External Building Fabric Noise Assessment
November 2020
Hann Tucker Associates

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17–37 WILLIAM ROAD

17-37 William Road
London, NW1 3ER

External Building Fabric Report

28066/EBF1

30 October 2020

For:
Euston One Limited

Hann Tucker Associates
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Document Control

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1	30/10/2020	Updated to reflect comments		pp. 
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Contents

Attachments

1.0 Introduction

It is proposed to replace the current building at 17-33, 35-37 William Road, Euston with a PBSA building (Purpose Build Student Accommodation). The project comprises the redevelopment of no. 35-37 to provide a 15 storey building with basement level for use as student accommodation, with affordable workspace at ground floor level of no. 17-37 and improvements to ground floor façade of no. 17-33, together with public realm improvements, servicing, cycle storage and facilities, refuse storage and other ancillary and associated works.

An environmental noise survey has previously been undertaken by ourselves, to establish the existing airborne noise levels due to road traffic and other environmental sources of airborne noise around the proposed development.

The data obtained has subsequently been used to undertake a detailed acoustic analysis to determine the sound insulation requirements of the external building fabric elements in order to control the aforementioned environmental airborne noise levels in line with required internal acoustic design criteria. Our findings and recommendations are presented herein.

2.0 Objectives

To establish the required internal acoustic design criteria which the levels of airborne road traffic and noise from other sources should not exceed.

To undertake detailed acoustic analysis of the aforementioned environmental noise intrusion into the building through the external building fabric.

To subsequently prepare sound reduction performance specifications for the external building fabric in order to control airborne noise intrusion in line with the internal acoustic design criteria.

3.0 External Noise Levels

The full results of our survey are presented in our Environmental Noise Survey Report 28066/ENS1 dated 30 October 2020. The results presented therein, with suitable corrections applied form the source noise data upon which our analysis and recommendations are based.

Additionally, CadnaA noise mapping has been undertaken in order to determine noise levels incident upon the building façade from surrounding roads and environmental noise sources. Images used in our analysis are attached to this report.

4.0 Architectural Assumptions

4.1 Room Finishes

In our calculations we have assumed bedrooms and living areas will have typical furnishings including beds, sofas, chairs etc.

4.2 Drawings

Our calculations have been based on the following drawings:-

- A295-MCO-XX-B0-DR-A-01098
- A295-MCO-XX-G0-DR-A-01099
- A295-MCO-XX-G0-DR-A-01100
- A295-MCO-XX-01-DR-A-01101
- A295-MCO-XX-04-DR-A-01104
- A295-MCO-XX-06-DR-A-01106
- A295-MCO-XX-08-DR-A-01108
- A295-MCO-XX-14-DR-A-01114
- A295-MCO-XX-15-DR-A-01115

5.0 Acoustic Design Criteria

There are no criteria in current Building Regulations concerning external noise intrusion. At this stage, we also understand neither the Planning Authority nor the end user/operator have imposed any specific noise criteria for external noise intrusion to the site at this stage. Therefore, there are currently no statutory requirements for controlling external noise intrusion on this project as we understand it.

5.1.1 BS 8233: 2014 “Guidance on sound insulation and noise reduction for buildings”

British Standard 8233: 2014 “Guidance on sound insulation and noise reduction for buildings” states that it is desirable that internal ambient noise levels do not exceed the following guideline values:

Activity	Location	Desirable Internal Ambient Criteria	
		07:00 – 23:00	23:00 to 07:00
Resting	Living Rooms	35 dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq,16hour}$	-
Sleeping (Daytime Resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

BS8233: 2014 also states:

"Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved."

5.1.2 Local Authority

We understand there are currently no planning conditions in respect of the development imposed by London Borough of Camden, however the "Camden Planning Guidance Amenity" published 2018 contains the following guidance:-

The implications of noise and vibration should be considered at the beginning of the design process so that the impacts of noise and vibration can be minimised.

Examples of design features which could reduce noise impacts include (but are not limited to):

- *locating noise sensitive areas/rooms away from the parts of the site most exposed to noises;*
- *creating setbacks;*
- *designing a building so its shape and orientation reflect noise and protect the most sensitive uses;*
- *stacking similar rooms (such as kitchens and living rooms) above each other;*
- *positioning non-residential uses closer to the noise source in mixed use developments;*
- *insulating and soundproofing doors, walls, windows, floors and ceilings;*
- *sealing air gaps around windows;*
- *double glazing;*
- *including architectural fins (where appropriate);*
- *laminated glass;*
- *anti-vibration foundations;*
- *noise barriers such as landscaping, fencing and solid balconies to reflect sound; and*
- *incorporating 'sound proof' construction/cladding materials.*

In instances where noise mitigation is necessary, proposals will be expected to include appropriate attenuation to alleviate or mitigate the impact of noise and vibrations to an acceptable level. Where noise mitigation has not been proposed adequately, but is considered necessary, the Council will consider the use of planning conditions or a legal agreement. Guidance regarding mitigation can be found within BS8233:2014 Guidance on sound insulation and noise reduction for buildings."

5.1.3 Summary

On the basis of the above we propose external noise intrusion levels (whether from road, rail or aircraft sources), should, after attenuation by the composite building envelope, not exceed the following criteria when measured in accordance with the Association of Noise Consultants (ANC) Guidance Noise Measurements in Buildings – Part 2: *Noise from External Sources.*

Activity	Location	Desirable Internal Ambient Criteria	
		07:00 – 23:00	23:00 to 07:00
Resting	Living Rooms	35 dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq,16hour}$	-
Sleeping (Daytime Resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

Please note this criteria is subject to final acceptance from the Local Authority and end user/operator.

Where external noise levels are above WHO guidelines, the above levels may be relaxed by up to 5 dB.

6.0 Sound Reduction Performance of Glazing

The composite sound reduction performance required of any portion of the building envelope will depend on its location relative to the principal noise sources around the site and the nature of the spaces behind it (noise criteria, size, room finishes etc).

The levels of noise incident upon each façade of the building are different. Consequently, each façade therefore has its own unique sound insulation requirement. In our experience, however, it is not appropriate to prepare numerous performance specifications. In this instance, for the sake of simplicity, we have prepared a specification with a single performance level, which corresponds to an appropriate notional glazing configuration.

The enclosed Acoustic Specification for Glazing details our recommended minimum octave band sound reduction indices (SRI's). In all cases, it is essential that the system is tested in accordance with BS EN ISO 10140-2:2010 and that the quoted minimum sound reduction specifications are met by the system as a whole, including frames, ventilators, grilles etc as appropriate - not just the glass.

Where structural glass or non-vision spandrel panels are proposed, they should provide sound reduction performance at least equal to that required of the glazing in order to maintain the acoustic integrity of the building envelope.

In order to comply with Building Regulations (Part F), it is necessary to provide background ventilation to habitable rooms (living rooms and bedrooms). It is proposed for this development to incorporate an MVHR system, ducted through the façade. Attenuators should be specified and fitted against any façade grilles to meet the required cumulative internal noise levels.

The specified octave band SRI's are based upon typical vent performances. It is acknowledged that alternative SRI shapes may also comply with the internal noise criteria but these would need to be reviewed by ourselves.

7.0 Construction Guidance For Glazing

It is essential that prospective glazing system suppliers can demonstrate compliance with the acoustic performance detailed in our specification rather than simply offering a generic glazing configuration. However, we would suggest that the following configurations could typically be expected to provide the required levels of noise insulation.

Construction Guidance - Glazing	
Example Configuration	**Minimum R_w+ C_{tr}**
4/16/6 or equivalent	30

N.B. The R_w +C_{tr} figures above are single figure simplifications. They are provided for guidance purposes only.

N.B. It is very difficult to give construction guidance regarding glass as there are so many influencing non-acoustic factors and these all need to be taken into account (by others), to a greater or lesser degree, when considering suitable specification. The above guidance is given on the assumption that even if there are no acoustic requirements, a glazing configuration such as 4/16/6 or equivalent is required to meet the non-acoustic factors. Please advise if this is not the case, because a more economical construction may still be acoustically adequate.

7.1 Windows Open

The constructions outlined above should provide reasonable sound insulation when windows are closed.

With partially opened windows it is generally accepted that the typical noise reduction achieved is around 15dBA (ref. BS 8233:2014 Annex G.1). This value is the difference between dBA

levels measured outside and inside typical dwellings, therefore 3dBA should be added to free field noise levels to determine outside levels.

When purge ventilation is required for short durations i.e. removing food/decorating smells, this is usually acoustically acceptable. When purge ventilation is required to provide cooling during the warmer summer months, a cooling strategy not reliant on opening the windows may be required i.e. mechanical cooling.

We therefore offer the following guidance in relation to incorporating open windows into the overheating or background ventilation strategy based on the ANC Acoustics Ventilation and Overheating Guide version 1.1 published 2020.

- North & West façades (up to level 8) - predicted internal levels with windows open would not meet industry standard criteria and the noise could be described as causing a material change in behaviour e.g. having to keep windows closed most of the time;

- South and East façade and North & West façades (above level 7) - predicted internal levels with windows open would not meet industry standard criteria and the noise could be described as having the potential to result in having to close windows for certain activities, for example ones which require a high level of concentration; potential for some reported sleep disturbance; affects the acoustic environment inside the dwelling such that there is a perceived change in quality of life.

Additionally, in the event that the windows have to be open for overheating/background as a rare occurrence this should be deemed acceptable (e.g if its only for 0.5 hours on the hottest night of the year).

A summary of acoustically acceptable purposes for incorporating opening windows into the ventilation strategy while maintaining reasonable internal acoustic conditions are outlined below:-

Acceptable Acoustic conditions for opening windows		
Façade	**Purge Ventilation or infrequent window opening**	**Overheating/Background Ventilation**
North and West up to level 8	✓	X
All facades above level 8 and entire South and East Façade	✓	May be acceptable dependant on the time the “overheating condition” occurs.

8.0 Flanking Transmission Performance of Cladding

In order to avoid weakness at junctions between cladding and party walls/floors the cladding shall incorporate suitable elements on partitioning lines against which partitions can be sealed. The complete system shall be tested for flanking transmission at a junction with party walls (between adjoining rooms at the same floor abutting cladding) and with floor slabs (between adjoining floors abutting cladding). The system shall provide a weighted normalised flanking level difference of at least $D_{nf,w}$ +C_{tr} 55dB dB when tested in a laboratory in general accordance with BS BS EN ISO 10848-2:2006 and rated in accordance with BS EN ISO 717-1:2013. Junctions with floor slabs shall be tested in the absence of raised floors and suspended ceilings.

N.B. To adequately control flanking transmission it is recommended that all party walls should be sealed to 2No. separate mullions and all party floors should be sealed to 2No. separate transoms.

9.0 Conclusion

The existing environmental noise levels due to traffic and other environmental sources have been previously established and presented in our Environmental Noise Survey Report.

Suitable environmental noise intrusion criteria have been proposed specified on the basis of BS 8233: 2014 and in accordance with the relevant local authority guidance.

Detailed acoustic analysis has been undertaken to assess the sound insulation requirements of the external glazing.

This has enabled a sound reduction performance specification for the glazing to be prepared, along with advice to be given on types of constructions we would typically expect to provide the required acoustic performance.

We would stress however, that the proposed glazing systems (including frames) must comply with the relevant enclosed performance specifications.

HT: 28066 **30 October 2020**

17-37 William Road
Acoustic Specification
For
Glazing To Residential Façades

SOUND REDUCTION PERFORMANCE

The complete glazing system shall achieve the following minimum sound reduction indices when tested in accordance with BS EN ISO 10140-2:2010.

Façades	Minimum Sound Reduction Index (dB) @ Octave Band Centre Frequency (Hz)					$R_w + C_{tr}$ (see note)
	125	250	500	1k	2k	
All	23	22	29	38	40	30

Note: $R_w + C_{tr}$ figures are single figure simplifications. They are provided for guidance purposes only.

The minimum sound reduction indices specified are required to ensure that levels of environmental traffic noise intrusion are controlled with regard to the criteria stated. It is the responsibility of the glazing system supplier to ensure that these performances are achieved as installed on site, and that the systems proposed for this project and methods of installation are selected in order to achieve this.

The specified octave band SRI's are based upon typical glazing configurations. It is acknowledged that alternative SRI shapes may also comply with the internal noise criteria but these would need to be reviewed, and agreed in writing, by ourselves.

FLANKING PERFORMANCE

Where party walls/floors abut the cladding it shall incorporate suitable elements on partitioning lines against which walls/floors can be sealed to control flanking. The complete system shall be tested for flanking transmission at a junction with party walls (between adjoining rooms at the same floor abutting cladding) and with floor slabs (between adjoining floors abutting cladding). The system shall provide a weighted normalised flanking level difference of at least $D_{nf,w}$ +Ctr 55dB when tested in a laboratory in general accordance with BS EN ISO 10848-2:2006 and rated in accordance with BS EN ISO 717-1:2013. Junctions with floor slabs shall be tested in the absence of raised floors and suspended ceilings. N.B. To adequately control flanking transmission it is recommended that all party walls should be sealed

to 2No. separate mullions and all party floors should be sealed to 2No. separate transoms.

The supplier must demonstrate through developed design details that vulnerable areas subjected to the passage of unwanted sound i.e. flanking transmission have been so developed along with trades immediately adjoining the cladding to produce sound reduction figures as prescribed by the Acoustic Engineer.

TEST DATA

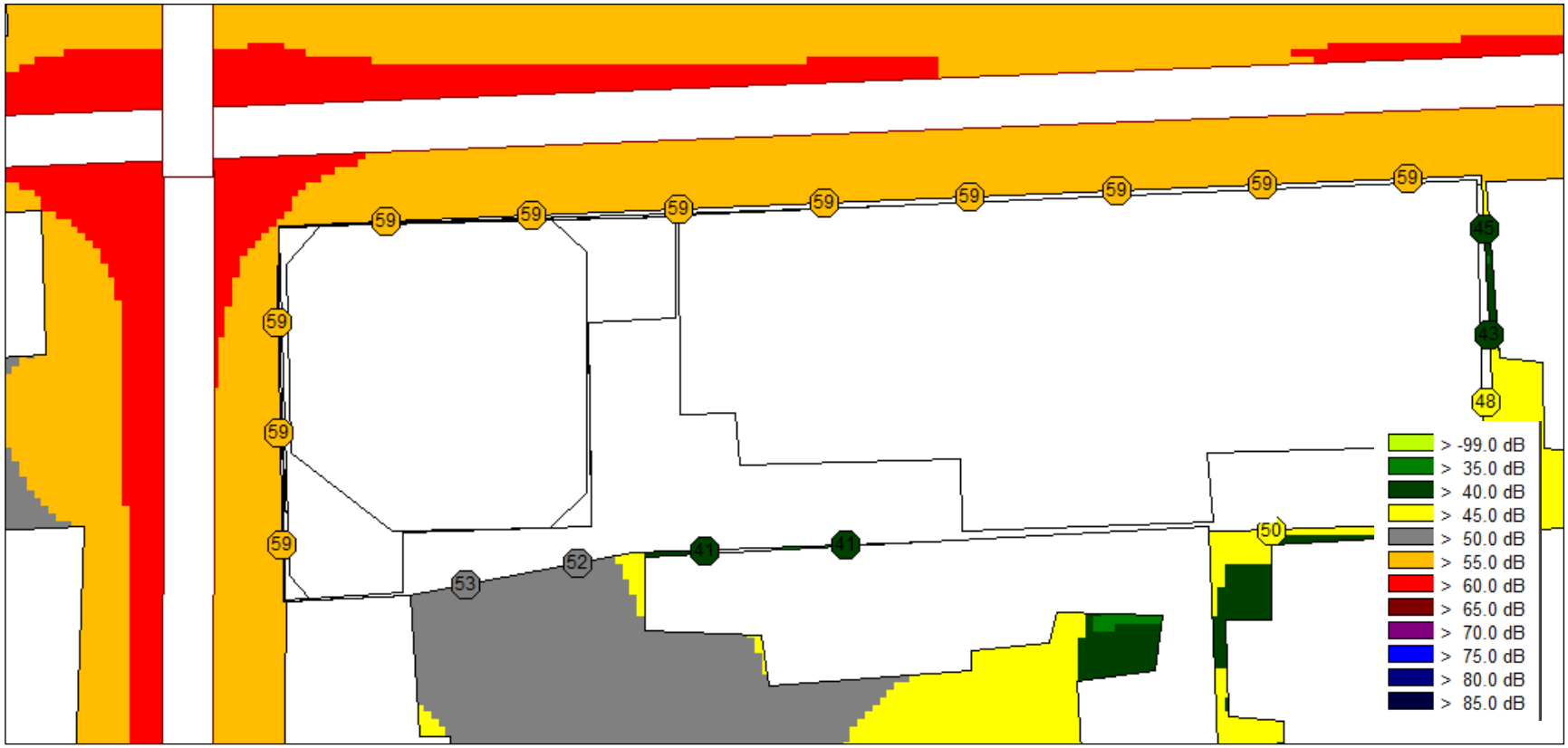
The supplier shall allow for the cost for supplying and testing a representative test sample in accordance with BS EN ISO 10848-1:2006 in an independent UKAS accredited or international equivalent acoustic test laboratory.

Fully detailed test reports shall be supplied. All test reports shall be in English or, a full English translation.

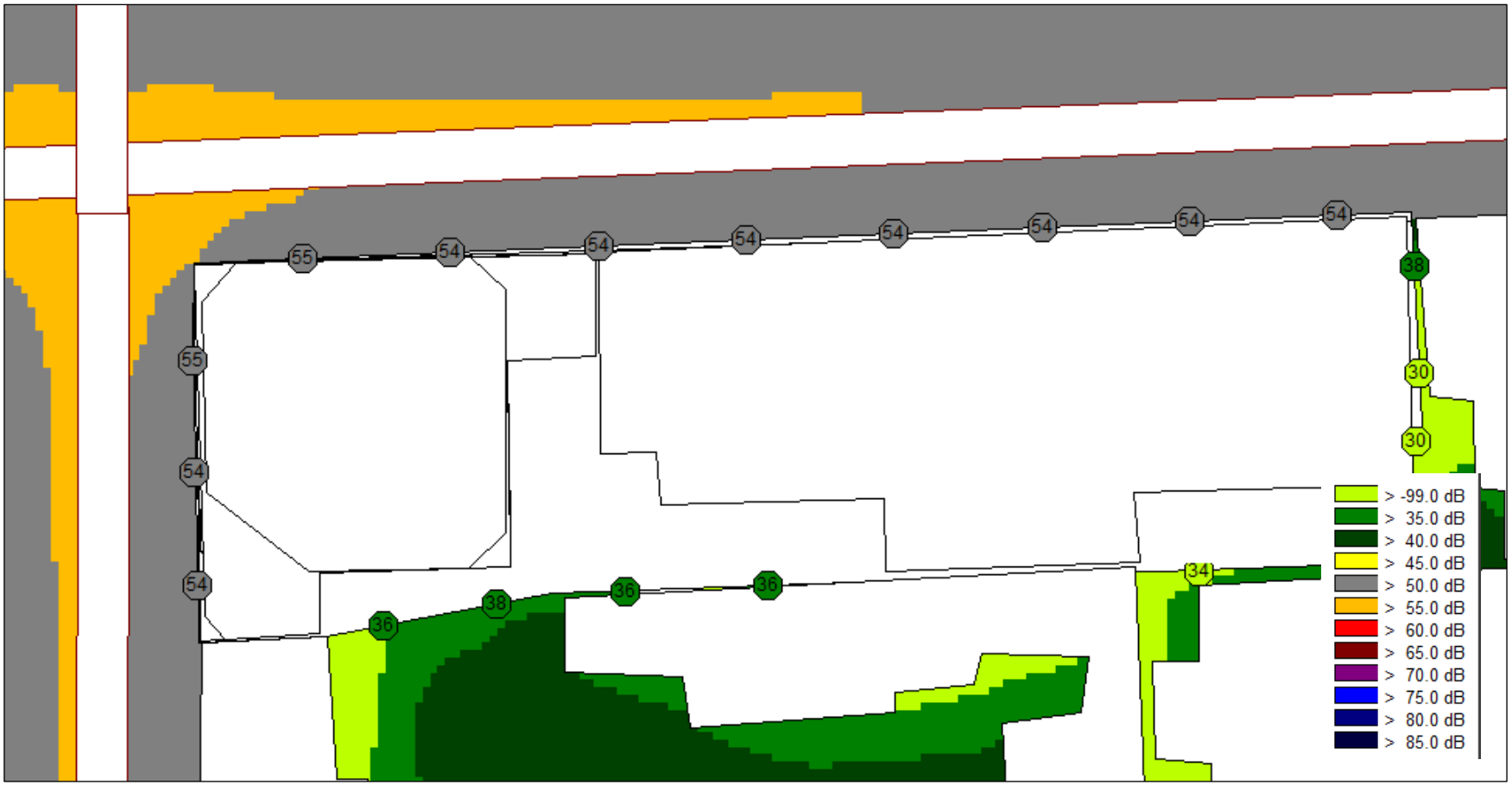
Test data should include the $^{1}/_{3}$ octave band results from 100Hz to 3150Hz inclusive, together with the corresponding octave band results from 125Hz to 4000Hz inclusive.

The test report shall be provided for test samples which are representation of the complete system for the relevant facades - including frames, joints, seals, spandrel panels and opening lights and trickle vents (as appropriate). The samples proposed should be approved by Hann Tucker Associates.

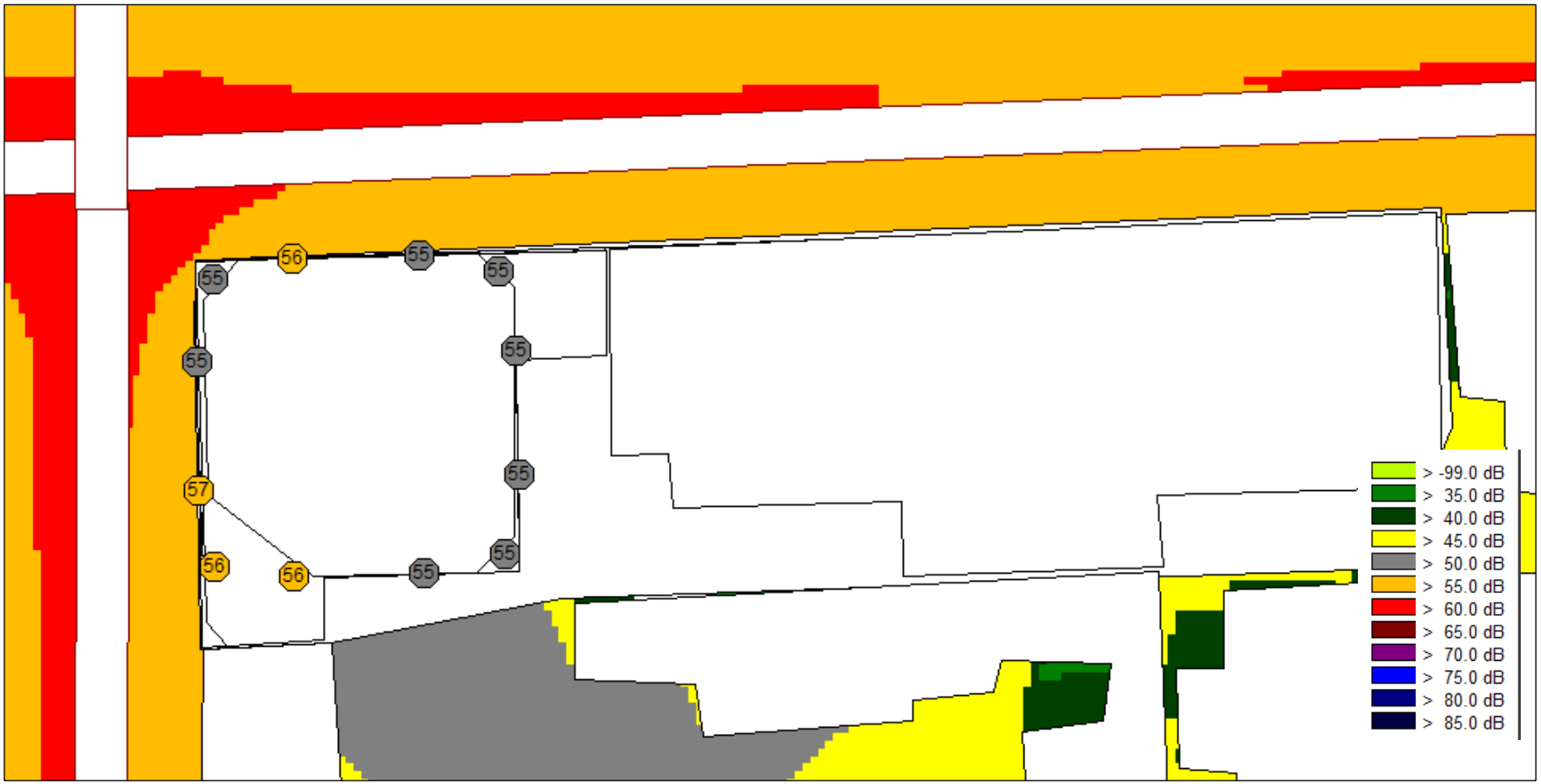
CadnaA Noise Mapping Images



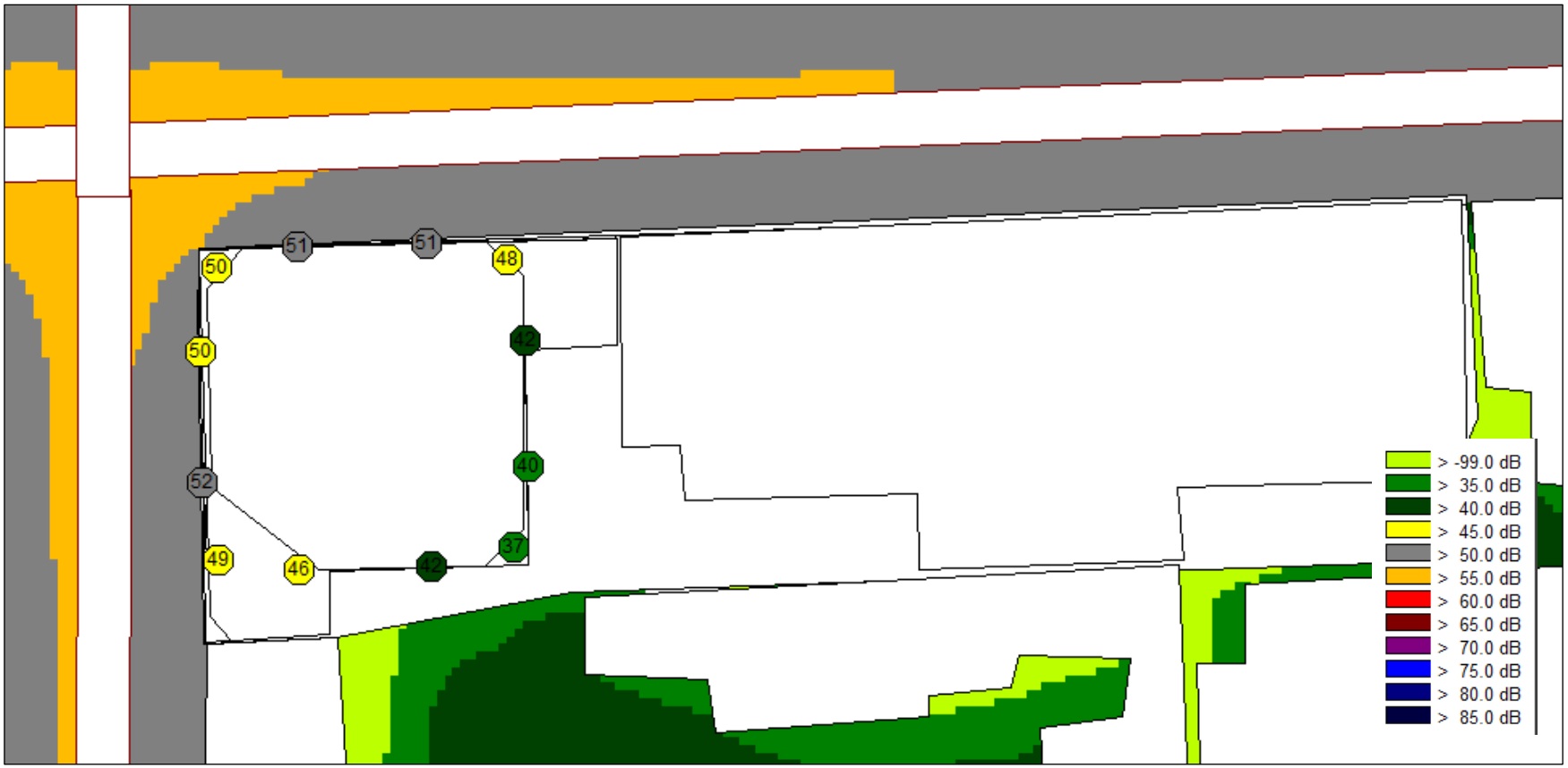
CadnaA Noise Mapping Image (1 of 8) – Ground Floor Noise Levels during Daytime Hours



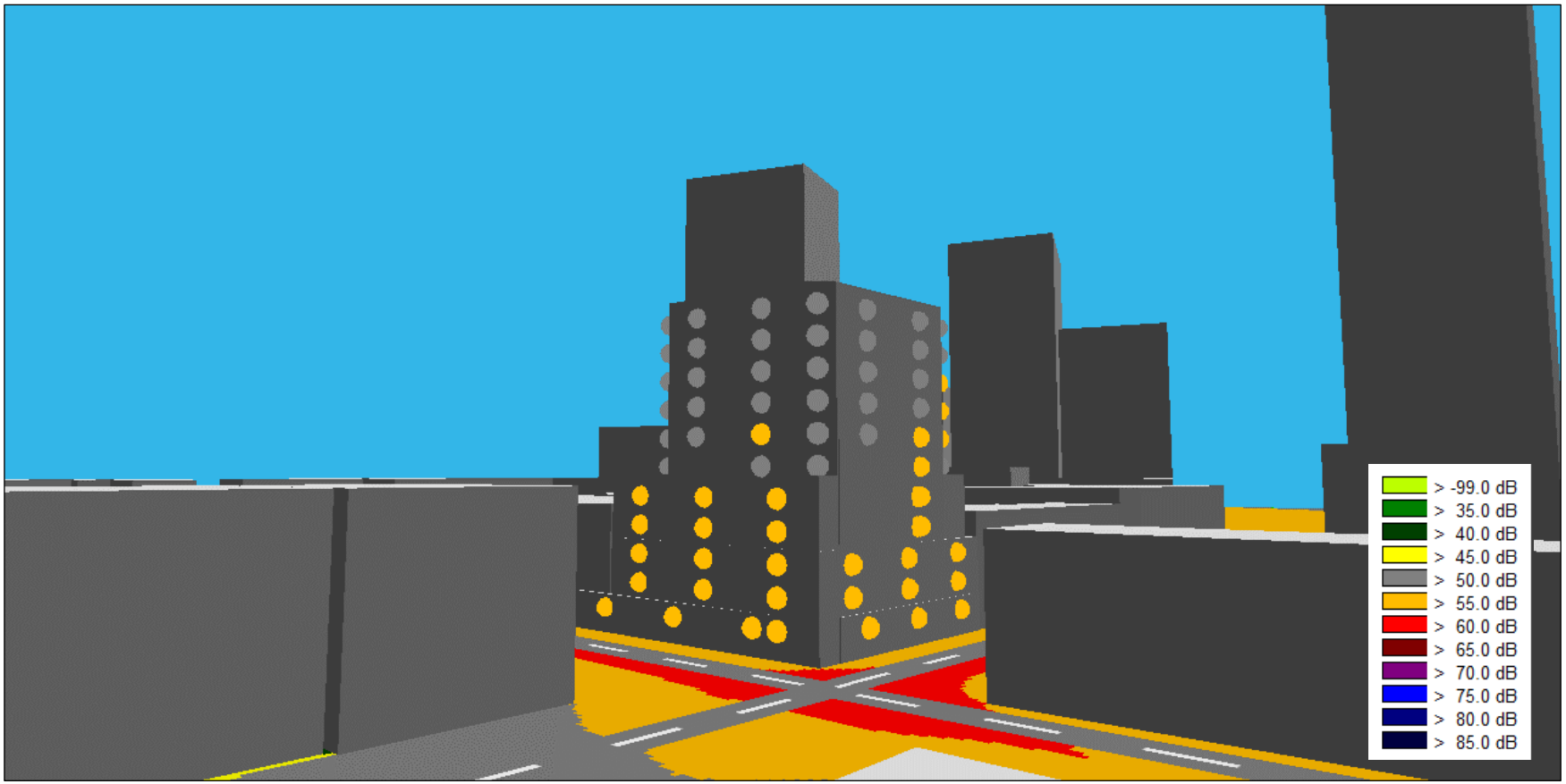
CadnaA Noise Mapping Image (2 of 8) – Ground Floor Noise Levels during Night-time hours



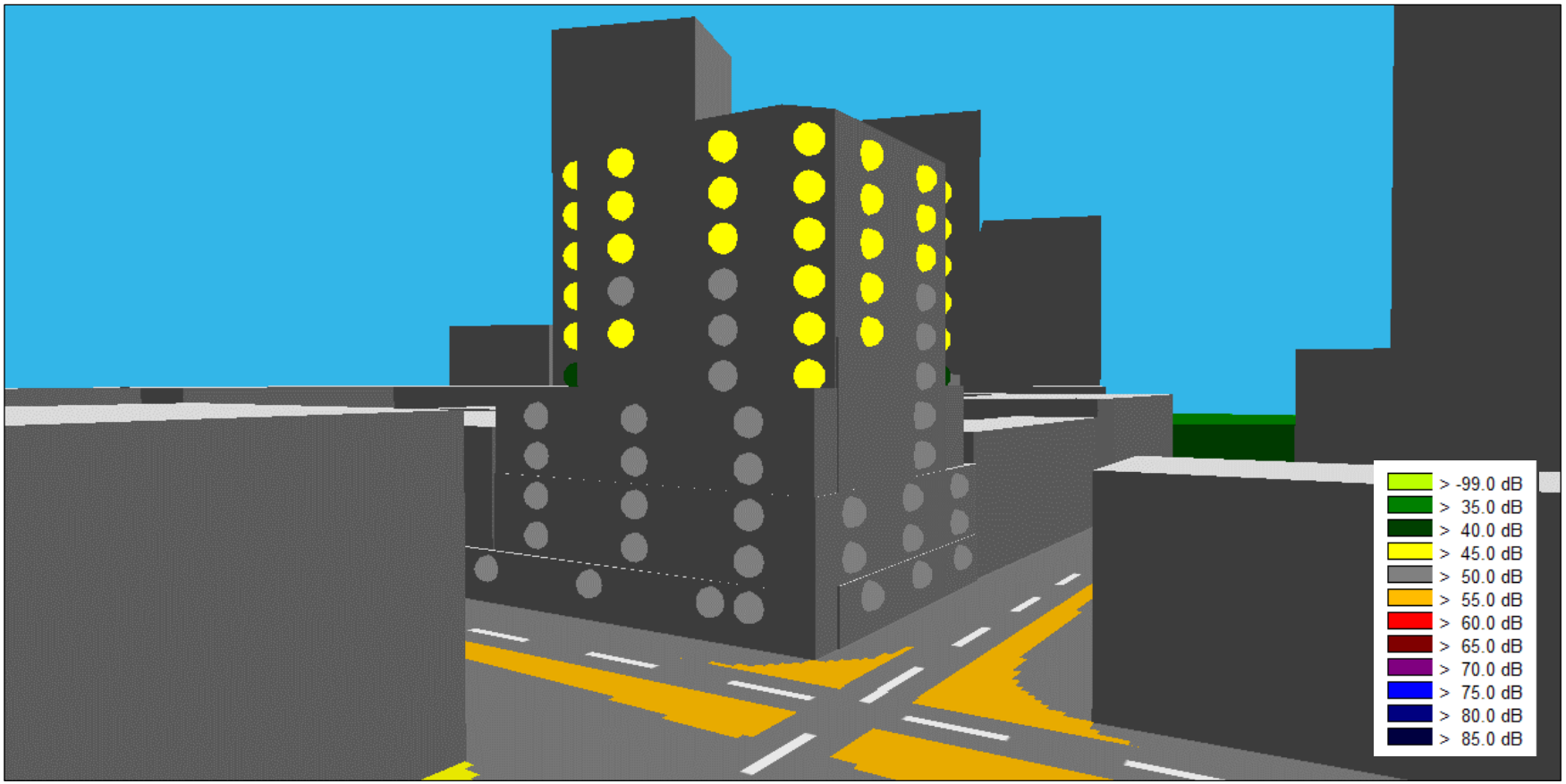
CadnaA Noise Mapping Image (3 of 8) – Upper Floors (level 8+) Noise Levels during daytime hours



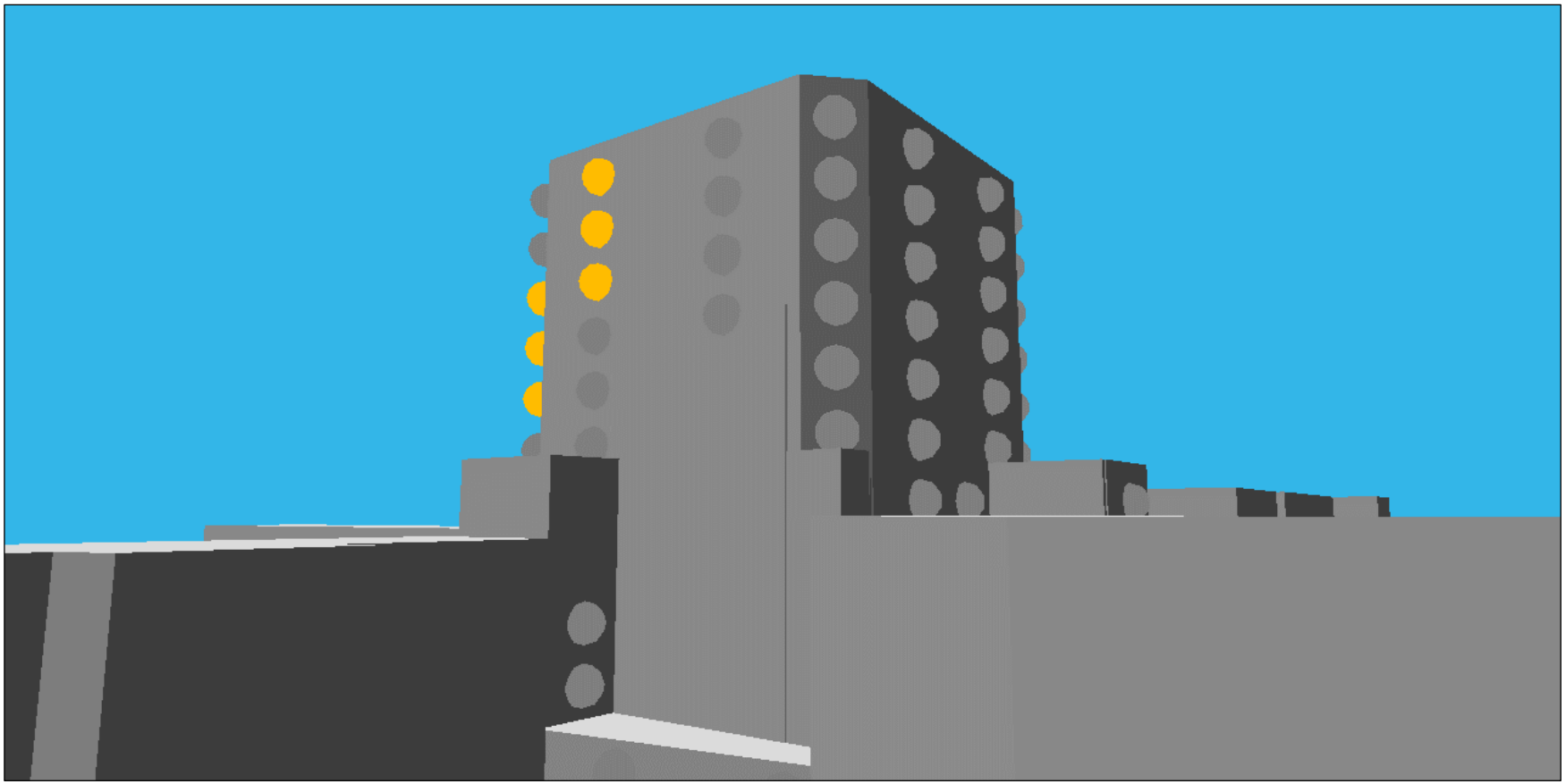
CadnaA Noise Mapping Image (4 of 8) – Upper Floors (level 8+) Noise Levels during Night-time hours



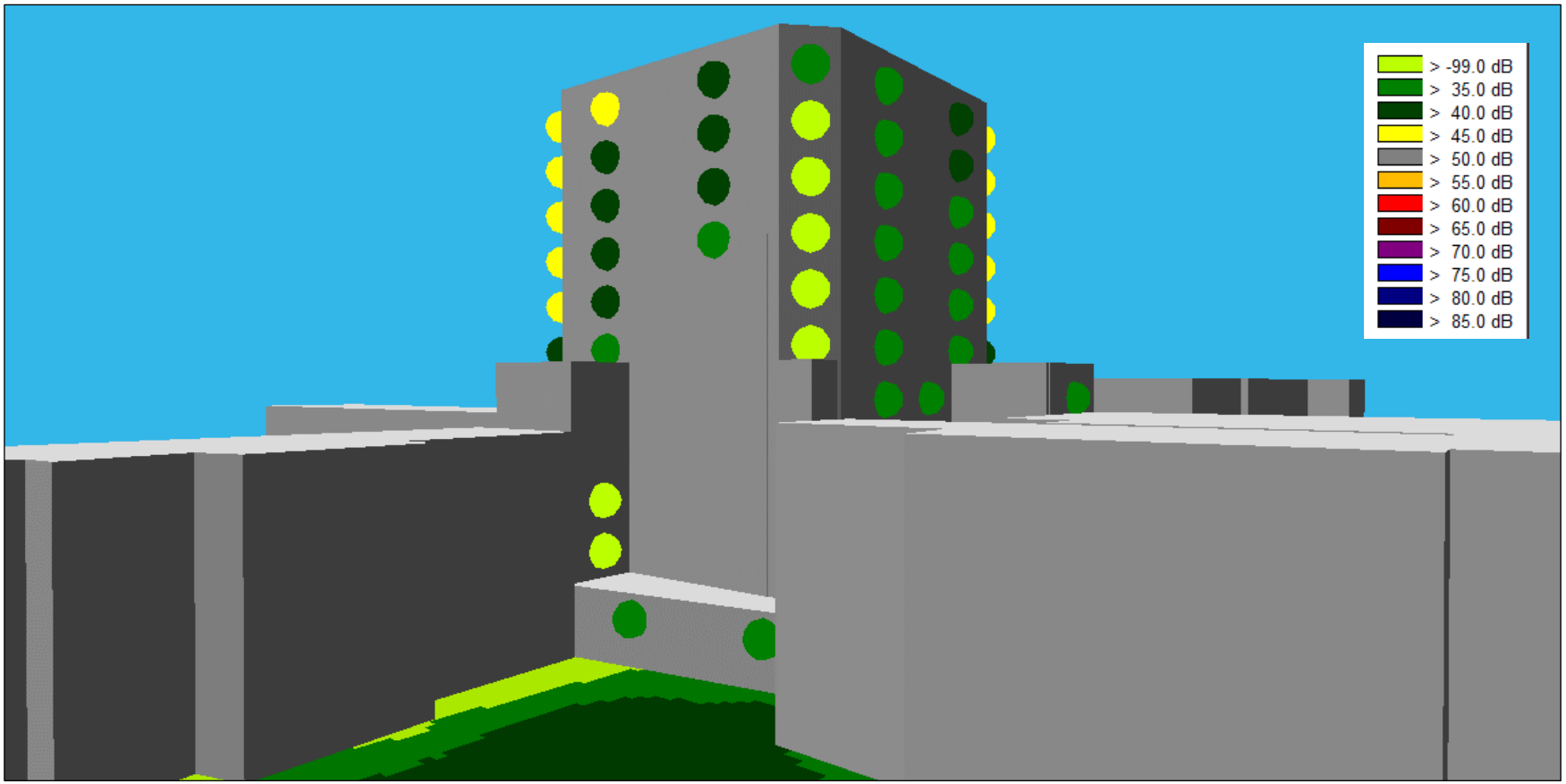
CadnaA Noise Mapping Image (5 of 8) – North and West Facades Daytime Noise Levels



CadnaA Noise Mapping Image (6 of 8) – North and West Facades Night-Time Noise Levels



CadnaA Noise Mapping Image (7 of 8) – South and East Facades Daytime Noise Levels



CadnaA Noise Mapping Image (8 of 8) – South and East Facades Night-Time Noise Levels