Acoustic Consultancy Report

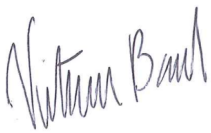
73348/3/1/4

External Plant Assessment

Report Prepared For

Estee Lauder Companies
279 High Street, Camden
17 July 2015

Report Author



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Contents

i) Executive Summary

New mechanical plant is to be installed at 279 Camden High Street, in London.

LCP has been commissioned by Estee Lauder to carry out an acoustic environment survey and to use the obtained data to assess the potential noise impact of the plant installation on surrounding noise sensitive receptors.

The design criterion is as follows:

Commercial Day:	55 dB $L_{Aeq,T}$ at 4m, nearest commercial;
Residential Day:	48 dB $L_{Aeq,T}$ at 15m, first floor window of 279 Camden High Street;
Residential Day:	55 dB $L_{Aeq,T}$ at 1m, terrace area of 279 Camden High Street.

Any new mechanical plant will be installed to meet the above design criteria.

The design as proposed and assessed will achieve the required criteria provided the mitigation detailed in section 5 of this report is implemented; the calculated rating levels are as follows:

Commercial Day:	54 dB $L_{Aeq,T}$ at 4m, nearest commercial;
Residential Day:	46 dB $L_{Aeq,T}$ at 15m, first floor window of 279 Camden High Street;
Residential Day:	53 dB $L_{Aeq,T}$ at 1m, terrace area of 279 Camden High Street.

This report concludes that the design criteria can be achieved.

ii) Document History

Issue	Date	Issue Details	Issued By	Checked By
1	17th July 2015	Initial Issue	VB	MB

1 Introduction

New mechanical plant is to be installed at 279 Camden High Street, in London.

LCP has been commissioned by Estee Lauder to carry out an acoustic environment survey and to use the obtained data to assess the potential noise impact of the plant installation on surrounding noise sensitive receptors.

The report details recommendations for necessary noise mitigation where necessary.

The guidance contained in this report is given on the basis that the operational period of the plant may potentially be continuous between 07:00 and 19:00.

2 Survey

2.1 Site Description

The site layout together with the measurement position is shown in the drawing contained within Appendix A.

2.2 Receiver Location

The site was surveyed to determine the location of the most affected receiver.

The nearest commercial receiver with direct line of sight to the plant area is 4m to the west of the site. The nearest residential receptor is the first and second storey of 279 Camden High Street. The terrace area of 279 Camden High Street adjoins the proposed plant location however the nearest window to the plant area is 15m to the east of the site. This is shown in the site plan in Appendix A.

2.3 Local Noise Climate

The predominant local noise sources were existing plant in close proximity to the proposed plant.

2.4 Measurements

The noise monitoring took place on the 7th July 2015 to the 8th July 2015. The measurement period was considered sufficient to establish the representative background sound levels corresponding to the operational period of the plant.

The weather conditions monitored during the survey are shown in the following table.

Table 1: Weather Conditions at Measurement Location

Weather	Value
Average Wind Speed	1m/s^{-1}
Wind Direction	West
Cloud Cover	10%
Max. Temperature	23°C

Weather	Value
Min. Temperature	13°C
Precipitation	None

2.5 Measurement Results

The measured statistical broad-band sound pressure levels are shown within Appendix B. The representative background sound level(s) obtained being as follows:

Table 2: Representative background sound levels, dB re $2x10^{-5}$ Pa

Measurement Position	$L_{A90,\ 15\ mins}$ Day*
MP1	58

* Day periods are defined as between 07:00 - 19.00.

3 Evaluation of Design Criteria

3.1 Residential Design Criterion

3.1.1 BS4142:2014

BS4142:2014 states that the significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs.

Table 3: BS4142 assessment based upon rating level

Difference between background noise and rating levels	Assessment
+ 10 dB	Indication of a significant adverse impact
+ 5 dB	Indication of an adverse impact
0 dB	Indication of low impact

Certain acoustic features can increase the significance of impact. The specific sound level should be corrected if a tone, impulse or other acoustic feature is expected to be present.

Table 4: Corrections for acoustic features, subjective method

Acoustic Feature	Correction, dB		
	Just Perceptible	Clearly Perceptible	Highly Perceptible
Tonality	2	4	6

Acoustic Feature	Correction, dB		
	Just Perceptible	Clearly Perceptible	Highly Perceptible
Impulsivity	3	6	9
Other Characteristics	3		
Intermittency	3		

Typically the acoustic feature correction would not be expected to exceed 10dB.

Where the level of uncertainty could affect the conclusion, take reasonably practicable steps to reduce the level of uncertainty.

3.1.2 World Health Organisation Night Noise Guidelines for Europe (2009)

The WHO's document 'Night Noise Guidelines for Europe (NNG) states the following:

"…*it is recommended that the population should not be exposed to night noise levels greater than 40 dB of* $L_{night,\ outside}$ *during the part of the night when most people are in bed*."

It then goes on to say:
"*An interim target (IT) if 55 dB* $L_{night,\ outside}$ *is recommended in the situations where the achievement of NNG is not feasible in the short run for various reasons*."

As the above guideline values consider the combined level of noise external to a façade (i.e. vehicular traffic, air traffic, building services noise etc, it is recommended that a criterion of 10 dB below these given levels is applied, depending on the particulars of the site in question.

3.1.3 World Health Organisation (WHO) Guidelines for Community Noise (1999)

The WHO's 'Guidelines for Community Noise' gives the following relevant noise criteria:

Table 5: Guideline values for community noise, from Guidelines for Community Noise (WHO, 1999)

Specific Environment	$L_{Aeq,\ T}$ dB	Time Base (hours)	L_{Amax}, fast dB
Outdoor living area (serious annoyance, daytime and evening)	55	16	-
Outdoor living area (moderate annoyance, daytime and evening)	50	16	-
Dwelling, indoors	35	16	-
Inside bedrooms	30	8	45
Outside bedrooms	45	8	60
Outdoors in parkland and conservation areas*	-	-	-

* Existing quiet outdoor areas should be preserved and the ratio of intruding noise to natural background sound should be kept low

The WHO's 'Guidelines for Community Noise' also gives the following general guidance on the expected sound insulation performance of a façade with a partly open window, it states that:

"*At night, sound pressure levels at the outside facades of the living spaces should not exceed 45 dB L_{Aeq} and 60 dB L_{Amax}, so that people may sleep with bedroom windows open. These values have been obtained by assuming that the noise reduction from outside to inside with the window partly open is 15 dB.*"

3.1.4 BS8233:2014

The criteria offered in BS8233 for residential buildings are largely based on the recommendations made in the Guidelines for Community Noise.

Using the general guidance from above, on the expected sound insulation performance of a façade with a partly open window, the criteria shown in the table below have been adapted from the criteria offered in table 4 of BS8233 in order to obtain acceptable external noise levels.

The noise levels shown should be treated as overall noise levels, i.e., the combination of all existing noise levels at the site, and noise levels from any proposed plant or activity.

Table 6: External ambient noise levels for dwellings, based on BS8233, dB re $2x10^{-5}$ Pa

Activity	**Location**	**Time period**	
		07:00 to 23:00	**23:00 to 07:00**
Resting	Living Room	50 $L_{Aeq,16\ hour}$	-
Dining	Dining Room/area	55 $L_{Aeq,\ 16\ hour}$	-
Sleeping (daytime resting)	Bedroom	50 $L_{Aeq,\ 16\ hour}$	45 $L_{Aeq,\ 8\ hour}$

In addition to the above criteria, BS8233 goes on to say:

"*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 50 $L_{Aeq,\ T}$, with an upper guideline value of 55 dB $L_{Aeq,\ T}$ which would be acceptable in nosier environments*."

The above criteria are in line with the recommendations made in WHO's 'Guidelines for Community Noise'.

3.1.5 Local Authority Requirements

The London Borough of Camden published "*Camden Development Policies 2010 – 2025*", Section 3 of which provides the following table.

Table E: Noise levels from plant and machinery at which planning permission will not be granted

Noise description and location of measurement	Period	Time	Noise level
Noise at 1 metre external to a sensitive façade	Day, evening and night	0000-2400	5dB(A) <LA90
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise at 1 metre external to sensitive façade where LA90>60dB	Day, evening and night	0000-2400	55dBL_{Aeq},

3.1.6 Recommended Residential Design Rating Level

On the basis of the above the recommended residential design rating level should therefore be:

Residential Design Rating Level
Representative $L_{A90,\ 15\ mins}$ - 10 dB

3.2 Commercial Design Criterion (BS8233:2014)

External design criteria for non-residential buildings have been derived from BS8233:2014.

Using the general guidance from WHO, on the expected sound insulation performance of a façade with a partly open window, the criteria shown in the table below have been adapted from the criteria offered in tables 2 and 6 of BS8233 in order to obtain acceptable external noise levels.

The noise levels shown should be treated as overall noise levels, i.e., the combination of all existing noise levels at the site, and noise levels from any proposed plant or activity.

Table 7: External ambient noise levels for non-domestic buildings, based on BS8233, dB re $2x10^{-5}$ Pa

Activity	**Location**	**Design Level $L_{Aeq,\ 16\ hr}$**
Speech or telephone communications	Department store, cafeteria, canteen, kitchen	70
	Concourse, corridor, circulation space	70

Activity	Location	Design Level $L_{Aeq, 16\ hr}$
Study and work requiring concentration	Library, gallery, museum	65
	Staff/meeting room, training room	60
	Executive office	55
	Open plan office	65
Listening	Place of worship, counselling, meditation, relaxation	50

3.2.1 Recommended Commercial Design Rating Level

On the basis of the above the recommended commercial design rating level should therefore be:

Commercial Design Rating level
$L_{Aeq, T}$ 55 dB

3.3 Design Rating Levels

The design levels to be adopted for this project are set out in the table below.

Table 8: Design rating levels, dB re $2x10^{-5}$ Pa

Receiver Premises	Approximate Distance (m)	Design Level (Day) $L_{Aeq, 12\ hr}$
279 Camden High Street, first floor window	15	48
279 Camden High Street, terrace area	1	55
Nearest commercial	4	55

4 Review of Current Design

4.1 Current Design

The proposed plant shall be located at basement and ground floor level of 279 Camden High Street. The plant location is shown in Appendix D.

The proposed plant shall comprise of two Mitsubishi P140YKM condenser units, one toilet extract fan, one basement staff extract fan, and one supply and extract for the main store.

The guidance contained in this report is given on the basis that the operational period of the plant may potentially be continuous between 07:00 and 19:00.

4.2 Calculated Results

Calculations of the predicted noise levels have been carried out with the appropriate corrections for geometric attenuation, barrier effect, reflective surfaces and multiple source addition.

The design rating levels to be adopted for this project, together with the predicted noise levels, are set out in the table below.

Table 9: Design and predicted rating levels, dB re $2x10^{-5}$ Pa

Receiver Premises	Approximate Distance (m)	Design Level (Day) $L_{Aeq,\ 12\ hr}$	Predicted Level $L_{Aeq,T}$
279 Camden High Street, first floor window	15	48	57
279 Camden High Street, terrace area	1	55	62
Nearest commercial	4	55	71

Plant noise level data used in this assessment are contained within Appendix C.

Calculations are shown within Appendix E.

5 Noise Mitigation Options

As the plant installation has been assessed to be over the required criteria at the surrounding noise sensitive receptors, following option shall be applied in order that noise emissions are reduced to acceptable levels.

Should the plant installation be redesigned after consideration of the mitigation options, the installation shall be re-assessed to ensure compliance to the specification has been achieved.

5.1 Noise Mitigation Scheme

The suggested mitigation measure is the introduction of a suitable noise mitigation scheme by means of an attenuator incorporated within the duct work of the staff extract, and the main store supply and extract. The required performance of the attenuators are shown in the table below.

Table 10: Required attenuator performance, dB

Description	Attenuator	Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Staff extract	PGO1U/1K/L	1	2	8	15	28	25	17	16
Main store supply	PGO1U/1K/L	1	2	8	15	28	25	17	16
Main store extract	PGO1U/1K/L	1	2	4	9	22	14	12	12

* data taken from CAICE Acoustic Air Movement Ltd.

In addition, LCP would recommend that acoustic panels be installed on the rear façade of 279 Camden High Street. Details of a suitable acoustic panel is shown in Appendix G.

Should this option be implemented, the design of the mitigation will need the services of a noise control company specialising in bespoke solutions to non-standard situations.

Such a company would visit the site, and attempt to arrive at an economic solution, taking into account all the parameters of this particular situation.

The problems of air flow, pressure drop etc, applicable to this equipment will all need to be taken into account.

Such a company is:

Company	Address	Telephone	Email/Web
Caice	Riverside House 3 Winnersh Fields Winnersh Wokingham RG41 5QS	0118 918 6470	enquiries@caice.co.uk www.caice.co.uk

5.2 Mitigated Results

The design rating levels to be adopted for this project, together with the predicted noise levels inclusive of the mitigation detailed in Section 5, are set out in the table below.

Table 11: Design and predicted rating levels, dB re $2x10^{-5}$ Pa

Receiver Premises	Approximate Distance (m)	Design Level (Day) $L_{Aeq,\ 12\ hr}$	Predicted Level $L_{Aeq,T}$
279 Camden High Street, first floor window	15	48	46
279 Camden High Street, terrace area	1	55	53
Nearest commercial	4	55	54

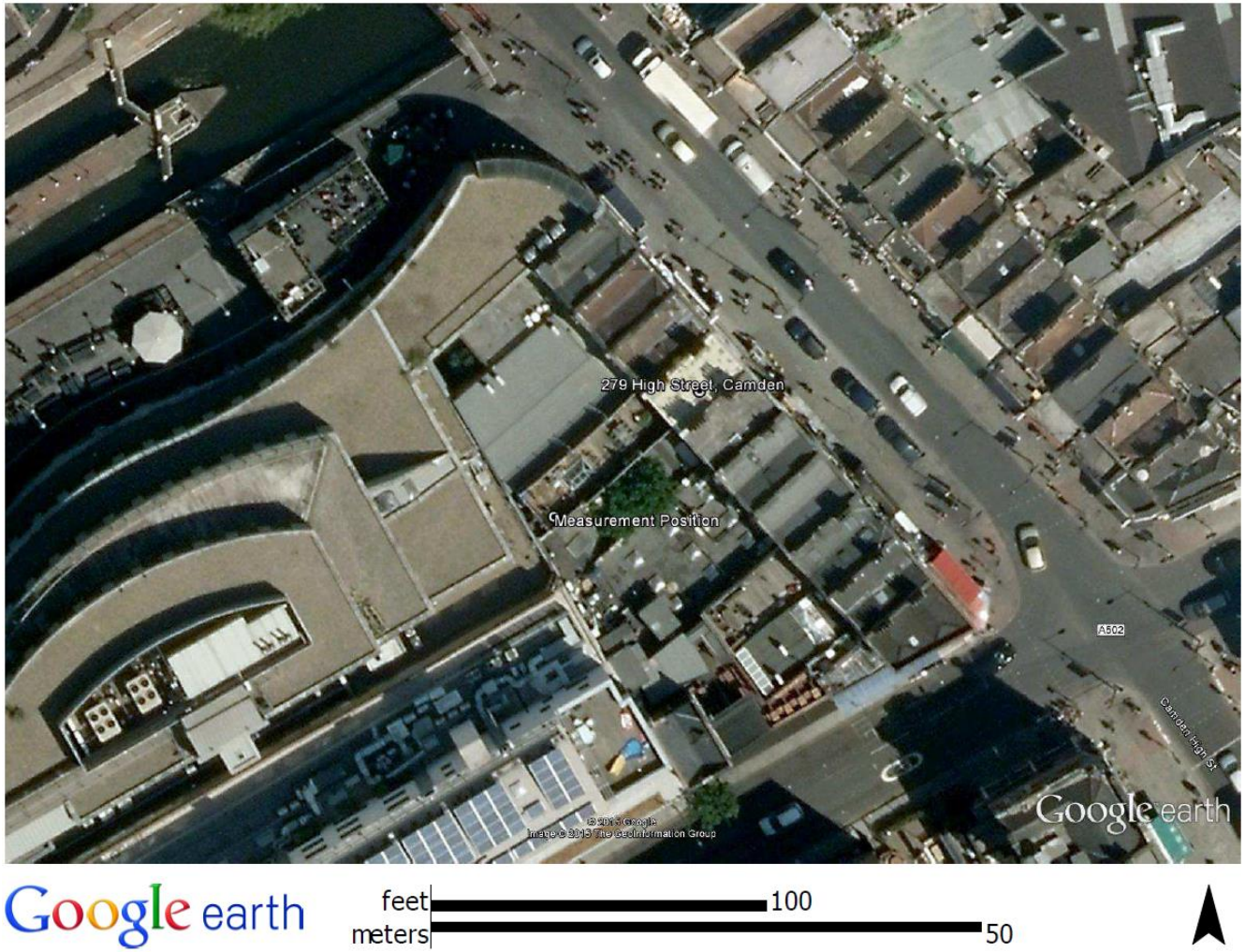
Calculations are shown within Appendix F.

6 Conclusion

An environmental noise survey has been undertaken in order to establish the representative background sound levels local to the site generally in accordance with the method contained within BS4142: 2014.

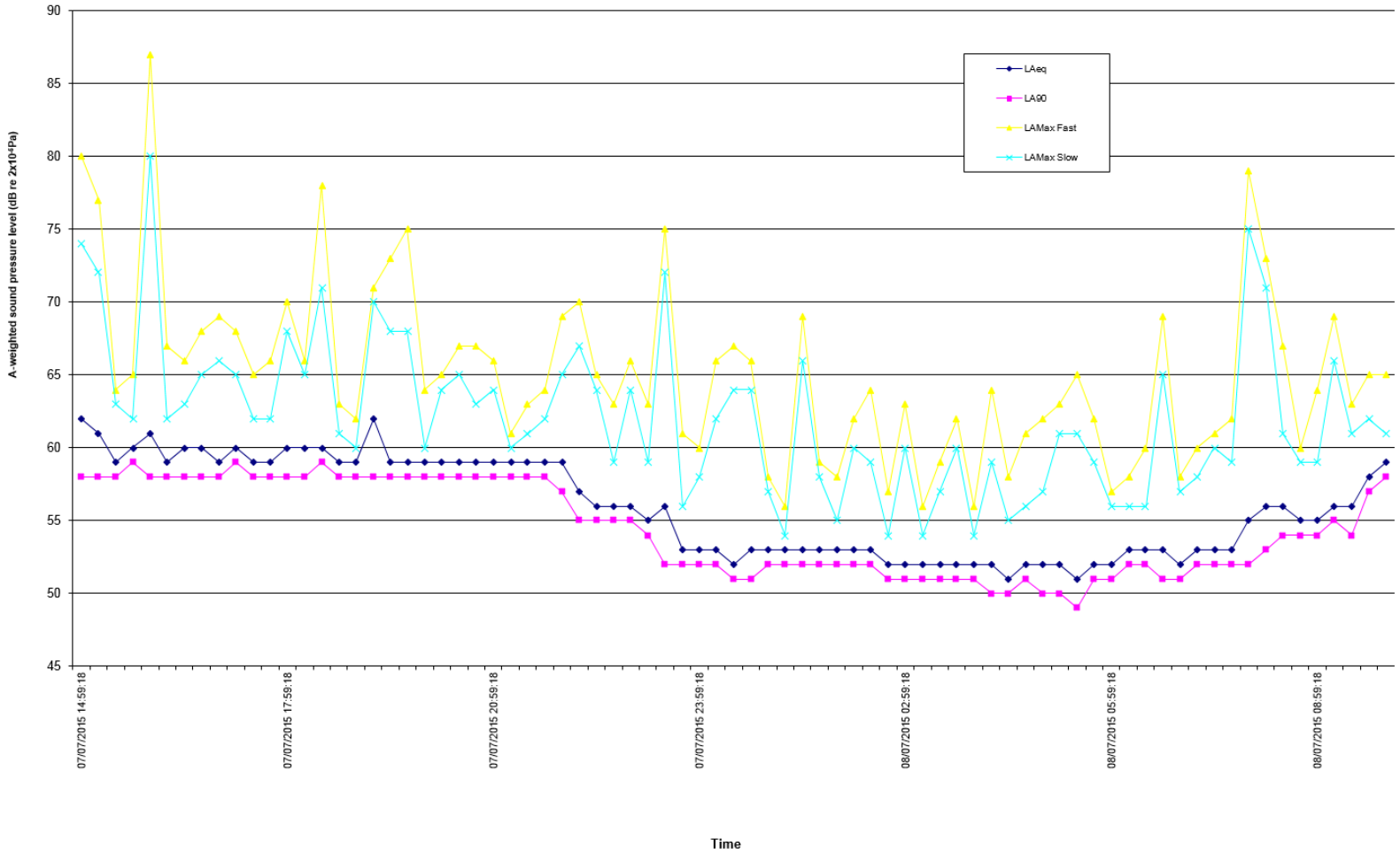
Calculations have been carried out to determine the noise levels at the nearest receiver premises. The calculations show that with the implementation the noise mitigation measures detailed in section 5 of this report the design criteria will be met.

Appendix A: Site Plan



Approximate measurement position (Latitude & Longitude) 51°32'27.03"N, 0° 8'42.03"W.

Appendix B: Measurement Data



Sound pressure level measurements were obtained using the following instrumentation complying with the Class 1 specification of BS EN 61672:2003

- Svantek 959 Sound Level Meter S/N: 11207
- Svantek pre-amplifier SV12L S/N: 13260 with GRAS microphone capsule 40AE S/N: 215511

Calibration checks were made prior to and after completion of measurements using a Svantek SV30A calibrator, S/N: 43066 complying with Class 1 specification of BS EN 60942:2003, calibration level 114.0 dB @ 1.0 kHz. All acoustic instrumentation carried current manufacturer's certificates of conformance.

Appendix C: Plant Data

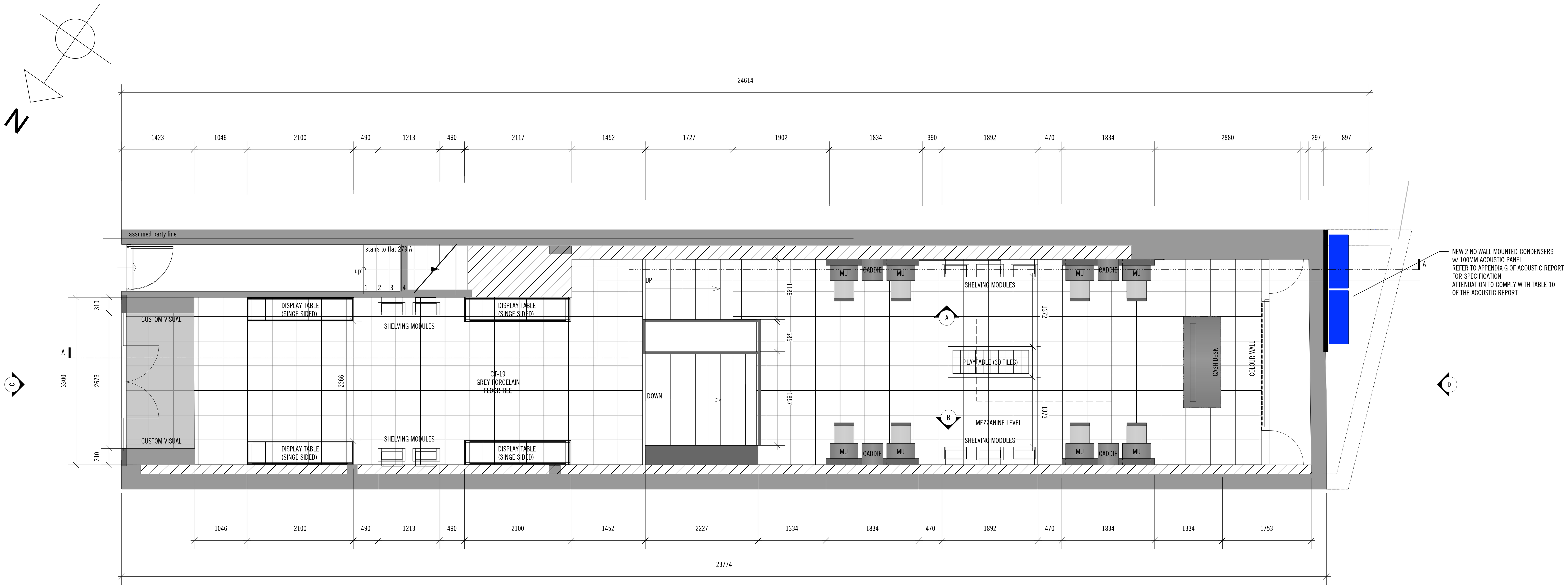
Plant noise data used in the preceding assessment follow.

Table 12: Manufacturer's plant sound power data, dB re 10^{-12} W

Plant	Octave Band Centre Frequency (Hz)								L_{WA}
	63	125	250	500	1k	2k	4k	8k	
Toilet extract - Nuaire Opus 60	48	57	57	55	54	55	51	44	60
Staff extract - Nuaire S4-SIL200	76	76	74	75	68	65	62	57	75
Main store supply – Nuaire S5-SIL250	69	69	70	63	45	55	57	53	66
Main store extract – Nuaire S5-SIL250	74	74	75	75	70	70	67	62	77

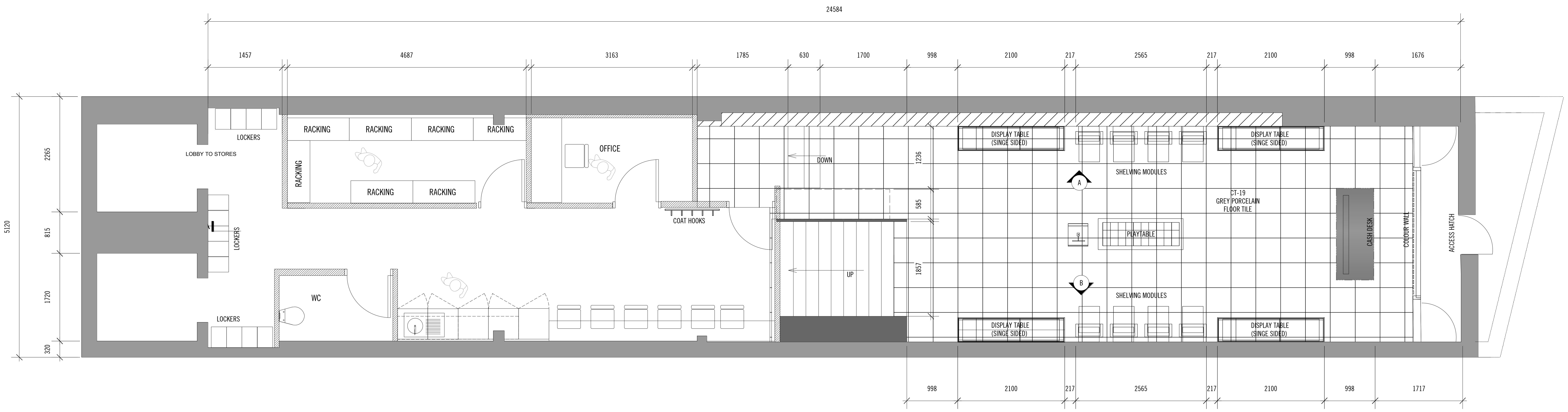
Table 13: Manufacturer's plant sound pressure data, dB re $2x10^{-5}$ Pa

Plant	Distance (m)	Octave Band Centre Frequency (Hz)								L_{PA}
		63	125	250	500	1k	2k	4k	8k	
Mitsubishi P140YKM	1	59	60	51	52	47	42	37	31	53



1 GROUND FLOOR - CONCEPT PLAN

SCALE @ 1:50



2 BASEMENT - CONCEPT PLAN

SCALE @ 1:50

0 1 2 3 4 5 6m
SCALE BAR

STORE DESIGN

STORE PLANNING DEPARTMENT
73 GROSVENOR ST, LONDON W1K 3BQ, UK
EMAIL: ESHONE@ESTEE-LAUDER.CO.UK

MATERIAL LEGEND

ACRYLIC

AC-1	CLEAR ACRYLIC W/ FLAME POLISHED EDGE - 19MM THICK CYRO ACRYLITE
AC-2	WHITE OPAQUE ACRYLIC - 6MM THICK CYRO ACRYLITE
AC-3	WHITE ACRYLIC LAMINATED TO CLEAR ACRYLIC - 3MM W /19 MM CLEAR
AC-4	ACRYLIC ACID ETCHED ON BOTH SIDES - 6MM THICK CYRO ACRYLITE
AC-5	ACRYLIC ACID ETCHED ON ONE SIDE - 6MM THICK CYRO ACRYLITE
AC-6	SIGN WHITE ACRYLIC - 6MM CYRO ACRYLITE #2447
AC-7	CLEAR ACRYLIC W/ TRANSLUCENT FILM BACKING - 6MM CYRON ACRYLITE
AC-8	MILKY WHITE MATTE ACRYLIC - 6MM CYRO ACRYLITE #P99-2447
AC-9	BLACK ACRYLIC P99 - 6MM CYRO ACRYLITE #P99-2447
AC-10	MIRRRORED ACRYLIC - 6MM CYRO ACRYLITE
AC-11	SMOKED MIRRORED ACRYLIC - 6MM 1050 GRAY EXTRUDED ACRYLIC MIRROR
AC-12	SATIN ICE ACRYLIC - 3MM (TBC) ACRYLITE

PLASTIC LAMINATES

PL-1	WHITE PLASTIC LAMINATE SOILD CORE - FORMICA BRITE 459-58 MATTE FINISH
PL-2	WHITE PLASTIC LAMINATE SOLID CORE - FORMICA BRITE 459-58 GLOSSY FINISH
PL-3	WHITE MELAMINE
PL-4	BLACK PLASTIC LAMINATE SOLID CORE - MATTE FINISH - FORMICA 909-C-58
PL-5	BLACK PLASTIC LAMINATE SOLID CORE - GLOSSY FINISH - FORMICA 909-C-90
PL-9	BLACK MELAMINE - FORMICA 909-58
PL-10	DECORATIVE BLACK MIRROR MOSAIC PANEL - BLACK ORNAMENTAL SURFACE DSBUS462 (38"X38")
PL-10A	DECORATIVE MIRROR - MOSAIC PANEL
PL-11	BLACK WOOD LAMINATE - 421 - GRAINWOOD
PL-12	GREYWOOD LAMINATE - 897 - GRAINWOOD
PL-13	LIGHT SILVER ORNAMENTAL SURFACE - DSBUS062 (102.5" x 39.37")
PL-14	DARK SILVER ORNAMENTAL SURFACE - DSBUS060 (102.5" x 39.37")
PL-15	GLOSSY BLACK WAVY ORNAMENTAL SURFACE - DSBUS370 (102.5" x 39.37")
PL-16	GLOSSY BLACK MIRROR FLEX - STRIKE - BLACK GLOSSY (4' x 8")

METAL

MT-1	STEEL POWDER COATED LOW GLOSS - CHARCOAL METALLIC HO-398-LT
MT-2	STEEL POWDER COATED LOW GLOSS - BLACK SANDEX PB-134-LT
MT-2S	STEEL POWDER COATED SATIN FINISH - SATIN BLACK EB-103-S
MT-3	STEEL - STAINLESS STEEL FINISH
MT-4	STEEL POWDER COATED LOW GLOSS - WHITE
MT-5	ALUMINUM LAMINATE - BRUSHED ALUMINUM 2022
MT-6	LACQUERED SILVER LAMINATE - 3 COATS OF ANTI UV LACQUER
MT-8	METAL MOSAIC TILES - SILVER DIMENSIONAL METALLICS MOSAIC COLLECTION SPMMC417
MT-9	METAL MOSAIC TILES - BLACK DIMENSIONAL METALLICS MOSAIC COLLECTION SPMMC417
MT-10	METAL MESH - SHIRE 8141 WIRE MESH 48" x 96"
MT-11	METAL MESH (STORE FRONTS) - PS/CR LANCET 186F-18 96" x 48"
MT-12	METAL MESH (SOFT) - WIRE BELTS TYPE 550 ELECTRO POLISHED
MT-13	INTERIOR LIGHT COVE REFLECTOR - STAINLESS AMBIENT #929

WOOD (TABLES)

WD-1	TIAMA WOOD VENEER - NON FIGURED - FLITCH #25
WD-2	WHITE OAK WOOD VENEER - NON FIGURED - PLAIN SAWN WHITE OAK
WD-3	GREY OAK - STRAIGHT GRAIN - 62204
WD-4	BLACK OAK - STRAIGHT GRAIN - 62304
WD-5	RECLAIMED OAK WOOD - FOR MAC PRO LOCATIONS
WD-6	BLACK HAKWOOD - SHADOW (OAK)
WD-7	BLACK OAK - EBONIZED BLACK OAK
WD-8	SMOKED OAK WOOD - SMOKE OAK WOOD
WD-9	OAK WHITE GREY - VENER (PENDING SAMPLE APPROVALS) - VENEER TO MATCH WD-8

STONE

ST-1	PAPERSTONE BLACK - 6MM THICK - COLOR: SLATE
ST-2	RICHLITE BLACK - 6MM THICK - COLOR: BLACK DIAMOND

GRANITE

GR-1	ZIMBABWE NERO - BLACK HONED GRANITE

GLASS

GL-1	CLEAR TEMPERED GLASS
GL-1.1	LOW IRON TEMPERED GLASS
GL-1.2	ANTI-GLARE TEMPERED GLASS
GL-2	ACID ETCHED TEMPERED GLASS
GL-3	LOW IRON GLASS WITH MIRROR BACKING
GL-4	LOW IRON ACID ETCHED GLASS WITH MIRROR BACKING
GL-5	ETCHED GLASS FRONT ENAMEL WHITE BACK
GL-6	LAMINATE GLASS WHITE PVB INSERT
GL-7	CLEAR TEMPERED GLASS WITH BACKCOATING
GL-8	SMOKED FROSTED GLASS WITH MIRROR BACKING
GL-9	SMOKED GLASS W/MIRRORED BACKING (MAC-031)
GL-10	SMOKED GLASS SMOKED GLASS (MAC-032)

PAINT

PT-1	WHITE PAINT - CEILING - WHITE INTERIOR READY MIX 01
PT-2	WHITE PAINT - WALLS - EGGSHELL FINISH - WHITE INTERIOR READY MIX 01
PT-3	BLANK PAINT - CEILING COVE - FLAT FINISH - 2132-10 BLACK
PT-6	BLACK PAINT - WALLS - EGGSHELL FINISH - 2132-10 BLACK (RAL 9004)
PT-7	GREY PAINT - FLAT FINISH - 1460 SILVER DOLLAR (RAL 7036)
PT-9	IDEA PAINT - DRY ERASE PAINT - TABRASSA BY IDEA PAINT # TAB50WH WHITE
PT-10	WARM GREY PAINT - CEILING - FLAT FINISH - 1474 CAPEMAY COBBLESTONE

FLOORING

VCT-1	OSCODA ANTI FATIGUE - 1/4" THICK LIGHT GREY - GLOSSY
VCT-1.1	OSCODA ANTI FATIGUE - 1/4" THICK DARK GREY - GLOSSY
VCT-2	VINYL TILE - AT BACK OF HOUSE - ARMSTRONG EXCELON 12"x 12" #51904 - STRELING
VCT-2.2	VINYL TILE - AT BACK OF HOUSE - ARMSTRONG EXCELON 12"x 12" #51915 - CHARCOAL
VCT-3	LONSEAL VINYL FLOORING - LONFLOOR VISTA #643 MIDNIGHT WITH MATCHING HEAT WELD THREAD ZT643
VCT-4	LONSEAL VINYL FLOORING - LONFLOOR VISTA UV #653UV ARCTIC HAZE UV WITH MATCHING HEAT WELD THREAD ZT653
VCT-4.1	LONSEAL VINYL FLOORING - LONFLOOR VISTA #31 CONCRETE W/MATCHING HEAT WELD - THREAD ZT31
VCT-5	WOOD VINYL FLOORING - AMTICO WZ739 WORN OAK
VCT-6	VINYL *GREY WOOD* FLOORING - LIMED GREY WOOD - AROW7670 - 6"W x 36"L
VCT-7	ASI MAGNETIC FLOOR SYSTEM "VINYL PLANKS" - SKU: FLSFG021 - 18" x 36" - THICKNESS 1/8" NOMINAL
VCT-8	ASI CONCRETE VINYL COLLECTION - SKU: FLRGB008 - 12" x 24" - THICKNESS: 5MM - NOMINAL W/12 MIL COMMERCIAL WEAR LAYER - FINISH: G88 CERAMIC BEADING COATING
VCT-9	ASI CONCRETE VINYL COLLECTION - SKU: FLRGB009 - 12" x 24" - THICKNESS: 5MM - NOMINAL W/12 MIL COMMERCIAL WEAR LAYER - FINISH: G88 CERAMIC BEADING COATING
CT-1	MOSA CERAMIC TILE WITH PORCELAIN GLAZE - 24" x 24" BLACK 1102 TILE - USE #22 MIDNIGHT BLACK LATICRETE GROUT
CT-2	MOSA CERAMIC TILE WITH PORCELAIN GLAZE - 24" x 24" BLACK 1103 TILE - USE #78 STERLING SILVER LATICRETE GROUT
CT-3	CERAMIC BATHROOM TILE - 2" x 2" UNGLAZED KEYSTONE #D014 - LIGHT GREY - USE #78 STERLING SILVER LATICRETE GROUT
CT-4	FULL BODIES PORCELAIN TILE - 24" x 24" COLD BLACK PORCELAIN TILE - USE #22 MIDNIGHT BLACK LATICRETE GROUT
CT-5	FULL BODIED PORCELAIN TILE - 24" x 24" WHITE PORCELAIN TILE
CT-6	FULL BODIES PORCELAIN TILE - 24" x 24" LIGHT GREY PORCELAIN TILE - USE #78 STERLING SILVER LATICRETE GROUT
CT-7	FULL BODIES PORCELAIN TILE - 24" x 24" JET BLACK POLISHED - USE #22 MIDNIGHT BLACK LATICRETE GROUT
CT-8	FULL BODIES PORCELAIN TILE - HEARTWOOD - NATURAL 6" x 36" (5.9" x 35.43") PLANKS - USE #41 KASHMIR LATICRETE GROUT
CT-9	FULL BODIES PORCELAIN TILE - DELCONCA MONTE NAPOLEONE - LM 9 (15 CM x 120 CM) USE GROUT #156 FAWN CUSTOM BUILDING PRODUCTS
CT-10	GLAZED CERAMIC TILE (WALL DECOR) - VISORE BLACK PEARL 22-B
CT-15	FULL BODIES PORCELAIN TILE - ROVERE GREY WOOD PLANKS 8" X 48"L
CT-17	CERAMIC TILE (WHITE BIANCO) - GRAFFITI BIANCO 36" x 36" (OR 24" x 24")
CT-18	CERAMIC TILE (GREY GRIGIO) - GRAFFITI GRIGIO 36" x 36" (OR 24" x 24")
CT-19	LIQUID CONCRETE PORCELAIN COLLECTION (GREY)*** - FLCME 229 - 24" x 48" (OR FLCME 226 - 24" x 24")
CT-20	LIQUID CONCRETE PORCELAIN COLLECTION (WHITE)*** - FLCME 227 - 24" x 48" (OR FLCME 234 - 24" x 24")
CT-21	LIQUID CONCRETE PORCELAIN COLLECTION (BEIGE) - FLCME ??? - 24" x 48" (OR FLCME 237 - 24" x 24")
CT-22	LIQUID CONCRETE PORCELAIN COLLECTION (BROWN/GREY) - FLCME ??? - 24" x 48" (OR FLCME 228 - 24" x 24")
WD-3	NATURAL GRADE WHITE OAK WITH WHITE WASH - 12CM WIDE PLANKS LENGTH MINIMUM 90CM
WD-4	EUROPEAN OAK - SPECIAL GOTHIC EURO OAK WITH OIL FINISH (5/8" x 7")
WD-8F	EUROPEAN HARDWOOD COLLECTION - OAK WITH GREY - FLHTG084 (MAC ALOMOANA USED THIS SPEC BUT IT WAS NOTED WD-7)
MG-1	STAINLESS/VINYL WALK OFF GRILL - FG-3
MG-2	PVC CHARCOAL WALK OFF GRILL - NUWAY' CHARCOAL SCRAPER BARS AND CHARCOAL WIPER STRIPS

BASE

B-1	RECESSED BASE - AT WALL - PITTCON INDUSTRIES #STR-200-063
B-2	RECESSED BASE - AT MILLWORK - PITTCON INDUSTRIES #STR-150-063
B-3	VINYL WALL BASE - AT BACK OF HOUSE - JOHNSONITE VAPOR GREY 100 MM BASE

CEILING

CM-1	STRETCHED FABRIC CEILING - TRANSLUCIDE #04013
CM-2	STRETCHED FABRIC CEILING - TOB TRANSLUCENT

WALLCOVERING

WC-1	FABRIC FOR TACKABLE WALL - VERTICAL SURFACE SOLIDS 2403 COLOR 513 CHARCOAL
WC-3	WHITE CUSTOM MAC LOGO WALLCOVERING - XOREL CUSTOM WOVEN WALLCOVERING
WC-3.1	BLACK CUSTOM MAC LOGO WALLCOVERING - XOREL CUSTOM WOVEN WALLCOVERING
WC-4	WHITE GLASS BEAD WALLCOVERING - #MUR02 DIAMOND 54* WIDE
WC-4.1	BLACK GLASS BEAD WALLCOVERING - #MUR05 ONYX 54* WIDE

PROJECT:

FSS CAMDEN

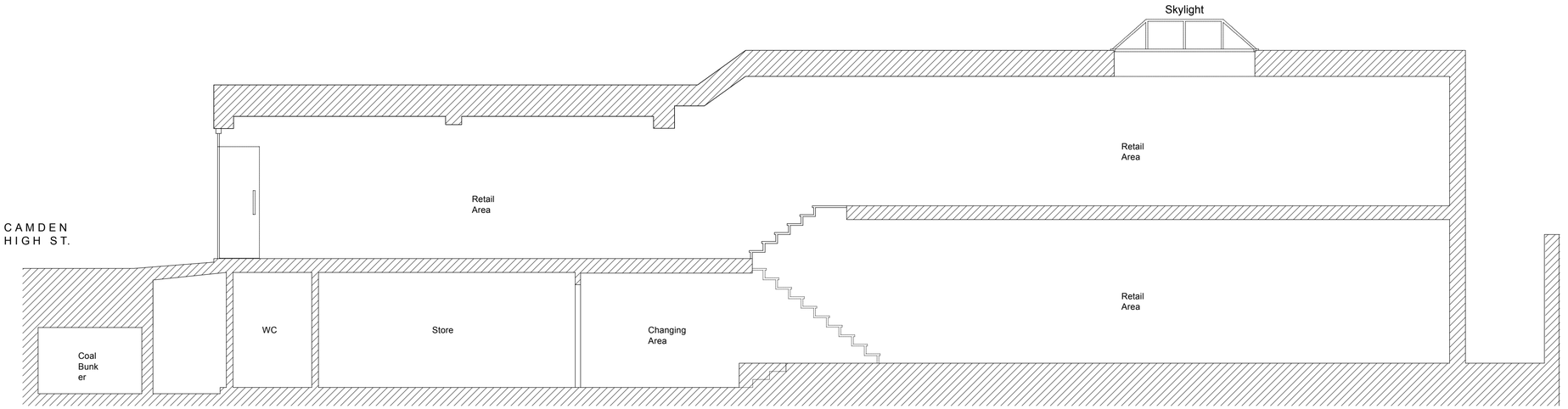
TITLE:

PROPOSED PLANS

DRWG NO:

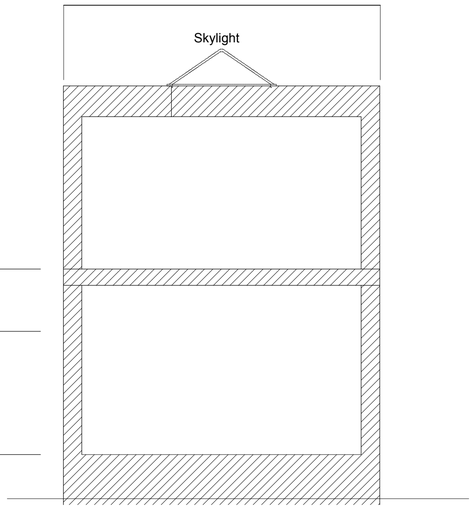
MAC4933/3

DATE:	DRAWN BY:	SCALE:
21/07/15	ESHONE	1:50@A1
A	DESCRIPTION	DATE XX/XX/XX



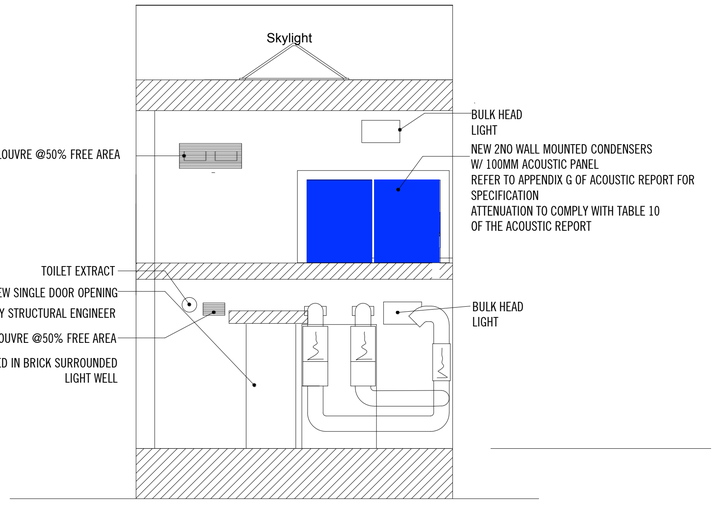
1 SECTION A - EXISTING

SCALE @ 1:50



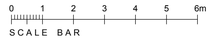
2 ELEVATION D - XISTING

SCALE @ 1:50



2 ELEVATION D - PROPOSED

SCALE @ 1:50



STORE DESIGN

STORE PLANNING DEPARTMENT
73 GROSVENOR ST, LONDON W1K 3BQ. UK
EMAIL: ESHONE@ESTEE-LAUDER.CO.UK

MATERIAL LEGEND

ACRYLIC

AC-1	CLEAR ACRYLIC W/ FLAME POLISHED EDGE - 19MM THICK CYRO ACRYLITE
AC-2	WHITE OPAQUE ACRYLIC - 6MM THICK CYRO ACRYLITE
AC-3	WHITE ACRYLIC LAMINATED TO CLEAR ACRYLIC - 3MM W /15 MM CLEAR
AC-4	ACRYLIC ACID ETCHED ON BOTH SIDES - 6MM THICK CYRO ACRYLITE
AC-5	ACRYLIC ACID ETCHED ON ONE SIDE - 6MM THICK CYRO ACRYLITE
AC-6	SIGN WHITE ACRYLIC - 6MM CYRO ACRYLITE #2447
AC-7	CLEAR ACRYLIC W/ TRANSLUCENT FILM BACKING - 6MM CYROIN ACRYLITE
AC-8	MILKY WHITE MATTE ACRYLIC - 6MM CYRO ACRYLITE #P99-2447
AC-9	BLACK ACRYLIC P99 - 6MM CYRO ACRYLITE #P99-2447
AC-10	MIRRORIZED ACRYLIC - 6MM CYRO ACRYLITE
AC-11	SMOKED MIRRORIZED ACRYLIC - 6MM 1050 GRAY EXTRUDED ACRYLIC MIRROR
AC-12	SATIN ICE ACRYLIC - 3MM (TBC) ACRYLITE

PLASTIC LAMINATES

PL-1	WHITE PLASTIC LAMINATE SOLID CORE - FORMICA BRITE 415-58 MATTE FINISH
PL-2	WHITE PLASTIC LAMINATE SOLID CORE - FORMICA BRITE 415-58 GLOSSY FINISH
PL-3	WHITE MELAMINE
PL-4	BLACK PLASTIC LAMINATE SOLID CORE - MATTE FINISH - FORMICA 909-C-58
PL-5	BLACK PLASTIC LAMINATE SOLID CORE - GLOSSY FINISH - FORMICA 909-C-90
PL-9	BLACK MELAMINE - FORMICA 909-58
PL-10	DECORATIVE BLACK MIRROR MOSAIC PANEL - BLACK ORNAMENTAL SURFACE DSBUS442 (38"X38")
PL-10A	DECORATIVE MIRROR - MOSAIC PANEL
PL-11	BLACK WOOD LAMINATE - EC1 - GRAINWOOD
PL-12	GREYWOOD LAMINATE - 897 - GRAINWOOD
PL-13	LIGHT SILVER ORNAMENTAL SURFACE - DSBUS562 (102.5" x 39.37")
PL-14	DARK SILVER ORNAMENTAL SURFACE - DSBUS560 (102.5" x 39.37")
PL-15	GLOSSY BLACK WAVY ORNAMENTAL SURFACE - DSBUS579 (102.5" x 39.37")
PL-16	GLOSSY BLACK MIRROR FLEX - STRIKE - BLACK GLOSSY (4' x 8')

METAL

MT-1	STEEL POWDER COATED LOW GLOSS - CHARCOAL METALLIC HO-398-LT
MT-2	STEEL POWDER COATED LOW GLOSS - BLACK SANDEA PB-134-LT
MT-2S	STEEL POWDER COATED SATIN FINISH - SATIN BLACK EB-103-S
MT-3	STEEL - STAINLESS STEEL FINISH
MT-4	STEEL POWDER COATED LOW GLOSS - WHITE
MT-5	ALUMINUM LAMINATE - BRUSHED ALUMINUM 3022
MT-6	LACQUERED SILVER LAMINATE - 3 COATS OF ANTI UV LACQUER
MT-8	METAL MOSAIC TILES - SILVER DIMENSIONAL METALLICS MOSAIC COLLECTION SPMMC417
MT-9	METAL MOSAIC TILES - BLACK DIMENSIONAL METALLICS MOSAIC COLLECTION SPMMC417
MT-10	METAL MESH - SHIRE 8141 WIRE MESH 48" x 96"
MT-11	METAL MESH (STONE FAIRE?) - PSYCH LANCET 16GF-L8 96" x 48"
MT-12	METAL MESH (SOFT) - WIRE BELTS TYPE SSC ELECTRO POLISHED
MT-13	INTERIOR LIGHT CONE REFLECTOR - STAINLESS AMBIENT #929

WOOD (TABLES)

WD-1	TIAMA WOOD VENEER - NON FIGURED - FLITCH #25
WD-2	WHITE OAK WOOD VENEER - NON FIGURED - PLAIN SAWN WHITE OAK
WD-3	GREY OAK - STRAIGHT GRAIN - 62704
WD-4	BLACK OAK - STRAIGHT GRAIN - 62504
WD-5	RECLAIMED OAK WOOD - FOR MAC PRO LOCATIONS
WD-6	BLACK HAWKWOOD - SHADOW (GW)
WD-7	BLACK OAK - EBONIZED BLACK OAK
WD-8	SMOKED OAK WOOD - SMOKE OAK WOOD
WD-9	OAK WHITE GREY - VENER (PENDING SAMPLE APPROVALS) - VENEER TO MATCH WD-8

STONE

ST-1	PAPERSTONE BLACK - 6MM THICK - COLOR: SLATE
ST-2	RICHLITE BLACK - 6MM THICK - COLOR: BLACK DIAMOND

GRANITE

GR-1	ZIMBABWE NERO - BLACK HONED GRANITE

GLASS

GL-1	CLEAR TEMPERED GLASS
GL-1.1	LOW IRON TEMPERED GLASS
GL-1.2	ANTI-GLARE TEMPERED GLASS
GL-2	ACID ETCHED TEMPERED GLASS
GL-3	LOW IRON GLASS WITH MIRROR BACKING
GL-4	LOW IRON ACID ETCHED GLASS WITH MIRROR BACKING
GL-5	ETCHED GLASS FRONT ENAMEL WHITE BACK
GL-6	LAMINATE GLASS WHITE PVB INDEXY
GL-7	CLEAR TEMPERED GLASS WITH BACKSCATING
GL-8	SMOKED FROSTED GLASS WITH MIRROR BACKING
GL-9	SMOKED GLASS W/MIRRORED BACKING (MAC-031)
GL-10	SMOKED GLASS SMOKED GLASS (MAC-032)

PAINT

PT-1	WHITE PAINT - CEILING - WHITE INTERIOR READY MIX 01
PT-2	WHITE PAINT - WALLS - EGGSHELL FINISH - WHITE INTERIOR READY MIX 01
PT-3	BLANK PAINT - CEILING COVE - FLAT FINISH - 2132-10 BLACK
PT-4	BLACK PAINT - WALLS - EGGSHELL FINISH - 2132-10 BLACK (BAL 9004)
PT-7	GREY PAINT - FLAT FINISH - 1660 SILVER DOLLAR (BAL 7036)
PT-9	IKEA PAINT - SKY EAGLE PAINT - TABARUSA BY IDEA PAINT IN TABSWH WHITE
PT-10	WARM GREY PAINT - CEILING - FLAT FINISH - 1674 CAPEMAY COBBLESTONE

FLOORING

VCT-1	OSCODA ANTI FATIGUE - 1/4" THICK LIGHT GREY - GLOSSY
VCT-1.1	OSCODA ANTI FATIGUE - 1/4" THICK DARK GREY - GLOSSY
VCT-2	VINYL TILE - AT BACK OF HOUSE - ARMSTRONG EXCELON 12"x 12" #51904 - STERLING
VCT-2.2	VINYL TILE - AT BACK OF HOUSE - ARMSTRONG EXCELON 12"x 12" #51915 - CHARCOAL
VCT-3	LONSEAL VINYL FLOORING - LONFLOOR VISTA #643 MIDNIGHT WITH MATCHING HEAT WELD THREAD 2563
VCT-4	LONSEAL VINYL FLOORING - LONFLOOR VISTA UV #6530V ARCTIC HAZE UV WITH MATCHING HEAT WELD THREAD 2563
VCT-4.1	LONSEAL VINYL FLOORING - LONFLOOR VISTA #31 CONCRETE W/MATCHING HEAT WELD - THREAD 2731
VCT-5	WOOD VINYL FLOORING - ARTICO NCT19 WORN OAK
VCT-6	VINYL "GREY WOOD" FLOORING - LIMED GREY WOOD - ARONTN370 - 6"W x 36"L
VCT-7	ASI MAGNETIC FLOOR SYSTEM "VINYL PLANK" - SKU: FLSYS321 - 18" x 36" - THICKNESS 1.97" NOMINAL
VCT-8	ASI CONCRETE VINYL COLLECTION - SKU: FLRS2R08 - 12" x 24" - THICKNESS: 5MM - NOMINAL W12 MIL COMMERCIAL WEAR LAYER - FINISH: G88 CERAMIC BEADING COATING
VCT-9	ASI CONCRETE VINYL COLLECTION - SKU: FLRS2R09 - 12" x 24" - THICKNESS: 5MM - NOMINAL W12 MIL COMMERCIAL WEAR LAYER - FINISH: G88 CERAMIC BEADING COATING
CT-1	MOSA CERAMIC TILE WITH PORCELAIN GLAZE - 24" x 24" BLACK 1102 TILE - USE #22 MIDNIGHT BLACK LATICRETE GROUT
CT-2	MOSA CERAMIC TILE WITH PORCELAIN GLAZE - 24" x 24" BLACK 1103 TILE - USE #78 STERLING SILVER LATICRETE GROUT
CT-3	CERAMIC BAMBOOM TILE - 2" x 2" UNGLAZED KEYSTONE #0514 - LIGHT GREY - USE #78 STERLING SILVER LATICRETE GROUT
CT-4	FULL BODIES PORCELAIN TILE - 24" x 24" COLD BLACK PORCELAIN TILE - USE #22 MIDNIGHT BLACK LATICRETE GROUT
CT-5	FULL BODIES PORCELAIN TILE - 24" x 24" WHITE PORCELAIN TILE
CT-6	FULL BODIES PORCELAIN TILE - 24" x 24" LIGHT GREY PORCELAIN TILE - USE #78 STERLING SILVER LATICRETE GROUT
CT-7	FULL BODIES PORCELAIN TILE - 24" x 24" JET BLACK POLISHED - USE #22 MIDNIGHT BLACK LATICRETE GROUT
CT-8	FULL BODIES PORCELAIN TILE - HEARTWOOD - NATURAL 6" x 36" (1.5" x 35.43") PLANKS - USE #41 MUSHMIX LATICRETE GROUT
CT-9	FULL BODIES PORCELAIN TILE - DELCONCA MONTE NAPOLEONE - UM 9 (15 CM x 120 CM)
	USE GROUT #156 FAWN CUSTOM BUILDING PRODUCTS
CT-10	GLAZED CERAMIC TILE (WALL DECOR) - VISONE BLACK PEARL 22-B
CT-15	FULL BODIES PORCELAIN TILE - ROVERE GREY WOOD PLANKS 8" X 48"L
CT-17	CERAMIC TILE (WHITE BIANCO) - GRAFFITI BIANCO 36" x 36" (DR 24" x 24")
CT-18	CERAMIC TILE (GREY GRIGIO) - GRAFFITI GRIGIO 36" x 36" (DR 24" x 24")
CT-19	LIQUID CONCRETE PORCELAIN COLLECTION (GREY)*** - FLCME 229 - 24" x 48" (OR FLCME 226 - 24" x 24")
CT-20	LIQUID CONCRETE PORCELAIN COLLECTION (WHITE)*** - FLCME 227 - 24" x 48" (OR FLCME 234 - 24" x 24")
CT-21	LIQUID CONCRETE PORCELAIN COLLECTION (BEIGE) - FLCME ??? - 24" x 48" (OR FLCME 237 - 24" x 24")
CT-22	LIQUID CONCRETE PORCELAIN COLLECTION (BROWN/GREY) - FLCME ??? - 24" x 48" (OR FLCME 228 - 24" x 24")
WD-3	NATURAL GRADE WHITE OAK WITH WHITE WASH - 12CM WIDE PLANKS LENGTH MINIMUM 90CM
WD-4	EUROPEAN OAK - SPECIAL GOTHIC EURO OAK WITH OIL FINISH (5/8" x 7")
WD-4F	EUROPEAN HARDWOOD COLLECTION - OAK WITH GREY - FEATUERAL OAKC ALOMUNIM USED THIS SPEC BUT IT WAS NOTED WD-7)
WG-1	STAINLESS/VINYL WALK OFF GRILL - FG-3
WG-2	PVC CHARCOAL WALK OFF GRILL - NUMAT CHARCOAL SCRAPER BARS AND CHARCOAL WIPER STRIPS

BASE

B-1	RECESSED BASE - AT WALL - PITTCON INDUSTRIES #STR-200-063
B-2	RECESSED BASE - AT MILLWORK - PITTCON INDUSTRIES #STR-150-063
B-3	VINYL WALL BASE - AT BACK OF HOUSE - JOHNSONITE WHPDR GREY 100 MM BASE

CEILING

CW-1	STRETCHED FABRIC CEILING - TRANSLUCIDE #54013
CW-2	STRETCHED FABRIC CEILING - TDB TRANSLUCENT

WALLCOVERING

WC-1	FABRIC FOR TACKABLE WALL - VERTICAL SURFACE SOLIDS 2403 COLOR 513 CHARCOAL
WC-3	WHITE CUSTOM MAC LOGO WALLCOVERING - KOREL CUSTOM WOVEN WALLCOVERING
WC-3.1	BLACK CUSTOM MAC LOGO WALLCOVERING - KOREL CUSTOM WOVEN WALLCOVERING
WC-4	WHITE GLASS BEAD WALLCOVERING - #WU802 DIAMOND 54" WIDE
WC-4.1	BLACK GLASS BEAD WALLCOVERING - #WU805 ONYX 54" WIDE

PROJECT:

FSS CAMDEN

TITLE:

EXISTING/PROPOSED ELEVATIONS

DRWG NO:

MAC4933/3

DATE:	DRAWN BY:	SCALE:
21/07/15	ESHONE	1:50@A1

	DESCRIPTION	DATE
A	.....	XX/XX/XX

Appendix E: Calculations with no mitigation

279 Camden High Street window:

Ref.	plant	Ref.dist.	Sound Level (Lp/Lw) 63	125	250	500	1k	2k	4k	8k	dB(A)	Lw dB(A)	Reciever Distance (m)	dB(A)	Lp	No. off	dB	Angular Directionality	63	125	250	500	1k	2k	4k	8k	Reflections	dB	Façade correction	dB	Duct Losses (input negative values) 63	125	250	500	1k	2k	4k	8k
1	itsubishi P140YK	1.00	59	60	51	52	47	42	37	31	53	61	15.0	-32	29	2	3	None	0	0	0	0	0	0	0	0	2	6	Yes	3								
2	toilet extract		48	57	57	55	54	55	51	44	60	60	15.0	-32	29	1	0	None	0	0	0	0	0	0	0	0	2	6	Yes	3	-17	-14	-10	-5	-6	-8	-11	-11
3	staff extract		76	76	74	75	68	65	62	57	75	75	15.0	-32	44	1	0	None	0	0	0	0	0	0	0	0	2	6	Yes	3	-14	-10	-6	-3	-3	-3	-4	-7
4	main store supply		69	69	70	63	45	55	57	53	66	66	15.0	-32	34	1	0	None	0	0	0	0	0	0	0	0	2	6	Yes	3	-8	-5	-3	-2	-3	-3	-4	-7
5	main store extract		74	74	75	75	70	70	67	62	77	77	15.0	-32	46	1	0	None	0	0	0	0	0	0	0	0	2	6	Yes	3	-8	-5	-3	-2	-3	-3	-4	-7

Ref.	plant	Receiver Lp 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	48	48	40	41	35	30	25	20	42
2	toilet extract	25	34	34	32	31	32	28	21	38
3	staff extract	53	53	51	52	45	42	39	34	53
4	main store supply	46	46	47	40	22	32	34	30	43
5	main store extract	51	51	52	52	47	47	44	39	55
	Total	**60**	**60**	**59**	**59**	**53**	**52**	**49**	**44**	**60**

Barrier Path Difference Loss: Source height	Receiver height	Barrier height	Source to barrier distance	Barrier to receiver distance	Calculated path difference	63	125	250	500	1000	2000	4000	8000
4.0	1.0			15.0	-3.74	0	0	0	0	0	0	0	0
5.0	2.0			15.0	-4.84	0	0	0	0	0	0	0	0
4.0	1.0			15.0	-3.74	0	0	0	0	0	0	0	0
4.0	1.0			15.0	-3.74	0	0	0	0	0	0	0	0
4.0	1.0			15.0	-3.74	0	0	0	0	0	0	0	0

Criteria NR	63	125	250	500	1k	2k	4k	8k	dB(A)
40	67	57	49	44	40	37	35	33	48

Barrier SRI			63	125	250	500	1k	2k	4k	8k	Rw
		Manual									0
		Unknown	100	100	100	100	100	100	100	100	101

Ref.	Plant	Excess 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	-19	-9	-10	-3	-5	-7	-10	-14	-7
2	toilet extract	-42	-22	-15	-11	-9	-5	-6	-12	-11
3	staff extract	-14	-3	2	9	5	5	5	1	4
4	main store supply	-21	-10	-2	-3	-18	-5	0	-3	-5
5	main store extract	-16	-5	3	9	7	10	10	6	6
	Total	-7	3	10	15	13	15	14	11	12

Barrier Deration		63	125	250	500	1k	2k	4k	8k
	Mitsubishi P140YK	0	0	0	0	0	0	0	0
	toilet extract	0	0	0	0	0	0	0	0
	staff extract	0	0	0	0	0	0	0	0
	main store supply	0	0	0	0	0	0	0	0
	main store extract	0	0	0	0	0	0	0	0

Ref.	Plant	Mitigated Receiver Lp 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	48	48	40	41	35	30	25	20	42
2	toilet extract	8	21	25	28	26	25	18	11	31
3	staff extract	39	43	45	49	42	39	35	27	49
4	main store supply	38	41	44	38	19	29	30	23	40
5	main store extract	43	46	49	50	44	44	40	32	52
	Total	**53**	**55**	**55**	**56**	**50**	**49**	**45**	**37**	**57**

Net barrier loss		63	125	250	500	1k	2k	4k	8k
	Mitsubishi P140YK	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	toilet extract	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	staff extract	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	main store supply	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	main store extract	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

279 Camden High Street terrace area:

Ref.	plant	Ref.dist.	Sound Level (Lp/Lw) 63	125	250	500	1k	2k	4k	8k	dB(A)	Lw dB(A)	Reciever Distance (m)	dB(A)	Lp	No. off	dB	Angular Directionality	63	125	250	500	1k	2k	4k	8k	Reflections	dB	Façade correction	dB	Duct Losses (input negative values) 63	125	250	500	1k	2k	4k	8k
1	itsubishi P140YK	1.00	59	60	51	52	47	42	37	31	53	61	1.0	-8	53	2	3	None	0	0	0	0	0	0	0	0	2	6	Yes	3								
2	toilet extract		48	57	57	55	54	55	51	44	60	60	1.0	-8	52	1	0	None	0	0	0	0	0	0	0	0	2	6	Yes	3	-17	-14	-10	-5	-6	-8	-11	-11
3	staff extract		76	76	74	75	68	65	62	57	75	75	1.0	-8	67	1	0	None	0	0	0	0	0	0	0	0	2	6	Yes	3	-14	-10	-6	-3	-3	-3	-4	-7
4	main store supply		69	69	70	63	45	55	57	53	66	66	1.0	-8	58	1	0	None	0	0	0	0	0	0	0	0	2	6	Yes	3	-8	-5	-3	-2	-3	-3	-4	-7
5	main store extract		74	74	75	75	70	70	67	62	77	77	1.0	-8	69	1	0	None	0	0	0	0	0	0	0	0	2	6	Yes	3	-8	-5	-3	-2	-3	-3	-4	-7

Ref.	plant	Receiver Lp 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	71	72	63	64	59	54	49	43	65
2	toilet extract	49	58	58	56	55	56	52	45	61
3	staff extract	77	77	75	76	69	66	63	58	76
4	main store supply	70	70	71	64	46	56	58	54	67
5	main store extract	75	75	76	76	71	71	68	63	78
Total		**83**	**83**	**82**	**82**	**76**	**75**	**73**	**68**	**84**

Barrier Path Difference Loss: Source height	Receiver height	Barrier height	Source to barrier distance	Barrier to receiver distance	Calculated path difference	63	125	250	500	1000	2000	4000	8000
2.0	3.0	4.0		1.0	2.00	-13	-15	-18	-21	-24	-24	-24	-24
1.0	3.0	4.0		1.0	2.18	-13	-15	-18	-21	-24	-24	-24	-24
1.0	3.0	4.0		1.0	2.18	-13	-15	-18	-21	-24	-24	-24	-24
2.0	3.0	4.0		1.0	2.00	-13	-15	-18	-21	-24	-24	-24	-24
2.0	3.0	4.0		1.0	2.00	-13	-15	-18	-21	-24	-24	-24	-24

Criteria NR	63	125	250	500	1k	2k	4k	8k	dB(A)
47	73	63	56	51	47	44	42	40	55

Barrier SRI					63	125	250	500	1k	2k	4k	8k	Rw
				Manual	6	11	17	23	26	20	28	28	24
				Manual	6	11	17	23	26	20	28	28	24

Ref.	Plant	Excess 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	-1	9	7	14	12	10	7	3	10
2	toilet extract	-24	-5	2	5	8	12	10	5	6
3	staff extract	4	14	19	25	22	22	21	18	21
4	main store supply	-3	7	15	13	-1	12	16	14	12
5	main store extract	2	12	20	25	24	27	26	23	23
Total		11	20	27	32	29	31	31	27	29

Barrier Deration					63	125	250	500	1k	2k	4k	8k
				Mitsubishi P140YK	7	6	3	2	2	5	1	1
				toilet extract	8	6	4	2	2	5	1	1
				staff extract	8	6	4	2	2	5	1	1
				main store supply	7	6	3	2	2	5	1	1
				main store extract	7	6	3	2	2	5	1	1

Ref.	Plant	Mitigated Receiver Lp 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	66	63	48	46	37	35	26	20	50
2	toilet extract	27	35	34	32	27	29	18	11	35
3	staff extract	58	58	55	54	44	44	36	28	54
4	main store supply	56	56	53	43	21	34	31	24	47
5	main store extract	61	61	58	55	46	49	41	33	56
Total		**71**	**69**	**64**	**61**	**52**	**53**	**46**	**38**	**62**

Net barrier loss					63	125	250	500	1k	2k	4k	8k
				Mitsubishi P140YK	**-6**	**-9**	**-15**	**-19**	**-22**	**-19**	**-23**	**-23**
				toilet extract	**-5**	**-9**	**-14**	**-19**	**-22**	**-19**	**-23**	**-23**
				staff extract	**-5**	**-9**	**-14**	**-19**	**-22**	**-19**	**-23**	**-23**
				main store supply	**-6**	**-9**	**-15**	**-19**	**-22**	**-19**	**-23**	**-23**
				main store extract	**-6**	**-9**	**-15**	**-19**	**-22**	**-19**	**-23**	**-23**

Nearest commercial:

Ref.	plant	Ref.dist.	Sound Level (Lp/Lw) 63	125	250	500	1k	2k	4k	8k	dB(A)	Lw dB(A)	Reciever Distance (m)	dB(A)	Lp	No. off	dB	Angular Directionality	63	125	250	500	1k	2k	4k	8k	Reflections	dB	Façade correction	dB	Duct Losses (input negative values) 63	125	250	500	1k	2k	4k	8k
1	itsubishi P140YK	1.00	59	60	51	52	47	42	37	31	53	61	3.0	-18	43	2	3	None	0	0	0	0	0	0	0	0	2	6	Yes	3								
2	toilet extract		48	57	57	55	54	55	51	44	60	60	3.0	-18	43	1	0	None	0	0	0	0	0	0	0	0	2	6	Yes	3	-17	-14	-10	-5	-6	-8	-11	-11
3	staff extract		76	76	74	75	68	65	62	57	75	75	3.0	-18	58	1	0	None	0	0	0	0	0	0	0	0	2	6	Yes	3	-14	-10	-6	-3	-3	-3	-4	-7
4	main store supply		69	69	70	63	45	55	57	53	66	66	3.0	-18	48	1	0	None	0	0	0	0	0	0	0	0	2	6	Yes	3	-8	-5	-3	-2	-3	-3	-4	-7
5	main store extract		74	74	75	75	70	70	67	62	77	77	3.0	-18	60	1	0	None	0	0	0	0	0	0	0	0	2	6	Yes	3	-8	-5	-3	-2	-3	-3	-4	-7

Ref.	plant	Receiver Lp 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	62	62	54	55	49	44	39	34	55
2	toilet extract	39	48	48	46	45	46	42	35	52
3	staff extract	67	67	65	66	59	56	53	48	67
4	main store supply	60	60	61	54	36	46	48	44	57
5	main store extract	65	65	66	66	61	61	58	53	69
	Safety	3	3	3	3	3	3	3	3	
	Total	**74**	**74**	**73**	**73**	**67**	**66**	**63**	**58**	**74**

Barrier Path Difference Loss: Source height	Receiver height	Barrier height	Source to barrier distance	Barrier to receiver distance	Calculated path difference	63	125	250	500	1000	2000	4000	8000
1.0	1.0			3.0	-1.16	0	0	0	0	0	0	0	0
1.0	2.0			3.0	-1.44	0	0	0	0	0	0	0	0
1.0	1.0			3.0	-1.16	0	0	0	0	0	0	0	0
1.0	1.0			3.0	-1.16	0	0	0	0	0	0	0	0
1.0	1.0			3.0	-1.16	0	0	0	0	0	0	0	0

Criteria NR	63	125	250	500	1k	2k	4k	8k	dB(A)
47	73	63	56	51	47	44	42	40	55

Barrier SRI	63	125	250	500	1k	2k	4k	8k	Rw
Manual									0
Unknown	100	100	100	100	100	100	100	100	101

Ref.	Plant	Excess 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	-11	-1	-2	4	2	0	-3	-7	1
2	toilet extract	-33	-14	-7	-4	-2	2	0	-5	-3
3	staff extract	-5	5	10	16	12	12	11	8	12
4	main store supply	-12	-2	6	4	-11	2	6	4	2
5	main store extract	-7	3	11	16	14	17	16	13	14
	Total	1	11	17	22	20	22	21	18	19

Barrier Deration		Mitsubishi P140YK	0	0	0	0	0	0	0	0
		toilet extract	0	0	0	0	0	0	0	0
		staff extract	0	0	0	0	0	0	0	0
		main store supply	0	0	0	0	0	0	0	0
		main store extract	0	0	0	0	0	0	0	0

Ref.	Plant	Mitigated Receiver Lp 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	62	62	54	55	49	44	39	34	55
2	toilet extract	22	35	39	42	40	39	32	25	45
3	staff extract	53	57	59	63	56	53	49	41	63
4	main store supply	52	55	58	52	33	43	44	37	54
5	main store extract	57	60	63	64	58	58	54	46	66
	Safety	3	3	3	3	3	3	3	3	
	Total	**67**	**69**	**69**	**70**	**64**	**63**	**59**	**51**	**71**

Net barrier loss		Mitsubishi P140YK	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		toilet extract	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		staff extract	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		main store supply	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		main store extract	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Appendix F: Calculations with mitigation

279 Camden High Street window:

Ref.	plant	Ref.dist.	Sound Level (Lp/Lw) 63	125	250	500	1k	2k	4k	8k	dB(A)	Lw dB(A)	Reciever Distance (m)	dB(A)	Lp	No. off	dB	Angular Directionality	63	125	250	500	1k	2k	4k	8k	Reflections	dB	Façade correction	dB	Duct Losses (input negative values) 63	125	250	500	1k	2k	4k	8k	Additional Attenuation 63	125	250	500	1k	2k	4k	8k
1	itsubishi P140YK	1.00	59	60	51	52	47	42	37	31	53	61	15.0	-32	29	2	3	None	0	0	0	0	0	0	0	0	1	3	Yes	3														
2	toilet extract		48	57	57	55	54	55	51	44	60	60	15.0	-32	29	1	0	None	0	0	0	0	0	0	0	0	1	3	Yes	3	-17	-14	-10	-5	-6	-8	-11	-11								
3	staff extract		76	76	74	75	68	65	62	57	75	75	15.0	-32	44	1	0	None	0	0	0	0	0	0	0	0	1	3	Yes	3	-14	-10	-6	-3	-3	-3	-4	-7	1	2	8	15	28	25	17	16
4	main store supply		69	69	70	63	45	55	57	53	66	66	15.0	-32	34	1	0	None	0	0	0	0	0	0	0	0	1	3	Yes	3	-8	-5	-3	-2	-3	-3	-4	-7	1	2	8	15	28	25	17	16
5	main store extract		74	74	75	75	70	70	67	62	77	77	15.0	-32	46	1	0	None	0	0	0	0	0	0	0	0	1	3	Yes	3	-8	-5	-3	-2	-3	-3	-4	-7	1	2	4	9	22	14	12	12

Ref.	plant	Receiver Lp 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	45	45	37	38	32	27	22	17	39
2	toilet extract	22	31	31	29	28	29	25	18	35
3	staff extract	50	50	48	49	42	39	36	31	50
4	main store supply	43	43	44	37	19	29	31	27	40
5	main store extract	48	48	49	49	44	44	41	36	52
	Total	**57**	**57**	**56**	**56**	**50**	**49**	**46**	**41**	**57**

Barrier Path Difference Loss: Source height	Receiver height	Barrier height	Source to barrier distance	Barrier to receiver distance	Calculated path difference	63	125	250	500	1000	2000	4000	8000
4.0	1.0			15.0	-3.74	0	0	0	0	0	0	0	0
5.0	2.0			15.0	-4.84	0	0	0	0	0	0	0	0
4.0	1.0			15.0	-3.74	0	0	0	0	0	0	0	0
4.0	1.0			15.0	-3.74	0	0	0	0	0	0	0	0
4.0	1.0			15.0	-3.74	0	0	0	0	0	0	0	0

Criteria NR	63	125	250	500	1k	2k	4k	8k	dB(A)
40	67	57	49	44	40	37	35	33	48

Barrier SRI		63	125	250	500	1k	2k	4k	8k	Rw
	Manual									0
	Unknown	100	100	100	100	100	100	100	100	101

Ref.	Plant	Excess 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	-22	-12	-13	-6	-8	-10	-13	-17	-10
2	toilet extract	-45	-25	-18	-14	-12	-8	-9	-15	-14
3	staff extract	-17	-6	-1	6	2	2	2	-2	1
4	main store supply	-24	-13	-5	-6	-21	-8	-3	-6	-8
5	main store extract	-19	-8	0	6	4	7	7	3	3
	Total	-10	0	7	12	10	12	11	8	9

Barrier Deration		63	125	250	500	1k	2k	4k	8k
	Mitsubishi P140YK	0	0	0	0	0	0	0	0
	toilet extract	0	0	0	0	0	0	0	0
	staff extract	0	0	0	0	0	0	0	0
	main store supply	0	0	0	0	0	0	0	0
	main store extract	0	0	0	0	0	0	0	0

Ref.	Plant	Mitigated Receiver Lp 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	45	45	37	38	32	27	22	17	39
2	toilet extract	5	18	22	25	23	22	15	8	28
3	staff extract	35	38	34	31	11	11	15	8	31
4	main store supply	34	36	33	20	-12	1	10	4	27
5	main store extract	39	41	42	38	19	27	25	17	39
	Total	**49**	**51**	**47**	**45**	**36**	**34**	**31**	**24**	**45**

Net barrier loss		63	125	250	500	1k	2k	4k	8k
	Mitsubishi P140YK	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	toilet extract	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	staff extract	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	main store supply	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	main store extract	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

279 Camden High Street terrace area:

Ref.	plant	Ref.dist.	Sound Level (Lp/Lw) 63	125	250	500	1k	2k	4k	8k	dB(A)	Lw dB(A)	Reciever Distance (m)	dB(A)	Lp	No. off	dB	Angular Directionality	63	125	250	500	1k	2k	4k	8k	Reflections	dB	Façade correction	dB	Duct Losses (input negative values) 63	125	250	500	1k	2k	4k	8k	Additional Attenuation 63	125	250	500	1k	2k	4k	8k
1	itsubishi P140YK	1.00	59	60	51	52	47	42	37	31	53	61	1.0	-8	53	2	3	None	0	0	0	0	0	0	0	0	1	3	Yes	3															
2	toilet extract		48	57	57	55	54	55	51	44	60	60	1.0	-8	52	1	0	None	0	0	0	0	0	0	0	0	1	3	Yes	3	-17	-14	-10	-5	-6	-8	-11	-11								
3	staff extract		76	76	74	75	68	65	62	57	75	75	1.0	-8	67	1	0	None	0	0	0	0	0	0	0	0	1	3	Yes	3	-14	-10	-6	-3	-3	-3	-4	-7	1	2	8	15	28	25	17	16
4	main store supply		69	69	70	63	45	55	57	53	66	66	1.0	-8	58	1	0	None	0	0	0	0	0	0	0	0	1	3	Yes	3	-8	-5	-3	-2	-3	-3	-4	-7	1	2	8	15	28	25	17	16
5	main store extract		74	74	75	75	70	70	67	62	77	77	1.0	-8	69	1	0	None	0	0	0	0	0	0	0	0	1	3	Yes	3	-8	-5	-3	-2	-3	-3	-4	-7	1	2	4	9	22	14	12	12

Ref.	plant	Receiver Lp 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	68	69	60	61	56	51	46	40	62
2	toilet extract	46	55	55	53	52	53	49	42	58
3	staff extract	74	74	72	73	66	63	60	55	73
4	main store supply	67	67	68	61	43	53	55	51	64
5	main store extract	72	72	73	73	68	68	65	60	75
	Total	**80**	**80**	**79**	**79**	**73**	**72**	**70**	**65**	**81**

Barrier Path Difference Loss: Source height	Receiver height	Barrier height	Source to barrier distance	Barrier to receiver distance	Calculated path difference	63	125	250	500	1000	2000	4000	8000
2.0	3.0	4.0		1.0	2.00	-13	-15	-18	-21	-24	-24	-24	-24
1.0	3.0	4.0		1.0	2.18	-13	-15	-18	-21	-24	-24	-24	-24
1.0	3.0	4.0		1.0	2.18	-13	-15	-18	-21	-24	-24	-24	-24
2.0	3.0	4.0		1.0	2.00	-13	-15	-18	-21	-24	-24	-24	-24
2.0	3.0	4.0		1.0	2.00	-13	-15	-18	-21	-24	-24	-24	-24

Criteria NR	63	125	250	500	1k	2k	4k	8k	dB(A)
47	73	63	56	51	47	44	42	40	55

Barrier SRI		63	125	250	500	1k	2k	4k	8k	Rw
	Manual	6	11	17	23	26	20	28	28	24
	Manual	6	11	17	23	26	20	28	28	24

Ref.	Plant	Excess 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	-4	6	4	11	9	7	4	0	7
2	toilet extract	-27	-8	-1	2	5	9	7	2	3
3	staff extract	1	11	16	22	19	19	18	15	18
4	main store supply	-6	4	12	10	-4	9	13	11	9
5	main store extract	-1	9	17	22	21	24	23	20	20
	Total	8	17	24	29	26	28	28	24	26

Barrier Deration		63	125	250	500	1k	2k	4k	8k
	Mitsubishi P140YK	7	6	3	2	2	5	1	1
	toilet extract	8	6	4	2	2	5	1	1
	staff extract	8	6	4	2	2	5	1	1
	main store supply	7	6	3	2	2	5	1	1
	main store extract	7	6	3	2	2	5	1	1

Ref.	Plant	Mitigated Receiver Lp 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	63	60	45	43	34	32	23	17	47
2	toilet extract	24	32	31	29	24	26	15	8	32
3	staff extract	54	53	44	36	13	16	16	9	40
4	main store supply	52	51	42	25	-10	6	11	5	38
5	main store extract	57	56	51	43	21	32	26	18	46
	Total	**68**	**65**	**56**	**49**	**38**	**38**	**31**	**24**	**53**

Net barrier loss		63	125	250	500	1k	2k	4k	8k
	Mitsubishi P140YK	-6	-9	-15	-19	-22	-19	-23	-23
	toilet extract	-5	-9	-14	-19	-22	-19	-23	-23
	staff extract	-5	-9	-14	-19	-22	-19	-23	-23
	main store supply	-6	-9	-15	-19	-22	-19	-23	-23
	main store extract	-6	-9	-15	-19	-22	-19	-23	-23

Nearest commercial:

Ref.	plant	Ref.dist.	Sound Level (Lp/Lw) 63	125	250	500	1k	2k	4k	8k	dB(A)	Lw dB(A)	Reciever Distance (m)	dB(A)	Lp	No. off	dB	Angular Directionality	63	125	250	500	1k	2k	4k	8k	Reflections	dB	Façade correction	dB	Duct Losses (input negative values) 63	125	250	500	1k	2k	4k	8k	Additional Attenuation 63	125	250	500	1k	2k	4k	8k
1	itsubishi P140YK	1.00	59	60	51	52	47	42	37	31	53	61	3.0	-18	43	2	3	None	0	0	0	0	0	0	0	0	1	3	Yes	3														
2	toilet extract		48	57	57	55	54	55	51	44	60	60	3.0	-18	43	1	0	None	0	0	0	0	0	0	0	0	1	3	Yes	3	-17	-14	-10	-5	-6	-8	-11	-11								
3	staff extract		76	76	74	75	68	65	62	57	75	75	3.0	-18	58	1	0	None	0	0	0	0	0	0	0	0	1	3	Yes	3	-14	-10	-6	-3	-3	-3	-4	-7	1	2	8	15	28	25	17	16
4	main store supply		69	69	70	63	45	55	57	53	66	66	3.0	-18	48	1	0	None	0	0	0	0	0	0	0	0	1	3	Yes	3	-8	-5	-3	-2	-3	-3	-4	-7	1	2	8	15	28	25	17	16
5	main store extract		74	74	75	75	70	70	67	62	77	77	3.0	-18	60	1	0	None	0	0	0	0	0	0	0	0	1	3	Yes	3	-17	-13	-9	-7	-7	-9	-9	-9	1	2	4	9	22	14	12	12

Ref.	plant	Receiver Lp 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	59	59	51	52	46	41	36	31	52
2	toilet extract	36	45	45	43	42	43	39	32	49
3	staff extract	64	64	62	63	56	53	50	45	64
4	main store supply	57	57	58	51	33	43	45	41	54
5	main store extract	62	62	63	63	58	58	55	50	66
Safety		0	0	0	0	0	0	0	0	
Total		**68**	**68**	**67**	**67**	**61**	**60**	**57**	**52**	**68**

Barrier Path Difference Loss: Source height	Receiver height	Barrier height	Source to barrier distance	Barrier to receiver distance	Calculated path difference	63	125	250	500	1000	2000	4000	8000
1.0	1.0			3.0	-1.16	0	0	0	0	0	0	0	0
1.0	2.0			3.0	-1.44	0	0	0	0	0	0	0	0
1.0	1.0			3.0	-1.16	0	0	0	0	0	0	0	0
1.0	1.0			3.0	-1.16	0	0	0	0	0	0	0	0
1.0	1.0			3.0	-1.16	0	0	0	0	0	0	0	0

Criteria NR	63	125	250	500	1k	2k	4k	8k	dB(A)
47	73	63	56	51	47	44	42	40	55

Barrier SRI		63	125	250	500	1k	2k	4k	8k	Rw
	Manual									0
	Unknown	100	100	100	100	100	100	100	100	101

Ref.	Plant	Excess 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	-14	-4	-5	1	-1	-3	-6	-10	-2
2	toilet extract	-36	-17	-10	-7	-5	-1	-3	-8	-6
3	staff extract	-8	2	7	13	9	9	8	5	9
4	main store supply	-15	-5	3	1	-14	-1	3	1	-1
5	main store extract	-10	0	8	13	11	14	13	10	11
Total		-5	5	11	16	14	16	15	12	13

Barrier Deration			63	125	250	500	1k	2k	4k	8k
		Mitsubishi P140YK	0	0	0	0	0	0	0	0
		toilet extract	0	0	0	0	0	0	0	0
		staff extract	0	0	0	0	0	0	0	0
		main store supply	0	0	0	0	0	0	0	0
		main store extract	0	0	0	0	0	0	0	0

Ref.	Plant	Mitigated Receiver Lp 63	125	250	500	1k	2k	4k	8k	dB(A)
1	Mitsubishi P140YKM	59	59	51	52	46	41	36	31	52
2	toilet extract	19	32	36	39	37	36	29	22	42
3	staff extract	49	52	48	45	25	25	29	22	45
4	main store supply	48	50	47	34	2	15	24	18	41
5	main store extract	44	47	50	47	29	35	34	29	47
Total		**60**	**61**	**55**	**54**	**47**	**43**	**39**	**34**	**55**

Net barrier loss			63	125	250	500	1k	2k	4k	8k
		Mitsubishi P140YK	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		toilet extract	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		staff extract	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		main store supply	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
		main store extract	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Appendix G: Acoustic Panel

Acoustic Panel Data Sheet

Specification:

50, 75 and 100mm thick panel with 1.5mm solid outer skin and 0.8mm XPM :30% free area inner skin

48kg controlled density resin bonded mineral wool infill, faced with a fibreglass tissue to ensure that internal faces are sealed against fibre egress.

Finish options:

Externally polyester powder painted to a standard stock colour, Standard factory finish galvanised metal.

General:

All materials shall be inorganic and non-combustible.

Acoustic panels shall be manufactured in accordance with BS3638:1987, ISO 354:1985 (Coefficient of absorption) and shall provide a minimum performance as detailed below table

Acoustic panels shall be manufactured in a accordance with BS2750:1980, ISO 140: 1978 (Sound transmission)

and shall provide a minimum performance as detailed below table

Panel details									Acoustic Performance															
									Sound Reduction Index (dB)								Random Incidence absorption coefficient							
Configuration	Depth	Outer skin	Inner skin	Inner facing	Infill	Plasterboard	Melinex	Paint	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k
Solid Outer Perforated Inner	50mm	1.5mm GSS	0.7mm XPM or 0.8mm perf	F/G tissue	45kg/m3 only	12mm optional	Optional bagged infill (facing omitted)	Optional polyester powder coat	11	17	22	28	33	40	41	37	0.12	0.20	0.38	0.69	0.85	0.90	0.82	0.70
	75mm								14	20	25	34	39	47	49	46	0.15	0.23	0.45	0.77	0.86	0.91	0.84	0.72
	100mm								16	22	27	37	41	49	50	47	0.22	0.32	0.50	0.91	0.95	0.92	0.86	0.81
Solid Outer Solid Inner	50mm	1.5mm GSS	1.2mm GSS	N/A	45kg/m3 only	12mm optional	N/A	Optional polyester powder coat	13	19	25	32	37	42	43	39	N/A							
	75mm								16	22	29	40	45	49	51	48	N/A							
	100mm								18	24	31	43	47	51	52	49	N/A							
Lining panel	50mm	N/A	0.7mm XPM or 0.8mm perf	F/G tissue	23kg/m3 or 45kg/m3	N/A	Optional bagged infill (facing omitted)	Optional polyester powder coat	N/A								0.12	0.20	0.38	0.69	0.85	0.90	0.82	0.70
	75mm																0.15	0.23	0.45	0.77	0.86	0.91	0.84	0.72
	100mm																0.22	0.32	0.50	0.91	0.95	0.92	0.86	0.81

caice
Acoustic Air Movement Ltd

Appendix H: Glossary

The list below details the major acoustical terms and descriptors, with brief definitions:

'A' Weighting
Weighting applied to the level in each stated octave band by a specified amount, in order to better represent the response of the human ear. The letter 'A' will follow a descriptor, indicating the value has been 'A' weighted. An 'A' weighted noise level may also be written as dB(A).
Airborne Noise
Noise transmitted through air.
Ambient Noise
The total noise level including all 'normally experienced' noise sources.
dB or Decibel
Literally meaning 'a tenth of a bel', the bel being a unit devised by the Bell Laboratory and named after Alexander Graham Bell. A logarithmically based descriptor to compare a level to a reference level. Decibel arithmetic is not linear, due to the logarithmic base. For example:

30 dB + 30 dB ≠ 60 dB	30 dB + 30 dB = 33 dB

$D_{nTw}+C_{tr}$	
The weighted, normalised difference in airborne noise levels measured in a source room (L1) and a receive room (L2) due to a separating partition.	
D	Is simply L1 – L2.
D_{nT}	Is the normalisation of the measured level difference to the expected (in comparison to the measured) reverberation time in the receiving room.
D_{nTw}	Is the weighted and normalised level difference. This value is the result of applying a known octave band weighting curve to the measured result.

C_{tr}	Is a correction factor applied to the D_{nTw} to account for the known effects of particular types of noise, such as loud stereo music or traffic noise.

Frequency (Hz)

Measured in Hertz (after Heinrich Hertz), and represents the number of cycles per second of a sound or tone.

Insertion Loss, dB

The amount of sound reduction offered by an attenuator or louvre once placed in the path of a noise level.

$L_{A90, T}$

The 'A' weighted noise level exceeded for 90% of the time period T, described or measured. The '90' can be substituted for any value between 1 and 99 to indicate the noise level exceeded for the corresponding percentage of time described or measured.

$L_{Aeq, T}$

The 'A' weighted 'equivalent' noise level, or the average noise level over the time period T, described or measured.

L_{Amax}

The 'A' weighted maximum measured noise level. Can be measured with a 'slow' (1 sec) or 'fast' (0.125 sec) time weighting.

L_{Amin}

The 'A' weighted minimum measured noise level.

NR

Noise Rating (NR) level. A frequency dependent system of noise level curves developed by the International Organisation for Standardisation (ISO). NR is used to categorise and determine the acceptable indoor environment in terms of hearing preservation, speech communication and annoyance in any given application as a single figure level. The US predominantly uses the Noise Criterion (NC) system.

Octave

The interval between a frequency in Hz (f) and either half or double that frequency (0.5f or 2f).

Pa

Pascals, the SI unit to describe pressure, after physicist Blaise Pascal.

Reverberation Time, T_{mf}, RT60, RT30 or RT20

The time taken in seconds for a sound to diminish within a room by 1,000 times its original level, corresponding to a drop in sound pressure of 60 dB. When taking field measurements and where background noise levels are high, the units RT20 or RT30 are used (measuring drops of 20 or 30 dB respectively). Sometimes given as a mid-frequency reverberation time, T_{mf} which is the average of reverberation time values at 500Hz, 1kHz and 2kHz.

R_w

The sound reduction value(s) of a constructional element such as a door, as measured in a laboratory, with a known octave band weighting curve applied to the result.

Sound Power Level

A noise level obtained by calculation from measurement data, given at the face of an item of plant or machinery. Referenced to 10^{-12} W or 1pW.

Sound Pressure Level

A noise level measured or given at a distance from a source or a number of sources. Referenced to $2x10^{-5}$ Pa.

Subjective Effect of Changes in Sound Pressure Level

The table below details the subjective effects of variations in sound pressures (adapted from Bies and Hansen).

Difference between background noise and rating levels	Increase in ambient noise level in 'real terms'	Change in apparent loudness
+ 10 dB	+ 10 dB	Twice as loud
+ 5 dB	+ 6 dB	Clearly noticeable
0 dB	+ 3 dB	Just perceptible
-10 dB	0 dB	No change

W

Watts, the SI unit to describe power, after engineer James Watt.