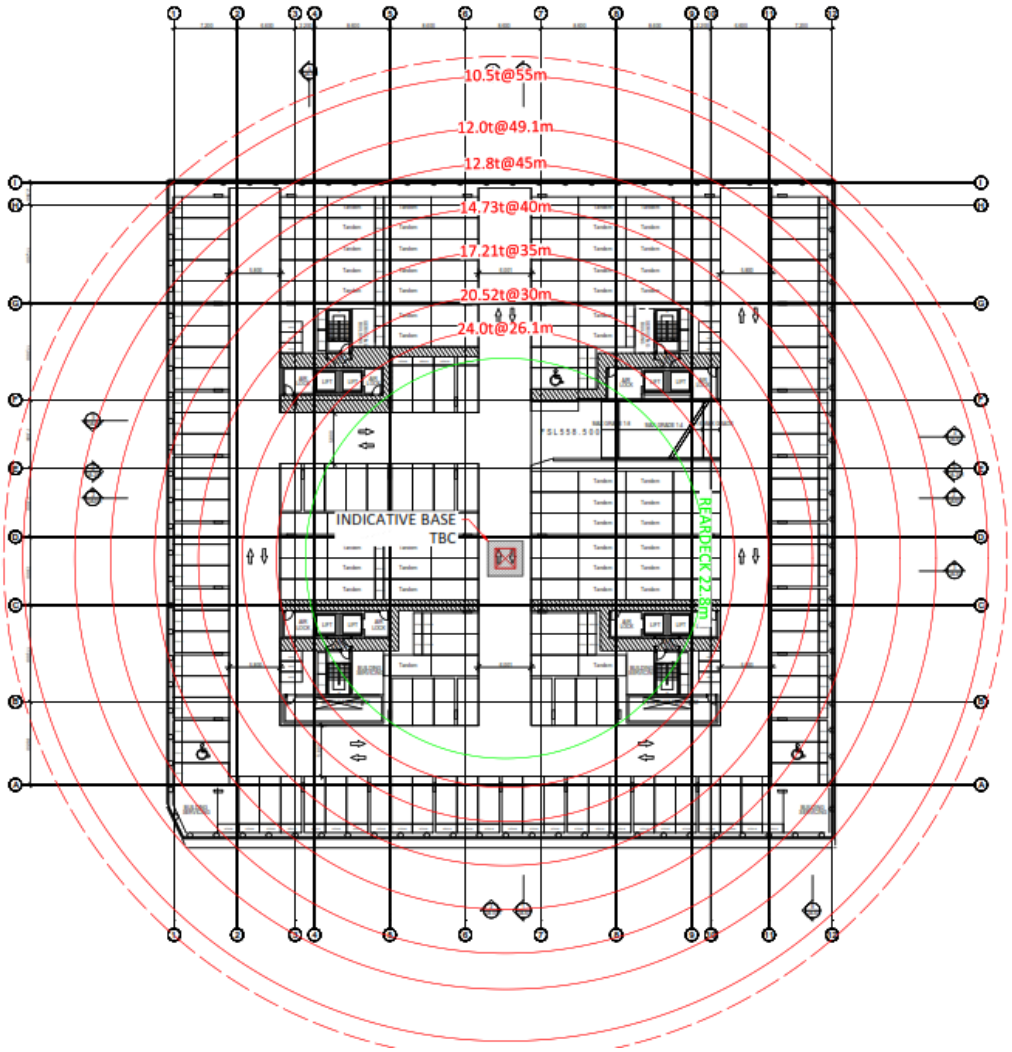
Vehicular Entry / Exit Points

Entry into site for construction vehicles will be through Gate 1 which is located off Pentland Street.

Site Management & Display suite

The Section 131 site Management team will operate out of the existing Greenwich Apartment building.
The display suite will also be located within the existing Greenwich Apartment building





Construction Working Hours

Site works at Section 131 are to be conducted between the following hours;

Monday to Friday – 7:00am to 6:00pm
Saturdays – 7:00am to 5:00pm
Sundays – As required after 9:00am, although not to exceed noise standards of 50dB(A)

Dust Mitigation Measures

Where building work generates dust, all reasonable and practicable measures will be taken to minimise dust.

The following procedures can achieve dust mitigation quite effectively depending on the situation at hand;

- Dampening the ground with a light water spray;
- Covering stockpiles and locating where are protected from the wind;
- Covering trucks loads that are transporting spoils to/from site;
- All trucks/machinery are to follow Koben site specific temporary traffic management plan to mitigate vehicle movements onsite;
- Constructing wind breaks on perimeter fencing, ie. Shade cloth.

Vibration Measures.

No onsite works will cause excessive vibration.

Noise Management Report

Acoustic Logic Noise Report has been completed for the development to identify the management of noise.

Temporary Traffic Management Plan

Attached is the development TTMP, when the finalised design is complete a site specific TTMP will be produced and approved.

Construction Workers Parking and Site Access

The proposed location for construction worker parking for the Section 131 Project is the public car park on the site across Constitution Ave. Site Staff and Workers will be notified of this on their induction into the site.

MANAGING DIRECTORS
MATTHEW PALAVIDIS
VICTOR FATTORETTO

GENERAL MANAGER
MATTHEW SHIELDS

C5 Block 1 Section 131 Campbell

Noise Management Plan

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TABLE OF CONTENTS

1 INTRODUCTION

This report presents our assessment of the potential noise impact including environmental noise on the acoustic amenity of proposed Block 1 Section 131 Campbell (Campbell 5 residential development) future occupants.

Additionally the relevant criteria for noise impact limiting noise generated from the operation of the proposed development have been presented in this report along with a number of other potential noise sources.

2 SITE DESCRIPTION

The proposed Block 1 Section 131 Campbell development is located within the block bound by Anzac Park East to the west.

The site location and measurement positions used as part of this assessment are detailed in the figure below.

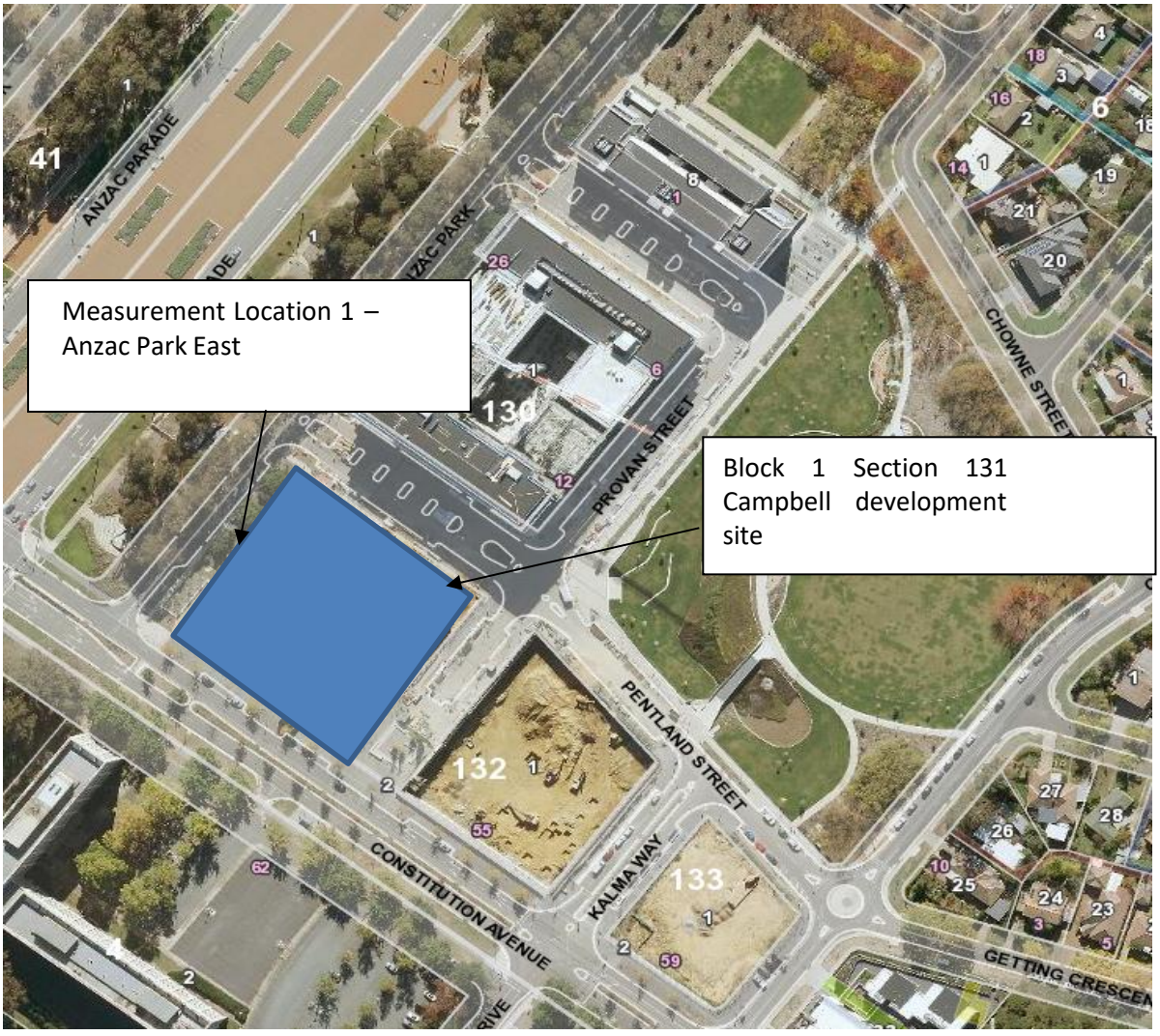


Figure 1 – Site Location and Noise Measurement Positions

3 ENVIRONMENTAL NOISE MEASUREMENTS

Measurements were performed generally in accordance with the Australian Standard AS 1055 - "Description and measurement of environmental noise - General Procedures".

3.1 MEASUREMENT LOCATION

Environmental noise levels were measured in the vicinity of the subject development. The measurement locations were determined to be representative of the relative noise exposure of the facade of the proposed development conditions. As the major source of noise impacting the site are the surrounding roadways and hence this is the location where noise measurements have been conducted.

3.2 TIME OF MEASUREMENTS

Attended noise monitoring of traffic noise was conducted at the site during a peak afternoon period of 3.30pm to 5pm on the 10th September, 2017.

3.3 MEASUREMENT EQUIPMENT

Noise measurements were obtained using a CEL-593 Type 1 Sound Level Analyser, set to A-weighted fast response. The sound level meter was calibrated before and after the measurements using a RION NC-73 Sound Level Calibrator. No significant drift was recorded.

3.4 NOISE DESCRIPTORS

Environmental noise constantly varies in level. Typically environmental noise is dominated by environmental noise which varies due to fluctuations in vehicle environmental speed, vehicle types, road conditions and environmental densities. Accordingly, it is not possible to accurately determine prevailing environmental noise conditions by measuring a single, instantaneous noise level. To accurately determine the effects of environmental noise a 15-20 minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters. These parameters are used to measure how much annoyance would be caused by a particular noise source.

In the case of environmental noise three principle measurement parameters are used, namely L_{10}, L_{90} and L_{eq}.

The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{10} parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced by the source.

Conversely, the L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

The L_{eq} parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. L_{eq} is important in the assessment of environmental noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of environmental noise.

Current practice favours the L_{eq} parameter as a means of measuring environmental noise, whereas the L_{10} parameter has been used in the past and is still incorporated in some codes. For the reasons outlined above, the L_{90} parameter is not used to assess environmental noise intrusion.

3.5 MEASURED NOISE LEVELS

Table 1 lists the measured L_{eq} dB(A) noise levels that were recorded at the site and will be used as the basis of this report.

Table 1 - Measured Environmental Noise Levels

MONITORING LOCATION	$L_{eq\ (15\ min)}$ dB(A)
Location 1 – Anzac Park East	67

4 PROJECT ACOUSTIC OBJECTIVES

The determination of an acceptable level of environmental noise within the residential apartments requires consideration of the activities carried out within the space and the degree to which noise will interfere with those activities

As sleep is the activity most affected by environmental noise, bedrooms are the most noise sensitive rooms. Higher levels of noise are acceptable in living areas without interfering with activities such as reading, listening to television, etc. Noise levels in utility spaces such as kitchens, bathrooms, laundries, etc can be higher.

This section of the report presents the assessment of environmental noise as required by Section 158 of the Territory Plan.

4.1 INTERNAL ENVIRONMENTAL NOISE OBJECTIVES

Internal environmental noise levels have been assessed in accordance with the project requirements and the Australian Standard AS2107:2000 and AS3671, for developments near minor roads which are detailed below and will be used as the assessment criteria for this project.

Table 2 - Environmental Noise Level Objectives

ROOM TYPE	NOISE LEVEL dB(A)
Bedrooms	35 dB(A) $L_{eq\ (9\ hours)}$
Living Rooms	40 dB(A) $L_{eq\ (24\ hours)}$

5 EVALUATION OF NOISE INTRUSION

Environmental noise intrusion into the apartments was assessed using the measured external noise levels reported in Section 3 above as a basis. The assessment is based on the preliminary drawings supplied to this office.

Calculations were performed taking into account the orientation of windows, the total area of glazing, facade transmission loss and room sound absorption characteristics. In this way the likely interior noise levels can be predicted.

6 RECOMMENDED CONSTRUCTIONS

6.1 GLAZING CONSTRUCTIONS

The typical glazing assemblies recommended to comply with internal noise level criteria are indicated in Table 3 below. In all cases, the selected glazing type reduces internal noise levels to within the nominated criterion for the various space types. The recommended glazing has been designed to control environmental noise intrusion.

The glazing thicknesses recommended are those needed to satisfy acoustic requirements and do not take into account other requirements such as structural, safety or other considerations. These additional considerations may require the glazing thickness to be increased beyond the acoustic requirement.

Table 3 - Recommended Glazing

Façade Location	Room Type	Typical Glazing Selection
Facing Anzac Park East	Bedrooms	6.39mm Laminated
	Living Areas	6.39mm Laminated
North East Façade	Bedrooms	6.39mm Laminated
	Living Areas	6mm Float
South West Façade	Bedrooms	6.39mm Laminated
	Living Areas	6mm Float
South East Façade	Bedrooms	6mm Float
	Living Areas	6mm Float

In addition to meeting the minimum glazing thickness requirements given, the design of the window mullions, perimeter seals and the installation of the windows/doors in the building openings shall not reduce the STC rating of the glazing assembly below the values nominated in Table 4. Note that mohair type seals will not be acceptable for the windows requiring acoustic seals.

The glazing shall be selected to meet all requirements and may result in increased glass thicknesses over those specified in this report but shall in no cases fall below the minimum thicknesses and requirements set out in this report.

The proposed suppliers should provide evidence that the window systems proposed have been tested in a registered laboratory with the recommended glass thicknesses and comply with the minimum STC requirements listed in Table 4.

Table 4 - Minimum STC of Glazing

Glazing Assembly	Minimum STC of Installed Window
6mm Float	29
6.38mm Laminated	30

6.2 ROOF/ CEILING CONSTRUCTIONS

Typical roof constructions of either light weight or concrete construction will be acoustically acceptable for internal noise intrusion from environmental noise impacts.

7 OTHER NOISE SOURCES

7.1 BUILDING SERVICES NOISE

As detailed building services selections have not been conducted at this time, an acoustic assessment of noise impact cannot be conducted.

A detailed services noise assessment will be conducted once plant selections and services drawings have been finalised as part of the construction documentation. Based on experience with similar development acoustic treatments are both possible and practical using acoustic treatments such as lining of ductwork, acoustic silences, variable speed controllers, time switches, acoustic screens etc.

Based on previous experience compliance with criteria detailed in this report is both possible and practice and will insure noise impacting on surrounding receivers does not reduce their acoustic amenity using treatments such as lined ductwork, acoustic screens, variable speed controllers and the like.

Details of acoustic treatments will be provided at the construction certificate stage of the development.

Building services noise will be assessed to ensure noise impact to neighbouring receivers complies with the ACT Environment Protection Act 1997 (the Act) and Environment Protection Regulations 2005 (the Regs). The development is located within an area within zone C. The suitable acoustic criteria for the project is therefore based on the relevant criteria for Zone C which is detailed below.

1. Australian Capital Territory Environmental Protection Regulation 2005, Schedule 2 for ACT Zoning.

Table 5 - External Noise Level Criteria Environmental Noise Emissions

Noise Zone	Zone Noise Standard dB(A) L_{10}			
	Mon – Sat 7am – 10pm	Mon – Sat 10pm – 7am	Sun and Public holidays 8am – 10pm	Sun and Public holidays 10pm – 8am
Zone C	55	45	55	45

7.2 BUILDING SERVICES NOISE TREATMENTS

As detailed plant selections for the proposed development are not available at this stage it is not possible to carry out a detailed examination of the ameliorative measures that may be required to achieve the noise targets. Noise within a residential tenancy is required to achieve a level at lest 5 dB(A) below the noise standard that would otherwise apply and as detailed in the table above.

Plant will be acoustically treated to prevent noise emissions from adversely impacting the surrounding properties in conjunction with the criteria detailed in this report. This may include selecting the quietest plant practicable, or treating the plant with enclosures, barriers, duct lining and silencers, etc as required to comply with the sound level recommendations.

Experience with similar projects indicates that it would be possible to achieve the requirement with appropriate treatment of the plant. General requirements for a number of potential plant items on the site are expanded on below.

7.2.1 Supply / Exhaust fans

Supply and exhaust fans may be located within the underground plant rooms or in rooftop plant areas. These units typically emit high noise levels and require acoustic treatment such as silencers and internal lined ductwork. Silencer requirements would be determined once fan selections have been completed.

7.2.2 Minor Plant

Other minor plant items, such as bathroom or kitchen exhaust fans, may also be required. These items typically emit relatively low noise levels and may require minimal acoustic treatment of a standard nature, such as internally lining of ductwork.

7.3 CONDENSER, HEATING AND REVERSE CYCLING AIR CONDITIONERS

It is at the construction design stage that consideration should be given to the placement of external air conditioning/ heating/ reverse cycle air conditioning units.

The location of heating/cooling units is the most important factor to ensure noise is not going to be intrusive. The location and selection of the proposed units associated with the development will be conducted such that noise impact to both the future residential tenancies and existing receivers will comply with the relevant EPA criteria of the noise standard less 5dB(A) and compliance with this standard inside any other unit in the same complex .

8 OTHER NOISE SOURCES

8.1 BUILDING DESIGN

Additionally the buildings architectural layout will be developed in conjunction with the recommended design standard detailed in the Territory Plan and the BCA of Australia.

8.2 CARPARK NOISE

The proposed concrete building structure will be acoustically acceptable to mitigate for the potential noise impact of use of the carpark to the residential receivers above. To ensure no negative noise impact on the receivers above any speed management for vehicles in the carpark should not be undertaken using ‘speed humps’, such that structure born vibration will not be generated in the building structure.

Noise from the motor closing the door and noise from the closing should be treated by isolating the door and equipment from the building structure. The floor finish of the carpark it to be not to be smooth finish (ie not painted) and can be off form concrete, broom finished or the like to reduce wheel noise.

8.3 GARBAGE COLLECTION NOISE

All garbage collection areas

Providing garbage collection is conducted in conjunction with the ACT Commercial Waste Industry Code of Practice (typically outside of night time hours) and on limited occasions during any given week, no negative noise impacts will be generated to surrounding receivers, both neighbouring and within the proposed development.

To limit this source of noise, the garbage chutes and compactors shall be resiliently attached to the building structure. This can be achieved in the following manner, namely;

1. Garbage rooms receiving waste from internal chutes should be contained within the building structure in a garbage room without a permanent opening to the environment.

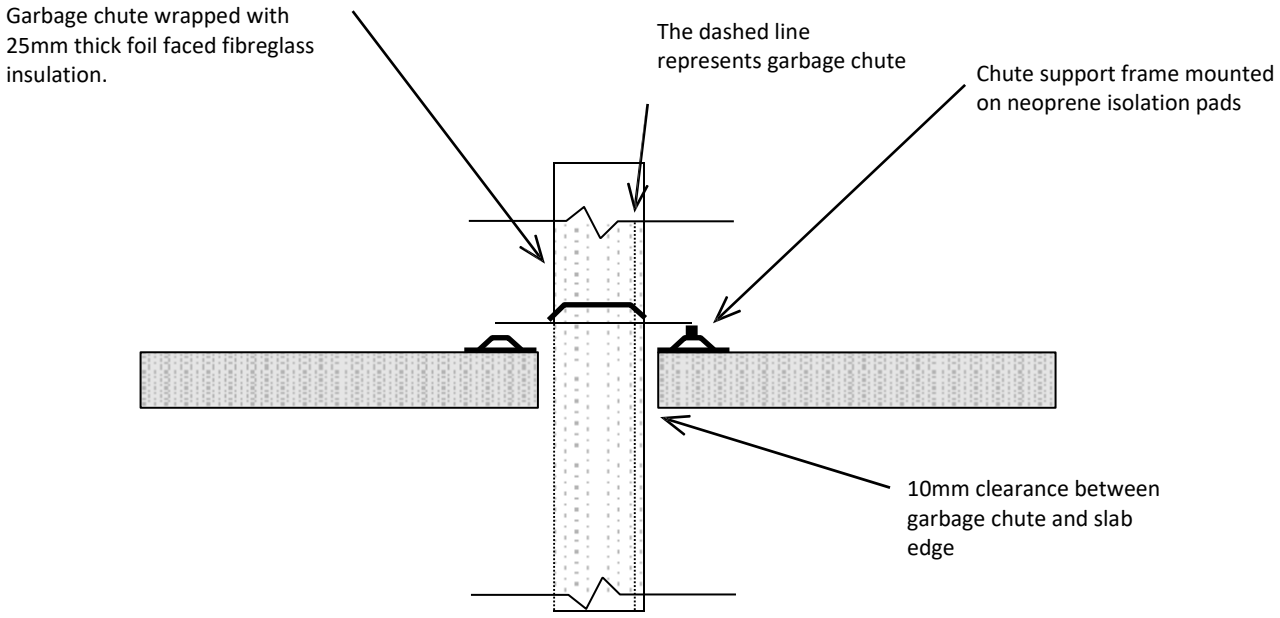
2. The isolation brackets used to support the chute and any compactors should be set on neoprene isolation mounts. The mounts should be designed to have a maximum static deflection of 5mm when fully loaded.

3. Garbage chutes are normally contained in a fire rated compartment within the building. Hence, there is no requirement to seal the slab penetrations where the chute passes from floor to floor. In order to control the transmission of structure-borne noise a 10mm gap should be left around the entire perimeter of the chute.

4. Alternatively, if it is required to seal the slab penetrations, then a resilient fire rated mastic compound, such as Selleys Fireblock should be used. This should be applied to a 10mm gap, fitted with a backing rod.

5. The garbage chute should be externally wrapped with 25mm thick foil faced fibreglass insulation or other dampening material.

A schematic representation of the proposed treatment is shown below:



9 CONSTRUCTION NOISE

Noise will be mitigated during the construction stage of the project as required by the Australian Standard AS2436 and include all possible and practical mitigations and will include the following:

1. Bored piers will be used on the project in lieu of sheet/driven piles which will eliminate the needs for vibration works during the civil construction phase and greatly reduce the impact of construction noise.

2. An electric tower crane will be used at Section 131 in lieu of a diesel powered tower crane, again greatly reducing the impact of construction noise.

3. All construction working will followed in accordance with EPA guidelines in regard to construction noise.

10 CONCLUSION

This report provides an evaluation of environmental noise intrusion into the proposed Block 1 Section 131, Campbell (Campbell 5 residential development) development.

Provided the glazing construction as recommended in Section 6 are implemented, internal noise levels will comply with the internal noise criteria given in Section 4 of this report, and fully comply with project expectations and the Australian Standard AS2107:2000.

Additionally noise level criteria for noise impacting on surrounding receivers have been detailed in Section 7 of the report as well as discussion into other potential noise impacts such as noise generated from building mechanical services will comply with the relevant noise level criteria. Proving the recommendations in Section 7.1, 7.2 and 8 are complied with by the development then the noise impact on surrounding areas to the project will comply with the all relevant criteria.

We trust this information is satisfactory. Please contact us should you have any further queries.

Report prepared by

ACOUSTIC LOGIC CONSULTANCY PTY LTD
Ben White

GENERAL TTM NOTES

1. SIGNS AND DEVICES SHALL BE INSTALLED BY A COMPETENT PERSON.
2. SIGNS AND DEVICES SHALL BE APPROPRIATE TO THE CONDITIONS AT THE WORK SITE AND SHALL BE USED IN ACCORDANCE WITH THIS STANDARD UNLESS A RISK ASSESSMENT BY A COMPETENT PERSON INDICATES THAT AN ALTERNATIVE ARRANGEMENT IS SATISFACTORY.
3. SIGNS AND DEVICES SHALL BE ERECTED AND DISPLAYED BEFORE WORK COMMENCES AT A WORK SITE.
4. SIGNS AND DEVICES SHALL BE REGULARLY CHECKED AND MAINTAINED IN A SATISFACTORY CONDITION.
5. SIGNS AND DEVICES SHALL BE REMOVED OR COVERED FROM A WORK SITE AS SOON AS PRACTICABLE. HOWEVER, APPROPRIATE SIGNS SHOULD REMAIN IN PLACE UNTIL ALL WORK HAS BEEN COMPLETED.
6. WHERE WORKS REQUIRE THE RELOCATION OF REGULATORY TRAFFIC CONTROL ITEMS, THEY SHALL BE RELOCATED OR REINSTALLED PROMPTLY IN POSITIONS WHERE THEY ARE VISIBLE AND CAN PERFORM THE REGULATORY FUNCTION.
7. ENSURE TEMPORARY TRAFFIC MANAGEMENT SIGNS DO NOT OBSTRUCT DRIVEWAY LINES OF SIGHT AND ARE VISIBLE TO TRAFFIC.
8. ENSURE TEMPORARY TRAFFIC MANAGEMENT SIGNS DO NOT BLOCK SAFE PEDESTRIAN MOVEMENT ESPECIALLY FOR DISABLED PERSONS.
9. ADDITIONAL TRAFFIC MANAGEMENT PLANS MAY BE REQUIRED DURING THE CONSTRUCTION PHASE OF THE DEVELOPMENT FOR SPECIFIC SITUATIONS. THE PROJECT MANAGER IS TO ARRANGE THE NECESSARY DOCUMENTATION, FEES, PERMITS AND APPROVALS AS REQUIRED.
10. ILLEGALLY PARKED VEHICLES MAY BE FINED.
11. ALL FEES AND PERMITS ARE TO BE PAID PRIOR TO THE RELEASE OF THE APPROVED TEMPORARY TRAFFIC MANAGEMENT PLAN.

PROVAN STREET
ANZAC PARK EAST
BLOCK 1 SECTION 130
PROVAN STREET
ONLY
(OUT OF BASEMENT)
ROAD CLOSED
SIDE ROAD CLOSED
PENTLAND STREET
ROAD CLOSED
FOOTPATH CLOSED
CONSTRUCTION VEHICLES EXCEPTED
ROAD CLOSED
FOOTPATH CLOSED
SIDE ROAD CLOSED
CRESWELL TRAFFIC ONLY
CRESWELL ST
DETOUR
AHEAD
ROAD CLOSED
ROAD CLOSED
BLOCK 1 SECTION 131
ROAD CLOSED
PENTLAND STREET
BLOCK 1 SECTION 132
SIDE ROAD CLOSED
CRESWELL ST CLOSED TURN LEFT AT KALMA WAY
PEDESTRIANS WATCH YOUR STEP
KALMA WAY
BLOCK 1 SECTION 133
ROAD CLOSED
AHEAD
FOOTPATH CLOSED
NO LEFT TURN
CRESWELL TRAFFIC ONLY
ROAD CLOSED
SIDE ROAD CLOSED
CRESWELL TRAFFIC ONLY
DETOUR
ROAD CLOSED
CONSTITUTION AVE
PEDESTRIANS WATCH YOUR STEP
FOOTPATH CLOSED
SIDE ROAD CLOSED
FOOTPATH CLOSED
NO LEFT TURN
ROAD CLOSED

ISSUE	DESCRIPTION	DATE	DRAWN
C	FOR WORKS APPROVAL	05.09.17	DA
B	FOR REVIEW	24.08.17	DA
A	FOR REVIEW	14.08.17	AM

CLIENT
CHASE

ARCHITECT
FRONT ARCHITECTS

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PROJECT TITLE
MIXED USE DEVELOPMENT
CAMPBELL 5

DESIGNED BY AM
CHECKED BY CO
AUTHORISED BY
DATE 05/09/2017

DRAWING TITLE
TEMPORARY TRAFFIC MANAGEMENT PLAN 1

PROJECT LOCATION
BLOCK 1 SECTION 131
CAMPBELL, ACT

SCALE
0m 5 10 15 20 25
1:500 @A1 1:1000 @A3

JOB NO. 140778
DRAWING NO. C104
REV. C