Item 6

1st April 2025

Planning Services 231 George Street GLASGOW G1 1RX Tel: 0141 287 8555 Email: onlineplanning@glasgow.gov.uk

Applications cannot be validated until all the necessary documentation has been submitted and the required fee has been paid.

Thank you for completing this application form:

ONLINE REFERENCE 100692007-001

The online reference is the unique reference for your online form only. The Planning Authority will allocate an Application Number when your form is validated. Please quote this reference if you need to contact the planning Authority about this application.

Applicant or Agent Details

Are you an applicant or an agent? * (An agent is an architect, consultant or someone else acting on behalf of the applicant in connection with this application) ☐ Applicant ☒ Agent

Agent Details

Please enter Agent details

Company/Organisation:	Alder King		
Ref. Number:		You must enter a Building Name or Number, or both: *	
First Name: *	James	Building Name:	Pembroke House
Last Name: *	Tarpy	Building Number:	
Telephone Number: *	[redacted]	Address 1 (Street): *	15 Pembroke Rd
Extension Number:		Address 2:	Pembroke House
Mobile Number:		Town/City: *	Bristol
Fax Number:		Country: *	England
		Postcode: *	BS8 3BA
Email Address: *	[redacted]		

Is the applicant an individual or an organisation/corporate entity? *

☐ Individual ☒ Organisation/Corporate entity

Applicant Details

Please enter Applicant details

Title:		You must enter a Building Name or Number, or both: *	
Other Title:		Building Name:	
First Name: *		Building Number:	33
Last Name: *		Address 1 (Street): *	Holborn
Company/Organisation	Sainsbury's Supermarkets Limited	Address 2:	
Telephone Number: *		Town/City: *	London
Extension Number:		Country: *	United Kingdom
Mobile Number:		Postcode: *	EC1N 2HT
Fax Number:			
Email Address: *	[redacted]		

Site Address Details

Planning Authority:	Glasgow City Council

Full postal address of the site (including postcode where available):

Address 1:	PLATFORM BLOCK A
Address 2:	32 ANDERSTON QUAY
Address 3:	
Address 4:	
Address 5:	
Town/City/Settlement:	GLASGOW
Post Code:	G3 8BG

Please identify/describe the location of the site or sites

Northing	664977	Easting	257825

Description of Proposal

Please provide a description of your proposal to which your review relates. The description should be the same as given in the application form, or as amended with the agreement of the planning authority: *
(Max 500 characters)

Frontage alterations

Type of Application

What type of application did you submit to the planning authority? *

☒ Application for planning permission (including householder application but excluding application to work minerals).

☐ Application for planning permission in principle.

☐ Further application.

☐ Application for approval of matters specified in conditions.

What does your review relate to? *

☒ Refusal Notice.

☐ Grant of permission with Conditions imposed.

☐ No decision reached within the prescribed period (two months after validation date or any agreed extension) – deemed refusal.

Statement of reasons for seeking review

You must state in full, why you are a seeking a review of the planning authority's decision (or failure to make a decision). Your statement must set out all matters you consider require to be taken into account in determining your review. If necessary this can be provided as a separate document in the 'Supporting Documents' section: * (Max 500 characters)

Note: you are unlikely to have a further opportunity to add to your statement of appeal at a later date, so it is essential that you produce all of the information you want the decision-maker to take into account.

You should not however raise any new matter which was not before the planning authority at the time it decided your application (or at the time expiry of the period of determination), unless you can demonstrate that the new matter could not have been raised before that time or that it not being raised before that time is a consequence of exceptional circumstances.

Please see attached supporting appeal statement.

Have you raised any matters which were not before the appointed officer at the time the Determination on your application was made? * ☐ Yes ☒ No

If yes, you should explain in the box below, why you are raising the new matter, why it was not raised with the appointed officer before your application was determined and why you consider it should be considered in your review: * (Max 500 characters)

Please provide a list of all supporting documents, materials and evidence which you wish to submit with your notice of review and intend to rely on in support of your review. You can attach these documents electronically later in the process: * (Max 500 characters)

Appeal Statement Appendix 1 - Decision Notice Appendix 2 - Officer Email Appendix 3 - Amended Plans Cover Letter Noise Impact Assessment Site Location Plan Existing Site Plan Proposed Site Plan Existing Elevations Proposed Elevations Signage Details

Application Details

Please provide the application reference no. given to you by your planning authority for your previous application.	24/00568/FUL
What date was the application submitted to the planning authority? *	28/02/2024
What date was the decision issued by the planning authority? *	07/10/2024

Review Procedure

The Local Review Body will decide on the procedure to be used to determine your review and may at any time during the review process require that further information or representations be made to enable them to determine the review. Further information may be required by one or a combination of procedures, such as: written submissions; the holding of one or more hearing sessions and/or inspecting the land which is the subject of the review case.

Can this review continue to a conclusion, in your opinion, based on a review of the relevant information provided by yourself and other parties only, without any further procedures? For example, written submission, hearing session, site inspection. *

☒ Yes ☐ No

In the event that the Local Review Body appointed to consider your application decides to inspect the site, in your opinion:

Can the site be clearly seen from a road or public land? *	☒ Yes ☐ No
Is it possible for the site to be accessed safely and without barriers to entry? *	☒ Yes ☐ No

Checklist – Application for Notice of Review

Please complete the following checklist to make sure you have provided all the necessary information in support of your appeal. Failure to submit all this information may result in your appeal being deemed invalid.

Have you provided the name and address of the applicant?. *	☒ Yes ☐ No
Have you provided the date and reference number of the application which is the subject of this review? *	☒ Yes ☐ No
If you are the agent, acting on behalf of the applicant, have you provided details of your name and address and indicated whether any notice or correspondence required in connection with the review should be sent to you or the applicant? *	☒ Yes ☐ No ☐ N/A
Have you provided a statement setting out your reasons for requiring a review and by what procedure (or combination of procedures) you wish the review to be conducted? *	☒ Yes ☐ No

Note: You must state, in full, why you are seeking a review on your application. Your statement must set out all matters you consider require to be taken into account in determining your review. You may not have a further opportunity to add to your statement of review at a later date. It is therefore essential that you submit with your notice of review, all necessary information and evidence that you rely on and wish the Local Review Body to consider as part of your review.

Please attach a copy of all documents, material and evidence which you intend to rely on (e.g. plans and Drawings) which are now the subject of this review *	☒ Yes ☐ No

Note: Where the review relates to a further application e.g. renewal of planning permission or modification, variation or removal of a planning condition or where it relates to an application for approval of matters specified in conditions, it is advisable to provide the application reference number, approved plans and decision notice (if any) from the earlier consent.

Declare – Notice of Review

I/We the applicant/agent certify that this is an application for review on the grounds stated.

Declaration Name: Mr James Tarpy

Declaration Date: 15/11/2024

alder king
PLANNING CONSULTANTS

APPEAL STATEMENT OF CASE

SAINSBURY'S LOCAL, LANCEFIELD QUAY, GLASGOW

Sainsbury's Supermarkets Limited
November 2024

JT/GM/98951

APPEAL STATEMENT OF CASE

SAINSBURY'S LOCAL, LANCEFIELD QUAY, GLASGOW

Date: November 2024

Prepared by: James Tarpy
Senior Planner

Reviewed by: Gary Morris, MRTPI
Partner

Alder King Planning Consultants
Pembroke House, 15 Pembroke Road, Clifton, Bristol BS8 3BA
Telephone: 0117 317 1000

Contents

Appendices

1.0 Introduction

1.1 This appeal is submitted on behalf of Sainsbury's Supermarkets Limited (the appellant) against the decision of the Glasgow City Council (the Council) to refuse a full planning application for alterations to the side and rear of a retail unit.

1.2 The application (ref: 24/00568/FUL) was submitted was submitted 28/02/24, validated 21/03/24 and then refused 07/10/24. The local authority refused the application based on the Council's placemaking principles, the impact of visual amenity, and the impact on the character of the surrounding area.

1.3 A copy of the decision notice issued by the Council is enclosed with this submission in **Appendix 1**.

1.4 The proposal related to amending the ground floor front and side elevations to facilitate the occupation of the unit as a Sainsbury's Local Convenience Store.

1.5 The proposal was refused under the Officer's delegated powers with the full refusal reasons listed below (reason 2 was incorrectly listed as 3 on the decision notice):

> *01. The proposal is contrary to NPF4 Policy 14 and Policy CDP1 and SG1 The Placemaking Principle of the adopted Glasgow City Plan 2017 as specified below and there are no material considerations that would justify a departure from the Development Plan.*
>
> *03. The proposed louvres on the north elevation, due to their location, design, presence and impact, together with the loss of glazed windows, would unacceptably detract from the amenity value of the residential amenity space and the quality of environment associated with the residential access to flats overhead.*
>
> *03. The proposed louvres and blanking off of windows on the west elevation, due to their location, design, presence and impact, together with the loss of glazed windows and activation of a key frontage, would unacceptably detract from the appearance of the building and would be significantly harmful to placemaking characteristics of the surrounding area.*

1.6 This appeal will cover the below sections in turn:

- The Site and Surroundings
- The Appeal Proposal
- Planning Legislation and Policy
- Grounds for Appeal
- Conclusion

2.0 Site and Surroundings

Site Description

2.1 The appeal site is a recently completed residential town block in the Anderston area of Glasgow and is located around 100 metres west of the M8 Kingston Bridge on the outer edge of the designated City Centre.

2.2 Anderston Quay runs along the southern edge of the site with the river Clyde being located further south, running along the edge of the road. The town block was still under construction when the application was initially submitted. **Figure 1** shows the completed site as it appeared in November 2024.

Figure 1: View of Site

2.3 The appeal site was previously industrial and was used in connection with shipping. The character of the immediate area is a mix of the remaining industrial uses, lighter commercial premises, and the newly completed residential dwellings with ground floor retail space. Directly to the west of the site, there are multiple office blocks.

2.4 To the southwest of the site along Anderston Quay there is a terrace of offices. There are several residential blocks around the site which are currently at different stages of planning and building, with the character of the area shifting towards being residential.

2.5 The appeal site is not within a conservation area or the context of one. The closest listed heritage asset to the site is the Kingston Bridge which is Category C listed.

Planning History

2.6 At the site, planning permission for the erection of a mixed-use development including offices, residential units, a hotel, and associated ground floor commercial uses (retail) with parking and landscaping was approved in 2017 (ref: 16/02414/DC). Further applications relating to this development were submitted in 2018 (ref: 18/02825/MSC) for the approval of matters specified in the conditions. In 2022 permission was granted to amend a condition to prevent the application from expiring (ref: 22/01369/PPP).

2.7 The application subject to this appeal was submitted alongside an advertisement consent appeal (ref: 24/00570/ADV). This application was also refused by the Council as they were seen as being too visually prominent and incongruous. The decision to refuse advertisement consent is also being appealed under a separate appeal.

3.0 Appeal Proposal

3.1 The planning permission for the development envisaged that the ground floor of the building would be occupied by a variety of smaller shops each with their entrances and shopfronts. However, commercial interest in the retail space has only come in the form of a single convenience store operator, Sainsbury's, with a requirement to operate the entirety of the space as one retail store providing a range of everyday grocery items. For this reason, changes are required to the approved (and installed) ground floor elevations to accommodate occupation of the ground floor (western side) as a single retail unit with appropriately positioned doors, windows and ventilation.

3.2 Planning permission is sought for elevation changes to facilitate the occupation of the unit as a Sainsbury's Local Convenience Store. The changes include altering the southern elevation to remove unnecessary doors, installing an ATM on the west elevation, and installing louvres on the western elevation to allow for the plant inside of the store to be correctly ventilated. Opportunities to install the plant on the rooftop have been investigated, but there is insufficient space in the building's internal ducting for Sainsbury's operational requirements. It is therefore necessary to locate the operation's plant for the necessary cold-stores, at ground floor level.

3.3 The proposed louvres would occupy the current windows to the northern elevation, which are set behind black metal railings fronting the western walkway. In addition, one single window bay on the western elevation (the northernmost bay) is also proposed to be replaced with louvres.

3.4 Full details of the proposed changes can be seen in the drawings which were included with the original application. It is important to note that the vinyl graphics shown on the original application drawing (images of fruit and vegetables) **are not part of this application**. These are the subject of a separate application for advertisement consent appeal. Allowing this appeal for the louvres, ATM and solid delivery door would not construe any approval of the advertisements. The application's elevation drawing was amended by email, dated 27/9/24, to remove the advertisements since they did not form part of the application for planning permission. A copy of the email to the officer is included at **Appendix 2**. **Appendix 3** shows a drawing without the advertisements which was sent to the officer but has erroneously not been included in the listed drawings submitted.

3.5 No louvres or other means to obscure visibility into the store are proposed to the main, southern, elevation fronting Anderston Quay.

4.0 Planning Legislation and Policy

4.1 The Development Plan for the area comes from the Glasgow City Development Plan (GCDP) (2017) and The National Planning Framework (NPF4) (2023) and supporting documents.

4.2 In their reason for refusal, the Council stated the application was contrary to:

- Policy CDP1 of the CGDP and Policy 14 of NPF4.
- They also stated that the application was contrary to Supplementary Planning Guidance Note 1: Placemaking.

4.3 Below is a summary of the relevant policies from the GCDP, NPF4, and additional guidance:

Glasgow City Development Plan

4.4 Policy CDP1 – The Placemaking Principle: New development should be distinctive, safe, welcoming, adaptable, and resource-efficient. Development should embed community facilities and local shopping facilities in convenient and accessible locations. New development should not introduce unacceptable levels of noise to areas.

4.5 Policy CDP2 – Sustainable Spatial Strategy: The Council will focus on the regeneration and redevelopment of existing urban areas to create a sustainable city. Protect and reinforce town centres as the preferred locations for uses which generate significant footfall, including retail.

National Planning Framework 4

4.6 Policy 14 – Design, quality, and place: Developments will be encouraged that are well-designed and make successful places by taking a design-led approach. Proposals which are poorly designed or detrimental to the amenity of the surrounding area will not be supported.

4.7 Policy 15 – Local Living and 20-minute neighbourhoods: Development proposals will contribute to local living including, where relevant, 20-minute neighbourhoods. Consideration will be given to existing settlement patterns and the level and quality of interconnectivity of the proposed development with the surrounding area.

4.8 Policy 27 – City, town, local and commercial centre: Development proposals that enhance and improve the vitality and viability of centres will be supported.

Supplementary Planning Guidance

4.9 SG1: Placemaking: the guidance provides detail for GCDP Policy CDP1, providing additional detail to explain how these policy aims will be achieved. Developments should contribute towards the creation of successful places, with the Council expecting all new developments to be of the highest standard. The Council will seek to create new places throughout the city, that look good, function well, and appeal to everyone.

5.0 Ground for Appeal

5.1 This section of the appeal statement sets out the grounds for this appeal concerning the proposed alterations on three of the ground floor elevations for the unit to be occupied as a Sainsbury's Local convenience store, following the refusal of the application for planning permission 24/00568/FUL.

5.2 The drawings submitted are attached with this appeal, along with the noise impact assessment which demonstrated the acceptability of the proposal in terms of noise. The advertisements related to the proposed Sainsbury's are shown on the drawings as the full planning application and advertisement consent were submitted together. This appeal relates only to the full planning application for elevation alterations. As such, there should be no consideration given in this appeal to the advertisements, which are subject of a separate appeal and are covered by separate legislation.

5.3 The Council's reasons for refusal are listed as follows:

> *01. The proposal is contrary to NPF4 Policy 14 and Policy CDP1 and SG1 The Placemaking Principle of the adopted Glasgow City Plan 2017 as specified below and there are no material considerations that would justify a departure from the Development Plan.*
>
> *03. The proposed louvres on the north elevation, due to their location, design, presence and impact, together with the loss of glazed windows, would unacceptably detract from the amenity value of the residential amenity space and the quality of environment associated with the residential access to flats overhead.*
>
> *03. The proposed louvres and blanking off of windows on the west elevation, due to their location, design, presence and impact, together with the loss of glazed windows and activation of a key frontage, would unacceptably detract from the appearance of the building and would be significantly harmful to placemaking characteristics of the surrounding area.*

5.4 We were not provided with the officer's report and the report was not available on the Council's website. As such we are not able to fully determine how the officer came to these conclusions. During the application process, we were in contact with the planning officer who raised serval issues with the proposed advertisements. During the process, they did not raise any issues with the proposed physical alterations until the day before the application was refused, despite numerous email exchanges and telephone calls.

5.5 The reasons for refusal focus on the impact of the louvres on the northern and western elevations. The reasons do not mention the reduction in the number of doors on the southern elevation, the introduction of a new door on the western elevation, or the insertion of the ATM. It must therefore be considered that the officer found these elements acceptable and as such the determining factor in this appeal is the acceptability of the visual impact of the louvers.

5.6 The officer does not mention within their report the noise impact of the internal plant, so it is considered this element was also found to be acceptable, in line with the submitted noise assessment, and it was not considered that the proposed development would have any impact on the noise environment.

Appeal Considerations

5.7 The proposed changes are proposed to facilitate the occupation of the unit with a quality retailer providing a meaningful range of everyday convenience goods which will ensure local residents can meet their top-up shopping requirements locally. Such a provision is at the very heart of the 20-minute neighbourhood concept championed by NPF4.

5.8 The proposed works respond in the most positive possible way to the policy aspirations of GCDP and embrace the placemaking principles set out in the supplementary guidance relating to shopfronts. Placemaking is not simply about the physical appearance of buildings. Proper placemaking also means facilitating the right uses, in the right places, where genuine improvements in the way people lead their lives can be made. For the residents of Platform, this includes having easy and convenient access to quality, affordable, everyday food items. Without the proposed louvres, the store's proposed plant and ventilation would not be able to function. Without that, the store would not operate, and it is likely that the units will remain empty. Vacant units contribute negatively to placemaking.

5.9 The proposed changes are minor in scale compared to the overall scale of the building and will facilitate the occupation of the unit as a Sainsbury's Local Convenience Store whilst maintaining the most possible visibility into the building. The layout of the store has been designed to maximise the efficiency of the floor area whilst minimising the impact on the external elevations by ensuring that the loss of windows only occurs at the rear of the unit. None of the primary frontage windows of the building are proposed to be lost.

5.10 The shape of the unit means that louvers are required to be implemented on the external elevations given the limited space within the internal ducting up through the building. Therefore, it is through necessity, that a small proportion of the windows on the western elevation and the northern elevation's windows need to be obscured with louvres. However, Sainsbury's store-format team has worked hard to ensure that the entire frontage of the unit is open with clear glazing facing Anderston Quay. This clear glazing returns to around the western elevation to ensure that this elevation also has a level of interaction with the street scene.

5.11 The superfluous existing doors will need to be removed to clean up the elevation and to prevent confusing customers by having additional unused doors. The removed doors will be replaced with glazing to match the remainder of the glazed elevation on this level of the building.

5.12 There is a lack of ATMs in the surrounding area, so the new facility will assist those who still rely on the use of cash. The ATM will be easily accessible by the residents of Lancefield Quay and the other surrounding residential developments. The ATM occupies a small portion of one section of the western elevation that would otherwise need to be obscurely glazed to screen the back-of-house area. The inclusion of an ATM will add street-frontage interest as well as provide a valuable facility. Its presence will not impact the surrounding quality of character of the area.

5.13 At the northern end of the western elevation and on the northern elevation, the new louvres will allow for the venting of the internal plant required to operate the store. The plant will be located within the separate back-of-house area at the northern end of the unit. The louvres will allow for airflow into the plant room and vent onto the service entrance on the side road. The louvres will be located away from the customer entrance to the store and will be away from the main views of the store's primary frontage when viewed from the Anderston Quay.

5.14 The southern elevation of the building is the primary elevation of the building given it faces onto the road and the main east-west pedestrian route joining the Lancefield Quay area with the city centre. The western elevation of the building is somewhat secondary and likely to carry less pedestrian footfall. The western elevation would be visible while passing the building along Anderston Quay, but only those who live within the building would travel further along the western walkway to the north of the site. The northern elevation is largenly hidden from public view by the security railings for the residential dwellings. **Figures 2 and 3** show views of the northern and western elevations.

Figure 2: Northern and Western Elevations

Figure 3: Northern and Western Elevations

5.15 From the above image, not only are the northern louvres away from the primary frontage of the building but they are also largely hidden from view by the existing wall and fencing. Only oblique views of them would be gained by pedestrians walking down the western side of the building. By far the dominant visual feature for these pedestrians will be the existing black railings. The northern elevation louvres would be barely visible behind them. They louvres have been designed to assimilate with the style of the building, using the same colours as the windows frames. The location and design are therefore considered to be acceptable on this northern elevation, given the limited visual value of this elevation.

5.16 The louvres on the western elevation will only occupy one single window bay at the northern end of the elevation, again, away from the primary frontage of the unit and away from the road. Whilst the louvres will be visible to pedestrians walking along the western side of the building, they will not appear as an incongruous feature of the elevation. The elevation extract below in **Figure 4**, was sent to the planning officer on 27 September 2024 as a formal submission drawing to show the proposed elevation without the advertisements (which do not feature as part of this appeal). It is important to note that other options exist in respect of the advertisements and the amendments sought through this appeal in respect of the elevations will, in no way, construe any acceptable of advertisements. This appeal relates solely to the louvres, door and ATM surround.

5.17 The application drawing below therefore represents an accurate *elevation drawing* of the appeal proposal in drawing-form. However, the reality is that the louvres and solid delivery door would look significantly more congruous because the building's glazing, which is depicted in white and blue on the drawings, is in

fact grey-smoked glass and appears considerably more similar in appearance to the proposed louvres and door than the drawing suggests.

Figure 4: Proposed Louvre, door and ATM surround on Western Elevation (without advertisements)

5.18 The glazing at the southern end of the western elevation is to be maintained meaning the permeability through the unit will not be interrupted, as shown in **Figure 5**, the unit will still provide active frontage and an attractive high-quality place which will be the cornerstone location for convenience goods for the growing residential community in the area.

Figure 5: Permeability of Western Elevation

5.19 The proposed louver on the western elevation will not impact the presence or function of this secondary frontage. It presents a simple and elegant solution to allow the unit to be occupied which will match the

existing building and maintain the significance of the unit. It is not in Sainsbury's interest to harm the appearance of the store it wishes to occupy; pass-by trade is an important part of the convenience store model and having an attractive and open frontage can be an important part in attracting in customers. The proposed changes will allow for the store to operate while maintaining its appearance as an attractive and active unit which will be able to service the local community.

5.20 Importantly, the retention of clear glazing on both the majority of the western elevation and the entirety of the southern elevation means that visibility through the building is afforded on the southwestern corner. This means that for pedestrians walking north to south along the side walkway, views across to Anderston Quay and the river can be gained through the glazing. This allows the wider streetscape and setting of the building to be appreciated before pedestrians reach the southern edge of the building.

5.21 Policy 15 of NPF4 states the importance of supporting 20-minute neighbourhoods and reducing the need for travel. The proposed store will provide convenient and accessible convenience goods for customers in the area. Any convenience operation which was proposed in this location would require ventilation to operate so it is unrealistic to assume that this space would ever be able to be used without some form of louvres for any plant.

5.22 As previously mentioned, the ATM and changing of the doors on the unit were not mentioned within the reasons for refusal so it is considered that these elements of the proposal were deemed acceptable by the officer and therefore in alignment with local and national policy.

5.23 The development will bring a new local shopping facility to a growing residential community and help regenerate a previously developed area of the designated city centre. The changes are high quality and fitting for this location and therefore the development is in alignment with GCDP Policies CDP1 and CDP2 and NPF4 Policies 14, 15, and 27.

6.0 Conclusion

6.1 This appeal is made against the decision of Glasgow City Council to refuse planning permission for alterations to the ground floor elevations at Platform. The Appellant is of the view that permission should have been granted given the reasons set out in this statement.

6.2 The proposed alterations will allow the unit to be occupied as a Sainsbury's Local Convenience Store which will serve an important purpose in providing convenience shopping to the growing surrounding community.

6.3 The introduction of 1no louvred panel on the western elevation, conversion of existing windows to louvres on the northern elevation behind existing railings, addition of ATM and solid delivery door will not result in a materially detrimental appearance to the building. On the contrary, these necessary changes will facilitate the occupation of the entire western retail unit by Sainsbury's, bringing a vibrant and much needed convenience store to the development. This, in turn, will introduce street-level activity which will contribute positively to placemaking, ensuring that the development serves as a destination for local residents and provides important convenience goods provision in line with the 20 minute neighbourhood concept.

6.4 Given the above considerations it is considered that the proposed development is in alignment with local and national planning policy and to this end, it is respectfully requested that the appeal be allowed and planning permission be granted for the proposed works.

Appendix 1: Decision Notice

Appendix 2: Officer Correspondence

Appendix 3: Proposed Elevations (without Advertisements)

Alder King Planning Consultants
Pembroke House, 15 Pembroke Road, Clifton, Bristol BS8 3BA

Sainsbury's Local
Lancefield Quay
Glasgow

Plant Noise Impact Assessment

On behalf of

Project Reference: 91751 | Revision: 00 | Date: 3rd October 2023

T: 01252 519881
W: noisesolutions.co.uk
E: hello@noisesolutions.co.uk
Noise Solutions Ltd, Unit 5, Oriel Court, Omega Park, Alton, GU34 2YT Reg no. 3483481

Document Information

Project Name	:	**Sainsbury's Local, Lancefield Quay, Glasgow**
Project Reference	:	**91751**
Report Title	:	**Plant Noise Impact Assessment**
Doc Reference	:	**91751/NIA**
Date	:	**3rd October 2023**

	Name	Qualifications	Initials	Date
Prepared by:	Justyna Lubas	MSc, AMIOA	JL	3rd October 2023
Reviewed and approved by:	Dean Bowden	BSc(Hons), MIOA	DMB	4th October 2023
For and on behalf of Noise Solutions Ltd				

Revision	Date	Description	Prepared	Reviewed/ Approved

Reg no. 3483481 Trading office Unit 5, Oriel Court, Omega Park, Alton, Hampshire, GU34 2YT

Contents

Appendices

1.0 Introduction

1.1. Noise Solutions Ltd (NSL) has been commissioned by CTS Shopfitting Ltd. to provide a noise impact assessment for new plant serving the proposed Sainsbury's Local store, to be located on Lancefield Quay in Glasgow.

1.2. An environmental sound survey has been undertaken to establish the prevailing background sound pressure levels at a location representative of the sound levels outside the nearest noise sensitive receptors to the site.

1.3. Cumulative plant noise emission levels for the proposed plant have been predicted at the most affected noise sensitive receptors and assessed against the local authority's usual requirements.

1.4. To assist with the understanding of this report a glossary of acoustic terms can be found in **Appendix A**. An in-depth glossary of acoustic terms can be viewed online at www.acoustic-glossary.co.uk.

2.0 Details of development proposals

2.1. The proposed Sainsbury's Local store will occupy the ground floor of a thirteen-storey building alongside Anderson Quay. The upper floors are residential.

2.2. The new refrigeration plant is proposed to be located within a plant room towards the north west of the site. Airflow will be maintained to the plant room via a louvre venting onto a service entrance, accessed by the side road. The refrigeration plant room louvres are to be fitted with suitably sized attenuators internally.

2.3. All plant and associated pipework will be fitted with suitably rated spring anti-vibration mounts in order to control structure-borne noise transmission to adjoining premises. In addition, an acoustic ceiling will be installed within the plant room in order to control airborne sound transmission through the slab to residential properties above.

2.4. The proposed refrigeration plant will potentially operate 24 hours a day, although it should be noted that these units operate as required to meet demand and that store demands for cooling are generally reduced at night. The AC units will operate only during store opening hours.

3.0 Nearest noise sensitive receptors

3.1. The surrounding area is predominantly commercial in use.

3.2. The nearest noise sensitive premises to the plant room louvres are assumed to be residential windows (Receptor R2 and R3), approximately 2m above the louvres. There will be also residential flats (Receptor R1) opposite the louvres, approximately 12m away.

3.3. **Appendix B** contains aerial photographs showing the site and surrounding area.

4.0 Existing noise climate

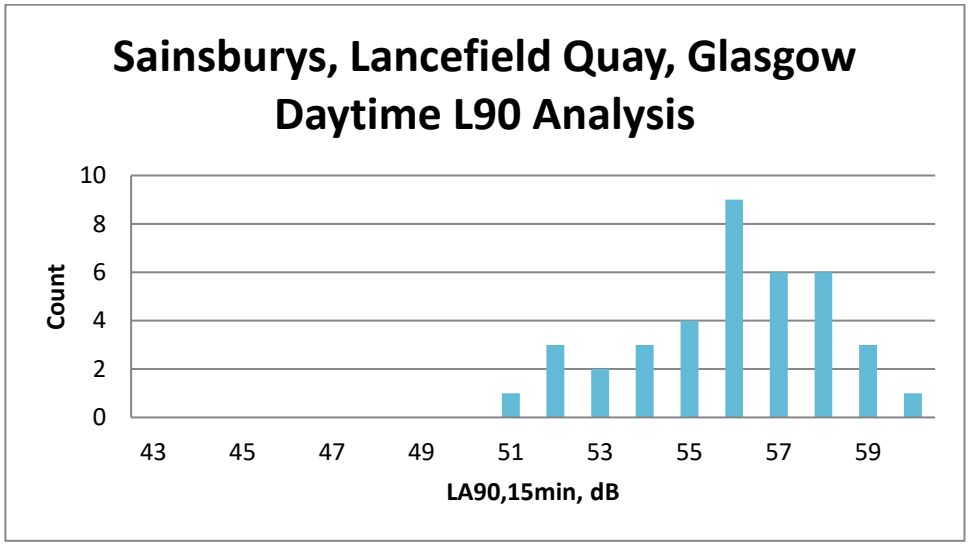
4.1. An environmental noise survey was undertaken to establish the typical background sound levels at a location representative of the noise climate outside the façades of the nearest noise sensitive receptor to the plant area during the quietest times at which the plant will operate.

4.2. The results of the environmental sound survey are summarised in Table 1 below. The full set of measurement results and details of the survey methodology are presented in **Appendix C**.

Table 1 Summary of survey results

Measurement period	Range of recorded sound pressure levels (dB)			
	$L_{Aeq(15mins)}$	$L_{Amax(15mins)}$	$L_{A10(15mins)}$	$L_{A90(15mins)}$
Daytime (07.00 – 23.00 hours)	64-73	78-96	68-74	51-60
Night-time (23.00 – 07.00 hours)	53-68	74-84	50-72	43-55

Figure 1 Histogram of daytime L_{A90} background sound pressure levels

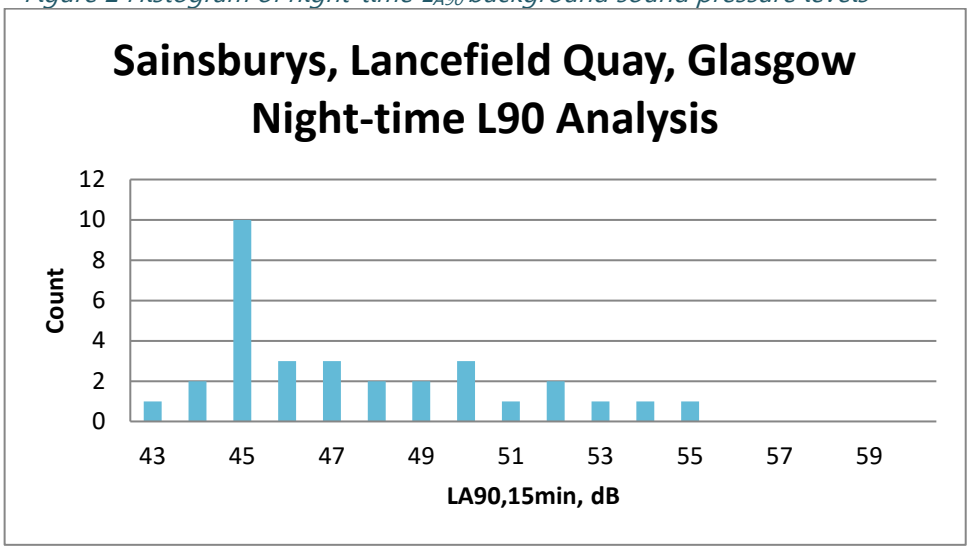


4.3. Additional statistical analysis has been undertaken. As shown in Table 2, the mean, median, and modal values have been calculated:

Table 2 Statistical analysis of $L_{A90,15min}$ levels during the daytime period

dB, L_{A90} daytime period	
Mean	56
Mode	56
Median	56

Figure 2 Histogram of night-time L_{A90} background sound pressure levels



4.4. Additional statistical analysis has been undertaken. As shown in Table 3, the mean, median, and modal values have been calculated:

Table 3 Statistical analysis of $L_{A90,15min}$ levels during the night-time period

dB, L_{A90} daytime period	
Mean	47
Mode	45
Median	46

4.5. Therefore, the following values are considered as representative of the existing background sound pressure levels at nearby noise sensitive premises:

- 52dB L_{90} during the daytime period; and
- 45dB L_{90} during the night-time period.

5.0 Plant noise design criteria

Glasgow City Council

5.1. A review of recent planning decisions shows that Glasgow Council typically imposes the following condition:

> *"Noise from or associated with the completed development (the building and fixed plant) shall not give rise to a noise level, assessed with windows open, within any dwelling or noise sensitive building in excess of that equivalent to Noise Rating Curve 35 between 0700 and 2200, and Noise Rating Curve 25 at all other times.*
>
> *Reason: To protect the occupiers of dwellings or noise sensitive buildings from excessive noise."*

Scottish Planning Policy, PAN and TAN

5.2. PAN 1/2011 provides guidance and advice in relation to noise and Scottish planning policy.

5.3. *Technical Advice Note - Assessment of noise* published by the Scottish Government sets out a methodology of assessing the impact of a new noise source on noise sensitive residential property in the form of stages.

5.4. The first stage directly compares the noise rating level to the prevailing background levels making reference to BS 4142:1997 (which has since been superseded[1]).

> *...the threshold of minor significant impacts is when the difference between the Rating and background noise levels is at least 5dB(A); and commonly do not become sufficiently significant to warrant mitigation until the difference between the Rating and background noise levels is more than 10dB(A).*

The noise sensitivity of a receptor is described in terms of the level of exceedance of the rating level, $L_{Ar,Tr}$ above the background noise level, $L_{A90,T}$, where the sensitivities are defined as follows:

* *Rating Level ($L_{Ar,Tr}$) – Background ($L_{A90,T}$) **<5** dB(A), the sensitivity is **Low***
* *Rating Level ($L_{Ar,Tr}$) – Background ($L_{A90,T}$) **≥ 5** dB(A), but less than **10** dB(A), the sensitivity is **Medium***
* *Rating Level ($L_{Ar,Tr}$) – Background ($L_{A90,T}$) **≥ 10** dB(A), the sensitivity is **High***

[1] BS4142:2014 *'Methods for rating and assessing industrial and commercial sound'*

5.5. The second stage is to look at the change in noise level, $L_{Aeq,T}$ before and after the development is analysed, which is assigned a Magnitude according to the following:

Table 4 Assigning Magnitudes of noise impact

Magnitude	Change in noise level, $L_{Aeq,T}$ dB (After – Before)
Major	≥5
Moderate	3 to 4.9
Minor	1 to 2.9
Negligible	0.1 to 0.9
No change	0

5.6. The final stage details the level of *significance of effect* of the noise impacts from industrial developments on the residential property which is determined from the matrix below:

Table 5 Assigning significance of effect of noise impact

Magnitude of Impact (After – Before) $L_{Aeq,T}$ dB	Sensitivity of Receptor based on likelihood of complaint x = (Rating ($L_{Ar,Tr}$) – Background ($L_{A90,T}$)) dB		
	Low (x < 5)	Medium (5 ≤ x < 10)	High (x ≥ 10)
Major (≥5)	Slight/Moderate	Moderate/Large	Large/Very Large
Moderate (3 to 4.9)	Slight	Moderate	Moderate/Large
Minor (1 to 2.9)	Neutral/Slight	Slight	Slight/Moderate
Negligible (0.1 to 0.9)	Neutral/Slight	Neutral/Slight	Slight
No change (0)	Neutral	Neutral	Neutral

BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

5.7. BS 4142:2014 +A1:2019 is intended to be used to assess the likely effects of sound on people residing in nearby dwellings. The scope of BS 4142:2014[2] includes *"sound from fixed plant installations which comprise mechanical and electrical plant and equipment"*.

5.8. The procedure contained in BS 4142:2014 is to quantify the *"specific sound level"*, which is the measured or predicted level of sound from the source in question over a one hour period for the daytime and a 15 minute period for the night-time. Daytime is defined in the standard as 07:00 to 23:00 hours, and night-time as 23:00 to 07:00 hours.

5.9. The specific sound level is converted to a rating level by adding penalties on a sliding scale to account for either potentially tonal or impulsive elements. The standard sets out objective methods for determining the presence of tones or impulsive elements, but notes that it is acceptable to subjectively determine these effects.

5.10. The penalty for tonal elements is between 0dB and 6dB, and the standard notes: *"Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible."*

[2] For brevity, references to BS 4142 and BS 4142:2014 should be read as BS 4142:2014 + A1:2019

5.11. The penalty for impulsive elements is between 0dB and 9dB, and the standard notes: *"Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible."*

5.12. The assessment outcome results from a comparison of the rating level with the background sound level. The standard states:

- *Typically, the greater this difference, the greater the magnitude of the impact.*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;*
- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

5.13. The standard does state that "*adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."*

5.14. The standard goes on to note that: *"Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."*

5.15. In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014 edition places emphasis upon an appreciation of the context, as follows:

"An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context."

5.16. BS 4142:2014 requires uncertainties in the assessment to be considered, and where the uncertainty is likely to affect the outcome of the assessment, steps should be taken to reduce the uncertainty.

Proposed criteria

5.17. In order to demonstrate compliance with Glasgow City Council's usual requirements, cumulative plant noise levels inside nearby residential premises should not exceed the following levels at any octave band centre frequency with windows open.

Table 6 Glasgow City Council's internal design criteria for noise from fixed plant

Period	Sound pressure level (dB) at octave band centre frequencies (Hz)								NR Level
	63 Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
Day	63	52	45	39	35	32	30	28	35
Night	55	44	35	29	25	22	20	18	25

6.0 Noise impact assessment

Prediction methodology

6.1. The cumulative plant noise levels at the nearest noise sensitive receptors have been predicted. Predictions are based on the manufacturer noise data provided in **Appendix D**. A proposed plant room layout drawing is provided in **Appendix E**.

6.2. The assessment has considered the reverberant conditions within the plantroom, the aperture size, directivity, and distance attenuation. The predictions for the plant room have been based on the proposed refrigeration plant operating at maximum duty during the daytime and night-time periods. The AC unit will only operate during the daytime period.

6.3. Predictions are inclusive of the following atmospheric attenuators fitted to the plant room:

Table 7 Proposed attenuators to plant room

Attenuator	Insertion loss (dB) at 1/1 octave band centre frequencies (Hz)							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Intake	10	20	36	45	45	45	45	44
VRV Discharge	11	23	38	45	45	45	45	45
Gas cooler Discharge	13	26	40	45	45	45	45	45

6.5. The full set of noise levels predictions are detailed in **Appendix F**.

NR assessment (Glasgow Council requirement)

6.6. The table below summarises the assessment of predicted NR levels inside the worst affected noise sensitive receptors in accordance with Glasgow City Council requirements (Paragraph 5.1). the predictions assume open windows for natural ventilation.

Table 8 Assessment of predicted internal plant noise levels using Glasgow City Council guidance

Receptor	Period	Predicted internal NR level	Criterion (NR level)	Difference
R2	Daytime (07.00 – 23.00 hours)	33	35	-2
	Night-time (23.00 – 07.00 hours)	20	25	-5
R3	Daytime (07.00 – 23.00 hours)	34	35	-1
	Night-time (23.00 – 07.00 hours)	15	25	-10

6.7. The above assessment demonstrates that predicted plant noise levels comply with Glasgow City Council requirements.

BS 4142:2014 assessment

6.8. Table 9 below summarises the assessment of predicted noise rating levels at the façade of the nearest noise sensitive receptor in accordance with BS 4142:2014 methodology.

6.9. It should be noted that the proposed plant is not anticipated to exhibit any tonal or impulsive characteristics provided it is well maintained. All proposed plant will be inverter driven and, therefore, will gently ramp up and down depending on the demands on the various systems. However, a penalty of 3dB as described in BS 4142:2014 has been included in the rating levels in Table 9 for the possible presence of *"…characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment…".*

Table 9 Assessment of predicted plant noise levels in accordance with BS 4142:2014

Receptor	Period	Predicted rating noise level at receptor, L_{Aeq} (dB)*	Representative background noise level (dB)	Difference (dB)
R1	Daytime (07.00 - 23.00 hours)	37	52	-15
	Night-time (23.00 – 07.00 hours)	28	45	-17
R2	Daytime (07.00 - 23.00 hours)	47	52	-5
	Night-time (23.00 – 07.00 hours)	38	45	-7
R3	Daytime (07.00 - 23.00 hours)	47	52	-5
	Night-time (23.00 – 07.00 hours)	35	45	-10

**predicted rating levels inclusive of +3dB feature correction as detailed in Paragraph 6.9.*

6.10. The assessment shows that plant noise rating levels will be lower than the representative background noise level and, therefore, will be of *'low impact, depending on context'*.

6.11. As BS 4142: 2014 advises, the impact must be considered within the context of the site and the surrounding acoustic environment. The following must, therefore, also be taken into consideration when determining the potential impact that may be experienced:

- The assessment considers plant operating simultaneously at maximum duty. Since the plant will not operate in this fashion at all times, particularly in the evenings and middle of the night when requirements for cooling are generally reduced, this makes for a robust assessment.

6.12. Where possible uncertainty in the above assessment has been minimised by taking the following steps:

- The meter and calibrator used have a traceable laboratory calibration and the meter was field calibrated before and after the measurements;
- Uncertainty in the calculated impacts has been reduced by the use of a well-established calculation method;

Scottish Planning Policy, TAN

6.13. The first stage directly compares the noise rating level to the prevailing background level. With reference to Table 9, since the Rating Level ($L_{Ar,Tr}$) – Background ($L_{A90,T}$) is less than 5 dB(A), the sensitivity is *'Low'.*

6.14. The second stage is to look at the change in noise level, $L_{Aeq,T}$ before and after the development. Table 10 summarises the assessment of the magnitude of noise impacts.

Table 10 Assessment of Magnitude of noise impact in accordance with TAN

Receptor	Period	Predicted specific noise level at receptor, L_{Aeq} (dB)	Measured average L_{Aeq} (dB)	Cumulative L_{Aeq} (dB)	Difference (dB) / Magnitude
R1	Daytime (07.00 - 23.00 hours)	34	68	68	0.0 / No change
	Night-time (23.00 – 07.00 hours)	25	61	61	0.0 / No change
R2	Daytime (07.00 - 23.00 hours)	44	68	68	0.0 / No change
	Night-time (23.00 – 07.00 hours)	35	61	61	0.0 / No change
R3	Daytime (07.00 - 23.00 hours)	44	68	68	0.0 / No change
	Night-time (23.00 – 07.00 hours)	32	61	61	0.0 / No change

6.15. Based on the matrix provided in Table 5, the *significance of effect* can be determined to be *'Neutral'* during both the daytime and night-time periods.

7.0 Summary

7.1. Noise Solutions Ltd (NSL) has been commissioned by CTS Shopfitting Ltd. to provide a noise impact assessment for new plant serving the proposed Sainsbury's Local store, to be located on Lancefield Quay in Glasgow.

7.2. An environmental sound survey has been undertaken to establish the prevailing background sound pressure levels at a location representative of the sound levels outside the nearest noise sensitive receptors to the site.

7.3. Cumulative plant noise emission levels for the proposed plant have been predicted at the most affected noise sensitive receptors and assessed against the local authority's usual requirements.

7.4. The noise level predictions demonstrate that cumulative noise emissions from the proposed plant will comply with the proposed limits at the nearest noise sensitive properties, inclusive of the following acoustic treatments:

- Suitable atmospheric-side attenuators fitted to plant room louvres.
- Suitable acoustic ceiling to be installed within plant room to control airborne sound transmission through the party floor to residences above.
- All plant and associated pipework to be fitted with suitable anti-vibration mounts/hangers.

7.5. Given the results of the above assessment, noise emissions should not be grounds for refusal of planning permission.

Appendix A Acoustic terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1/s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A –weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level that is exceeded for 90% of the measurement time interval, T. It gives an indication of the lower levels of fluctuating noise. It is often used to describe the background noise level and can be considered to be the "average minimum" noise level and is a term used to describe the level to which non-specific noise falls during quiet spells, when there is lull in passing traffic for example.

Appendix B Aerial photographs of site showing areas of interest

Appendix C Environmental sound survey

Details of environmental sound survey

C.1 Measurements of the existing background sound levels were undertaken between 16.30 hours on Tuesday 5th September and 10.00 hours on Wednesday 6th September 2023.

C.2 The sound level meter was programmed to record the A-weighted L_{eq}, L_{90}, L_{10} and L_{max} noise indices for consecutive fifteen-minute sample periods for the duration of the survey.

Measurement position

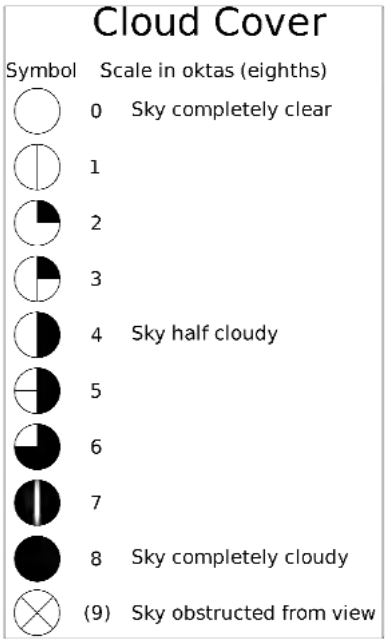
C.3 The representative measurement position was located on a lamppost on a junction of Lancefield Quay and Elliot Street (location indicated on the site plan in **Appendix B**). In accordance with BS 7445-2:21991 *'Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use'*, the measurements were undertaken under free-field conditions.

Equipment

C.4 Details of the equipment used during the survey are provided in the table below. The sound level meter was calibrated before and after the survey; no significant change (+/-0.2 dB) in the calibration level was noted.

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 977/ 69747	01/08/2022	1503080-1
Condenser microphone	ACO Pacific 7052E / 70829		
Preamplifier	Svantek SV12L / 73687		
Calibrator	Svantek SV30A / 10843	02/11/2022	1503080-2

C.5 Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were generally appropriate for environmental noise measurements. The table below presents the weather conditions recorded on site at the beginning and end of the survey.

Weather Conditions				
Measurement Location	**Time/Date**	**Description**	**Beginning of Survey**	**End of Survey**
As indicated on Appendix B	16.30 5 Sep - 10.00 6 Sep 2023	Temperature (°C)	23	18
		Precipitation:	No	No
		Cloud cover (oktas – see guide)	1	7
		Presence of fog/snow/ice	No	No
		Presence of damp roads/wet ground	No	No
		Wind Speed (m/s)	<6*	<5*
		Wind Direction	N	N
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	-	-

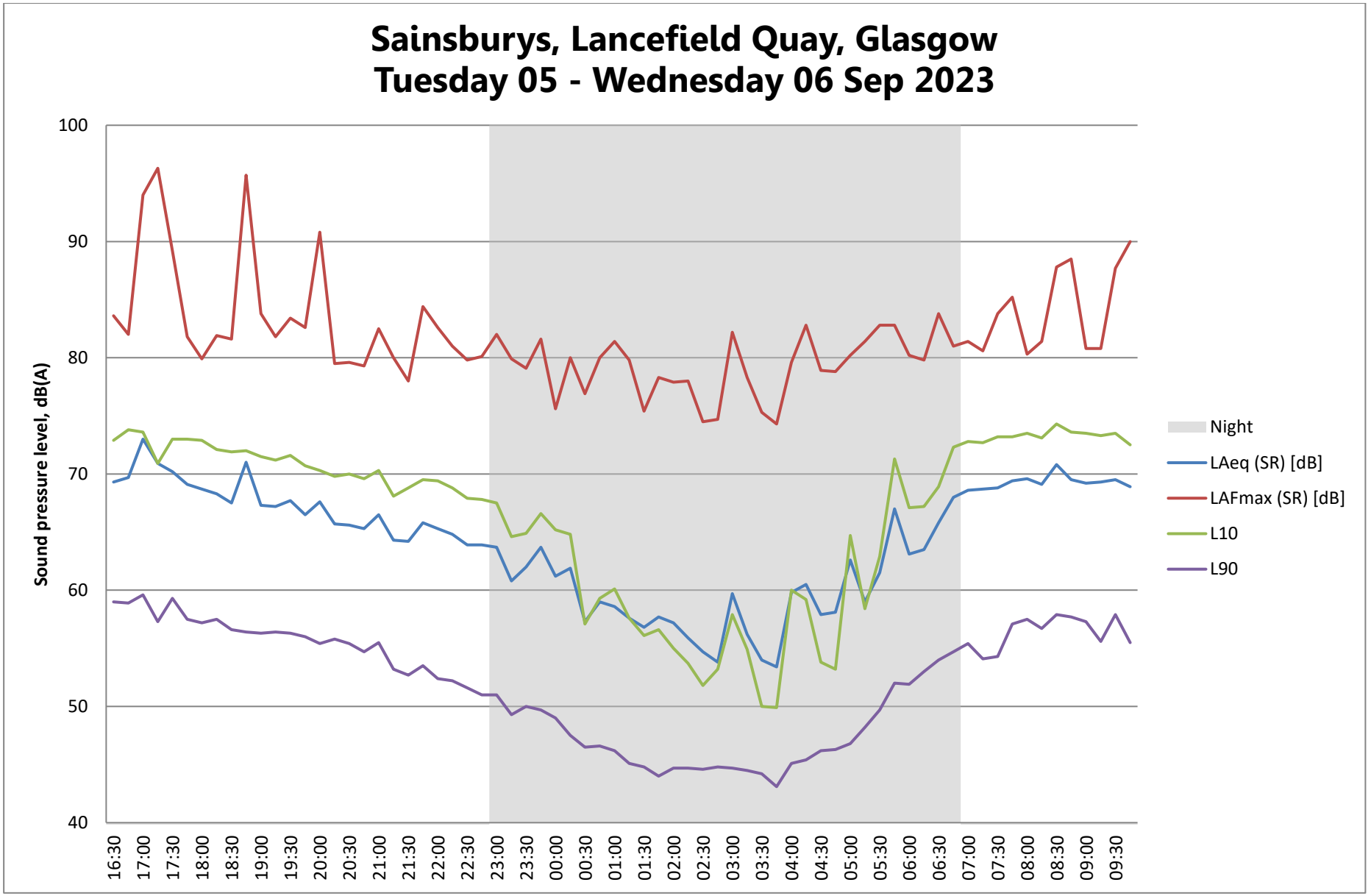
**Wind Speed during set up was higher than 5 m/s, however, measured data includes periods where wind speed is less than 5m/s. Therefore, noise data was considered to be acceptable.*

Results

C.6 The results of the survey are considered to be representative of the background sound pressure levels at the façades of the most affected noise-sensitive receptors to the plant area during the quietest times at which the plant will operate.

C.7 The noise climate at the measurement position was dominated by local traffic. Distance traffic and wind were also noted to be audible, although to a much lesser degree.

C.8 The results of the survey are presented in a time history graph overleaf.


Sainsburys, Lancefield Quay, Glasgow
Tuesday 05 - Wednesday 06 Sep 2023
Sound pressure level, dB(A)
100
90
80
70
60
50
40
16:30
17:00
17:30
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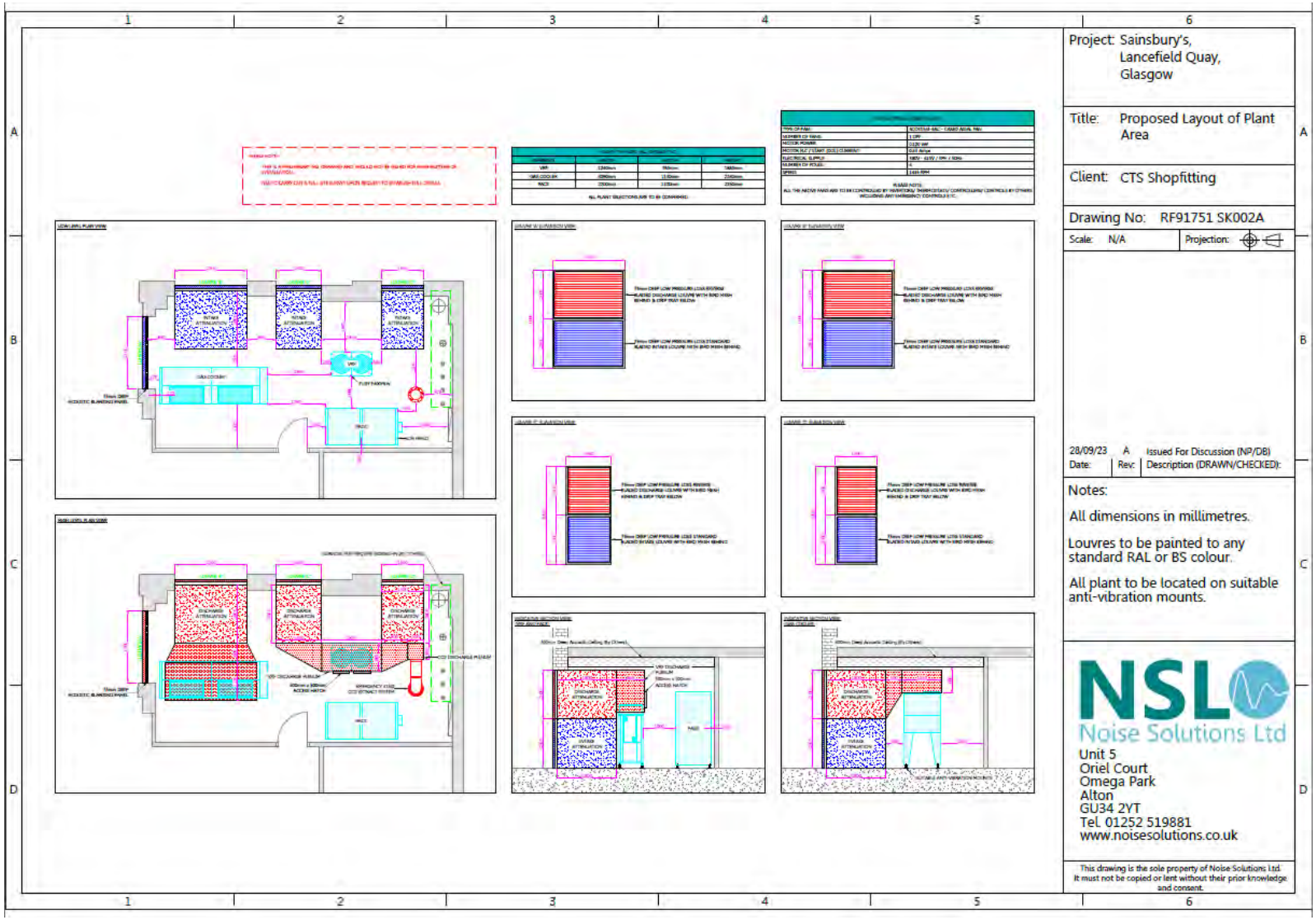
06:00
06:30
07:00
07:30
08:00
08:30
09:00
09:30
Night
LAeq (SR) [dB]
LAFmax (SR) [dB]
L10
L90

Appendix D Plant information and manufacturer published sound pressure levels

Plant	Unit/Model	No. of units	Description	Sound power level (dB) at octave band centre frequencies (Hz)								dBA (dB)
				63	125	250	500	1000	2000	4000	8000	
Gas cooler	Kelvion / GE-MA102G5-HH-063B-AM-10FPI	1	L_w (intake)	77	77	73	66	66	64	60	60	72
			L_w (discharge)	84	84	80	73	73	71	67	67	79
DA Pack	Hubbard	1	L_p @ 10m									45
AC	Mitsubishi / PURY-P400YNW-A	1	L_w (intake)	93	82	82	80	74	71	66	61	81
			L_w (discharge)	99	88	88	86	80	77	72	67	87

Appendix E Plant room layout drawing



Appendix F Predicted noise levels

Refrigeration plant room (daytime)

Description	Notes	Sound level (dB) at octave band centre frequency								LAeq (dB)
		63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	
Plant room										
Intake										
Reverberant level in plant room	Rev Lp	90	80	77	75	70	66	61	58	77
All plant running										
Opening area (m2)	7.35	9	9	9	9	9	9	9	9	
SRI of opening	I.L	-10	-20	-36	-45	-45	-45	-45	-44	
Inside-outside correction		-6	-6	-6	-6	-6	-6	-6	-6	
Lw of opening	Lw	83	63	44	33	28	24	19	16	57
R1										
Directivity correction	(4900,0deg x 1500,0deg)	4	5	6	6	6	6	6	6	
Distance correction (m)	12	-30	-30	-30	-30	-30	-30	-30	-30	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R1	Lp @ R1	60	41	23	12	7	3	-2	-4	34
R2										
Directivity correction	(4900,90deg x 1500,0deg)	-5	-5	-8	-7	-7	-7	-7	-7	
Distance correction (m)	2.5	-16	-16	-16	-16	-16	-16	-16	-16	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R2	Lp @ R2	65	45	24	13	8	4	-1	-4	39
R3										
Directivity correction	(4900,90deg x 1500,0deg)	-5	-5	-8	-7	-7	-7	-7	-7	
Distance correction (m)	2.5	-16	-16	-16	-16	-16	-16	-16	-16	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R3	Lp @ R3	65	45	24	13	8	4	-1	-4	39

Condenser Discharge										
Sound power	Lw	84	84	80	73	73	71	67	67	79
End reflection	3.3	-1	0	0	0	0	0	0	0	
SRI of opening	I.L	-11	-23	-38	-45	-45	-45	-45	-45	
Lw of opening		72	61	42	28	28	26	22	22	49
R1										
Directivity correction	(2200,0deg x 1500,0deg)	3	4	5	6	6	6	6	6	
Distance correction (m)	12	-30	-30	-30	-30	-30	-30	-30	-30	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R1	Lp @ R1	49	39	21	8	8	6	2	2	26
R2										
Directivity correction	(2200,90deg x 1500,0deg)	0	0	-4	-7	-7	-7	-7	-7	
Distance correction (m)	2	-14	-14	-14	-14	-14	-14	-14	-14	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R2	Lp @ R2	61	50	27	10	10	8	4	4	38
R3										
Directivity correction	(2200,90deg x 1500,45deg)	-1	-1	-6	-9	-9	-9	-9	-9	
Distance correction (m)	3	-18	-18	-18	-18	-18	-18	-18	-18	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R3	Lp @ R3	57	45	22	5	5	3	-1	-1	33
VRV Unit Discharge										
Sound power	Lw	99	88	88	86	80	77	72	67	87
End reflection	3.3	-3	-1	0	0	0	0	0	0	
SRI of opening	I.L	-13	-26	-40	-45	-45	-45	-45	-45	
Lw of opening		83	61	48	41	35	32	27	22	57
R1										
Directivity correction	(2200,0deg x 1500,0deg)	3	4	5	6	6	6	6	6	
Distance correction (m)	12	-30	-30	-30	-30	-30	-30	-30	-30	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R1	Lp @ R1	59	38	26	20	14	11	6	1	34
R2										
Directivity correction	(2200,90deg x 1500,45deg)	-1	-1	-6	-9	-9	-9	-9	-9	
Distance correction (m)	2	-14	-14	-14	-14	-14	-14	-14	-14	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R2	Lp @ R2	71	48	31	21	15	12	7	1	45
R3										
Directivity correction	(2200,90deg x 1500,0deg)	0	0	-4	-7	-7	-7	-7	-7	
Distance correction (m)	2	-14	-14	-14	-14	-14	-14	-14	-14	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R3	Lp @ R3	72	49	32	23	17	14	9	3	46

	63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	
Receptor R1									
Intake	60	41	23	12	7	3	-2	-4	34
Condenser Discharge	49	39	21	8	8	6	2	2	26
VRV Discharge	59	38	26	20	14	11	6	1	34
Cumulative	**63**	**44**	**29**	**21**	**16**	**13**	**8**	**5**	**37**
Receptor R2									
Intake	65	45	24	13	8	4	-1	-4	39
Condenser Discharge	61	50	27	10	10	8	4	4	38
VRV Discharge	71	48	31	21	15	12	7	1	45
Cumulative	**72**	**53**	**33**	**22**	**17**	**14**	**9**	**7**	**47**
Receptor R3									
Intake	65	45	24	13	8	4	-1	-4	39
Condenser Discharge	57	45	22	5	5	3	-1	-1	33
VRV Discharge	72	49	32	23	17	14	9	3	46
Cumulative	**73**	**52**	**33**	**23**	**18**	**15**	**10**	**5**	**47**

Refrigeration plant room (night- time)

Description	Notes	Sound level (dB) at octave band centre frequency								LAeq (dB)
		63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	
Plant room										
Intake										
Reverberant level in plant room	Rev Lp	78	76	72	66	65	61	57	55	70
All plant running										
Opening area (m2)	7.4	9	9	9	9	9	9	9	9	
SRI of opening	I.L	-10	-20	-36	-45	-45	-45	-45	-44	
Inside-outside correction		-6	-6	-6	-6	-6	-6	-6	-6	
Lw of opening	Lw	71	59	39	24	22	19	15	14	47
R1										
Directivity correction	(4900,0deg x 1500,0deg)	4	5	6	6	6	6	6	6	
Distance correction (m)	12.0	-30	-30	-30	-30	-30	-30	-30	-30	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R1	Lp @ R1	48	37	18	3	2	-2	-6	-7	25
R2										
Directivity correction	(4900,90deg x 1500,0deg)	-5	-5	-8	-7	-7	-7	-7	-7	
Distance correction (m)	2.5	-16	-16	-16	-16	-16	-16	-16	-16	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R2	Lp @ R2	53	41	18	4	2	-1	-5	-6	29
R3										
Directivity correction	(4900,90deg x 1500,0deg)	-5	-5	-8	-7	-7	-7	-7	-7	
Distance correction (m)	2.5	-16	-16	-16	-16	-16	-16	-16	-16	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R3	Lp @ R3	53	41	18	4	2	-1	-5	-6	29

Condenser Discharge										
Sound power	Lw	84	84	80	73	73	71	67	67	79
End reflection	3.3	-1	0	0	0	0	0	0	0	
SRI of opening	I.L	-11	-23	-38	-45	-45	-45	-45	-45	
Lw of opening		72	61	42	28	28	26	22	22	49
R1										
Directivity correction	(2200,0deg x 1500,0deg)	3	4	5	6	6	6	6	6	
Distance correction (m)	12.0	-30	-30	-30	-30	-30	-30	-30	-30	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R1	Lp @ R1	49	39	21	8	8	6	2	2	26
R2										
Directivity correction	(2200,90deg x 1500,0deg)	0	0	-4	-7	-7	-7	-7	-7	
Distance correction (m)	2.0	-14	-14	-14	-14	-14	-14	-14	-14	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R2	Lp @ R2	61	50	27	10	10	8	4	4	38
R3										
Directivity correction	(2200,90deg x 1500,45deg)	-1	-1	-6	-9	-9	-9	-9	-9	
Distance correction (m)	3.0	-18	-18	-18	-18	-18	-18	-18	-18	
Screening (δ = /m)	-	0	0	0	0	0	0	0	0	
Surface Directivity		0	0	0	0	0	0	0	0	
BS4142		3	3	3	3	3	3	3	3	
Resultant at receptor R3	Lp @ R3	57	45	22	5	5	3	-1	-1	33

	63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	
Receptor R1									
Intake	48	37	18	3	2	-2	-6	-7	25
Condenser Discharge	49	39	21	8	8	6	2	2	26
Cumulative	**52**	**41**	**22**	**9**	**9**	**6**	**2**	**2**	**28**
Receptor R2									
Intake	53	41	18	4	2	-1	-5	-6	29
Condenser Discharge	61	50	27	10	10	8	4	4	38
Cumulative	**62**	**51**	**28**	**11**	**11**	**9**	**5**	**5**	**38**
Receptor R3									
Intake	53	41	18	4	2	-1	-5	-6	29
Condenser Discharge	57	45	22	5	5	3	-1	-1	33
Cumulative	**58**	**47**	**24**	**7**	**7**	**4**	**0**	**0**	**35**

Cumulative levels at receptors

Summary of results	R1		R2		R3	
	Day	Night	Day	Night	Day	Night
Intake Louvre	34	25	39	29	39	29
Condenser Discharge Louvre	26	26	38	38	33	33
VRV Discharge Louvre	34		45		46	
Combined (exc CO2/Vent)	37	28	47	38	47	35
CO2 Vent Discharge louvre	12	1	25	15	26	16

Cumulative	**37***	**28***	**47***	**38***	**47***	**35***
Target	52	45	52	45	52	45
Excess	**-15**	**-17**	**-5**	**-7**	**-5**	**-10**

**levels inclusive of +3dB feature correction*

NR assessment at Receptor R2 and R3

R2

COMBINED - Daytime	63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	dBA	NR
Specific external	69	50	30	19	14	11	6	4	44	**43**
Reduction through partially opened window	-8	-10	-12	-12	-12	-12	-12	-12		
Predicted internal in nearest dwelling	61	40	18	7	2	-1	-6	-8	36	**33**

R2

COMBINED - Nighttime	63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	dBA	NR
Specific external	59	48	25	8	8	6	2	2	35	**30**
Reduction through partially opened window	-8	-10	-12	-12	-12	-12	-12	-12		
Predicted internal in nearest dwelling	51	38	13	-4	-4	-6	-10	-10	27	**20**

R3

COMBINED - Daytime	63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	dBA	NR
Specific external	70	49	30	20	15	12	7	2	44	**44**
Reduction through partially opened window	-8	-10	-12	-12	-12	-12	-12	-12		
Predicted internal in nearest dwelling	62	39	18	8	3	0	-5	-10	36	**34**

R2

COMBINED - Nighttime	63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	dBA	NR
Specific external	55	44	21	4	4	1	-3	-3	32	**25**
Reduction through partially opened window	-8	-10	-12	-12	-12	-12	-12	-12		
Predicted internal in nearest dwelling	47	34	9	-8	-8	-11	-15	-15	23	**15**

BS 8233 states that an open window will provide an overall noise reduction of approximately 15dB. The above worst case assessment is based on measured data from the NSL database and errs on the side of caution.