ACENTECH

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September 25, 2019

Jaime Lewis
Neo Organics
635 Boston Post Road #184
Sudbury, MA 01776

Phone 415-519-1063

Subject Noise Mitigation Plan
Neo-Organics Cannabis Cultivation Facility – Medway, MA
Acentech Project No. 632403

Dear Jaime,

Neo-Organics has retained Acentech to conduct a study of community noise produced by mechanical equipment serving proposed cannabis cultivation and processing facility located at 4 Marc Road in Medway, Massachusetts (the facility). Acentech has worked with Neo-Organics to develop this Noise Mitigation Plan, which is required as part of the Town of Medway's Special Permit Process. This Noise Mitigation Plan has been reviewed by an acoustical consultant whose qualifications include Institute of Noise Control Engineering (INCE) board certification.

We have reviewed project drawings and sound data for submitted noise-producing equipment to develop a community noise model. From the results of this modeling, we have developed concept noise-control recommendations.

PROJECT NOISE REQUIREMENTS OF THE TOWN OF MEDWAY

The Medway noise ordinance as currently written has outdated octave-band limits. The Town of Medway and their noise peer review consultant (NCE, Billerica, MA) have estimated corresponding limits in the current octave-bands in connection with another nearby facility, and we have referred to these estimates to facilitate our work. The daytime and nighttime noise limits from the ordinance in modern octave bands are shown below in TABLE 1. The daytime noise limits are 5 dB greater than the nighttime limits. We understand the noise ordinance to be applicable at the source property lines.

TABLE I. Medway Noise Ordinance

Octave-band center frequency (Hz)	63	125	250	500	1000	2000	4000	8000
Nighttime	67	55	48	42	38	35	32	28
Daytime	72	60	53	47	43	40	37	33

Our current engagement does not include review of facility sound in connection with the noise policies of the MassDEP, but based on our experience, we recommend that noise levels at the nearest residences should not exceed ~30 dBA during nighttime hours. Further, MassDEP has a noise policy preventing tonal noise. Determining compliance with the tonal requirements was not within the scope of our study.

COMMUNITY NOISE MODELING

Model Description

We have developed a computer model of facility sound using CadnaA, an acoustic modeling software that considers 3-dimensional propagation of sound. This model implements the methods and equations of ISO 9613-2 “Attenuation of sound during propagation outdoors -- Part 2: General method of calculation”. FIGURE 2 presents the receptor locations used in computer modeling.

The facility has noise-producing equipment located on grade that includes a 300 kw generator, a transformer, air handling units, and condensing units. In addition, there are two rooftop exhaust fans. The mechanical equipment is identified in FIGURE I. The sound power levels of the equipment are given in TABLE II below. APPENDIX A includes the sound data sheets from the manufacturers. Currently, we have assumed that all equipment, except the generator, will run at all hours at maximum capacity.

TABLE II. Equipment sound power levels used in computer modeling

Description	Sound power level (dB re: 1pW)								
Octave-band center frequency (Hz)	63	125	250	500	1000	2000	4000	8000	dBA
300 kw Generator*	83	89	91	96	96	91	86	81	99
Exhaust Fan (EF-X)	80	77	76	68	64	63	59	53	72
Air Handling Unit (AHU-1)	89	97	94	92	89	83	79	75	94
Ground mounted unit (GRTU-1)	89	85	87	81	79	78	73	62	85
GPod Condenser Small (GPCU-1)	73	74	69	68	66	62	56	52	71
GPod Condenser Large (GPCU-2)	38	55	56	60	62	61	52	49	66
Trane Condenser (CU-1)**	65	62	59	56	53	50	47	44	59
Trane Condenser (DCU)**	56	53	50	47	44	41	38	35	50
Mitsubishi Condenser (CU-2)**	65	62	59	56	53	50	47	44	59
2000 kVA Transformer***	80	82	77	77	71	66	61	54	77

* We have assumed daytime maintenance testing only.
**Octave band data unavailable, assumed spectrum.
*** Sound data estimated based on NEMA rating.

Model Results, No Noise Controls

Based on our baseline computer model (as designed, no noise mitigation), we expect that the proposed equipment will *not* comply with the Medway noise ordinance at all facility property lines (see APPENDIX B, Table IV).

Noise Control Recommendations

A partial contribution analysis of the noise-producing equipment revealed that the most significant noise sources are the GRTUs and AHUs. To mitigate the noise from these sources, we recommend placing barriers, identified in FIGURE 3, around the sources (3 m tall barriers for GRTUs, 4.5 m tall barriers for AHUs). We also recommend that you select a generator and enclosure that meets the criteria 64 dBA at a distance of 7 m.

Model Results, Noise Controls

TABLE III summarizes the calculated noise levels at the property lines with noise control applied. The estimated sound levels created by MEP equipment are all below the octave-band provisions of the Medway noise regulation.

However, our model predicts that the transformer will exceed the criteria by 1 dB in the 500 Hz octave band at one property line receptor. We have used generic estimates of transformer sound power levels based on the estimated NEMA rating and surface area. The 1 dB exceedance is within the uncertainty of our model, which we can refine upon receipt of more representative sound data.

It is possible that some equipment will have reduced fan speeds during nighttime operation, leading to reduced sound levels. Currently, we have assumed that all equipment, except the generator, will run at all hours at maximum capacity. Nighttime sound data for major equipment could influence the following noise control recommendations.

TABLE III. Estimated nighttime octave-band sound levels at facility property lines (dB re: 20 µPa)

Receptor	63	125	250	500	1000	2000	4000	8000
PL01	45	51	45	42	37	29	23	<20
PL02	45	46	41	39	35	29	23	<20
PL03	42	39	39	35	32	29	21	<20
PL04	47	44	45	39	37	35	28	<20
PL05	49	45	47	40	37	35	29	<20
PL06	42	38	39	35	32	29	20	<20
PL07	37	32	32	29	26	22	<20	<20
PL08	34	34	29	25	24	<20	<20	<20
PL09	36	40	36	31	26	20	<20	<20
PL10	37	40	37	32	27	21	<20	<20
PL11	40	45	40	36	31	24	<20	<20
PL12	42	47	42	38	32	25	<20	<20
PL13	41	46	41	37	31	24	<20	<20
PL14	48	52	47	43	38	31	26	<20
Medway Noise Ordinance	67	55	48	42	38	35	32	28

Full modeling results with and without mitigation are shown in APPENDIX B.

* * * * *

I trust this memo provides the information you need at this time. Please contact us if you have any questions or comments.

Sincerely,

Andy Carballeira, INCE Bd Cert
Senior Consultant
617-499-8025

Alex Odom
Consultant
617-499-8027

CC: Alex Odom (Acentech)
Encl: FIGURES
APPENDIX A: Manufacturer Noise Data
APPENDIX B: Modeling Results

FIGURES

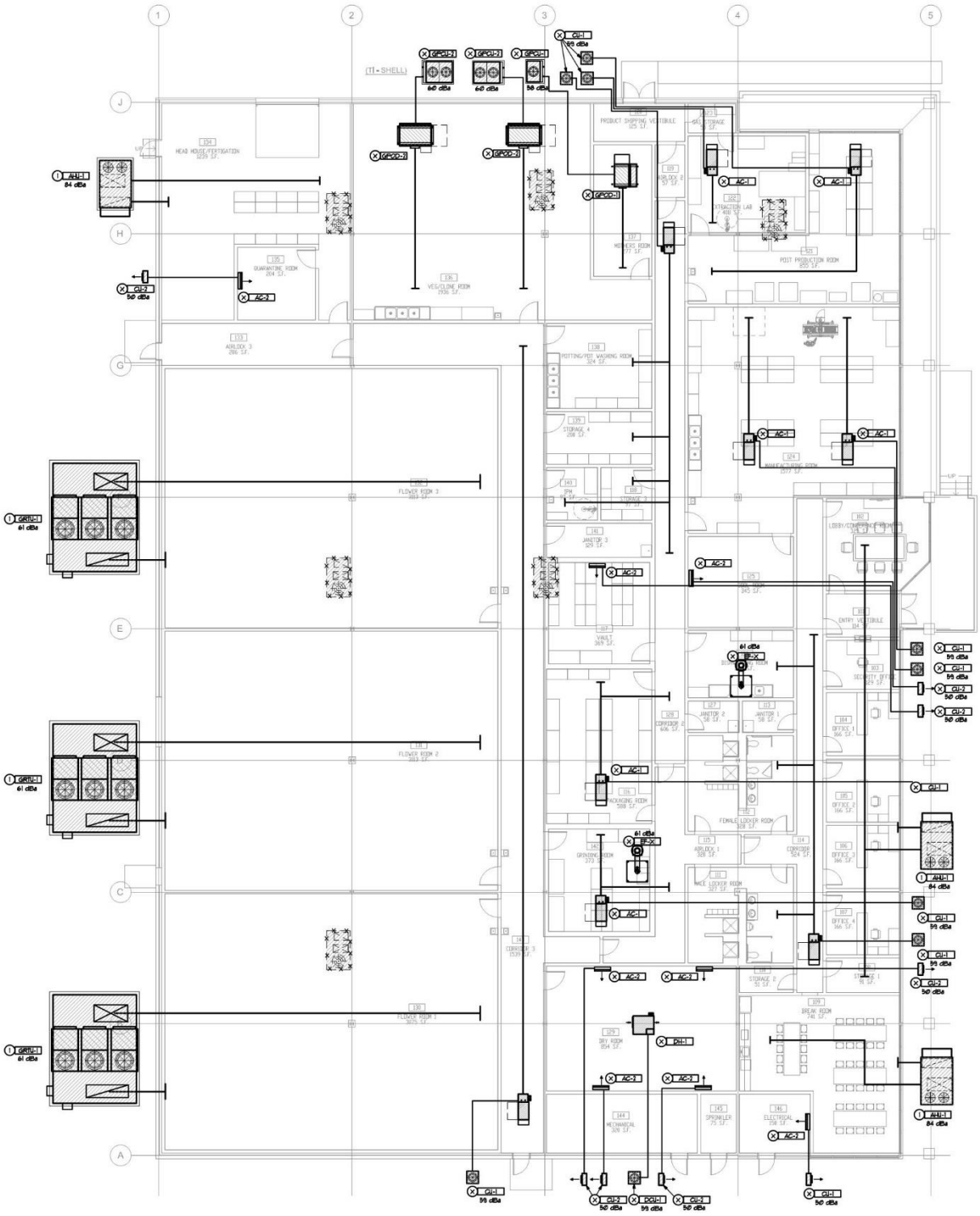


FIGURE 1. Facility Mechanical Plan

FIGURE 2. Computer model receptor points on source property line and beyond

FIGURE 3. Recommended Noise Control Solutions, Barriers shown in Orange around GRTUs and AHUs

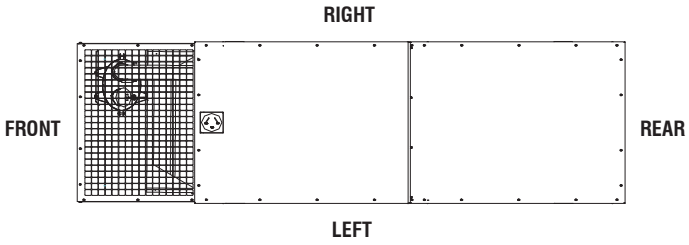
APPENDIX A

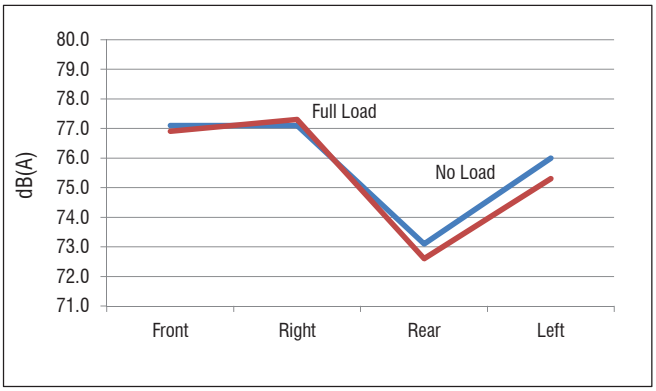
MANUFACTURER NOISE DATA

LEVEL 2 ACOUSTIC ENCLOSURE
SD300 10.3L FPT

	60Hz NO-LOAD DATA, dB(A)								DISTANCE: 7 METERS	
MICROPHONE LOCATION	OCTAVE BAND CENTER FREQUENCY (Hz)									
	31.5	63	125	250	500	1000	2000	4000	8000	dB(A)
FRONT	45.9	57.9	62.8	67.0	73.2	71.6	65.6	64.9	60.7	77.1
RIGHT	43.9	61.4	64.9	67.3	70.7	73.0	68.8	62.7	58.1	77.1
REAR	40.1	55.9	62.1	65.2	68.1	68.2	61.7	54.9	49.2	73.1
LEFT	41.5	58.9	65.7	64.9	71.4	70.8	66.9	60.1	56.2	76.0
AVERAGE	42.9	58.5	63.9	66.1	70.9	70.9	65.7	60.6	56.0	**75.8**

	60Hz FULL-LOAD DATA, dB(A)								DISTANCE: 7 METERS	
MICROPHONE LOCATION	OCTAVE BAND CENTER FREQUENCY (Hz)									
	31.5	63	125	250	500	1000	2000	4000	8000	dB(A)
FRONT	46.9	58.3	64.5	68.6	73.1	69.1	67.5	65.2	61.3	76.9
RIGHT	44.0	60.6	66.4	67.8	72.4	70.8	69.2	64.9	61.6	77.3
REAR	41.9	57.4	62.7	65.0	68.6	65.5	60.7	56.2	53.9	72.6
LEFT	43.4	60.6	66.6	65.4	71.5	67.6	64.7	61.2	60.4	75.3
AVERAGE	44.0	59.2	65.1	66.7	71.4	68.2	65.5	61.9	59.3	**75.6**





1. All positions at 23 feet (7 meters) from side faces of generator set.
2. Test conducted on a 100 foot diameter asphault surface.
3. Sound pressure levels are subject to instrumentation, installation and testing conditions.

Generac Power Systems, Inc. | P.O. Box 8 | Waukesha, WI 53187
P: (262) 544-4811

Part No. 0188480SSD
Rev. B 04/16/15

Job Name: Clover
Prepared By: Impact Engineering
Unit Tag: 15 Ton
Quantity: 1

Trane Voyager Gas/Electric Packaged Rooftop

Unit Overview - YHD180G4RHB**00B1A1000000000000000000000

Application	Unit Size	Supply Fan		External Dimensions (in.)			Weight		EER	IEER/SEER
		Airflow	External Static Pressure	Height	Width	Length	Minimum	Maximum		
Gas/Electric	15 Ton	6000 cfm	1.000 in H2O	66.250 in	84.188 in	121.688 in	2241.0 lb	2663.0 lb	12.1 EER	14.00

Unit Features

Panels/Filters	Std panels/2" pltd filters MERV 8

Unit Electrical

Voltage/phase/hertz	460/60/3
MCA	33.00 A
MOP	45.00 A

Controls

Unit Controls	Reliatel

Cooling Section

Entering Dry Bulb	80.00 F	**Capacity**	
Entering Wet Bulb	67.00 F	**Gross Total**	180.52 MBh
Ambient Temp	95.00 F	**Gross Sensible**	142.17 MBh
Leaving Coil Dry Bulb	58.06 F	**Net Total**	171.67 MBh
Leaving Coil Wet Bulb	57.30 F	**Net Sensible**	133.32 MBh
Leaving Unit Dry Bulb	59.77 F	**Fan Motor Heat**	8.85 MBh
Leaving Unit Wet Bulb	57.96 F	**Refrig Charge-circuit 1**	13.0 lb
Refrigeration System Options		**Refrig Charge-circuit 2**	8.5 lb
Leaving Dew Point	56.82 F		

Heating Section

Heat Type	Gas
Heating Stages	2
Output Heating Capacity	280.00 MBh
Heating EAT	55.00 F
Heating LAT	98.01 F
Heating Temp Rise	43.01 F

Fan Section

Indoor Fan Data		**Outdoor Fan Data**	
Type	FC Centrifugal	**Type**	Propeller
Drive Type	Belt	**Fan Quantity**	2
Indoor Fan Performance		**Drive Type**	Direct
Airflow	6000 cfm	**Outdoor Fan Performance**	
Design ESP	1.000 in H2O	**Outdoor Motor Power**	0.89 kW
Component SP	0.040 in H2O	**Condenser Fan FLA**	1.35 A
Total SP	1.058 in H2O	**Exhaust Fan Performance**	
Indoor Motor Operating Power	2.81 bhp	**Exhaust Fan FLA**	4.80 A
Indoor Motor Power	2.09 kW		
Indoor RPM	709 rpm		

Compressor Section

Power	12.28 kW
Circuit 1 RLA	14.70 A
Circuit 2 RLA	7.00 A

Accessories

Roof curb	yes

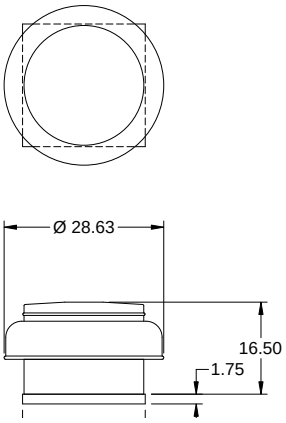
Acoustics

Sound Path	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Ducted Discharge	87 dB	82 dB	76 dB	79 dB	72 dB	70 dB	69 dB	63 dB
Ducted Inlet	91 dB	82 dB	74 dB	70 dB	65 dB	60 dB	60 dB	53 dB
Outdoor Noise	89 dB	97 dB	94 dB	92 dB	89 dB	83 dB	79 dB	75 dB

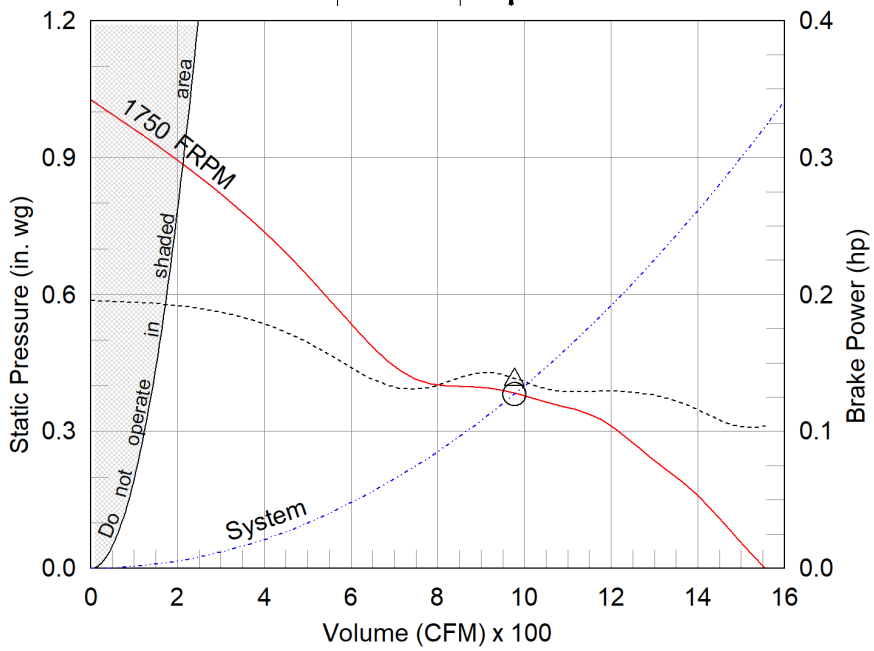
Model: AE-12-433-A4

Propeller Hooded Roof Direct Drive Exhaust Fan

Dimensional	
Quantity	1
Weight w/o Acc's (lb)	41
Weight w/ Acc's (lb)	43
Max T Motor Frame Size	0
Roof Opening (in.)	14.5 x 14.5



Performance	
Requested Volume (CFM)	1,000
Actual Volume (CFM)	976
Total External SP (in. wg)	0.381
Fan RPM	1750
Operating Power (hp)	0.14
Elevation (ft)	663
Airstream Temp.(F)	75
Air Density (lb/ft3)	0.073
Tip Speed (ft/min)	5,498
Static Eff. (%)	43



Motor	
Motor Mounted	Yes
Size (hp)	1/4
Voltage/Cycle/Phase	115/60/1
Enclosure	ODP
Motor RPM	1750
Windings	1

△ Operating Bhp point
○ Operating point at Total External SP
Fan curve
System curve
Brake horsepower curve

Static Pressure Calculations

External SP	0.4	in. wg
Direct Drive RPM Adjustment	-0.019	in. wg
Total External SP	0.381	in. wg

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	80	77	76	68	64	63	59	53	72	61	11.1

Notes:
All dimensions shown are in units of in.
*Please consult factory for actual motor amp draw
LwA - A weighted sound power level, based on ANSI S1.4
dBA - A weighted sound pressure level, based on 11.5 dB attenuation per Octave band at 5 ft - dBA levels are not licensed by AMCA International
Sones - calculated using AMCA 301 at 5 ft

Acoustic Analysis Report

Project	GRW
Date	September 13, 2019

Price Acoustic Analysis utilizes industry accepted algorithms and laboratory tested data. Sources include Chapter 48 of the 2011 ASHRAE Applications Handbook, AHRI, and HVAC acoustic algorithms. Only qualified design professionals should provide noise control recommendations. Price accepts no responsibility for the design of systems through the use of Price Acoustic Analysis.

PROJECT:	GRW	REP NAME:	
LOCATION:		REP OFFICE:	
DATE:	SEPTEMBER 13, 2019	ENGINEER:	
REVISION:		CONTRACTOR:	

General Unit Information:

Model: GRW

Tag: Unit 1

Casing: 0.08 Aluminum

Insulation Type: 3.5” Fiberglass

Liner: 0.08 Aluminum

Latent Fans: APM Size 27 Dual

Airflow: 22,000 CFM

TSP: 4.11 in.w.g.

Fan Speed: 1456 RPM

Sensible Fans: APD Size 355 Dual

Airflow: 4,070 CFM

TSP: 3.23 in.w.g.

Fan Speed: 2365 RPM

Compressors:

Qty 3 ZPDT31 Digital Tandem

Qty 3 ZPDT36 Digital Tandem

Cond Fans

Qty 6 33” fans, ~860 RPM, 10 degrees

Sound Analysis Definitions:

Sum = Logarithmic addition of sound sources less attenuation of components and adjustment for receiver distance.

Target = target sound pressure level at a specified distance

Current = A-weighted sound pressure (dBA) or sound power (LwA) level of the sum values

PROJECT: GRW
LOCATION:
DATE: SEPTEMBER 13, 2019
REVISION:

REP NAME:
REP OFFICE:
ENGINEER:
CONTRACTOR:

CONDENSER FANS

Element	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz	Comments
Condenser Fan 1	78	74	74	72	71	70	65	53	
Condenser Fan 2	78	74	74	72	71	70	65	53	
Condenser Fan 3	78	74	74	72	71	70	65	53	
Condenser Fan 4	78	74	74	72	71	70	65	53	
Condenser Fan 5	78	74	74	72	71	70	65	53	
Condenser Fan 6	78	74	74	72	71	70	65	53	
Receiver	-24	-24	-24	-24	-24	-24	-24	-24	
Sum	**62**	**58**	**58**	**56**	**55**	**54**	**49**	**37**	
Target:									
Current: 60 dBA									

Notes:

Sound data created by theoretical methods

Sound pressure calculated at a distance of 20 feet using a directivity factor (Q) of 2 assuming one reflective surface. The environment influences sound pressure, therefore dBA levels cannot be guaranteed.

LATENT FANS RADIATED

Element	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz	Comments
Supply Fan - Dual	89	92	98	93	90	85	80	77	
Breakout *- Cabinet Attenuation*	-11	-15	-20	-31	-38	-40	-40	-40	Thermoshield Cabinet
Receiver	-24	-24	-24	-24	-24	-24	-24	-24	
Sum	**54**	**53**	**54**	**38**	**28**	**21**	**16**	**13**	
Target:									
Current: 46 dBA									

Notes:

Sound data created by theoretical methods

Sound pressure calculated at a distance of 20 feet using a directivity factor (Q) of 2 assuming one reflective surface. The environment influences sound pressure, therefore dBA levels cannot be guaranteed.

PROJECT: GRW
LOCATION:
DATE: SEPTEMBER 13, 2019
REVISION:

REP NAME:
REP OFFICE:
ENGINEER:
CONTRACTOR:

LATENT FANS AT FA INLET

Element	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz	Comments
Supply Fan - Dual	83	88	96	87	81	79	75	72	Inlet
4 Row Coil	0	-3	-3	-5	-6	-6	-8	-8	
6 Row Coil	0	-3	-5	-5	-7	-7	-9	-8	
6 Row Coil	0	-3	-5	-5	-7	-7	-9	-8	
4" Panel Filter	0	-1	-1	-2	-1	-3	-4	-4	
Receiver	-24	-24	-24	-24	-24	-24	-24	-24	
Sum	**59**	**54**	**58**	**46**	**36**	**32**	**21**	**20**	
Target:									
Current: 51 dBA									

Notes:

Sound data created by theoretical methods

Sound pressure calculated at a distance of 20 feet using a directivity factor (Q) of 2 assuming one reflective surface. The environment influences sound pressure, therefore dBA levels cannot be guaranteed.

SENSIBLE FANS RADIATED

Element	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz	Comments
Sensible Fan - Dual	84	83	85	82	82	78	75	70	
Breakout *- Cabinet Attenuation*	-11	-15	-20	-31	-38	-40	-40	-40	Thermoshield Cabinet
Receiver	-24	-24	-24	-24	-24	-24	-24	-24	
Sum	**49**	**44**	**41**	**27**	**20**	**14**	**11**	**6**	
Target:									
Current: 35 dBA									

Notes:

Sound data created by theoretical methods

Sound pressure calculated at a distance of 20 feet using a directivity factor (Q) of 2 assuming one reflective surface. The environment influences sound pressure, therefore dBA levels cannot be guaranteed.

PROJECT: GRW
LOCATION:
DATE: SEPTEMBER 13, 2019
REVISION:

REP NAME:
REP OFFICE:
ENGINEER:
CONTRACTOR:

SENSIBLE FAN AT FA INLET

Element	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz	Comments
Sensible Fan - Dual	84	83	85	78	73	73	70	66	Inlet
4 Row Coil	0	-3	-3	-5	-6	-6	-8	-8	
4" Panel Filter	0	-1	-1	-2	-1	-3	-4	-4	
Receiver	-24	-24	-24	-24	-24	-24	-24	-24	
Sum	**60**	**55**	**57**	**47**	**42**	**40**	**34**	**30**	
Target:									
Current: 51 dBA *(NC 49 / RC 43)*									

Notes:

Sound data created by theoretical methods

Sound pressure calculated at a distance of 20 feet using a directivity factor (Q) of 2 assuming one reflective surface. The environment influences sound pressure, therefore dBA levels cannot be guaranteed.

COMPRESSORS RADIATED

Element	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz	Comments
ZPDT36 Compressor 1	73	63	71	78	79	80	76	71	
ZPDT36 Compressor 2	73	63	71	78	79	80	76	71	
ZPDT36 Compressor 3	73	63	71	78	79	80	76	71	
ZPDT31 Compressor 1	68	57	62	76	76	79	73	69	
ZPDT31 Compressor 2	68	57	62	76	76	79	73	69	
ZPDT31 Compressor 3	68	57	62	76	76	79	73	69	
Breakout *- Cabinet Attenuation*	-11	-15	-20	-31	-38	-40	-40	-40	Thermoshield Cabinet
Receiver	-24	-24	-24	-24	-24	-24	-24	-24	
Sum	**43**	**29**	**32**	**31**	**24**	**24**	**19**	**15**	
Target:									
Current: 32 dBA									

Notes:

Sound data created by theoretical methods

Sound pressure calculated at a distance of 20 feet using a directivity factor (Q) of 2 assuming one reflective surface. The environment influences sound pressure, therefore dBA levels cannot be guaranteed.

PROJECT: GRW
LOCATION:
DATE: SEPTEMBER 13, 2019
REVISION:

REP NAME:
REP OFFICE:
ENGINEER:
CONTRACTOR:

COMPRESSORS AT FA INLET

Element	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz	Comments
ZPDT36 Compressor 1	73	63	71	78	79	80	76	71	
ZPDT36 Compressor 2	73	63	71	78	79	80	76	71	
ZPDT36 Compressor 3	73	63	71	78	79	80	76	71	
ZPDT31 Compressor 1	68	57	62	76	76	79	73	69	
ZPDT31 Compressor 2	68	57	62	76	76	79	73	69	
ZPDT31 Compressor 3	68	57	62	76	76	79	73	69	
Breakout *- Cabinet Attenuation*	-11	-14	-17	-23	-29	-35	-35	-35	Internal Walls
Receiver	-24	-24	-24	-24	-24	-24	-24	-24	
Sum	**43**	**30**	**35**	**39**	**33**	**29**	**24**	**20**	
Target:									
Current: 39 dBA									

Notes:

Sound data created by theoretical methods

Sound pressure calculated at a distance of 20 feet using a directivity factor (Q) of 2 assuming one reflective surface. The environment influences sound pressure, therefore dBA levels cannot be guaranteed.

SINGLE UNIT SUMMATION

Path	63Hz	125Hz	250Hz	500Hz	1KHz	2KHz	4KHz	8KHz
Condenser Fans	62	58	58	56	55	54	49	37
Latent Fans Radiated	54	53	54	38	28	21	16	13
Latent Fans at FA inlet	59	54	58	46	36	32	21	20
Sensible Fans Radiated	49	44	41	27	20	14	11	6
Sensible Fan at FA inlet	60	55	57	47	42	40	34	30
Compressors Radiated	43	29	32	31	24	24	19	15
Compressors at FA Inlet	43	30	35	39	33	29	24	20
Sum	**65**	**61**	**63**	**57**	**55**	**54**	**49**	**38**
Current: 61 dBA								

Notes:

Sound data created by theoretical methods

Sound pressure calculated at a distance of 20 feet using a directivity factor (Q) of 2 assuming one reflective surface. The environment influences sound pressure, therefore dBA levels cannot be guaranteed.

AIR FLOW DATA

SYSTEM SIZE	36K	48K	58K
Outdoor (CFM)	2,130	4,500	4,415

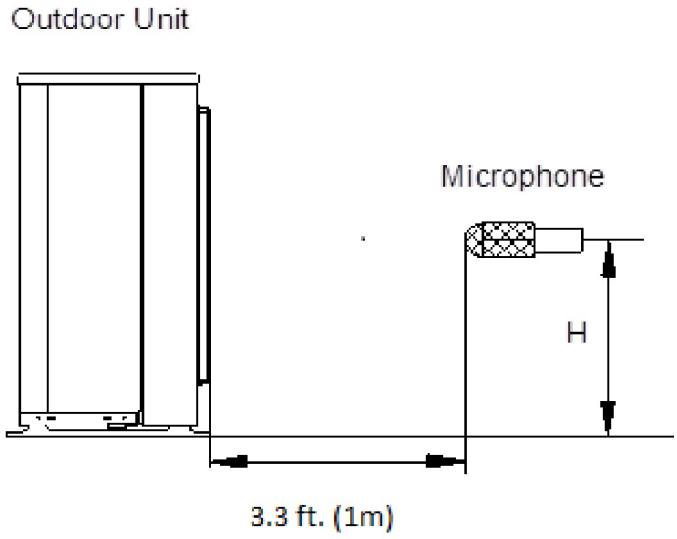
SOUND PRESSURE

SYSTEM SIZE		36K	48K	58K
Outdoor sound pressure level	dBa	63	62.5	64

SOUND PRESSURE IN OCTAVE BANDS

SIZE	Frequency (Hz)	63	125	250	500	1000	2000	4000	8000
36K	Cooling dB(A)	51.3	59.2	56.3	51.3	49.4	46.8	42.6	35.7
	Heating dB(A)	53.8	62.3	60.8	53.7	52.0	48.4	45.8	37.8
48K	Cooling dB(A)	59.2	61.6	55.9	58.1	59.6	51.9	47.8	43.8
	Heating dB(A)	65.1	66.1	61.3	59.7	58.2	54.1	47.5	43.6
58K	Cooling dB(A)	22.9	41.3	46.6	50.1	50.8	52.6	46.0	40.4
	Heating dB(A)	30.0	46.8	48.4	52.0	54.3	52.8	43.7	41.3

OUTDOOR UNIT SOUND PRESSURE TEST CONDITIONS



NOTE: H=0.5 x Height of outdoor unit

	INDOOR CONDITION		OUTDOOR CONDITION	
	DB	WB	DB	WB
Cooling	80.6F (27C)	66.2F (19C)	95F (35C)	75.2F (24C)
Heating	68F (20C)	59F (15C)	44.6F (7C)	42.8F (6C)

APPENDIX B

MODELING RESULTS

TABLE IV. Estimated nighttime octave-band sound levels without mitigation (dB re: 20 µPa)

Receptor	63	125	250	500	1000	2000	4000	8000	dBA
R01	26	24	25	<20	20	<20	<20	<20	23
R02	32	31	32	25	23	<20	<20	<20	28
R03	34	34	33	28	25	22	<20	<20	31
R04	36	39	36	33	29	24	<20	<20	34
R05	36	41	38	35	32	27	20	<20	37
R06	39	44	41	40	37	30	21	<20	41
R07	40	44	41	39	37	30	20	<20	41
PL01	51	58	53	51	49	43	38	30	54
PL02	51	55	50	49	46	41	35	27	51
PL03	42	42	41	36	34	34	28	<20	40
PL04	47	46	48	45	43	42	36	22	48
PL05	49	48	52	46	44	43	37	24	50
PL06	42	39	43	39	37	36	29	<20	43
PL07	36	35	35	30	35	30	22	<20	38
PL08	40	43	38	36	38	31	22	<20	41
PL09	44	50	44	43	42	35	27	<20	46
PL10	45	51	46	45	43	37	30	<20	47
PL11	48	55	51	49	48	42	36	24	52
PL12	49	56	52	51	49	43	37	27	53
PL13	49	55	50	49	47	41	35	25	51
PL14	55	62	57	56	54	48	43	36	58
Medway Noise Ordinance	67	55	48	42	38	35	32	28	-

TABLE V. Estimated nighttime octave-band sound levels with mitigation (dB re: 20 µPa)

Receptor	63	125	250	500	1000	2000	4000	8000	dBA
R01	26	22	23	18	15	10	-6	-54	20
R02	32	30	30	23	20	15	4	-25	26
R03	34	32	33	27	24	21	11	-16	30
R04	36	33	31	27	26	22	12	-12	31
R05	34	37	33	29	25	20	10	-12	31
R06	35	39	34	32	27	19	8	-16	33
R07	34	39	34	32	26	18	7	-19	32
PL01	45	51	45	42	37	29	23	13	43
PL02	45	46	41	39	35	29	23	13	40
PL03	42	39	39	35	32	29	21	3	38
PL04	47	44	45	39	37	35	28	13	43
PL05	49	45	47	40	37	35	29	15	44
PL06	42	38	39	35	32	29	20	7	38
PL07	37	32	32	29	26	22	13	-5	31
PL08	34	34	29	25	24	19	10	-2	28
PL09	36	40	36	31	26	20	11	-5	33
PL10	37	40	37	32	27	21	12	-2	34
PL11	40	45	40	36	31	24	17	5	38
PL12	42	47	42	38	32	25	18	7	39
PL13	41	46	41	37	31	24	18	6	38
PL14	48	52	47	43	38	31	26	17	45
Medway Noise Ordinance	67	55	48	42	38	35	32	28	-