

Unit 1, 7Hills Business Park
37 Bankhead Crossway South
Edinburgh
EH11 4EP

T: 0345 062 0000
E: rmp@napier.ac.uk
www.rmp.biz

BRIEF FOR CONSULTANCY:

To conduct a noise impact assessment in relation to the proposed development and to offer advice as necessary to facilitate compliance with the relevant standards and guidelines.

Noise Impact Assessment Proposed Service Station Refurbishment, 126-128 Restalrig Road, Edinburgh, EH7 6UW

Technical Report No. R-9608-LH1-RGM
21st March 2024

PREPARED FOR:

Sandy McAllister
AMCA Architects,
Castlecroft Business Centre
Tom Johnston Road,
Dundee,
DD4 8XD

Edinburgh Napier
UNIVERSITY 



Contents

1.0 Introduction 3

2.0 Relevant planning guidance..... 4

3.0 Noise Impact Assessment 7

4.0 Mitigation 10

5.0 Conclusion 12

Appendix A: Proposed Planning Site Layout Plan 13

1.0 Introduction

- 1.1 We were instructed by AMCA Architects on behalf of RJ Fuels Ltd to undertake a noise impact assessment for the proposed refurbishment of an existing service station at 126-128 Restalrig Road, Edinburgh and to offer any acoustical advice necessary to facilitate compliance with the acoustic planning guidelines.
- 1.2 The project planning layout drawing for proposed development indicates that the refurbishment of the existing service station will include a new external plant area to the rear of the existing 1 storey cashier / shop building. The existing jet wash area and self-service laundry unit will remain in their current positions and will not be relocated as part of the development.. The proposed development site is a well established service station which has been operating at this location for many years. Figure 1 shows the existing service station.




Figure 1. Existing service station

- 1.3 Appendix A details the proposed layout of the service station following refurbishment.

2.0 Relevant planning guidance

- 2.1 Planning Conditions relating to noise are intended to ensure there is no loss of amenity for residents due to excess noise from any external source. Reduction of residential amenity by noise is considered, during night-time hours, as the potential for sleep disturbance and, during daytime hours, as annoyance and disturbance from any task requiring concentration.
- 2.2 Current guidance for local authorities with regard to noise affecting planning matters is given in the Scottish Government's PAN 1/2011 "*Planning and Noise*" document, with further details on the assessment of noise provided in its associated Technical Advice Note (TAN): 'Assessment of Noise'.
- 2.3 Paragraph 15 of PAN 1/2011 gives the following advice:
- 2.4 Issues which may be relevant when considering noise in relation to a development proposal include:
- *Type of development and likelihood of significant noise impact,*
 - *Sensitivity of location (e.g. existing land uses, NMA, Quiet Area),*
 - *Existing noise level and likely change in noise levels,*
 - *Character (tonal, impulsivity etc), duration, frequency of any repetition and time of day of noise that is likely to be generated, and*
 - *Absolute level and possible dose-response relationships e.g. health effects if robust data available.*
- 2.5 Paragraph 19 recommends that in order to assist in the preparation and consideration of planning applications, Noise Impact Assessments may be requested by the planning authority. Noise Impact Assessments are to "*demonstrate whether any significant adverse noise impacts are likely to occur and if so, identify what effective measures could reduce, control and mitigate the noise impact.*"

-
- 
- 2.1 Paragraph 23 states “*Road traffic noise impact assessments should take account of level, potential vibration, disturbance and variation in noise levels throughout the day, the pattern of vehicle movements and the configuration of the road system*”.
- 2.2 Other than the example assessments, PAN 1/2011 and TAN do not suggest criteria to employ for the noise assessments, but rather delegate this task to the planning authorities.
- 2.3 Information provided by AMCA Architects in relation to the previous planning application for the site, which we understand was withdrawn is detailed below. We are to assume for the purposes of this assessment that the local authority criteria in relation to static plant noise will remain unchanged.

“I refer to the above application.

The Design and Access Statement says that a new plant area will be formed to the rear, however I couldn't see anything drawn on the plans. Environmental Protection do have concerns on the proposal as the new plant could potentially cause a noise issue, especially if there is significantly more plant than there is currently, which may be the case with the re-design. Can you please provide more details on the new plant. Currently there appears to be one refrigeration unit to the front and one to the side. Positioning these two units to the rear will increase noise levels directed towards the flats at the rear, even if no new plant is added.

Their other concern is the jet wash. Jet wash are a very common source of complaint and very hard to mitigate against. Whilst there is already a jet wash, the new jet washes will be moved very close to the gable end of the nearest residential building.

To alleviate these concerns, please submit a Noise Impact Assessment (NIA). It should assess all mechanical plant noise including the refrigeration, a/c , jet washes, washing machines and tumble dryers.

Plant that operates 24/7 will require to meet the NR25 standard through a slightly open window in nearby / worst affected residential accommodation. The noise criterion for the jet washes, washing machines and tumble dryers will require to meet NR30 standard.”



2.4 The NR25 & NR30 criteria is a spectrum-based criteria which requires that the maximum noise level at a range of frequencies should not be exceeded as indicated in Table 1.

Table 1. NR Criteria (dB)							
Frequency (Single Octave Bands), Hz	63	125	250	500	1k	2k	4k
NR 25	55.2	43.7	35.2	29.2	25.0	21.9	19.5
NR 30	59.2	48.3	39.9	34.0	30.0	26.9	24.7

3.0 Noise Impact Assessment

3.1 External Plant Area

3.2 The existing jet wash area and self-service laundry unit are to remain in their existing locations and are not to be relocated as part of the development proposals. Therefore, no assessment will be made of these areas, given that they form part of the existing operations and will not be subject to change.

3.3 Project drawings for the development show that there is to be a plant area located at the rear of the existing service station building. Discussions with AMCA have concluded that there will be three items of static mechanical plant within the proposed plant area. Information provided by Vertex (R.A.S.) Ltd on the proposed external plant items along with their octave band centre frequency data is shown below in Table 2. Noise data for the proposed external plant has been requested by RMP and supplied by the manufacturers of proposed plant items.

Table 2. Proposed External Plant Noise Levels (dB re 20µPa)								
Model	Octave-band centre frequencies, Hz							
	63	125	250	500	1k	2k	4k	L _{WA}
Danfoss OP-LSQM067LL	60*	64*	66*	68*	67*	71*	71*	76
Danfoss OP-MSXM034ML	56*	61*	62*	63*	64*	64*	62*	71
Model	63	125	250	500	1k	2k	4k	L _{Aeq}
Mitsubishi FDC140VNA-W	71**	63**	59**	56**	57**	52**	47**	58
Notes: * Octave band centre frequency values are 'A' Weighted sound power levels ** Octave band centre frequency values taken from the more onerous heating mode noise levels								

3.4 Discussions with AMCA have concluded that the proposed plant items will be located at ground level within the proposed plant area. Figure 2 shows the proposed location of the static plant items. The nearest residential dwellings in relation to the proposed plant will be those located to the north on Restalrig Park.

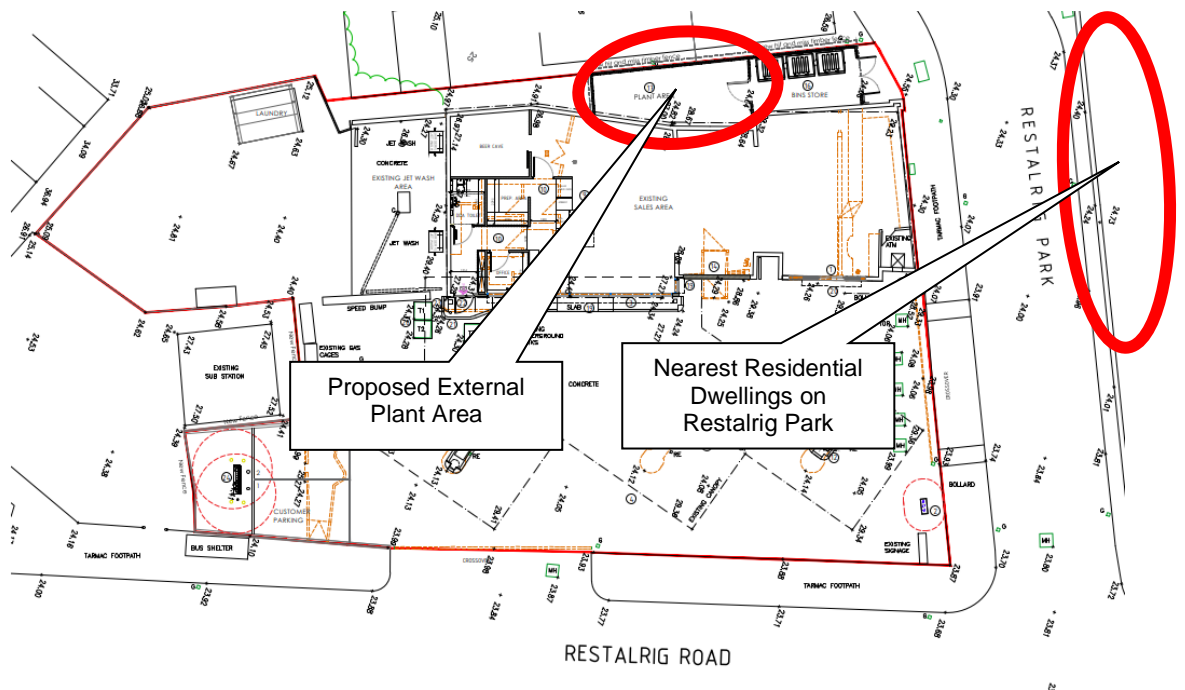


Figure 6: proposed External Plant Location

3.5 Table 3 below presents the predicted internal plant noise within the nearest residential dwellings on Restalrig Park based on manufacturer plant noise data. Octave band centre frequency noise data for the two Danfoss units will be corrected to unweighted sound power levels. Corrections will be applied for distance attenuation (approximately 26m to nearest residential façade), façade reflections and a 15dB reduction for a partially open window for ventilation.


Table 3. Predicted Internal Noise Levels (dB re 20µPa) at Nearest Residential Dwellings Restalrig Park from External Plant Noise							
Descriptor	Octave-band centre frequencies, Hz						
	63	125	250	500	1k	2k	4k
OP-LSQM067LL Corrected (SWL)	86.2	80.1	74.6	71.3	67	69.8	70
Distance Attenuation	-28.3	-28.3	-28.3	-28.3	-28.3	-28.3	-28.3
Reflections (2 surfaces)	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0
SWL to SPL formula constant	-8	-8	-8	-8	-8	-8	-8
Open Window Reduction	-15	-15	-15	-15	-15	-15	-15
Internal Level	37.9	31.8	26.3	23.0	18.7	21.5	21.7
OP- MSXM034ML Corrected (SWL)	82.2	77.1	70.6	66.3	64	62.8	61
Distance Attenuation	-28.3	-28.3	-28.3	-28.3	-28.3	-28.3	-28.3
Reflections (2 surfaces)	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0
SWL to SPL formula constant	-8	-8	-8	-8	-8	-8	-8
Open Window Reduction	-15	-15	-15	-15	-15	-15	-15
Internal Level	33.9	28.8	22.3	18.0	15.7	14.5	12.7
FDC140VNA-W (SPL)	71	63	59	56	57	52	47
Distance Attenuation	-28.3	-28.3	-28.3	-28.3	-28.3	-28.3	-28.3
Reflections (2 surfaces)	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0	+3.0
Open Window Reduction	-15	-15	-15	-15	-15	-15	-15
Internal Level	30.7	22.7	18.7	15.7	16.7	11.7	6.7
Cumulative Internal Level (all plant items)	39.9	33.9	28.3	24.8	22	22.7	22.3
NR 25 Criteria	55.2	43.7	35.2	29.2	25.0	21.9	19.5
Exceedance	0.0	0.0	0.0	0.0	0.0	0.8	2.8

3.6 It can be seen from Table 3 above that the cumulative plant noise level within the nearest residential dwelling is likely to exceed the Local Authority NR25 criteria. Exceedances at the 2000Hz centre octave band frequency are seen as negligible / marginal, as the exceedance is below 1dB. Exceedances at the 4000Hz centre octave band are 2.8dB above the NR25 criterion. The excess is due to the noise

from the Danfoss OP-LSQM067LL unit. Therefore, mitigation of plant noise will be required to meet Local Authority criteria.

4.0 Mitigation

- 4.1 **External Plant Noise:** it was seen from the assessment of external plant noise that the cumulative level of plant noise was likely to exceed the Local Authority criteria of NR25 within the nearest residential dwellings with a partially open window for ventilation. Therefore mitigation of plant noise levels will be required to meet Local Authority criteria.
- 4.2 We would recommend that in order to reduce received plant noise levels at the nearest noise sensitive receivers the following options are considered.
- 4.3 **Option 1:** The most effective solution to reduce received noise levels from external plant would be to select plant items that operate on a quieter noise level than those presently selected. Analysis of the predictive calculations show that if the Danfoss OP-LSQM067LL unit was to be replaced by a quieter unit then the NR 25 criterion is likely to be met within the nearest residential property. Details of the quieter and alternative plant item should be passed to RMP to confirm the suitability of the plant to meet Local Authority criteria.
- 4.4 **Option 2:** Another alternative would be to install a new proprietary acoustic enclosure around the Danfoss OP-LSQM067LL plant unit to reduce noise levels at the nearest receivers. The chosen acoustic enclosure should be solid without any gaps and / or openings. Should louvres be required to provide ventilation / air supply to the plant items then these should be high performance attenuated louvres that will maintain the overall insertion loss performance. Table 4 below details the minimum insertion loss required by the acoustic enclosure.



Frequency (Hz)	63	125	250	500	1k	2k	4k
Performance Requirement	0	0	0	0	0	5	5

- 4.5 We would recommend that the enclosure if required should be connected to the building structure and/or ground level with the use of suitable resilient mounts and / or fixings to reduce the likelihood of structure borne noise and / or vibration.
- 4.6 Details of the enclosure performance should be passed to RMP to confirm the suitability to meet Local Authority criteria
- 4.7 Examples of typical enclosures can be found on the links below.

www.ice-ltd.co.uk/air-conditioning/air-conditioning-acoustic-enclosures/

<http://www.gallowaygroup.co.uk/expertise-2/construction/acoustics-consultancy-and-noise-solutions/acoustic-enclosures/#:~:text=Galloway's%20acoustic%20enclosures%20are%20designed,audiology%20rooms%20and%20recording%20studios.>

<https://www.iacacoustics.global/industrial-noise-control/acoustic-enclosures-canopies/>

5.0 Conclusion

- 5.1 We were instructed by AMCA Architects on behalf of RJ Fuels Ltd to undertake a noise impact assessment for the proposed refurbishment of an existing service station at 126-128 Restalrig Road, Edinburgh and to offer any acoustical advice necessary to facilitate compliance with the acoustic planning guidelines.
- 5.2 The project planning layout drawing for proposed development indicates that the refurbishment of the existing service station will include a new external plant area to the rear of the existing 1 storey cashier / shop building. The existing jet wash area and self-service laundry unit will remain in their current positions and will not be relocated as part of the development.. The proposed development site is a well established service station which has been operating at this location for many years.
- 5.3 Mitigation measures have been provided to reduce the impact of the proposed external mechanical plant to meet Local Authority criteria. Mitigation measures included the options of the selection of quieter plant or an appropriate acoustic enclosure.

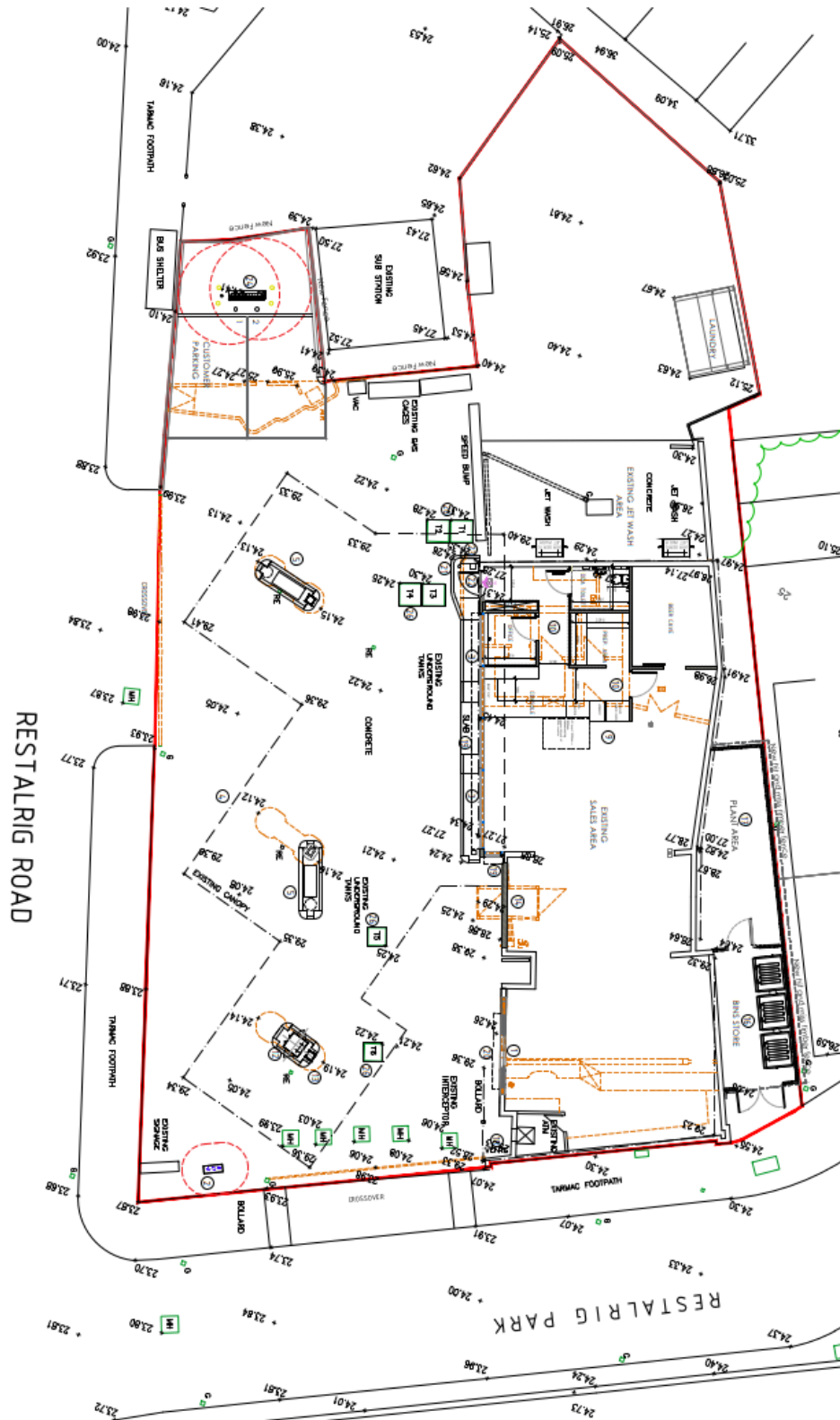
Prepared by:

Approved by:

Lee Hadden
BSc (Hons), PGDip, MSc, AMIOA

Richard Mackenzie
BSc, PGDip, MIOA, MInst SCE

Appendix A: Proposed Planning Site Layout Plan



RMP works in partnership with Edinburgh Napier University's Institute for Sustainable Construction bringing together a wide range of specialist expertise in construction innovation.



**Institute
for
Sustainable
Construction**

**Construction technologies
for tomorrow's communities**

Our primary research and innovation support centres include:

Building Performance Centre

Centre for Geotechnics

Centre for Offsite Construction and Innovative Structures

Robin Mackenzie Partnership

Scottish Energy Centre

Centre for Sustainable Communities

www.napier.ac.uk/isc

OFFICES

Head Office Edinburgh

Unit 1, 7Hills Business Park
37 Bankhead Crossway South
Edinburgh
EH11 4EP
0345 062 0000

South West

17 Bishops Close
Torquay
Devon
TQ1 2PL
07908 144954

South East

The Officer's Mess
Royston Road
Duxford
Cambridge
CB22 4QH
07592 104564

rmp@napier.ac.uk

www.rmp.biz

www.soundtest.co.uk

www.airtest.org.uk



@RMPsoundtesting

