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Environmental Noise Assessment

Prepared: 26th March 2021

Report No	21364-1
Client	Rowlinson Construction Ltd
Site	Bellamy Court Abbey Hey Lane Manchester

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1. Quality Management

Report Number	21364 - 1
Issue	Issue 1
Prepared	26 th March 2021
Prepared By	Jonathan Seiffert BSc, TechIOA
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3. Executive Summary

3.1.1. An environmental noise assessment has been carried out for a proposed residential development at Bellamy Court, Abbey Hey Lane, Manchester ("Proposed Development").

3.2. Measurement, Assessment and Evaluation

3.2.1. The survey was carried out to BS7445-1:2003,¹ BS7445-2:1991² and BS4142:2014³ which are covered under our UKAS Accreditation.

3.2.2. The interpretation of the data and the specification of suitable mitigation or treatment are outside the scope of our UKAS accreditation but is covered in our 17025 Quality Management System and reporting procedure.

3.3. Scope

3.3.1. This report covers all aspects of the noise survey, including:

- the identification of acoustic design criteria;
- the identification of specific sound sources;
- an objective sound pressure level survey of the existing site;
- 3D noise model to determine the specific sound levels;
- calculation of appropriate acoustic feature corrections and determination of the rating level ;
- assessment of the specific sound sources based on guidance contained in BS4142:2014; and
- the design of any mitigation to meet the required internal noise criteria

3.4. Results Summary

3.4.1. A numerical BS4142 assessment shows that the specific sound could have low impact on proposed new residential receivers.

3.4.2. In this context the new residential receivers and M&E plant associated with the development are being introduced close to proposed residential receivers. This is likely to result in reduced impact when compared to the situation where new sources are being introduced close to existing residential receivers.

¹ BS7445-1:2003 "Description and measurement of environmental noise – Part 1: Description of quantities and procedures"

² BS7445-2:1991 "Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use"

³ BS4142:2014 "Methods for rating and assessing industrial and commercial sound"

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5. Background

5.1. Noise Policy Statement for England

- 5.1.1. The Noise Policy Statement for England (NPSE), published in March 2010, states the long-term vision of Government noise policy is to *“promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development”*.
- 5.1.2. This long-term vision is supported by the following aims; through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:
- Avoid significant adverse impacts on health and quality of life;
 - Mitigate and minimise adverse impacts on health and quality of life;
 - Where possible, contribute to the improvement of health and quality of life.
- 5.1.3. The intention is that the NPSE should apply to all types of noise apart from noise in the workplace (occupational noise).

5.2. National Planning Policy Framework

- 5.2.1. The National Planning Policy Framework (NPPF) was published on 19th June 2019 and sets out the Government’s planning policies for England and how these are expected to be applied. The framework states that the planning system should contribute to and enhance the natural and local environment by:
- “preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability”*.
- 5.2.2. The NPPF requires that new developments be appropriate to their locations such that the effects of pollution on health have been taken into account. Planning policies and decisions should aim to:
1. avoid noise giving rise to significant adverse impacts on health and the quality of life;
 2. mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development; and,
 3. identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value.
- 5.2.3. Existing businesses near to proposed development should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.

5.3. National Planning Practice Guidance

- 5.3.1. The National Planning Practice Guidance (PPG) is a web-based resource, launched by the Department for Communities and Local Government (DCLG) which was updated on the 22nd July 2019 to reflect the changes made to the NPPF and make it more accessible.⁴

⁴ <http://planningguidance.communities.gov.uk/>

- 5.3.2. It advises on how planning can manage potential noise impacts in new development. The guidance is regularly reviewed and updated and noise is listed as a specific category. A summary of the effects of noise exposure (in terms of health and quality of life) associated with both noise generating developments and noise sensitive developments is presented within the PPG and reproduced in Table 1.

Perception	Examples of outcomes	Effect level	Action
Not noticeable	No effect	No observed effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect (NOAEL)	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very intrusive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 1 – Noise exposure hierarchy

- 5.3.3. There are a number of factors that determine whether a noise could be a concern to a receptor. These include: the absolute level of the noise and when it occurs, whether it is existing or new to the area, temporal characteristics, spectral content and the acoustic absorption in the area.
- 5.3.4. It is emphasised in the PPG that the planning process should be used to mitigate and minimise the impact of noise. This could include: engineering the noise sources to be quiet, minimising the impact of noise through layout, using conditions/obligations to restrict activities, mitigating the impact in places where noise is likely to be experienced (e.g. using facade sound insulation).

6. Introduction

6.1.1. An environmental noise assessment has been carried out for new fixed plant at a proposed residential development at Bellamy Court, Abbey Hey Lane, Manchester.

6.2. Proposed Development

6.2.1. An image showing the proposed location and layout of the Proposed Development is given in Figure 1.



Figure 1 - Plan showing the layout of the Proposed Development

6.3. Noise Climate

6.3.1. The general noise climate in the area at the time of the survey was dominated by road traffic noise from Abbey Hey Lane.

6.4. Specific Sound Sources

- 6.4.1. A list of mechanical and electrical plant equipment was provided by the client. The specific sound sources have been summarised in Table 2.

Source
Plant Room
Lowara Multistage Booster Pumps – 3 Pumps
Air con
Mitsubishi MUZ-AP50VG
Supply & extract
Lossney LGH 80
Lossney LGH 50
Vent Axia ACM 100T x2
Vent Axia ACM 150T x3
VEKAINT 3000 – 21 x2

Table 2 – Description of the specific sound sources local to the proposed development

7. Assessment Criteria

7.1. BS4142:2014

- 7.1.1. BS4142 provides methods for rating and assessing **specific sound sources** of an industrial and/or commercial nature, which includes: industrial and manufacturing processes, fixed services plant, sound generated by the loading/unloading of goods and sound from mobile plant/vehicles associated with industrial/commercial premises (e.g. fork-lift trucks). The **assessment location** is outside a residential receptor.
- 7.1.2. The standard is specifically precluded from being used to assess the likely impact inside a building or from the assessment of various sound sources for which other (more relevant) guidance exists, including: music/entertainment noise, noise from people and construction noise.
- 7.1.3. The foundation of the assessment is to establish the following quantities, either by measurement or prediction:
- **Ambient sound:** The overall sound at the assessment location
 - **Residual sound:** The ambient sound without the specific sound source operating
 - **Specific sound:** The ambient sound with the specific sound source operating, corrected for residual sound
 - **Background sound:** Residual sound present for 90% of the time
- 7.1.4. How these quantities relate to the sound that would be measured during a survey has been illustrated in Figure 2.

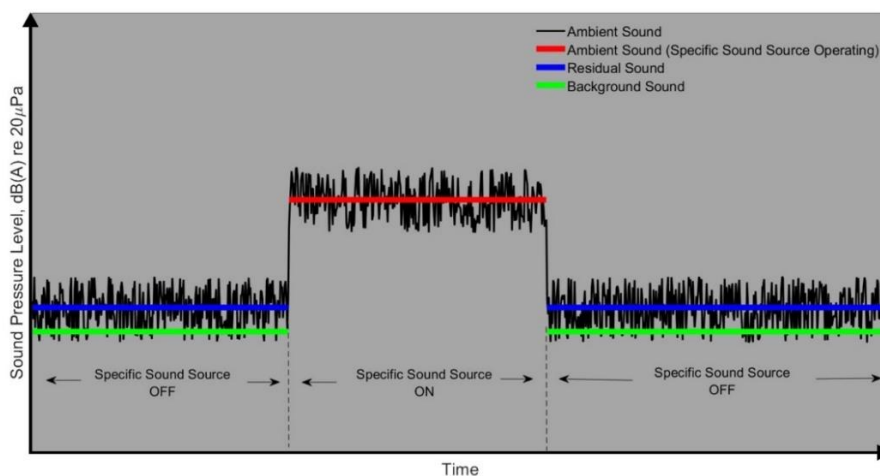


Figure 2 – Diagrammatic illustration of the definitions of ambient, residual, specific and background sound

- 7.1.5. Once the specific sound level has been determined, this must be corrected for the presence of acoustic features that are audible at the assessment location to determine the **rating level**:

$$\text{Rating Level} = \text{Specific Sound Level} + \text{Character Corrections}$$

- 7.1.6. Normally it is possible to carry out a subjective assessment of characteristics, based on the following correction guidelines:
- Tonality: +2dB for a 'just perceptible' tone, +4dB for 'clearly perceptible', and rising to +6dB for 'highly perceptible' tones.
 - Impulsivity (rapidity of change and overall change in level): +3 dB for 'just perceptible' impulsivity, +6dB for 'clearly perceptible', rising to +9 dB for 'highly perceptible' impulsivity.

- Intermittency: if the on/off-time of the specific sound is readily distinctive at the noise-sensitive receivers, +3dB.

7.1.7. It should be noted that, where one feature is clearly perceived as dominant, it may be appropriate to apply a single correction. Where multiple features are likely to affect perception and response, each should be added arithmetically.

7.1.8. An estimate of the magnitude of the impact is evaluated by subtracting the measured background sound level at the assessment location from the rating level

Assessment Level = Rating Level – Background Sound Level

7.1.9. Typically, the greater the difference between the background and rating level, the greater the magnitude of impact, although BS 4142 emphasises that this is highly context-specific. As an initial estimate, BS4142 states that:

- A difference (between the background and rating level) of around +10 dB or more is likely to be indicative of significant adverse impact, depending on context
- A difference (between the background and rating level) of around +5 dB or more is likely to be indicative of adverse impact, depending on context
- Where the rating level does not exceed the background level, this is an indication that the specific sound will have a low impact, depending on context

7.1.10. Where the initial estimate of the impact needs to be modified due to the context, other factor should be considered, including: absolute sound levels, the character and level of the residual sound and the sensitivity of the receiver, which includes the effect of building façade sound insulation.

7.2. Guideline Internal Sound Levels

7.2.1. BS8233:2014 draws on the results of research and experience to provide information on the design of buildings that have internal acoustic environments appropriate to their function. The standard provides guideline internal values for dwellings for steady external noise sources. These have been summarised in Table 3.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35dB $L_{Aeq,16hour}$	-
Dining	Dining Room	40dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35dB $L_{Aeq,16hour}$	30dB $L_{Aeq,8hour}$

Table 3 – BS8233:2014 guideline values for internal ambient noise levels from steady external noise sources

7.2.2. The guideline values are issued by the World Health Organisation (WHO) and assume normal diurnal fluctuations in external noise. They are expected to be achieved based on normal annual data and not in all circumstances. For example, it is normal to exclude occasional events such as fireworks night or New Year's Eve.

7.2.3. For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$ with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In such cases, the lowest practicable levels should be achieved in external amenity areas, but the development should not be prohibited.

7.3. Ventilation and Overheating Requirements

- 7.3.1. This section addresses ventilation issues that may conflict with the acoustic design of the building. They are provided for reference purposes only as this report is addressing the acoustic parameters of the development and building design only.
- 7.3.2. BS8233:2014 states that, if relying on closed windows to achieve the guideline values, there needs to be an appropriate alternative ventilation scheme that does not compromise the facade sound insulation or the resulting noise level. However, rooms should have adequate ventilation, i.e. trickle ventilators should be assumed to be open for any assessment.
- 7.3.3. Ventilation requirements for dwellings are covered under Building Regulations Approved Document F⁵ ("ADF"). It describes the purpose of ventilation as for the removal of stale air from inside a building and replacement with fresh air from outside.
- 7.3.4. ADF prescribes three types of ventilation provision:
1. **Whole dwelling ventilation** – running continuously (includes background ventilation)
 2. **Extract ventilation** – removing vapour/pollutants from a space e.g. from bathrooms and kitchens
 3. **Purge ventilation** – manually controlled rapid ventilation
- 7.3.5. Where a means of ventilation is required as an alternative to open windows, there are four broad categories of ventilation system that each meet the requirements of ADF:
- System 1** – Background ventilators and intermittent extract fans
- System 2** – Passive stack ventilation
- System 3** – Continuous mechanical extract ventilation (MEV)
- System 4** – Continuous mechanical supply and extract with heat recovery (MVHR)
- Systems 1-3 require penetrations in the facade to allow air to flow into and out of the building. In order to control the noise break-in from external noise sources, it should be checked that the penetration offers sufficient resistance to the passage of sound. The sound insulation of these, typically small, penetrations is often specified in terms of the element normalised sound pressure level difference, $D_{n,e,w}$, which is often corrected for the spectrum shape of road traffic using the C_{tr} correction term.
- 7.3.6. Ventilation provisions, including open windows, will not necessarily meet cooling needs. Building Regulations Approved Document L2a⁶ ("ADL2a") requires that overheating be mitigated by controlling the solar gains by means of building orientation, shading and the g-value of the glazing. It recommends that the developer assess the overheating risk using CIBSE TM 37.⁷

7.4. Local Authority Criteria

- 7.4.1. The Local Planning Authority has provided a noise related planning condition for this site. This condition has been recreated below:
- "Prior to occupation of the development a scheme for the acoustic insulation of any externally mounted ancillary equipment to ensure that it achieves a background noise level of 5dB below the existing background (La90) in each octave band at the nearest noise sensitive location shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the equipment. The approved scheme shall be implemented prior to occupancy and shall remain operational thereafter."*

⁵ Approved Document F: Means of Ventilation (2010 Edition)

⁶ Approved Document L2a : Conservation of Fuel and Power (2013 Edition)

⁷ CIBSE Guide TM 37 "Design for Improved Solar Shading Control"

8. Survey

8.1. Measurement Locations

- 8.1.1. Fixed position monitoring took place at one position to determine the representative background sound levels. The monitoring equipment was located 1.5m from the ground and at least 3m from the next nearest reflecting surface. The monitoring position is shown in Figure 3.

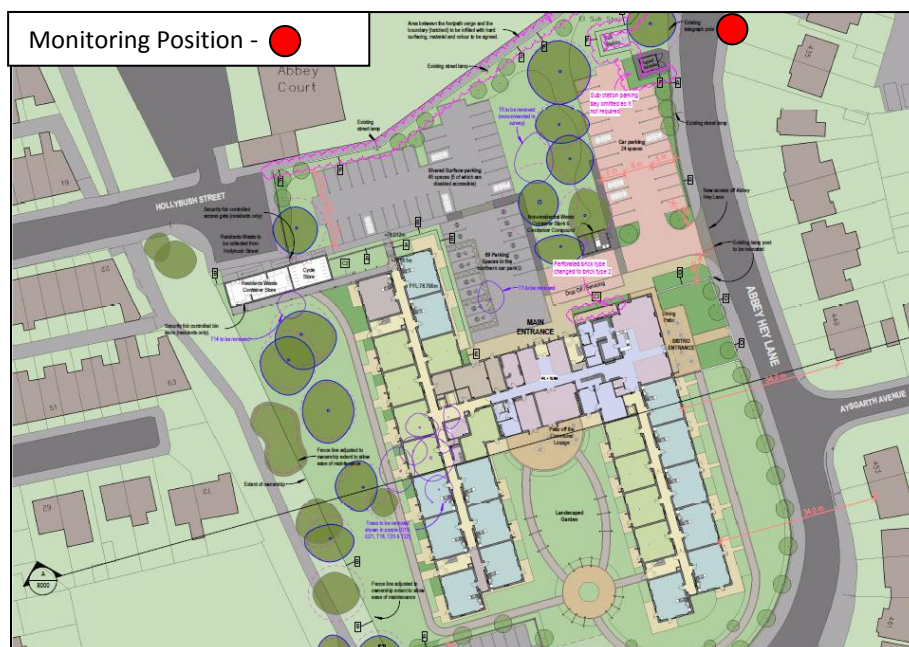


Figure 3 - Noise monitoring locations on site.

- 8.1.2. The measurement instrumentation used during the survey is detailed in the appendix. The acoustic equipment was calibrated to comply with Section 4.2 of BS7445-1:2003⁸ before and after the surveys. The calibration details are also detailed in the appendix.

8.2. Meteorology

- 8.2.1. During the survey the weather information was noted. This is summarised in Table 4.

	25 th February 2021	26 th February 2021
Roads(Wet/Dry)	Dry	Dry
Wind Speed (ms ⁻¹)/Direction	4 / S	2 / S

Table 4 - Meteorological data noted during the survey

8.3. Measurement and Timescale

- 8.3.1. Unattended monitoring was carried out between 25th February 2021 and 26th February 2021. The measurements that have been made are summarised in Table 5.

Monitoring position	Date	Type	Quantity
1	25/02/2021 – 26/02/2021	Unattended	LA90,15min

Table 5 – Measurements made at the site of the Proposed Development

- 8.3.2. Sound pressure measurements were subsequently averaged into hourly, daytime and night-time periods. The acoustic measurements and their interpretation have been in accordance with BS 7445: Parts 1, and 2⁹. All sound pressure levels are in dB (re 20μPa).

⁸ BS7445-1:2003 "Description and measurement of environmental noise – Part 1: Guide to quantities and procedures"

⁹ BS7445-2:1991 "Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use"

Background Sound Levels

8.3.3. Figure 4 shows the results of the data analysis in terms of the frequency of occurrence of each data value during the daytime and the night-time respectively.

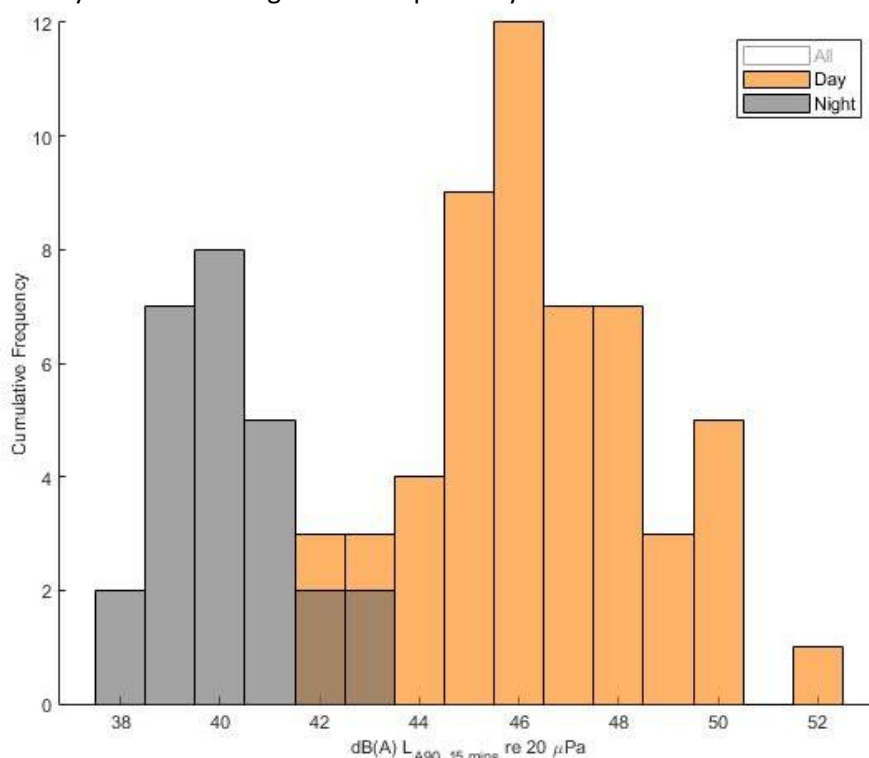


Figure 4 – Distribution of background sound levels during the daytime (07:00-23:00) and night-time (23:00-07:00)

8.3.4. As can be seen in Figure 4 the background sound levels ranged between 42dB $L_{A90,15min}$ and 52dB $L_{A90,15min}$ during the daytime period and between 38dB $L_{A90,15min}$ and 43dB $L_{A90,15min}$ during the night-time period. The typical background sound level has been taken to be 46dB $L_{A90,15min}$ during the daytime and 40dB $L_{A90,15min}$ for the night-time.

Specific Sound Levels

8.3.5. Sound data for the specific sources was taken from manufacturer's documentation. The full datasheets can be found in the appendix. Table 6 gives the sound pressure levels ($L_{Aeq,T}$)/sound power levels (L_w) that have been used for the calculations. As some of the data has been given without details as to the measurement quantity, $L_{Aeq,T}$ measurements have been assumed.

Source	Sound pressure level / Sound power level
Lowara Multistage Booster Pumps – 3 Pumps	77dB* L_w
Mitsubishi MUZ-AP50VG	52dB $L_{Aeq,T}$ @1m
Lossney LGH 80	47dB $L_{Aeq,T}$ @outlet
Lossney LGH 50	43.5dB $L_{Aeq,T}$ @outlet
Vent Axia ACM 100T x2	22dB $L_{Aeq,T}$ @ 3m
Vent Axia ACM 150T x3	36dB $L_{Aeq,T}$ @ 3m
VEKAINT 3000 – 21 x2	67dB L_{WA}
*Sound power calculated using formula detailed on Page 443 of Engineering Noise Control ¹⁰	

Table 6 – Summary of the specific sound level data

¹⁰ Engineering Noise Control Theory And Practice– David A. Bies and Colin H. Hansen – Second Edition - 1996

9. 3D Noise Model

- 9.1.1. A 3D noise model has been constructed using SoundPLAN™ in order to predict the propagation of sound across the site of the Proposed Development. The calculation procedure has been used from ISO9613-2:1996¹¹ to predict the propagation of sound from source to receiver, taking into account distance, screening, and atmospheric and ground conditions.
- 9.1.2. The booster pump set in the plant room has been included as a point source inside the plant room and the internal sound pressure level calculated using SoundPLAN. The absorption of the internal surfaces of the plant room have been assumed using an absorption spectrum from the SoundPLAN library for unplastered brick. The louvred door of the plant room has been set with a sound reduction spectrum taken from Detailing For Acoustics¹² and an assumed R_w value of 20dB. The hair and beauty salon condenser unit has been assumed to not be running in the night-time period. All other plant has been assumed to be running for 24 hours.
- 9.1.3. The external condenser unit and rooftop supply and extract have been included in the model as point sources and the extract vents have been included as areas sources located on the walls.

9.2. Image maps

- 9.2.1. The results of the model have been illustrated in noise contour map in Figure 5.

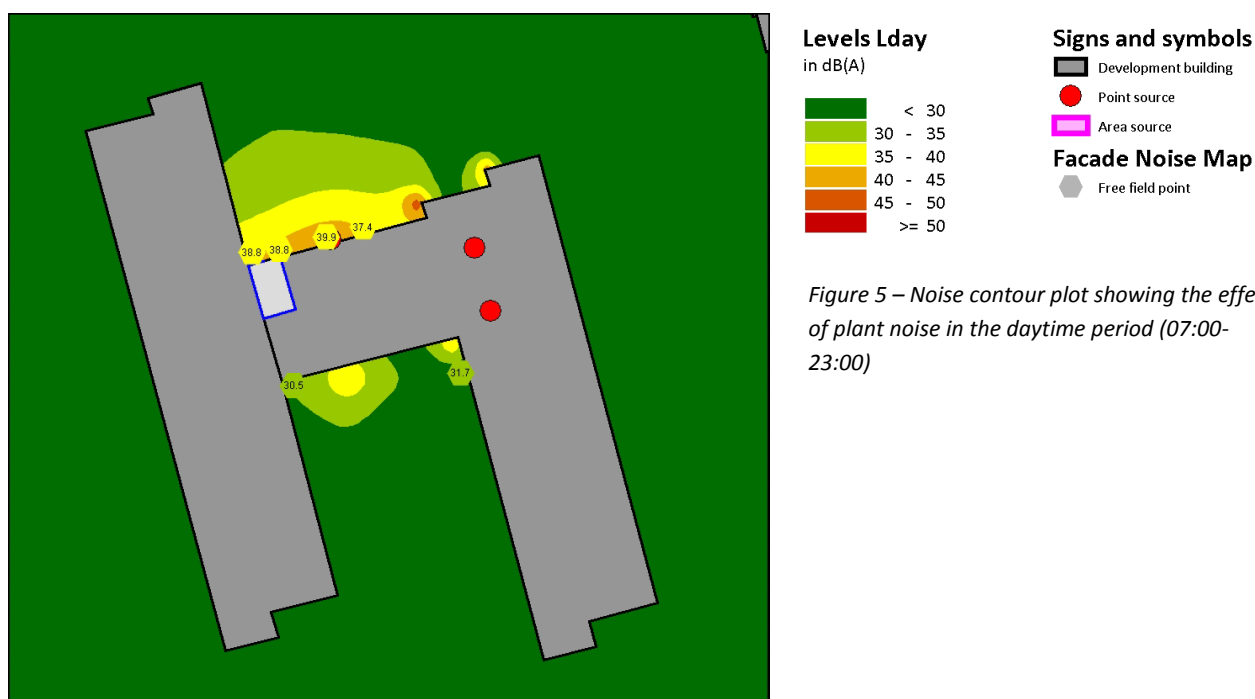


Figure 5 – Noise contour plot showing the effect of plant noise in the daytime period (07:00-23:00)

¹¹ ISO9613-2:1996 "Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation"

¹² Detailing For Acoustics – Peter Lord & Duncan Templeton – Third Edition - 1996

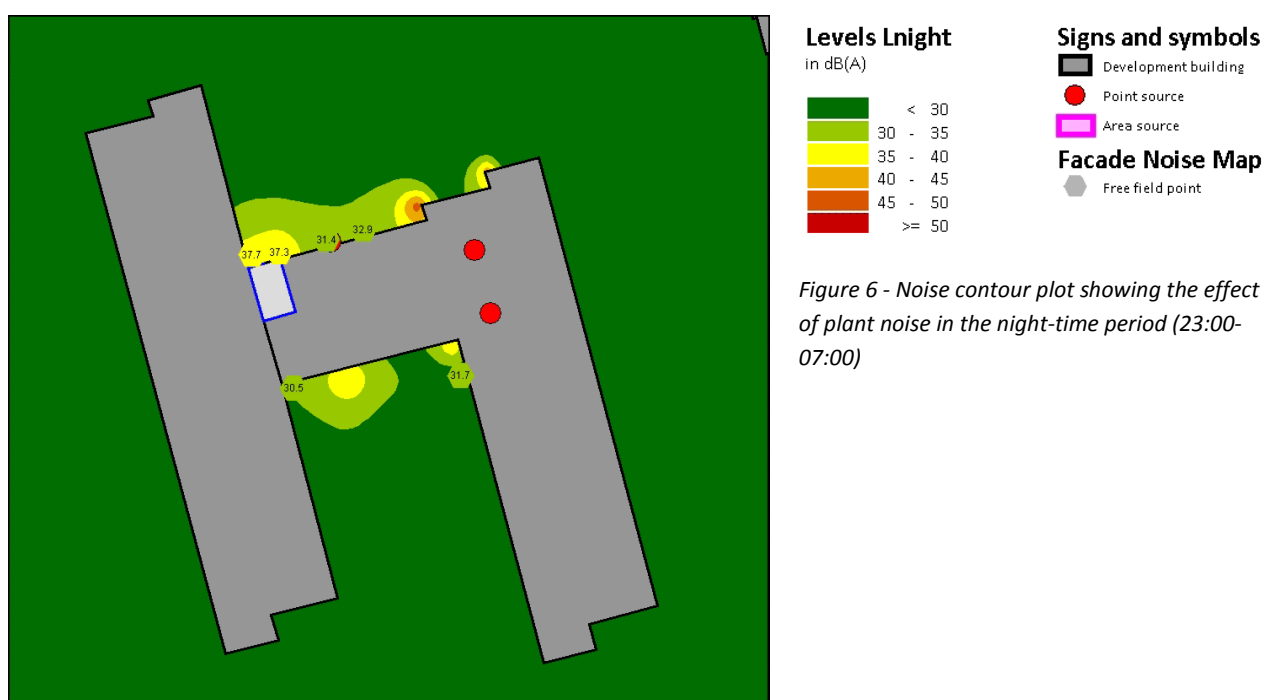


Figure 6 - Noise contour plot showing the effect of plant noise in the night-time period (23:00-07:00)

9.2.2. The worst case predicted sound pressure levels are given in Table 7. It should be noted that the value given in Table 7 have been subject to a -3dB façade correction to account for reflections from the façade and provide a free field level.

Predicted worst case sound pressure level $L_{Aeq,T}$	
Day (07:00-23:00)	Night (23:00-07:00)
36.9dB	34.7dB

Table 7 - Worst case predicted specific sound pressure levels

10. BS4142 Assessment

10.1. Rating level

- 10.1.1. The commercial sound sources were not operating at the time of the attended survey. The sources have been assessed based previous experience with similar types of equipment.

Tonality

- 10.1.2. It is possible that tonal sound will be generated by the equipment. However, given that most of the equipment is located inside the building, and the external plant generates a relatively low level of noise, it is considered unlikely that the tonal sound will be perceptible at the nearest sensitive receivers.

Impulsivity

- 10.1.3. It is not expected that any impulsive sound will be perceptible at the sensitive receivers. Therefore, no correction has been applied for impulsivity.

Intermittency

- 10.1.4. It is not expected that this equipment will turn on and off multiple times in an hour period. Therefore, no correction has been applied for intermittency.

10.2. Assessment

- 10.2.1. The BS4142 assessment is detailed in Table 8.

	Level, dB	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Background sound level, dB $L_{A90,15min}$	46	40
Specific sound level, dB(A)	37	35
Acoustic feature corrections		
Tonality	0	0
Impulsivity	0	0
Intermittency	0	0
Other	0	0
Rating level		
Specific sound level + corrections	37	35
Assessment Level		
Rating level – Background sound level	-9	-5
<i>“Where the rating level does not exceed the background level, this is an indication that the specific sound will have a low impact, depending on context”</i>		

Table 8 - The assessment procedure from BS4142

10.3. Context

- 10.3.1. In this situation, the new residential receivers are being introduced close to the specific sound sources. The impact of the industrial/commercial sound is likely to be significantly reduced compared to the situation where new sound sources are being introduced close to existing residential receivers.

11. Conclusions

- 11.1.1. An environmental noise assessment has been carried out at the site of a proposed residential development at Bellamy Court, Abbey Hey Lane, Manchester to determine typical ambient sound levels.
- 11.1.2. A numerical BS4142 assessment shows that the specific sound could have low impact on proposed new residential receivers.
- 11.1.3. In this context the new residential receivers and M&E plant associated with the development are being introduced close to proposed residential receivers. This is likely to result in reduced impact when compared to the situation where new sources are being introduced close to existing residential receivers.
- 11.1.4. We strongly recommend that this report be passed to the local planning authority for approval prior to any works being carried out.

12. Appendix

APPENDIX A: Summary Information

Required ISO Test Report Information (cross referenced where required)			
		Measurements carried out to:	Analysed to:
A	Standards	BS 7445-1: 2003 BS 7445-2: 1991 BS4142:2014	BS 8233:2014 BS4142:2014
B	Organisation performed the measurements	noise.co.uk Ltd, The Haybarn, Newnham Grounds, Kings Newnham Lane, Bretford, Coventry, CV23 0JU.	
C	Name of Client	Rowlinson Construction Ltd	
D	Full site address	Bellamy Court Abbey Hey Lane Manchester	
E	Date of surveys	Survey Date: 25 th February 2021 – 26 th February 2021	
F	Description & identification of Proposed Development	It is proposed to develop the site for residential use.	
G	Brief Description of details of Procedure & equipment	See Section 5 of this report.	

APPENDIX B: Technical Appendix

12.1.1. Measurements were made using the following equipment:

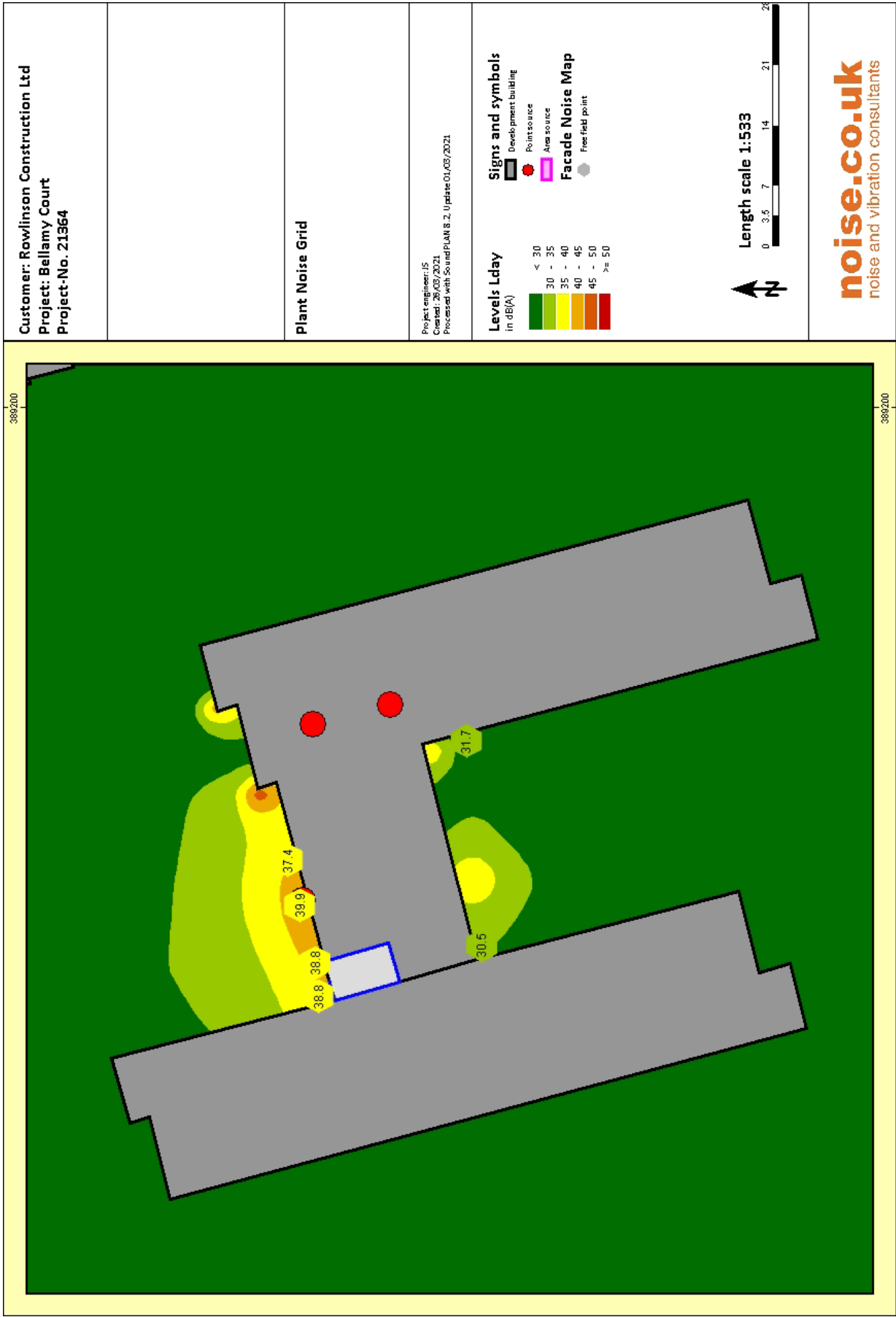
Monitoring Position	Sound Level Meter (Serial Number)	Calibrator (Serial Number)
1	Norsonic 140 (1405557)	Norsonic 1251 (33826)

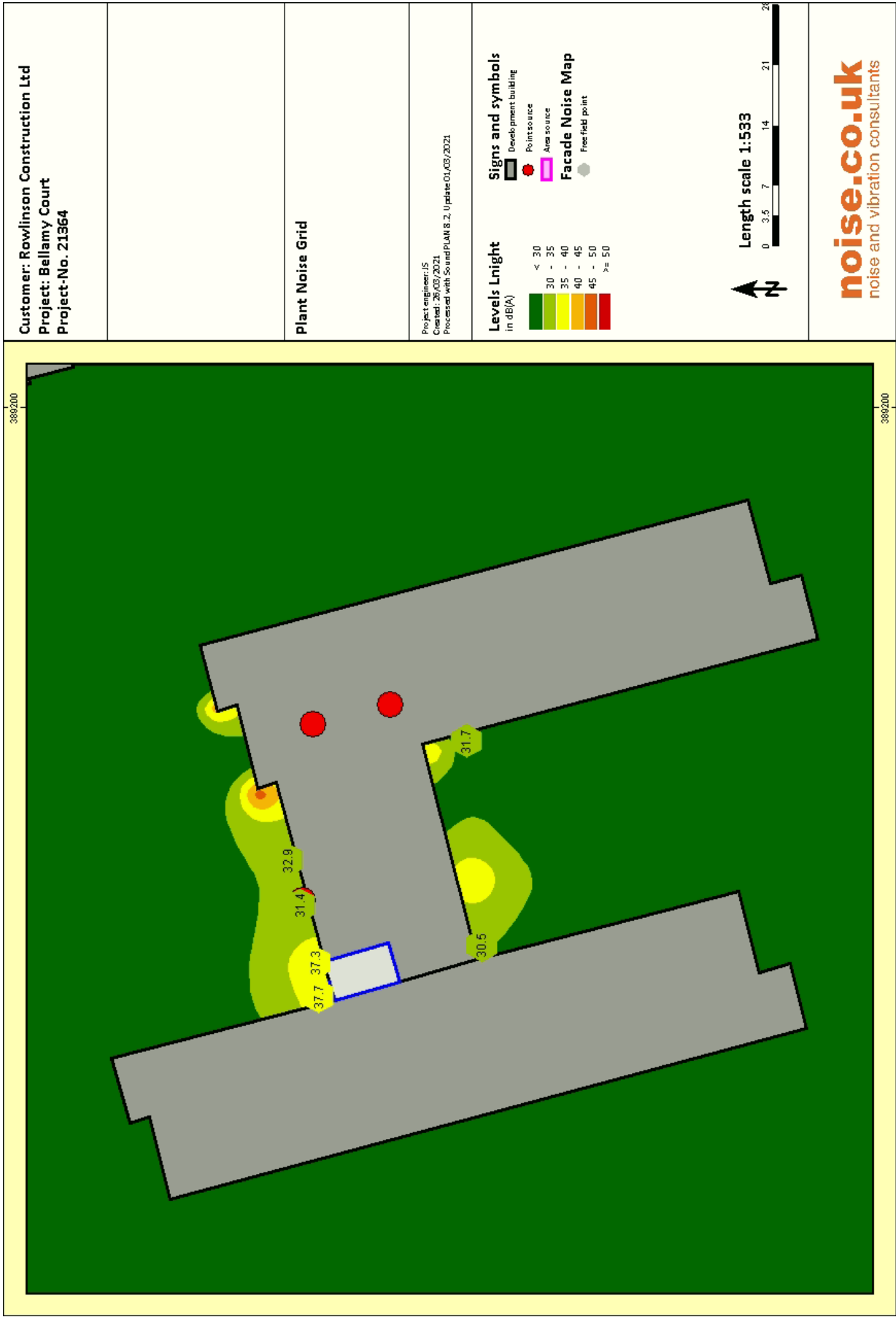
12.1.2. The equipment has traceable calibration. The sound level meter was calibrated immediately prior to and immediately after the measurements were carried out.

Sound Level Meter	Before	After
Norsonic 140 (1405557)	114.0 dB	114.0 dB

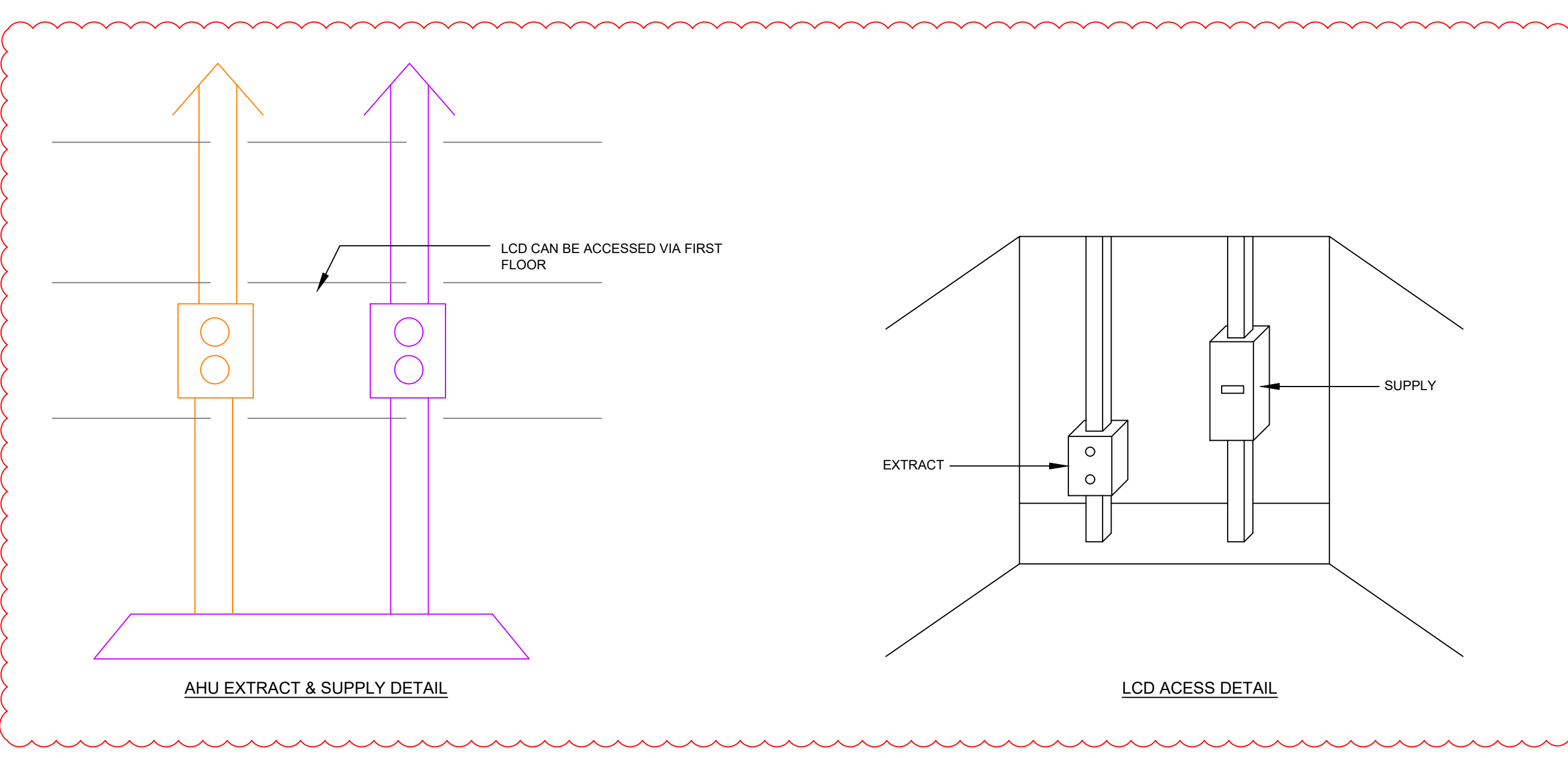
12.1.3. There was no adverse deviation.

APPENDIX C: Full sized SoundPLAN image maps





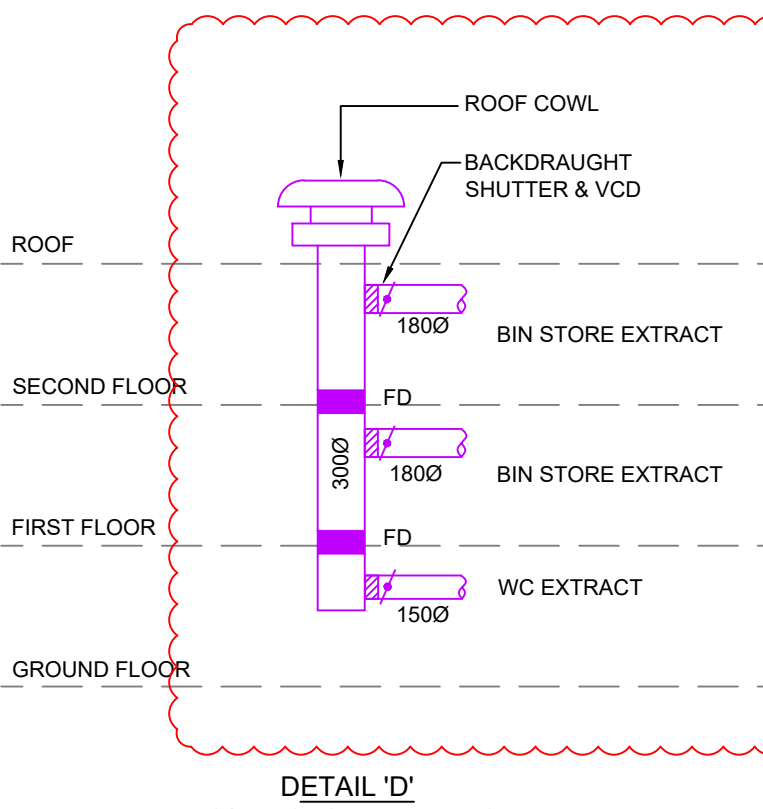
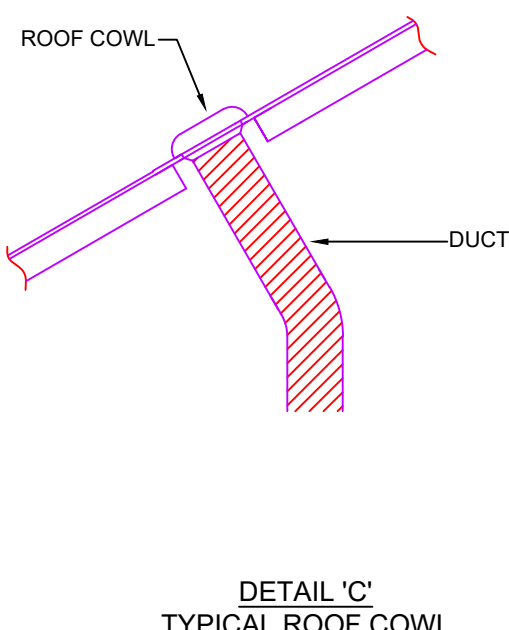
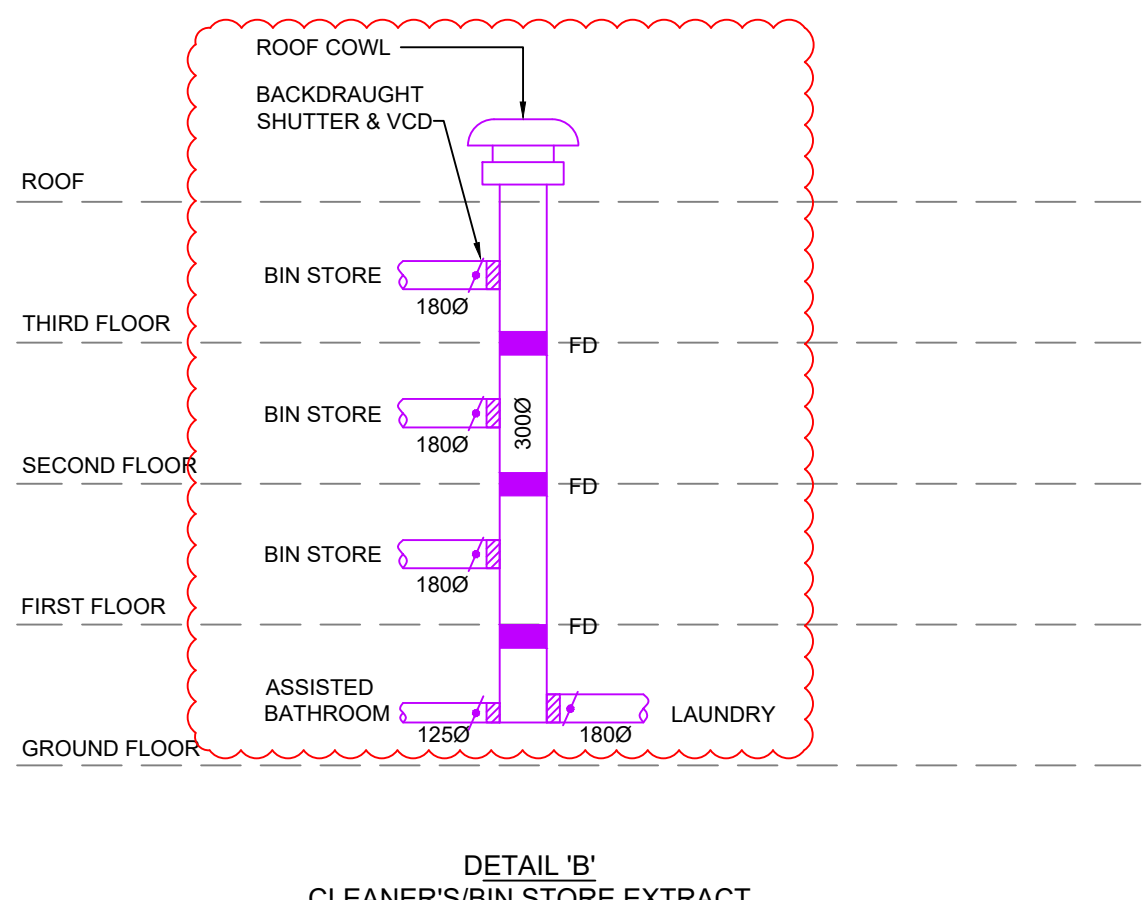
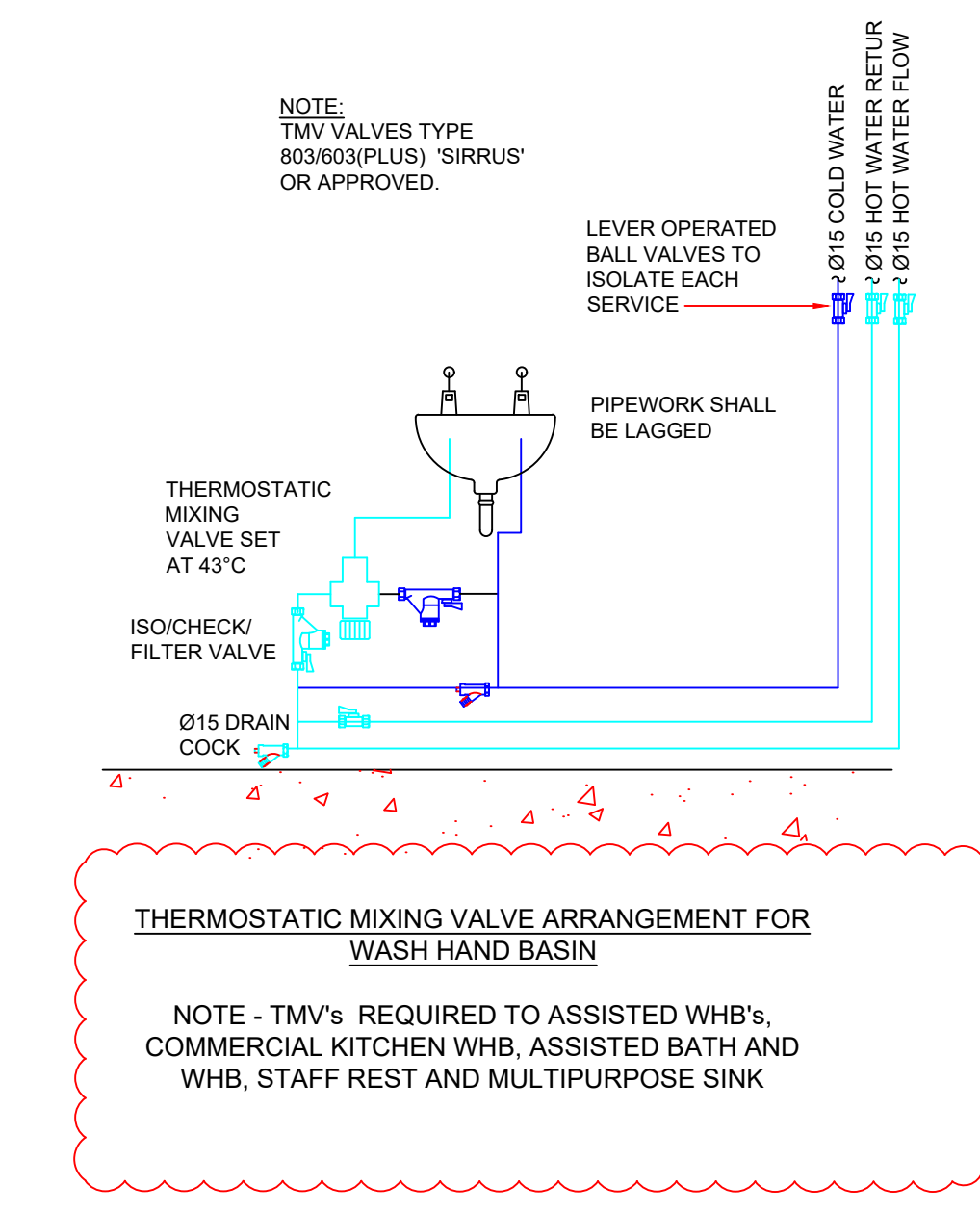
APPENDIX D: Client & manufacturer information



- GENERAL NOTES**
- 1) THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE MECHANICAL ENGINEERING GENERAL AND PARTICULAR SPECIFICATIONS.
- GENERAL NOTES FOR HEATING SERVICES**
- 1) ALL PIPEWORK SHALL BE PROVIDED WITH AUTOMATIC AIR VENTS (AAVS) AT HIGH POINTS AND DRAIN COCKS AT LOW POINTS.
- 2) ALL RADIATOR CONNECTIONS BBOE UNLESS SPECIFIED OTHERWISE ON DRAWING.
- 3) ALL HEATING F&R DROPPERS 15mm UNLESS INDICATED OTHERWISE ON DRAWING.
- GENERAL NOTES FOR VENTILATION**
- 1) ALL DUCTWORK ROUTES AND POSITIONS OF EQUIPMENT ARE APPROXIMATE. EXACT ROUTES AND POSITIONS ARE TO BE AGREED OR VERIFIED ON SITE.
- 2) ALL EQUIPMENT SHALL BE LOCATED/POSITIONED TO SPATIAL REQUIREMENT FOR MAINTENANCE AS RECOMMENDED BY THE MANUFACTURER.
- 3) ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- 4) ALL EQUIPMENT SUPPORTED FROM WALLS/Ceilings/FLOORS TO BE FIXED BY A METHOD TO BE APPROVED BY THE CONSULTING ENGINEER PRIOR TO COMMENCEMENT OF WORK OF FIXING.
- 5) FOR DETAILS OF ALL EQUIPMENT REFER TO THE SPECIFICATION.
- 6) NEW DUCTWORK TO BE INSULATED AS DETAILED WITHIN THE SPECIFICATION.
- 7) ALL DUCTWORK TO BE INSTALLED FULLY IN ACCORDANCE WITH HVCA DW144.
- 8) FLEXIBLE DUCTWORK SHALL BE NO GREATER THAN 500mm.
- GENERAL NOTES FOR DOMESTIC SERVICES**
- 1) ALL SANITARYWARE OUTLETS PLANT AND EQUIPMENT TO BE PROVIDED WITH ISOLATION VALVES TO LOCAL ISOLATORS.

MECHANICAL SERVICES LEGEND	
SYMBOL	DESCRIPTION
	COLD WATER TANK AND BOOSTER SET
	PIPEWORK AT LOW LEVEL
	PIPEWORK AT HIGH LEVEL WITHIN CEILING VOID
	PIPEWORK RISE OR FALL
	ISOLATION VALVE
	BALANCING VALVE
	DOUBLE CHECK VALVE
	HOT/COLD WATER OUTLET
	COLD WATER METER
	MIXER SHOWER
	IN-LINE EXTRACT FAN
	HEAT RECOVERY UNIT
	SUPPLY AIR GRILLE
	EXTRACT AIR GRILLE
	SUPPLY LOUVRE
	EXTRACT LOUVRE
	DUCTWORK
	DOOR TRANSFER GRILLE CW INTRINSINC/SCORE
	VOLUME CONTROL DAMPER
	CROSS TALK ATTENUATOR
	WALL MOUNTED AIR CONDITIONING EXTERNAL CONDENSER
	FLOOR STANDING AIR CONDITIONING EXTERNAL CONDENSER
	CEILING MOUNTED AIR CONDITIONING UNIT
	AIR CONDITIONING CONTROLLER
	HEAT RECOVERY UNIT CONTROLLER
	WALL MOUNTED AIR CONDITIONING UNIT
	BACKDRAUGHT SHUTTER
	RECTANGULAR DUCTWORK RISE/FALL
	RTA
	DTLL
	HL
	LL
	RFB

DRAWING NOTES	
	NATURALLY VENTILATED VIA OPENING DOORS/WINDOWS



18	EXTRACT & SUPPLY RISERS INDICATED.	D.W.	Sep. '20
17	UPDATED IN LINE WITH SEALY'S COMMENTS.	J.J.	Feb. '20
16	DRY RISER POSITIONS INDICATED.	D.L.	Dec. '19
15	REVISED FOLLOWING FURTHER COMMENTS	D.L.	Nov. '19
14	REVISED FOLLOWING DTM 15/10/19	D.L.	Oct. '19
13	REVISED IN LINE WITH ARCHITECTS COMMENTS	P.T.	Oct. '19
12	REVISED FOLLOWING DTM 10/9/19	P.T.	Sep. '19
11	INFORMATION ISSUE.	P.T.	Aug. '19
Rev.	Description	Revised By	Date

STATUS	INFORMATION
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22/05/2022	22/05/2022	22/05/2022	18
DATE	TIME	DATE	TIME
Aug. 2019	1:10 @ A0	P.H.	P.T.

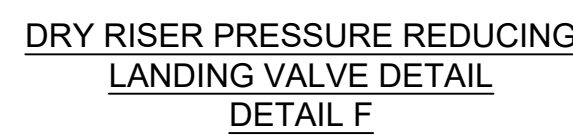
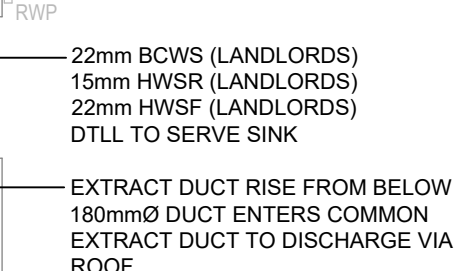
JOB TITLE	Bellamy Court
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DRAWING TITLE	First Floor Domestic Services & Ventilation Layout
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DRAWING NOTES

 NATURALLY VENTILATED VIA
OPENING DOORS/WINDOWS



APPENDIX		REF:	BOOSTER SET SCHEDULE (LANDLORDS)	
PROJECT NAME: BELLAMY COURT				
JOB NO: 22/057			DATE: AUGUST 2020	
ENGINEER: PT			REVISION: 4	
CHECKED: SL				
Reference		BS01		
Location		Plant Rooms		
System		Boosted Cold Water		
Type		Booster Set		
Manufacturer		Toleno Ltd		
Model		Lowara Multisage Booster Pumps 3 Pumps		
Volume			4 l/s	
Electrical Supply			5 kW	
			400 V	
			3 Ph	
			50 Hz	
Dimensions (Booster Set)		Width		1100 mm
		Depth		1400 mm
		Height		1000 mm
Head (bar)			3 bar	
Working Pressure (bar)			10 bar	
Fluid Type			Clean cold water @ >10°	
Number of Pumps			3	

APPENDIX	REF:	EXTRACT & SUPPLY GRILLE SCHEDULE (LANDLORDS)
PROJECT NAME: BELLAMY COURT		
JOB NO: 22/057		DATE: AUGUST 2020
ENGINEER: PT		REVISION: 4
CHECKED: SL		

Ref	System	Air Vol m ³ /s	Size mm x mm	Type	Model	Pressure Drop Pa	NR	Plenum Box	Spigot Size Dia.
EG1	Various	0.025-0.04	150 x 150	Gilberts DG4	DG4 4-Way	<20	<20	√	Various See drawings
EG2	Various	0.06 – 0.1	225 x 225	Gilberts DG4	DG4 4-Way	<20	<20	√	Various See drawings
SG1	Various	0.025-0.04	150 x 150	Gilberts DG4	DG4 4-Way	<20	<20	√	Various See drawings
SG2	Various	0.06 – 0.1	225 x 225	Gilberts DG4	DG4 4-Way	<20	<20	√	Various See drawings

NOTES:

APPENDIX		REF:	HOT WATER PUMP SCHEDULE (LANDLORDS)						
PROJECT NAME: BELLAMY COURT									
JOB NO: 22/057				DATE: AUGUST 2020					
ENGINEER: PT				REVISION: 4					
CHECKED: SL									
Reference	P1								
Location	Hot Water Return Pump								
Manufacturer	Wilo								
Model Reference	Star Z 20/7-3 (150mm)								
No.Off	1 x Single Head								
System	Hot Water Return Pump								
Pump Type	Gladless Standard Pump								
Duty	0.1 l/s @ 38 KPA								
System Temperature	60/55								
Electrical Supply	1ph 230 v 50hz								

APPENDIX	REF:	WATER TANK SCHEDULE (LANDLORDS)	
PROJECT NAME: BELLAMY COURT			
JOB NO: 22/057		DATE: AUGUST 2020	
ENGINEER: PT		REVISION: 4	
CHECKED: SL			
Reference	T01		
Location	Ground Floor Mechanical Plant Room		
System	Cold Water Service		
Type	Toleno Sectional Tank		
Capacity (Nominal)		6400 l (actual)	
Dimensions (Nominal)	Length	2550mm	
	Width	2450mm	
	Height	2150mm	
Connections	Ball valve/inlet	No 2	32mm
	Outlet	No 2	76mm
	Overflow	No 2	54mm
	Drain	No 2	28mm
Constructions	Material	1FB Sectional Tank	
Regulations	Comply with Water Byelaw 30		
	Comply with BSEN 806		
Notes			

APPENDIX		REF:	LOUVRE / COWL SCHEDULE (LANDLORDS)							
PROJECT NAME: BELLAMY COURT										
JOB NO: 22/057				DATE: AUGUST 2020						
ENGINEER: PT				REVISION: 4						
CHECKED: SL										
Ref No.	System	Air Vol m3/s	Size mm x mm	Type	Model	Pressure Drop Pa	Velocity	NR	Plenum Box	Spigot Size Dia.
EL1	HRU Dining	0.334	700 x 300	Gilberts	WG38	<20	2		√	300
SL1	HRU Dining	0.334	700 x 300	Gilberts	WG38	<20	2		√	300
EL2	HRU Office	0.104	300 x 300	Gilberts	WG38	<20	1.8		√	200
SL2	HRU Office	0.104	300 x 300	Gilberts	WG38	<20	1.8		√	200
EL3	Hair & Beauty	0.073	300 x 300	Gilberts	WG38	<20	1.5		√	150
EL4	WC & Locker Extract	0.1	300 x 300	Gilberts	WG38	<20	1.8		√	200
RC1	Common Extract Roof Cowl	0.44	Roof Cowl 400 Ø							
RC2	Common Extract Roof Cowl	0.2	Roof Cowl 300 Ø							

APPENDIX		REF:	FAN & AHU SCHEDULE (LANDLORDS)					
PROJECT NAME: BELLAMY COURT								
JOB NO: 22/057			DATE: SEPTEMBER 2020					
ENGINEER: PT			REVISION: 5					
CHECKED: SL								
Reference	HRU1	HRU2		EF1	EF2	EF3	EF4	EF5
System	Dining Area Extract / Supply	Office Extract / Supply		Scooter Store Extract	Hair & Beauty Extract	Assisted Bathroom	Laundry Extract	Bin Store
Location	Dining Area CV	Office CV		Ceiling Void	Ceiling Void	Ceiling Void	Ceiling Void	Ceiling Void
Manufacturer	Mitsubishi	Mitsubishi		Vent Axia	Vent Axia	Vent Axia	Vent Axia	Vent Axia
Model Reference	Lossney LGH 80	Lossney LGH 50		ACM 100 T	ACM 150 T	ACM 100 T	ACM 150 T	ACM 150 T
Supply Duty (m³/s)	0.167 @ Speed 3	0.104 @ Speed 3		N/A	N/A	N/A	N/A	N/A
Extract Duty (m³/s)	0.167 @ Speed 3	0.104 @ Speed 3		25 l/s @ 70 pa (low speed)	75 l/s @ 70pa (low speed)	25 l/s @ 70 pa (low speed)	75 l/s @ 70 pa (low speed)	75 l/s @ 70 pa (low speed)
External Resistance (Pa)	85pa @ Speed 3	68 @ Speed 3		70 pa (low speed)	70 pa (low speed)	70 pa (low speed)	70 pa (low speed)	70 pa (low speed)
Comments	CO2 sensor and wall mounted controller. Wall controller to be located in inaccessible location to avoid residents modifying controls.	Controlled via wall mounted controller		Controlled via PIR	Controlled via wall mounted fan controller	Controlled via PIR	Controlled via Humidistat	Controlled via Time Switch

Reference	EF6	EF7	EF8	EF9	EF10	SF1		
System	GF 2No WCs	GF WC & Locker	Shower & Locker Room	Staff Room	Kitchen Extract	Kitchen Supply		
Location	Ceiling Void	Ceiling Void	Ceiling Void	Wall Mounted	Kitchen	Kitchen		
Manufacturer	Vent Axia	Vent Axia	Vent Axia	Vent Axia	Helios	Helios		
Model Reference	ACM 100 T	ACM 150 T	ACM 100 T	Low Carbon Revive Wall Fan	VEKAINT3000	VEKAINT3000-21 61		
Supply Duty (m³/s)	N/A	N/A	N/A	N/A	N/A	N/A		
Extract Duty (m³/s)	50 l/s @ 50 pa (high speed)	100 l/s @ 50 pa (low speed)	50 l/s @ 25 pa (high speed)	30 l/s	837/s	711 l/s		
External Resistance (Pa)	50 pa (High Speed)	50 pa (low speed)	25 pa (high speed)	N/A	60pa	60pa		
Comments	Controlled via PIR	Controlled via PIR	Controlled via PIR	Controlled via wall mounted controller	Controlled as a slave unit to supply (SFI) AHU via LCD Dimensions 670mm x 670mm x 500mm H Elec Supply 230V 1ph 50Hz Weight 43kg	Controlled via mounted AHU LCD screen Dimensions 1062mm x 1800mm x 550mm H Elec Supply 400V 3ph 50Hz 4.5Amp Weight 136kg – C/W Electric heater -3°C to 18°C (18kW)		



APPENDIX	REF:	WATER CYLINDER SCHEDULE (LANDLORDS)	
PROJECT NAME: BELLAMY COURT			
JOB NO: 22/057		DATE: AUGUST 2020	
ENGINEER: PT		REVISION: 4	
CHECKED: SL			
Reference	CY1		
Location	Plant Room		
Manufacturer	Heatrae Sadia		
Model	Megaflo Eco Indirect 300i		
Storage Vessel	Capacity	300	
Connections	Inlet	22mm	
	Return	22mm	
Details	Coil Rating	28.3 kW	
	Recovery Time	39 mins	
	Safety Valve	90°C @ 1 bar (factory fitted)	
Flow	Maximum Flow at 3 bar	76 l/min	
	Minimum Flow at 1 bar	45 l/min	
Standing Heat Loss		1.69 kWh / 24h	
Immersions	Factory fitted immersion heaters		
Dimensions	Height	2053mm	
	Diameter	579mm	
	Weight (full)	358kg	

Note: Cylinders by GSHP Specialist.

APPENDIX		REF:		FAN & AHU SCHEDULE (RESIDENTS)				
PROJECT NAME: BELLAMY COURT								
JOB NO: 22/057				DATE: AUGUST 2020				
ENGINEER: PT				REVISION: 4				
CHECKED: SL								
Reference	MEV 1							
System	Apartments							
Location	Apartments – Store cupboard ceiling void							
Manufacturer	Vent Axia							
Model Reference	Lo Carbon Multivent MVDC MSH							
Extract Duty (m³/s)	0.05							
External Resistance (Pa)	50 pa							
Comments	Trickle vent, boost controlled via humidistat and kitchen boost switch.							

APPENDIX		REF:	LOUVRE / COWL SCHEDULE (RESIDENTS)							
PROJECT NAME: BELLAMY COURT										
JOB NO: 22/057				DATE: AUGUST 2020						
ENGINEER: PT				REVISION: 4						
CHECKED: SL										
Ref No.	System	Air Vol m3/s	Size mm x mm	Type	Model	Pressure Drop Pa	Velocity	NR	Plenum Box	Spigot Size Dia.
EL5	Apartments	0.05	200x 200	Gilberts	WG38	<20	2		√	204 x 60

NOTES:

APPENDIX	REF:	EXTRACT & SUPPLY GRILLE SCHEDULE (RESIDENTS)
PROJECT NAME: BELLAMY COURT		
JOB NO: 22/057		DATE: AUGUST 2020
ENGINEER: PT		REVISION: 4
CHECKED: SL		

Ref	System	Air Vol m ³ /s	Size mm x mm	Type	Model	Pressure Drop Pa	NR	Plenum Box	Spigot Size Dia.
EG3	Apartments	0.025	150 x 150	GDL	Air Valve	21 @+6	21 NC		

NOTES:

APPENDIX	REF:	WATER CYLINDER SCHEDULE (RESIDENTS)	
PROJECT NAME: BELLAMY COURT			
JOB NO: 22/057		DATE: AUGUST 2020	
ENGINEER: PT		REVISION: 4	
CHECKED: SL			
Reference	CY2		
Location	Apartments		
Manufacturer	Heatrae Sadia		
Model	Megaflo Eco Indirect 170i		
Storage Vessel	Capacity	170	
Connections	Inlet	22mm	
	Return	22mm	
Details	Coil Rating	24.3 kW	
	Recovery Time	22 mins	
	Safety Valve	90°C @ 1 bar (factory fitted)	
Flow	Maximum Flow at 3 bar	76 l/min	
	Minimum Flow at 1 bar	45 l/min	
Standing Heat Loss		1.2 kWh / 24h	
Immersions	Factory fitted immersion heaters		
Dimensions	Height	1384mm	
	Diameter	579mm	
	Weight (full)	233kg	

Note: Cylinders by GSHP Specialist.

Specifications and rated conditions of main electric parts

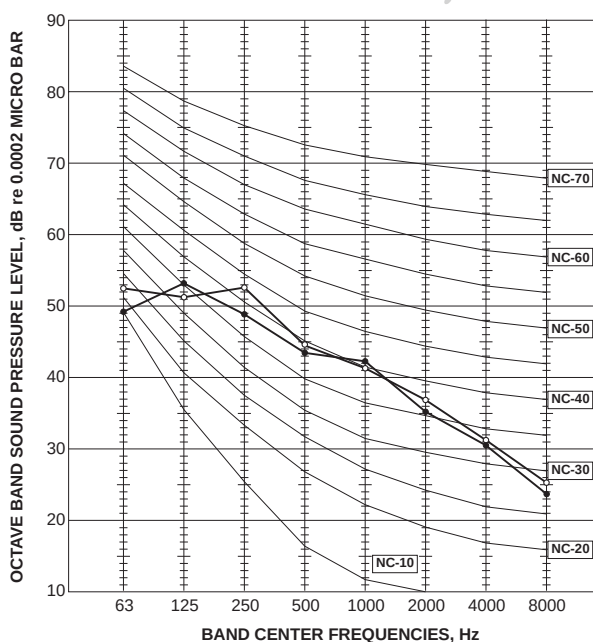
Model		MUZ-AP25VG	MUZ-AP25VGH	MUZ-AP35VG	MUZ-AP35VGH	MUZ-AP42VG	MUZ-AP42VGH	MUZ-AP50VG	MUZ-AP50VGH
Smoothing capacitor	(C61)	—				600 μF/ 620 μF 420 V			
	(C62, C63)	600 μF/ 620 μF 420 V							
Diode module	(DB61)	15 A 600 V						25 A 600 V	
Diode module	(DB65)	25 A 600 V							
Fuse	(F61)	25A 250V							
	(F62)	15A 250V							
	(F701, F801, F901)	T3.15AL250V							
Defrost heater	(H)	—	230 V 60W	—	230 V 60W	—	230 V 60W	—	230 V 130W
Power module	(IC700)	15 A 600 V				20 A 600 V			
	(IC932)	5 A 600 V							
Expansion valve coil	(LEV)	12 V DC							
Reactor	(L61)	18 mH		23 mH					
Switch power transistor	(Q821)	30 A 600 V							
Current-limiting PTC thermistor	(PTC64, PTC65)	33 Ω							
Terminal block	(TB1)	5 P							
Relay	(X63)	3 A 250 V							
	(X64)	20 A 250 V							
	(X66)	—	3 A 250 V	—	3 A 250 V	—	3 A 250 V	—	3 A 250 V
	(X69)	10 A 230 V							
R.V.coil	(21S4)	220 - 240 V AC							
Heater protector	(26H)	—	Open 45°C	—	Open 45°C	—	Open 45°C	—	Open 45°C

5

NOISE CRITERIA CURVES

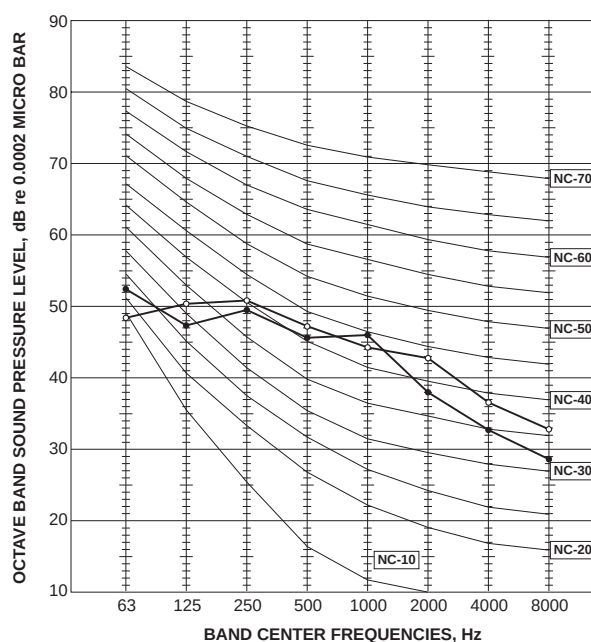
MUZ-AP25VG MUZ-AP25VGH

FUNCTION	SPL(dB(A))	LINE
COOLING	47	●—●
HEATING	48	○—○



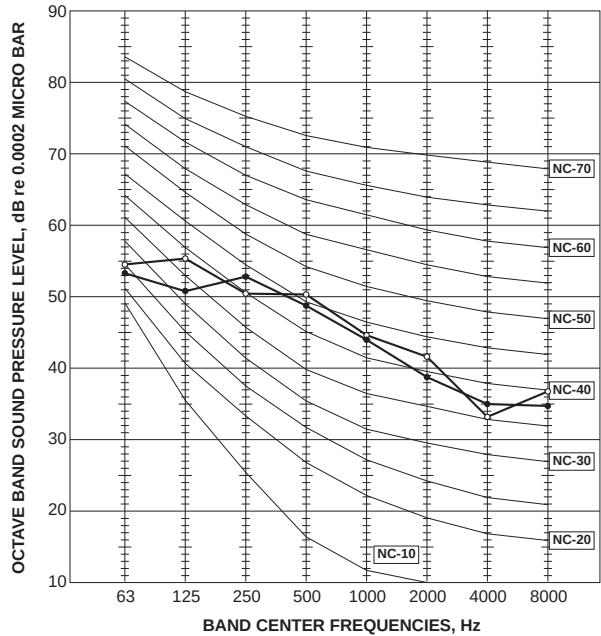
MUZ-AP35VG MUZ-AP35VGH

FUNCTION	SPL(dB(A))	LINE
COOLING	49	●—●
HEATING	50	○—○



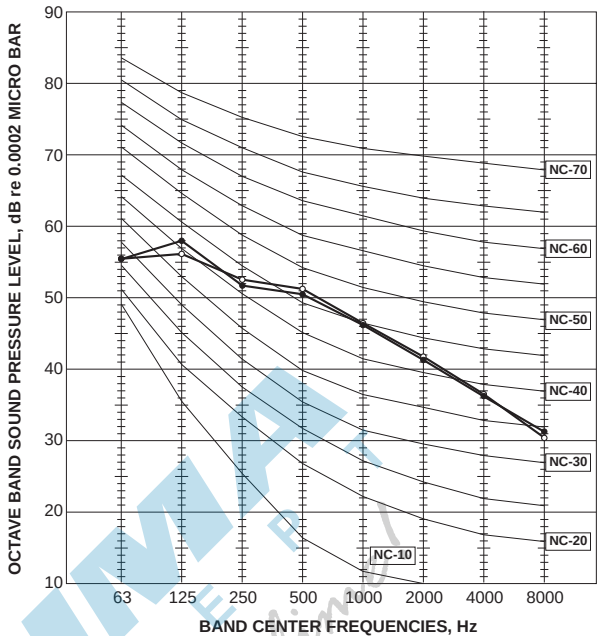
MUZ-AP42VG
MUZ-AP42VGH

FUNCTION	SPL(dB(A))	LINE
COOLING	50	
HEATING	51	

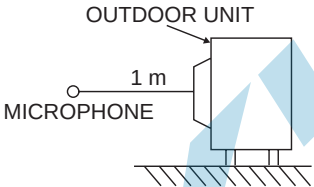


MUZ-AP50VG
MUZ-AP50VGH

FUNCTION	SPL(dB(A))	LINE
COOLING	52	
HEATING	52	



Test conditions
 Cooling: Dry-bulb temperature 35°C Wet-bulb temperature 24°C
 Heating: Dry-bulb temperature 7°C Wet-bulb temperature 6°C



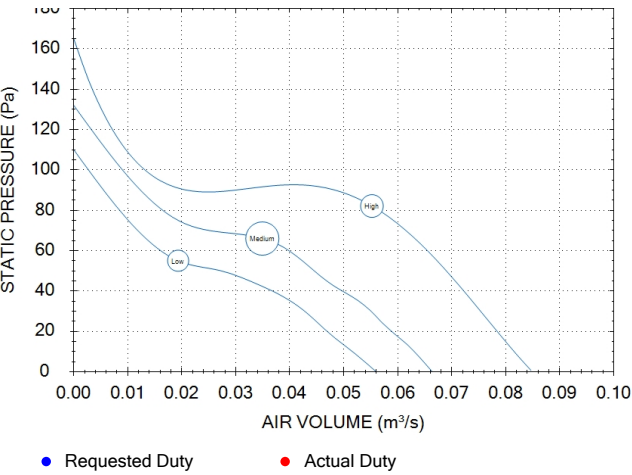
MODEL	LGH-35RX4-E												
Heat exchange system	Air-to-air total heat exchange(sensible heat + latent heat)exchange												
Heat exchange element material	Partition-spacing plate-special treated paper												
Cladding	Galvanized steel sheet												
Heat insulating material	Self-extinguishing urethane foam												
Motor	Totally enclosed capacitor permanent split-phase induction motor.4 poles,2 units												
Blower	220mm dia. Centrifugal fan												
Filter material	Non-woven fabrics filter(Gravitational method 82%)												
Operation enviroment(Supply air)	-10℃ to 40℃,RH 80% or less												
Operation and room air temperature	OA temperature shall be -15℃ to +40℃, less than 80%RH, with general air conditioning room environment. Subject to outdoor air conditioning unit. Pre-Heat OA in the case of using Lossnay in the cold region less than -15℃.												
Functions	Lossnay ventilation/Bypass ventilation High(Extra high)-Low switching												
Weight	30kg												
Power source	Single phase 220-240V												
Frequency	50Hz						60Hz						
Ventilation mode	Lossnay ventilation			Bypass ventilation			Lossnay ventilation			Bypass ventilation			
Fan speed	Extra high	High	Low	Extra high	High	Low	Extra high	High	Low	Extra high	High	Low	
Current (A)	0.78-0.79	0.71-0.71	0.46-0.48	0.81-0.82	0.72-0.73	0.46-0.49	0.99-0.99	0.83-0.87	0.46-0.50	1.00-1.00	0.83-0.86	0.46-0.50	
Power consumption (W)	169-187	154-167	97-110	176-192	156-172	97-111	215-236	180-207	97-117	217-236	180-206	97-117	
Air volume	(m³/h)	350	350	230	350	350	230	350	350	210	350	350	210
	(L / s)	97	97	64	97	97	64	97	97	58	97	97	58
External static pressure	(mmH ₂ O)	15.3	7.1	2.5	15.3	7.1	2.5	19.4	5.1	2.0	19.4	5.1	2.0
	(Pa)	150	70	25	150	70	25	190	50	20	190	50	20
Temperature exchange efficiency (%)		79	79	84	—	—	—	79	79	85	—	—	—
Enthalpy exchange efficiency (%)	Heating	70	70	77	—	—	—	70	70	78	—	—	—
	Cooling	68	68	74.5	—	—	—	68	68	76	—	—	—
Noise (dB)	Measured at 1.5m under the center of panel	31-32	28-30	23-24	31.5-32.5	28-30	23-24	32-33	27-29	21-22	33-34	28-30	21-22
	Air outlets	39-40	35-37	28-29	39.5-40.5	35.5-37.5	28-29	40-41	34-36	26-27	41-42	35-37	26-27
Starting current	Under 1.7A less												
Insulation resistance	10MΩ or more (500V megger)												
Dielectric strength	AC 1500V 1 minute												

MODEL	LGH-50RX4-E												
Heat exchange system	Air-to-air total heat exchange(sensible heat + latent heat)exchange												
Heat exchange element material	Partition-spacing plate-special treated paper												
Cladding	Galvanized steel sheet												
Heat insulating material	Self-extinguishing urethane foam												
Motor	Totally enclosed capacitor permanent split-phase induction motor.4 poles,2 units												
Blower	220mm dia. Centrifugal fan												
Filter material	Non-woven fabrics filter(Gravitational method 82%)												
Operation enviroment(Supply air)	-10℃ to 40℃,RH 80% or less												
Operation and room air temperature	OA temperature shall be -15℃ to +40℃, less than 80%RH, with general air conditioning room environment. Subject to outdoor air conditioning unit. Pre-Heat OA in the case of using Lossnay in the cold region less than -15℃.												
Functions	Lossnay ventilation/Bypass ventilation High(Extra high)-Low switching												
Weight	33kg												
Power source	Single phase 220-240V												
Frequency	50Hz						60Hz						
Ventilation mode	Lossnay ventilation			Bypass ventilation			Lossnay ventilation			Bypass ventilation			
Fan speed	Extra high	High	Low	Extra high	High	Low	Extra high	High	Low	Extra high	High	Low	
Current (A)	0.94-0.95	0.89-0.90	0.57-0.60	0.95-0.96	0.90-0.93	0.58-0.60	1.21-1.27	1.05-1.10	0.60-0.63	1.22-1.25	1.05-1.09	0.60-0.63	
Power consumption (W)	204-225	193-214	123-142	206-228	196-221	125-142	262-291	231-262	130-151	263-288	228-261	130-151	
Air volume	(m³/h)	500	500	350	500	500	350	500	500	300	500	500	300
	(L / s)	139	139	97	139	139	97	139	139	83	139	139	83
External static pressure	(mmH ₂ O)	15.3	6.1	3.1	15.3	6.1	3.1	20.4	6.1	2.0	20.4	6.1	2.0
	(Pa)	150	60	30	150	60	30	200	60	20	200	60	20
Temperature exchange efficiency (%)	77	77	82	—	—	—	77	77	83.5	—	—	—	
Enthalpy exchange efficiency (%)	Heating	67.5	67.5	73.5	—	—	—	67.5	67.5	75.5	—	—	—
	Cooling	64.5	64.5	71.5	—	—	—	64.5	64.5	73.5	—	—	—
Noise (dB)	Measured at 1.5m under the center of panel	33-34	29.5-31.5	23.5-24.5	34-35.5	31-33	24.5-25.5	33-35.5	28.5-31	23-24	34.5-36	30-32	23-24
	Air outlets	41-42	37.5-39.5	29.5-30.5	42-43.5	39-41	30.5-31.5	41-43.5	36.5-39	29-30	42.5-44	38-40	29-30
Starting current	Under 1.9A less						Under 1.8A less						
Insulation resistance	10MΩ or more (500V megger)												
Dielectric strength	AC 1500V 1 minute												

MODEL	LGH-65RX4-E												
Heat exchange system	Air-to-air total heat exchange(sensible heat + latent heat)exchange												
Heat exchange element material	Partition-spacing plate-special treated paper												
Cladding	Galvanized steel sheet												
Heat insulating material	Self-extinguishing urethane foam												
Motor	Totally enclosed capacitor permanent split-phase induction motor.4 poles,2 units												
Blower	245mm dia. Centrifugal fan												
Filter material	Non-woven fabrics filter(Gravitational method 82%)												
Operation enviroment(Supply air)	-10℃ to 40℃,RH 80% or less												
Operation and room air temperature	OA temperature shall be -15℃ to +40℃, less than 80%RH, with general air conditioning room environment. Subject to outdoor air conditioning unit. Pre-Heat OA in the case of using Lossnay in the cold region less than -15℃.												
Functions	Lossnay ventilation/Bypass ventilation High(Extra high)-Low switching												
Weight	46kg												
Power source	Single phase 220-240V												
Frequency	50Hz						60Hz						
Ventilation mode	Lossnay ventilation			Bypass ventilation			Lossnay ventilation			Bypass ventilation			
Fan speed	Extra high	High	Low	Extra high	High	Low	Extra high	High	Low	Extra high	High	Low	
Current (A)	1.40-1.40	1.30-1.30	0.85-0.90	1.40-1.40	1.30-1.30	0.85-0.90	1.80-1.80	1.50-1.60	0.90-1.00	1.80-1.80	1.50-1.60	0.90-1.00	
Power consumption (W)	295-325	270-300	185-210	300-330	275-305	185-210	380-430	320-370	195-230	380-430	325-375	195-230	
Air volume	(m³/h)	650	650	500	650	650	500	650	650	440	650	650	440
	(L/s)	181	181	139	181	181	139	181	181	122	181	181	122
External static pressure	(mmH ₂ O)	11.2	5.1	3.1	11.2	5.1	3.1	18.9	7.1	3.6	18.9	7.1	3.6
	(Pa)	110	50	30	110	50	30	185	70	35	185	70	35
Temperature exchange efficiency (%)		76	76	79	—	—	—	76	76	80	—	—	—
Enthalpy exchange efficiency (%)	Heating	68	68	71.5	—	—	—	68	68	73.5	—	—	—
	Cooling	64.5	64.5	69	—	—	—	64.5	64.5	71	—	—	—
Noise (dB)	Measured at 1.5m under the center of panel	34.5-35	32.5-33	27-28	35.5-36	33.5-34	27.5-28.5	35.5-36	32.5-33	27-28	36.5-37	33.5-34	27.5-28.5
	Air outlets	42.5-43	40.5-41	35-36	43.5-44	41.5-42	35.5-36.5	43.5-44	40.5-41	35-36	44.5-45	41.5-42	35.5-36.5
Starting current	Under 2.8A less						Under 2.6A less						
Insulation resistance	10MΩ or more (500V megger)												
Dielectric strength	AC 1500V 1 minute												

MODEL	LGH-80RX4-E												
Heat exchange system	Air-to-air total heat exchange(sensible heat + latent heat)exchange												
Heat exchange element material	Partition-spacing plate-special treated paper												
Cladding	Galvanized steel sheet												
Heat insulating material	Self-extinguishing urethane foam												
Motor	Totally enclosed capacitor permanent split-phase induction motor.4 poles,2 units												
Blower	245mm dia. Centrifugal fan												
Filter material	Non-woven fabrics filter(Gravitational method 82%)												
Operation enviroment(Supply air)	-10℃ to 40℃,RH 80% or less												
Operation and room air temperature	OA temperature shall be -15℃ to +40℃, less than 80%RH, with general air conditioning room environment. Subject to outdoor air conditioning unit. Pre-Heat OA in the case of using Lossnay in the cold region less than -15℃.												
Functions	Lossnay ventilation/Bypass ventilation High(Extra high)-Low switching												
Weight	61kg												
Power source	Single phase 220-240V												
Frequency	50Hz						60Hz						
Ventilation mode	Lossnay ventilation			Bypass ventilation			Lossnay ventilation			Bypass ventilation			
Fan speed	Extra high	High	Low	Extra high	High	Low	Extra high	High	Low	Extra high	High	Low	
Current (A)	1.70-1.70	1.60-1.60	1.40-1.40	1.70-1.70	1.60-1.60	1.40-1.40	2.10-2.20	1.90-2.00	1.50-1.60	2.10-2.10	1.90-2.00	1.50-1.60	
Power consumption (W)	365-385	340-370	290-315	350-380	335-360	290-315	455-510	405-465	315-375	455-500	410-460	325-375	
Air volume	(m³/h)	800	800	670	800	800	670	800	800	660	800	800	660
	(L/s)	222	222	186	222	222	186	222	222	183	222	222	183
External static pressure	(mmH ₂ O)	14.3	10.2	7.1	14.3	10.2	7.1	23.5	12.2	8.2	23.5	12.2	8.2
	(Pa)	140	100	70	140	100	70	230	120	80	230	120	80
Temperature exchange efficiency (%)		78	78	80.5	—	—	—	78	78	81	—	—	—
Enthalpy exchange efficiency (%)	Heating	71	71	73.5	—	—	—	71	71	74	—	—	—
	Cooling	67	67	70.5	—	—	—	67	67	71	—	—	—
Noise (dB)	Measured at 1.5m under the center of panel	33.5-34.5	32-33	30-31	34.5-35.5	33-34	30.5-31.5	35-36	31-32.5	29-30.5	36-37	32-33.5	29.5-31
	Air outlets	44.5-45.5	43-44	40-41	45.5-46.5	44-45	40.5-41.5	46-47	42-43.5	39-40.5	47-48	43-44.5	39.5-41
Starting current	Under 3.6A less						Under 3.3A less						
Insulation resistance	10MΩ or more (500V megger)												
Dielectric strength	AC 1500V 1 minute												

Performance Chart



17104020

Tech Ref File:
Stock Reference: 17104020
Product Description: ACM100T
Product Type: Ventilation
Product Range: In-Line Fans
Impeller: Mixed Flow
Casing: ABS thermoplastic
Speed: 2200 rpm
Airstream Temperature: -30°C to 50°C
dBA: 22
Specific Fan Power & dB(A) shown are at duty point.

Warranty: 2 Years

Acoustic Information

	63	125	250	500	1k	2k	4k	8k	Total	dBA@3m
Inlet	38	42	57	56	54	46	38	30	61	37
Outlet	36	41	52	52	53	44	37	28	58	35
Breakout	32	36	41	39	37	37	28	22	46	22

Sound Power Level Spectra dB (re 10⁻¹² Watts)

For ducted units, sound power is given as In Duct with end reflections added.

Stated dB(A) levels at 3m with spherical propagation at a reference level of 2 x 10⁻¹² Pa

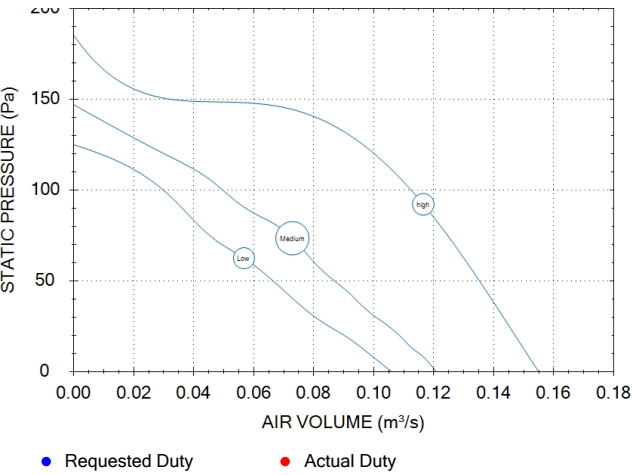
Electrical Information

Watts 23
Supply Voltage: 220-240V/1/50Hz
Full Load Current: 0.1 A
Motor Poles: 2
Insulation: B
Motor IP Rating: IP44
S.T.O.P. Protection: Yes
Speed Controllable: No

Optional Accessories

Part No	Description
FLX100	FLEXIBLE CONNECTOR

Performance Chart



17106020

Tech Ref File:
Stock Reference: 17106020
Product Description: ACM150T
Product Type: Ventilation
Product Range: In-Line Fans
Impeller: Mixed Flow
Casing: ABS thermoplastic
Speed: 2350 rpm
Airstream Temperature: -30°C to 50°C
dBA: 36
Specific Fan Power & dB(A) shown are at duty point.

Warranty: 2 Years

Electrical Information

Watts: 48
Supply Voltage: 220-240V/1/50Hz
Full Load Current: 0.21 A
Motor Poles: 2
Insulation: B
Motor IP Rating: IP44
S.T.O.P. Protection: Yes
Speed Controllable: No

Acoustic Information

	63	125	250	500	1k	2k	4k	8k	Total	dBA@3m
Inlet	40	49	59	63	59	63	55	47	68	46
Outlet	36	48	54	60	58	61	54	46	65	44
Breakout	26	28	41	45	48	54	41	29	56	36

Sound Power Level Spectra dB (re 10⁻¹² Watts)

For ducted units, sound power is given as In Duct with end reflections added.

Stated dB(A) levels at 3m with spherical propagation at a reference level of 2 x 10⁻¹² Pa

Optional Accessories

Part No	Description
FLX150	FLEXIBLE CONNECTOR

Face velocity	[m/s]	2	2	2	2	2
Normal external pressure	[Pa]	250	250	250	250	250
Internal pressure drop of ventilation components	[Pa]	95	95	95	95	95
Static efficiency of fans used in accordance with Regulation No 327/2011	[%]	42,8	42,8	42,8	42,8	42,8
Declared maximum external leakage	[%]	<1	<1	<1	<1	<1
Casing sound power level (Lwa)	[dB(A)]	61	61	61	61	61
Energy classification of the filters		C	C	C	C	C
Filter Correction(F)	[Pa]	200	200	200	200	200
Description of visual filter warning		Pressure controlled	Pressure controlled	Pressure controlled	Pressure controlled	Pressure controlled
ErP Compliance		2018	2018	2018	2018	2018
Internet address for disassembly instructions		www.salda.it				

VEKA INT EKO		3000-15 L1 SW2	3000-21 L1 SW2	3000-30 L1 SW2	3000-39 L1 SW2	3000-40,6 L1 W SW2
Declared typology		bidirectional	bidirectional	bidirectional	bidirectional	bidirectional
Type of drive		Variable	Variable	Variable	Variable	Variable
Type of HRS		N/A	N/A	N/A	N/A	N/A
Thermal efficiency of heat recovery	[%]	N/A	N/A	N/A	N/A	N/A
Nominal NRVU flow rate	[m³/s]	0,95	0,95	0,95	0,95	0,95
Effective electric power input	[kW]	0,84	0,84	0,84	0,84	0,84
SFPint	[W/(m³/s)]	219	219	219	219	219
Face velocity	[m/s]	2,2	2,2	2,2	2,2	2,2
Normal external pressure	[Pa]	250	250	250	250	250
Internal pressure drop of ventilation components	[Pa]	105	105	105	105	105
Static efficiency of fans used in accordance with Regulation No 327/2011	[%]	47,9	47,9	47,9	47,9	47,9
Declared maximum external leakage	[%]	<1	<1	<1	<1	<1
Declared maximum internal leakage	[%]	-	-	-	-	-
Energy classification of the filters		C	C	C	C	C
Description of visual filter warning		Pressure control	Pressure control	Pressure control	Pressure control	Pressure control
Casing sound power level (Lwa)	[dB(A)]	67	67	67	67	67
ErP Compliance		2018	2018	2018	2018	2018
Internet address for disassembly instructions		www.salda.it				

VEKA INT EKO		4000-21 L1 SW2	4000-27 L1 SW2	4000-39 L1 SW2	4000-54 L1 SW2	4000-54 L1 W SW2
Declared typology		bidirectional	bidirectional	bidirectional	bidirectional	bidirectional
Type of drive		Variable	Variable	Variable	Variable	Variable
Type of HRS		N/A	N/A	N/A	N/A	N/A
Thermal efficiency of heat recovery	[%]	N/A	N/A	N/A	N/A	N/A
Nominal NRVU flow rate	[m³/s]	1,21	1,21	1,21	1,21	1,21
Effective electric power input	[kW]	1,12	1,12	1,12	1,12	1,12
SFPint	[W/(m³/s)]	222	222	222	222	222
Face velocity	[m/s]	2,82	2,82	2,82	2,82	2,82
Normal external pressure	[Pa]	250	250	250	250	250
Internal pressure drop of ventilation components	[Pa]	125	125	125	125	125
Static efficiency of fans used in accordance with Regulation No 327/2011	[%]	56,4	56,4	56,4	56,4	56,4
Declared maximum external leakage	[%]	<1	<1	<1	<1	<1
Declared maximum internal leakage	[%]	-	-	-	-	-
Energy classification of the filters		C	C	C	C	C