

**MANAGING DIRECTORS**

MATTHEW PALAVIDIS  
VICTOR FATTORETTO

**DIRECTORS**

MATTHEW SHIELDS  
BEN WHITE



**300 Manchester Road, Auburn**

**Noise Impact Assessment**

---

SYDNEY  
A: 9 Sarah St  
MASCOT 2020  
T: (02) 8339 8000

SYDNEY MELBOURNE BRISBANE CANBERRA  
LONDON DUBAI SINGAPORE GREECE

ABN: 11 068 954 343

The information in this document is the property of Acoustic Logic Consultancy Pty Ltd ABN 11 068 954 343 and shall be returned on demand. It is issued on the condition that, except with our written permission, it must not be reproduced, copied or communicated to any other party nor be used for any purpose other than that stated in particular enquiry, order or contract with which it is issued.

## DOCUMENT CONTROL REGISTER

<b>Project Number</b>	20180815.1
<b>Project Name</b>	300 Manchester Road, Auburn
<b>Document Title</b>	Noise Impact Assessment
<b>Document Reference</b>	20180815.1/0208A/R2/JS
<b>Issue Type</b>	Email
<b>Attention To</b>	Constant 9 Pty Ltd ATF C11 Unit Trust

<b>Revision</b>	<b>Date</b>	<b>Document Reference</b>	<b>Prepared By</b>	<b>Checked By</b>	<b>Approved By</b>
0	21/06/2018	20180815.1/2106A/R0/JS	JS		JS
1	1/08/2018	20180815.1/0108A/R1/JS	JS		JS
2	2/08/2018	20180815.1/0208A/R2/JS	JS		JS

## TABLE OF CONTENTS

1	INTRODUCTION .....	4
2	SITE PROPOSAL.....	5
3	ASSESSMENT CRITERIA .....	9
3.1	DEVELOPMENT NEAR RAIL CORRIDORS AND BUSY ROADS INTERIM GUIDELINE	9
3.2	NOISE POLICY FOR INDUSTRY	9
4	NOISE MODELLING .....	10
4.1	MODELLING ASSUMPTIONS	10
4.2	MODELLING ASSUMPTIONS – TRAIN MOVEMENTS	11
4.3	MODELLING ASSUMPTIONS – WARNING HORNS	14
4.4	PREDICTED NOISE LEVES – TRAIN MOVEMENTS	19
4.5	PREDICTED NOISE LEVELS – WARNING HORNS	19
5	DISCUSSION.....	20
6	CONCLUSION .....	21

## 1 INTRODUCTION

Acoustic Logic Consultancy have been engaged to conduct an acoustic assessment of potential noise impacts associated with the proposed land subdivision to be located along Manchester Road, Auburn. The subject site is situated adjacent the Auburn Rail Maintenance and Stabling Yards.

Concern has been raised by Sydney Trains with regard to the potential for the residential development to restrict operations on the site due to noise impact on future receivers. Additional treatments to the facades directly facing the rail yards may require additional acoustic treatment to essentially future proof reasonable levels of noise from future development within the rail yard.

This assessment addresses typical noise emissions from the site and impacts on the masterplan built form. The objective is to:

- Noise from the operation of the existing worst-case noise levels emanating from the site operation will not have impact on the future residential occupants of the developments,
- Illustrate that the taller buildings to be located along the shared boundary of the site with the rail yards will provide acoustic screening to receivers behind thus resulting in a more typical acoustic environment for receivers (i.e. typical urban high density) not immediately adjacent to the rail yard.

Noise impacts have been assessed with consideration to the following:

- Department of Planning - Development Near Rail Corridors and Busy Roads – Interim Guideline
- Sydney Trains Environmental Management System Document EMS-09-GD-0080 Noise and vibration from Rail Facilities Chapter 4 – Stabling Yards.
- Acoustic Logic Consultancy reports for 300 Manchester Road, Auburn:
  - ‘Planning Proposal Acoustic Assessment’ dated 28/11/2017
  - ‘Environmental Noise Impact Review’ dated 28/03/2018

### **SoundPlan™ Note**

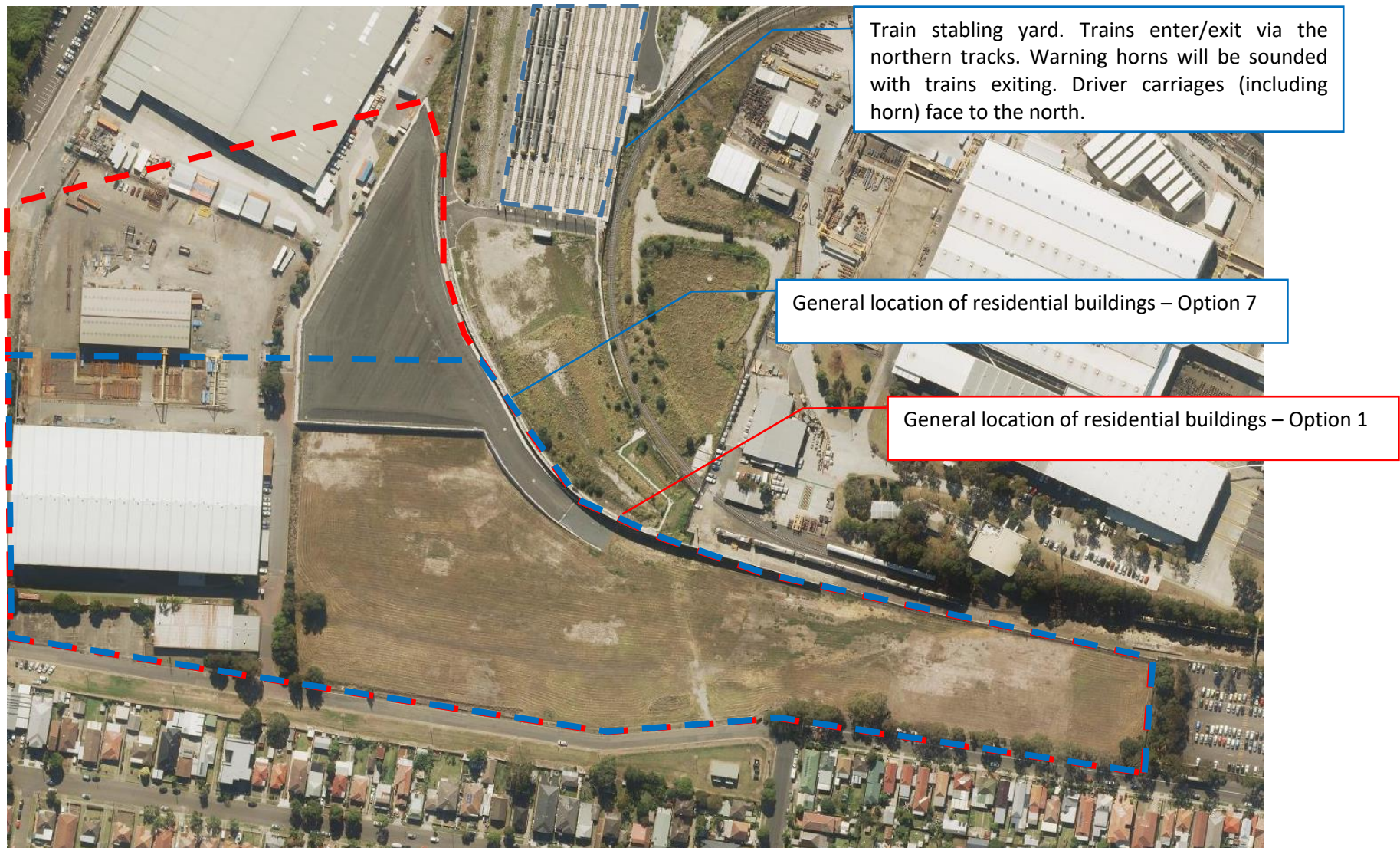
Noise levels have been predicted at the receiver locations using SoundPlan™ modelling software implementing the ISO 9613-2:1996 “*Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation*” noise propagation standard. Noise levels presented in the body of this report are the receiver incidence levels and do not include façade reflection.

## 2 SITE PROPOSAL

The master plan has been assessed for two options, which include multi story residential development and commercial industrial uses on the land at 300 Manchester Road, Auburn. The site is bounded by Manchester Road to the south of the site with existing industrial use on the land to the west and a railway siding to the north of the site.

Train noise from the maintenance yards is the primary source of noise and vibration affecting the proposed development. The rail corridor is also the primary vibration source affecting the development. Noise and vibration monitoring has been previously undertaken at the site and presented in the ALC report titled 'DA Acoustic Assessment' dated 2 May 2015.

The proposed development and site plan are detailed in the following figures.



Train stabling yard. Trains enter/exit via the northern tracks. Warning horns will be sounded with trains exiting. Driver carriages (including horn) face to the north.

General location of residential buildings – Option 7

General location of residential buildings – Option 1

Figure 1: Site Survey

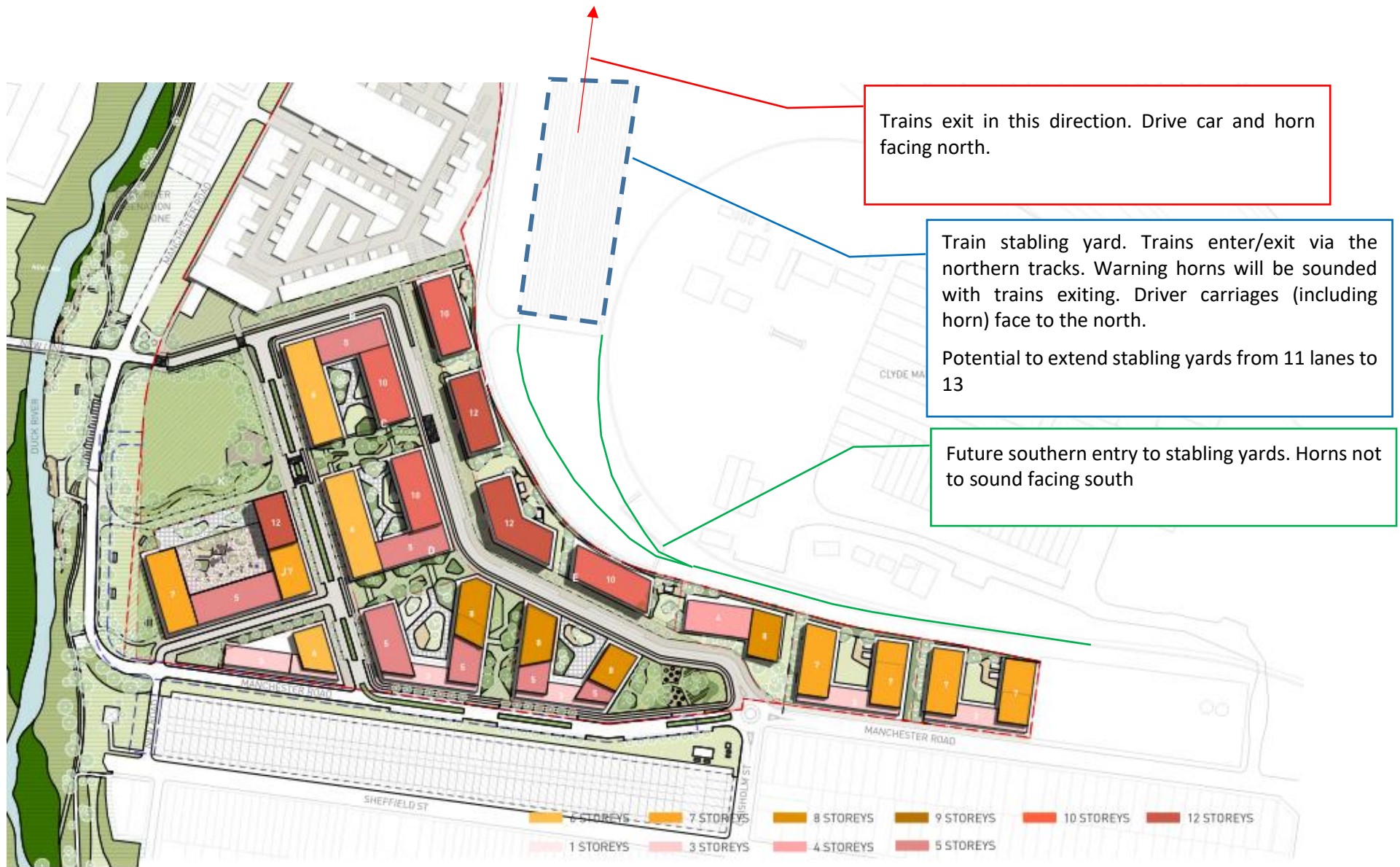


Figure 2: Site Masterplan – Option 1

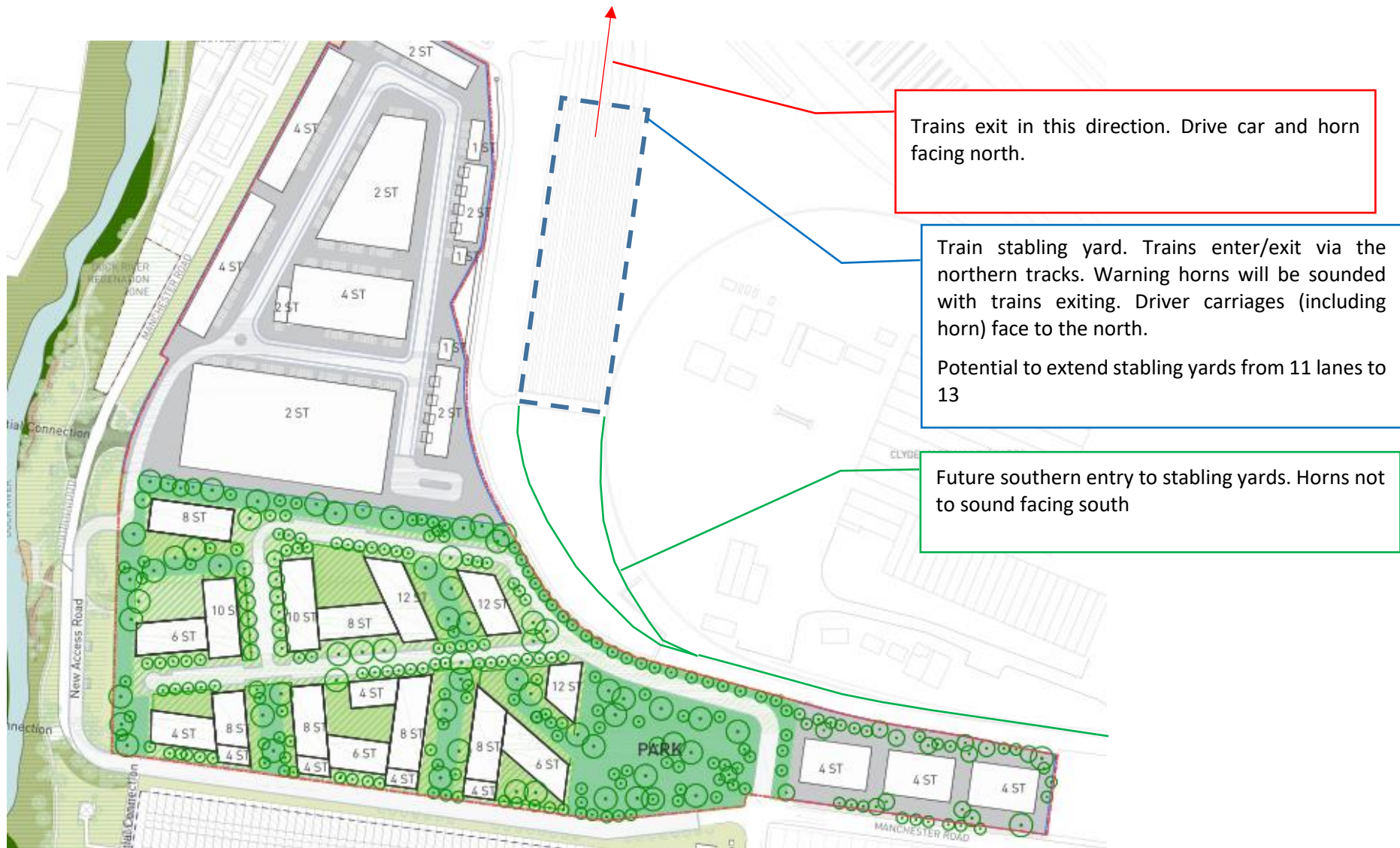


Figure 3: Site Masterplan – Option 7



### 3 ASSESSMENT CRITERIA

The assessment has addressed noise associated with the following:

- Train movements are assessed against the requirements of the NSW Department of Planning document 'Development Near Rail Corridors and Busy Roads Interim Guideline'.
- Sleep disturbance has been assessed against the maximum noise level criteria of the EPA Noise Policy for Industry.

#### 3.1 DEVELOPMENT NEAR RAIL CORRIDORS AND BUSY ROADS INTERIM GUIDELINE

Noise emanating from the rail yards has been assessed against the requirement of the department of planning interim guideline which are provided below.

Table 3.1: Noise criteria		
<b>Residential Buildings</b>		
Type of occupancy	Noise Level dBA	Applicable time period
Sleeping areas (bedroom)	35	Night 10 pm to 7 am
Other habitable rooms (excl. garages, kitchens, bathrooms & hallways)	40	At any time
<b>Non-Residential Buildings</b>		
Type of occupancy		Recommended Max Level dBA
Educational Institutions including child care centres		40
Places of Worship		40
Hospitals	- Wards	35
	- Other noise sensitive areas	45

Note: airborne noise is calculated as  $L_{eq}(9h)$  (night) and  $L_{eq}(15h)$ (day). Groundborne noise is calculated as  $L_{max}$  (slow) for 95% of rail pass-by events.

#### 3.2 NOISE POLICY FOR INDUSTRY

The potential for sleep disturbance has been assessed against the maximum noise level criteria of the EPA Noise Policy for Industry which nominates the following.

*Where the subject development/premises night-time noise levels at a residential location exceed:*

- $L_{Aeq,15min}$  40dB(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,
- a detailed maximum noise level event assessment should be undertaken.*

Based on noise monitoring conducted at the site, background noise levels are in the order of 35dB(A)  $L_{90}$  during the night time period. On this basis, maximum noise levels will be based on 52dB(A)  $L_{AFMax}$  as opposed to the RBL + 15dB (50dB(A)) noise criterion.

In the event that noise levels exceed the aforementioned maximum levels, an assessment of sleep disturbance should be conducted in accordance with the EPA Road Noise Policy (RNP).

## 4 NOISE MODELLING

Noise emanating from the rail yards have been previously recorded and addressed in the ALC document prepared for the site. Concern has been raised by Sydney Trains with regard to flexibility to expand the rail yard operation and potential restrictions that may occur due to the incorporation of residential uses along the boundary.

The current operation is typically associated with sporadic train movements around the railyard southern perimeter and stabling along the western boundary. (refer to Figure 2). ALC have undertaken noise modelling to ascertain the level of impact associated with typical worst-case operations within the rail yards.

Whilst there is no specific plan for the development, Sydney Trains have advised that the following could be plausibly incorporated in the future:

- Extension of the stabling yard to include two additional lanes on the western side
- Additional access to the stabling via a southern rail line. The rail line would join existing tracks and run along the southern boundary of the rail yard.

Trains entering the stabling yard typically move at slow speeds and do not result in significant noise emanating from the site. The highest level of noise impact associated with the rail yards is expected to be associated with the potential for sleep disturbance from horn testing. Notwithstanding rail movements have been assessed for trains entering the stabling yard via the future southern corridor the potential for sleep disturbance due to horn testing.

### 4.1 MODELLING ASSUMPTIONS

Noise data for trains have been adopted from the Sydney Trains Environmental Management System Document EMS-09-GD-0080 Noise and vibration from Rail Facilities Chapter 4 – Stabling Yards as provided in the ‘New Intercity Fleet Everleigh Facility Project – Noise and Vibration Assessment’ dated March 2017.

Noise modelling has been based on the following noise data for the Waratah (A-set) train sets. Trains transiting the southern future corridor have been addressed for roof mounted equipment include air-conditioning condensers and inverters.

**Table 1 – Source Noise Levels**

Noise Source	Sound Power Level	Location of Source
Air-conditioning unit	$L_{eq(15min)}$ 80dB(A)	Top of train, two units per car
Static inverter	$L_{eq(15min)}$ 83dB(A)	Top of train, two units per car
Horn Testing (Town)	$L_1(1min)$ 136dB(A)	Underfloor at end of train

Predicted noise levels from the operation of the facility has been undertaken using the SoundPlan™ noise modelling software.

## 4.2 MODELLING ASSUMPTIONS – TRAIN MOVEMENTS

Noise associated with trains entering the stabling yard are based on:

- 13 trains enter the stabling yard during the night time period.
- Trains are assumed as 8-car sets.
- Air-conditioning units on top of the trains are operating.
- Static inverters on top of the trains are operating.
- Noise from the train movement itself is generally negligible in comparison with the above noise sources.

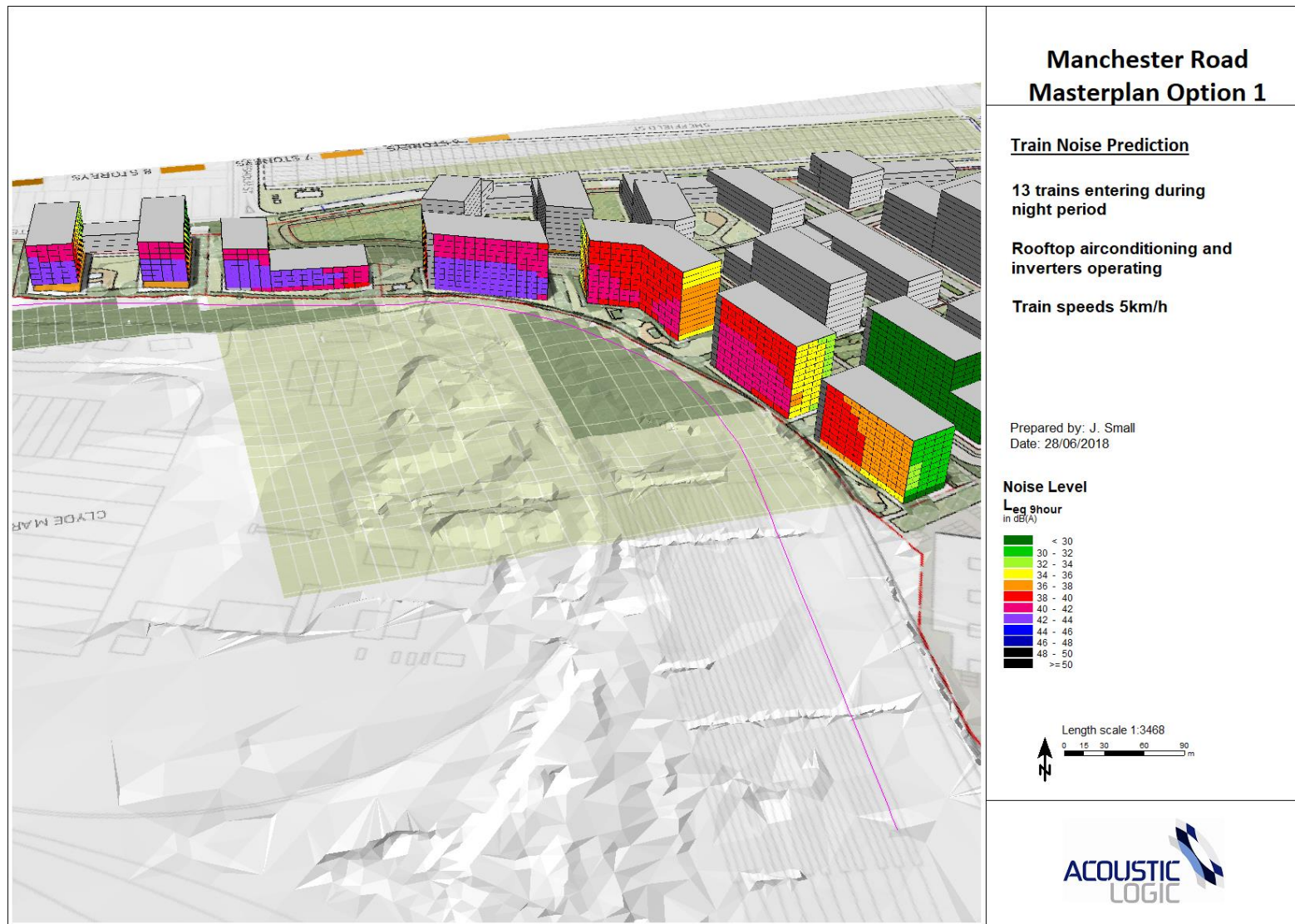
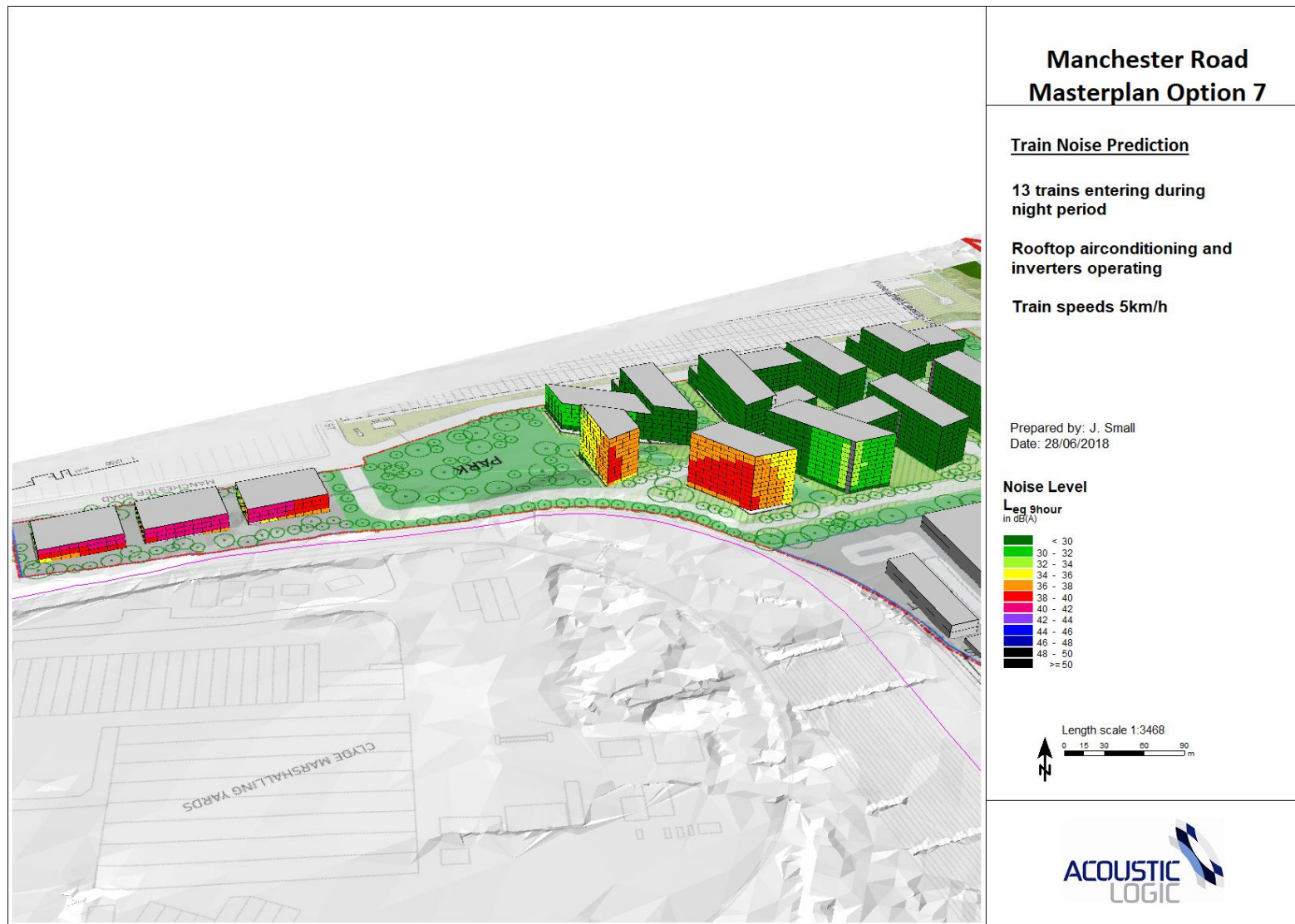


Figure 4: Manchester Road - Option 1 – Train Movement Noise Façade Noise Map



**Figure 5: Manchester Road - Option 7 – Train Movement Noise Façade Noise Map**

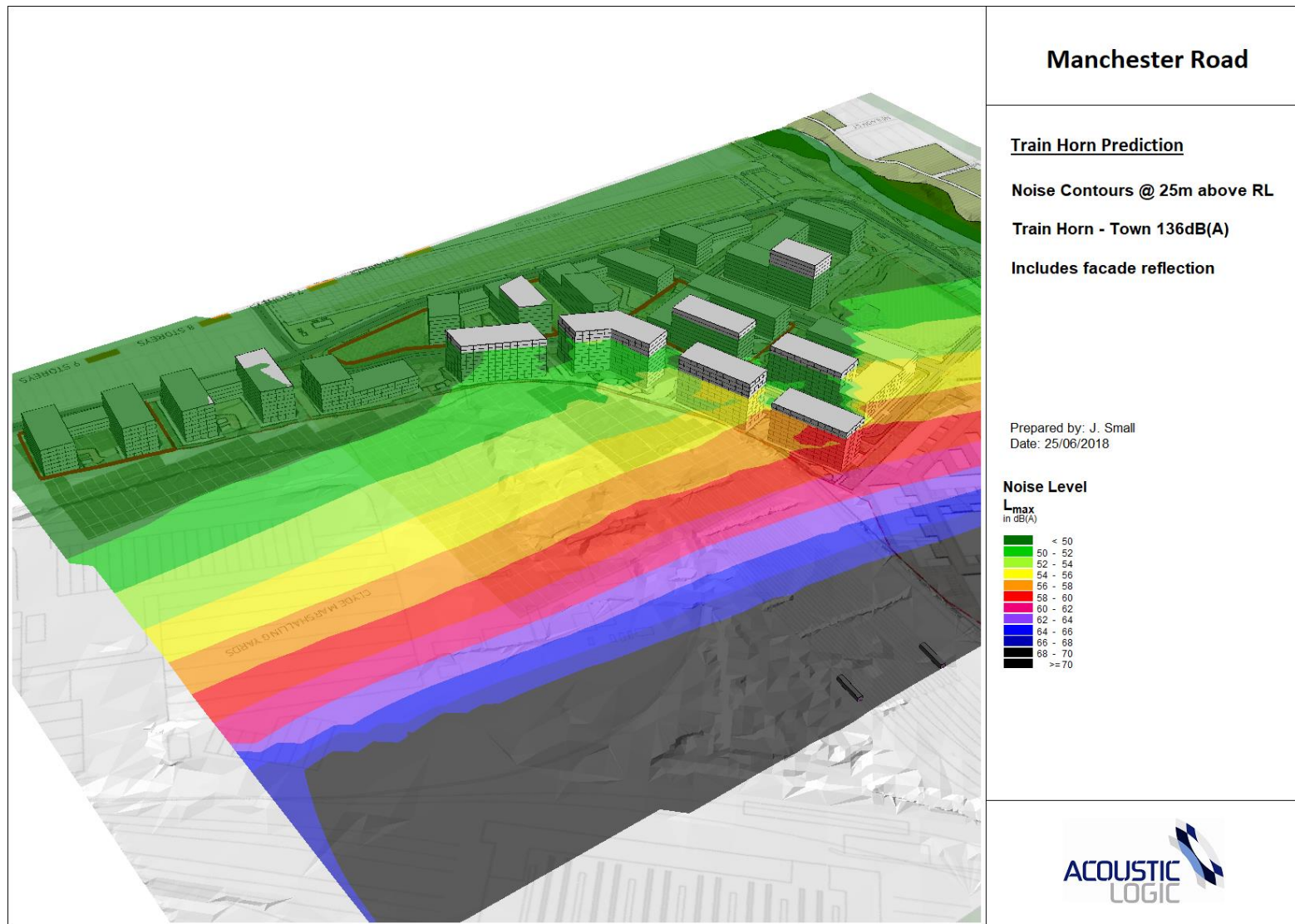
### 4.3 MODELLING ASSUMPTIONS – WARNING HORNS

Noise associated with warning horns are based on:

- Testing of horns occurs before each car train exits the stabling yard.
- The horn is located on the driving car facing north away from the development toward Clyde. This is consistent with the recommended management conditions outlined in the Transport Construction Authority documented prepared by GHD titled 'Auburn Stabling Project – Review of Environmental Factors – Volume 1 Main Report) included in Attachment A of the Determination Report.
- Screening provided by the driver car has been included.
- No directivity has been incorporated into the prediction.
- A single drive car in the eastern most rail lane, and
- A single drive car in the western most rail lane,
- All other stabling lanes are assumed empty such that any acoustic screening provided by other trains in between the outermost lanes is negated. This will provide the most conservative of assessments.

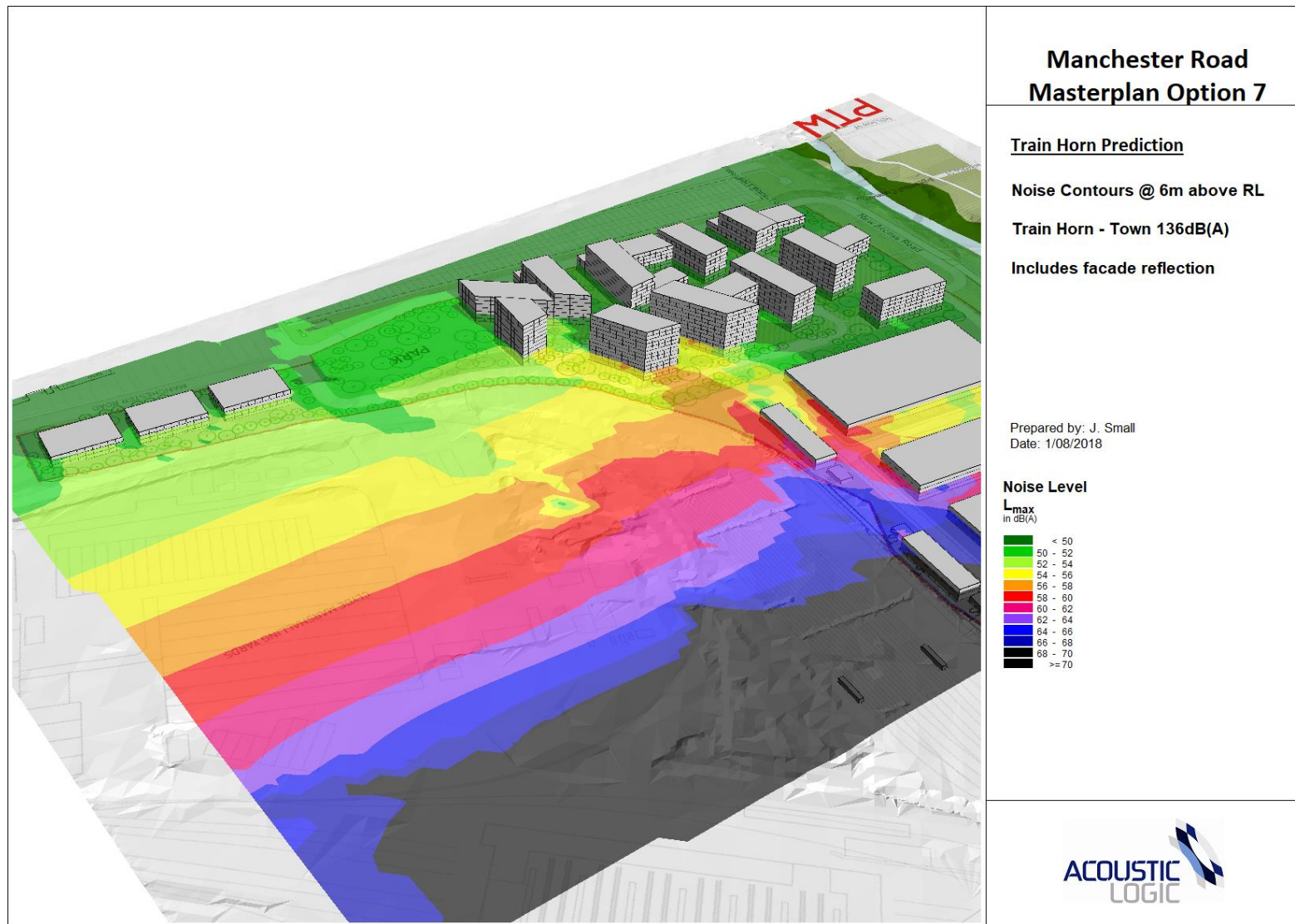


Figure 6: Manchester Road - Option 1 - Horn Noise @ 6m

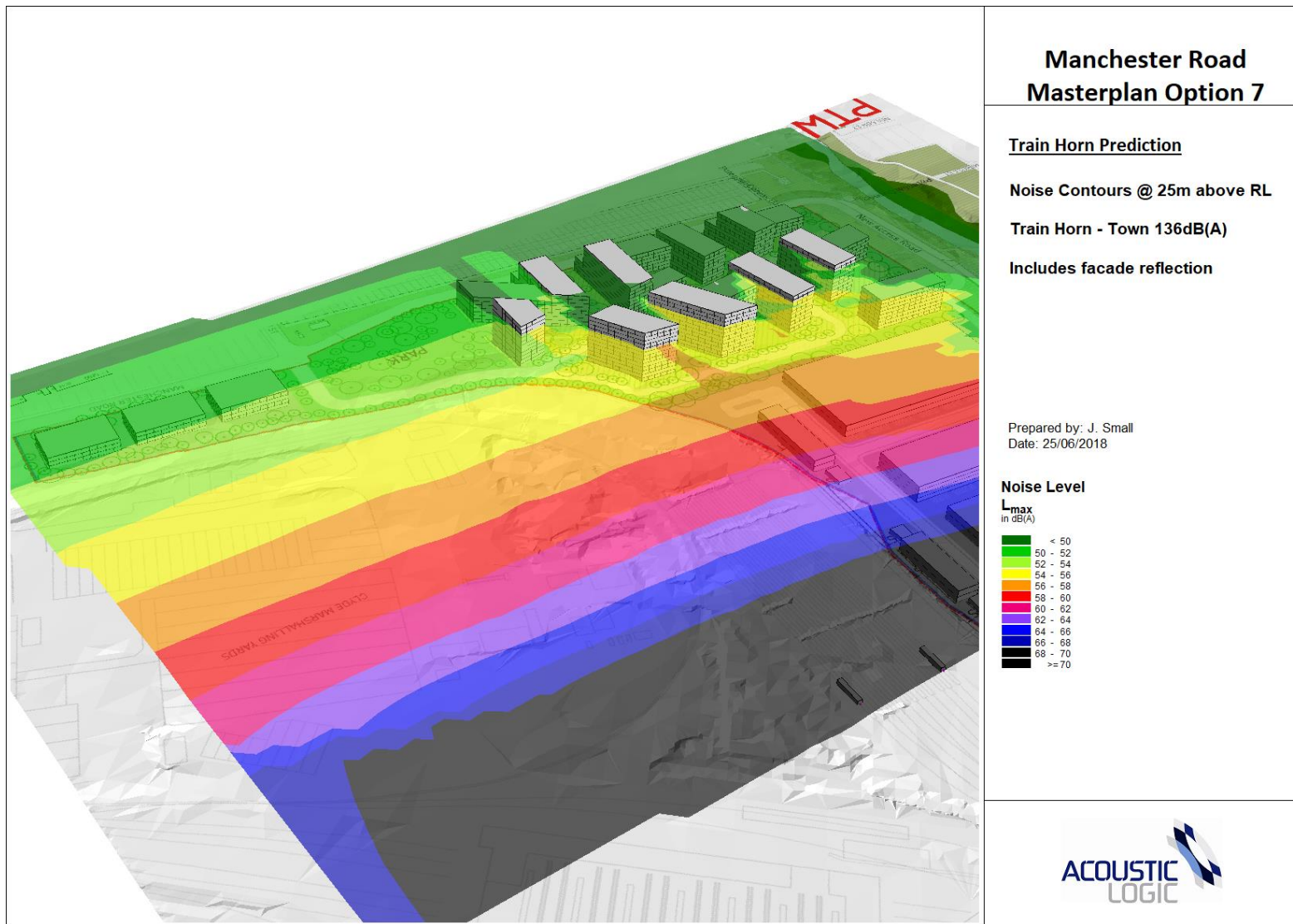


**Figure 7: Manchester Road - Option 1 - Horn Noise @ 25m**





**Figure 8: Manchester Road - Option 7 - Horn Noise @ 6m**



**Figure 9: Manchester Road - Option 7 - Horn Noise @ 25m**

#### 4.4 PREDICTED NOISE LEVELS – TRAIN MOVEMENTS

The predicted worst-case noise levels are presented in the following table. Predicted noise levels are façade noise levels and do not include façade reflection.

**Table 2 – Predicted Noise from Train Movements**

Masterplan Option	Façade	Predicted External Noise Level, dB(A) $L_{eq}$ 9 hour
1	Worst case – North façade of southern buildings	44
7	Worst case – North façade of southern buildings	42

#### 4.5 PREDICTED NOISE LEVELS – WARNING HORNS

The predicted worst-case noise levels are presented in the following table. Predicted noise levels are façade noise levels and do not include façade reflection.

**Table 3 – Predicted Maximum Noise Levels**

Masterplan Option	Façade	Predicted External Noise Level, dB(A) $L_{Max}$
1	Worst case – north façade of northmost building	58
7	Worst case – north façade of northmost building	55

Predicted noise levels external to the building will exceed the maximum noise requirement. As is consistent with the Noise Policy for Industry and analysis should be conducted using the RNP. Section 5.4 of the RNP states that:

- Maximum internal noise level below 50-55 dB(A) are unlikely to cause awakening reactions.
- One or two noise events per night, with maximum internal noise levels of 65–70 dBA, are not likely to affect health and wellbeing significantly.

ALC have adopted the 55dB(A)  $L_{Max}$  internal noise level as a basis for assessing the potential for sleep arousal during the night time period of operation.

A 10dB(A) reduction will typically be achieved for an open façade sufficient to satisfy ventilation requirements under the BCA. This results in the following:

- For option 1, based on the external predicted level of 58dB(A)  $L_{Max}$  an internal level of 48dB(A)  $L_{Max}$  would apply.
- For option 7, based on the external predicted level of 55dB(A)  $L_{Max}$  an internal level of 45dB(A)  $L_{Max}$  would apply.

The predicted internal noise level of 48dB(A)  $L_{Max}$  and 45dB(A)  $L_{Max}$  for masterplan options 1 and 7 would satisfy the 50-55dB(A) noise level under the RNP for events unlikely to cause awakening reactions.

## 5 DISCUSSION

An assessment of noise associated with the rail yards has been conducted. In this regard:

- Noise associated with trains entering via the future southern rail line will be generally negligible. The development would be capable of achieving internal noise criteria under natural ventilation conditions.
- With regard to noise associated with horns, the potential for sleep disturbance with windows open sufficient to satisfy the BCA will be minimal as per the guidance of the RNP.
- General operations on the rail site based on existing measurements would require that acoustic construction be incorporated to facades facing the rail line as detailed in the previous noise assessment by ALC. With consideration to the fact that sleep disturbance will be unlikely with windows open, the potential for sleep disturbance would be significantly reduced with windows closed sufficient to satisfy the general operation noise requirement.
- The noise contours indicate that the buildings along the front of the development in masterplan option 1 will provide substantial screening to noise emanating from the stabling yards.
- Masterplan option 7 will provide less screening, however noise impacts from the yards would be unlikely to cause any significant disturbance in any case.

## 6 CONCLUSION

An assessment of noise impacts from typical worst-case noise levels emanating from the rail yards have been assessed.

- Predicted noise level from train movements on the future southern rail line will have negligible impact on the development.
- Predicted noise levels from worst-case noise levels (i.e. horns) within the stabling yards have been assessed and will be unlikely to cause awakening reactions even with windows open.
- General noise levels associated with the site have been previously assessed in the ALC documents submitted with the planning proposal.
- Noise contour plots indicate that buildings along the boundary will provide substantial acoustic screening to buildings central to the development from noise sources within the stabling yards.

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

Yours faithfully,



James Small  
Acoustic Logic Consultancy