Appendix G

Operational Noise Analysis

Steve Rogers Acoustics

Calleguas Municipal Water District
Lindero Pump Station Rehabilitation Project
Thousand Oaks, CA

Noise Impact Analysis & Recommendations

May 10, 2021

Revised: June 24, 2021

Prepared for:

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By:

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1. Background & Context

a) The project includes replacement of existing pumps and installation of a new diesel back-up generator at the Calleguas Lindero Pump Station property in Thousand Oaks, CA.

b) Calleguas has requested that an analysis of the noise generated by the project be performed to evaluate and potentially mitigate noise impact on sensitive uses nearby, including homes on Coalfax Court and Erbes Road, as well as the Los Cerritos Middle School.

c) Existing ambient noise levels are mostly due to surface street traffic, particularly on Erbes Road and Avenida de las Flores. To establish baseline ambient noise levels, we monitored noise for a continuous 24-hour period between April 22 and 23, 2021 at two locations – selected to represent conditions at the closest sensitive uses – as shown in Figure 1. During this period, the existing pumps were not run so that pump noise would be excluded from the baseline readings.

Figure 1: Site vicinity plan showing location of ambient noise monitors

d) Data collected by the two noise monitors is presented as hourly, A-weighted Equivalent Sound Pressure Level graphs in Appendix A to this report. The measured noise level range is summarized in Table 1:

Table 1: Measured ambient noise levels (Leq, 1-hour in dBA)

Monitor Location	DAYTIME Maximum	NIGHTTIME Minimum
A	57.6	39.0
B	54.6	38.3

2. Applicable Noise Regulations

City of Thousand Oaks Noise Ordinance

Noise is regulated in the City of Thousand Oaks by Chapter 21 of the Municipal Code, also known as the City of Thousand Oaks Noise Ordinance. Emergency activities and equipment are exempt from the City's noise regulations, as stated in Section 5-21.04 which reads:

> *Sec. 5-21.04. Emergency activities exempted.*
>
> *This chapter shall not apply to any public equipment, public vehicle, or public action taken by the City needed in order to protect the public health, safety and welfare.*

While Calleguas is distinct from the City of Thousand Oaks, Lindero Pump Station serves the residents of the city and the proposed generator is needed to protect public health and welfare. We therefore infer that the emergency activities exemption would apply to the generator proposed for this project – provided that the generator is for emergency use only.

For non-emergency equipment – such as the new pumps proposed for this project – the City's noise ordinance does not provide quantifiable (decibel) noise limits. Instead, Section 5-21.02 establishes the following qualitative noise limit:

> *Sec. 5-21.02. Powered equipment in residential areas.*
>
> *Between the hours of 9:00 p.m. and 7:00 a.m. of the following day, no person shall operate any lawn mower, backpack blower, lawn edger, riding tractor, or any other machinery, equipment, or other mechanical or electrical device, or any hand tool which creates a loud, raucous or impulsive sound, within any residential zone or within any commercial zone which can be heard from any inhabited real property in a residential zone.*

Many factors determine the audibility of the noise in a given context and the City's requirement for inaudibility between the hours of 9:00 PM and 7:00 AM cannot therefore be converted into a decibel noise limit with total certainty. However, as a general rule-of-thumb, we would typically expect that mechanical noise would need to be 10 dBA below the otherwise prevailing ambient noise level in order for the mechanical noise to be inaudible. This is a very stringent noise control standard, much more so than typical noise limits imposed by other cities in Southern California. For example, the nighttime noise limit for mechanical equipment prescribed by the City of Los Angeles noise ordinance is 45 dBA (or 40 dBA if the equipment exhibits tonal or impulsive noise characteristics).

3. Calleguas' Noise Control Goals for the Project

Calleguas believes that the City noise ordinance should not be applied to critical infrastructure facilities such as pump stations. In addition, noise produced by the existing pumps is audible in the neighborhood and yet Calleguas is not aware of any complaints or concerns from the City or local residents about noise from the pump station. In keeping with Calleguas' practice of considering the impact of noise on nearby sensitive land uses – Calleguas has proposed the following noise control goals for the project:

- Noise levels produced by the replacement pumps shall not exceed noise levels produced by the existing pumps.
- Noise produced by the new generator shall be limited to 60 dBA or less at the nearest residential use.

4. Generator & Pumps - Current Design Proposals

a) Our noise evaluation is based on the description of the new emergency generator and replacement pump installations provided in the Preliminary Design Report (PDR) for the project dated April 7, 2021, which are summarized as follows:

b) A new 3 MW diesel back-up generator with fuel tank is proposed for the north eastern corner of the pump station yard. For space and budget reasons, the generator set will not be housed in a building. Instead, a weatherproof, sound-attenuating enclosure will be provided.

c) Three new 1,000 HP vertical turbine pumps are proposed. Each will replace an existing pump pair (train) and will be located in the same location – to the southwest of the pumps station building. The pumps themselves will be located in below-grade steel pump barrels, leaving only the motors exposed above grade.

d) An equipment canopy will be provided over the three new pumps, to provide some basic weather protection. The canopy will comprise a pitched roof at approximately 20-feet above grade. There will be no walls around the pumps; the canopy structure will be open on all four sides.

5. Noise Analysis & Modeling

a) The noise impact of the project has been analyzed using SoundPLAN software to create a scale 3D computer model of the project site and its surroundings, including the topography of the area and presence of existing buildings. The model has allowed us to evaluate various scenarios by inserting noise sources – including the existing pumps, new generator (with and without attenuation) and replacement pumps.

b) Noise characteristics of the existing pumps were determined by direct noise measurements made at Lindero Pump Station on April 23, 2021, with the measurement microphone positioned at various points around pump Trains C and D as each operated in turn. Results of these measurements are summarized in Table 2.

Table 2: Existing pump noise levels

	Sound Pressure Level (dB re 20 microPascals) at Octave Band Center Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Pump C-1 (measured at 6-ft)	61.0	67.5	62.4	61.4	68.6	64.6	59.0	47.7	71.1
Pump C-2 (measured at 6-ft)	57.5	74.7	62.3	60.8	70.5	67.2	57.5	46.5	73.0
Motor C-1 (measured at 6-ft)	60.1	70.6	65.6	65.9	78.5	75.8	69.5	59.6	81.2
Motor C-2 (measured at 6-ft)	61.2	68.9	65.8	64.8	76.6	73.5	61.6	50.7	78.9
Pump D-1 (measured at 10-ft)	73.7	78.4	71.9	70.6	71.6	71.7	65.0	59.1	76.7
Pump D-2 (measured at 10-ft)	75.8	82.1	73.5	72.4	70.7	70.7	62.4	58.8	76.5
Motor D-1 (measured at 10-ft)	75.9	83.5	75.1	72.9	76.0	76.7	68.8	61.0	80.2
Motor D-2 (measured at 10-ft)	76.9	80.0	74.4	72.2	74.9	76.2	66.5	61.3	81.1

c) We noticed a high-pitched "whine" from motor C-1, which may have been produced by a worn bearing. This resulted in elevated high-frequency noise levels (especially in the 4 kHz octave band) and overall dBA level for motor C-1.

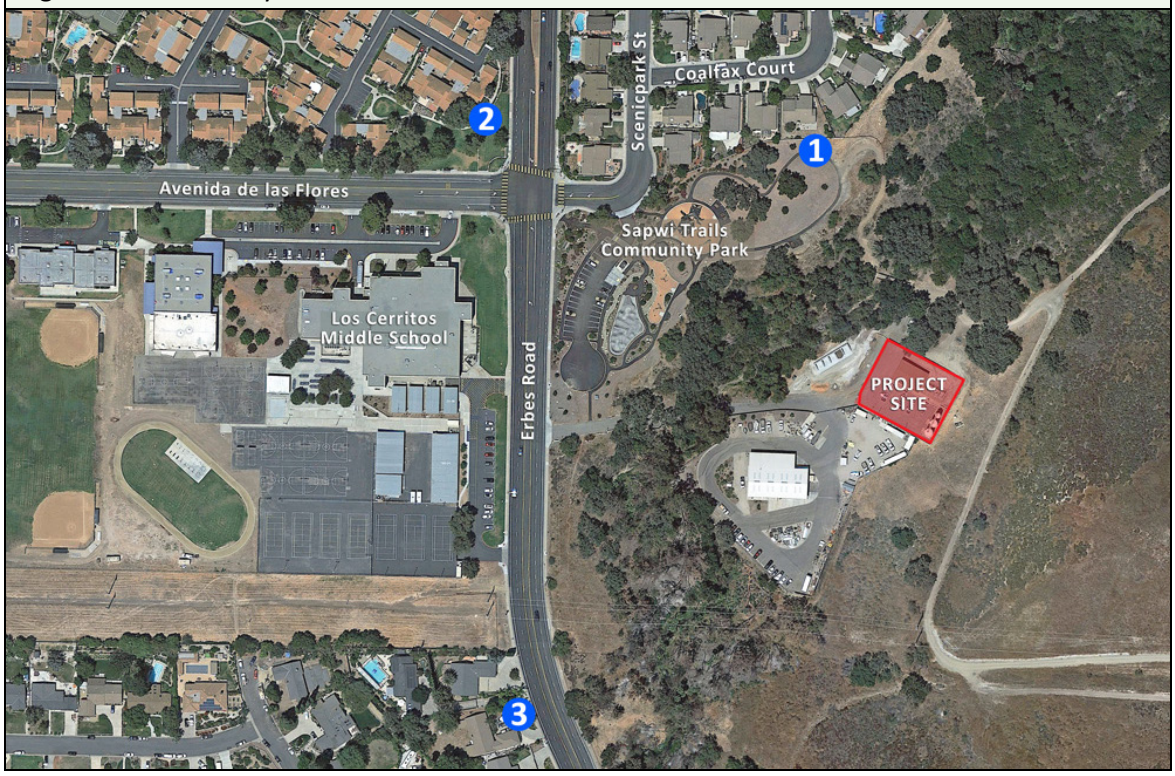
d) Existing pump Train B is currently non-operational and was not included in our noise measurements.

e) Data provided by Kohler and Caterpillar (copies of data sheets attached in Appendix C) has been used to establish composite noise spectra which are attributed to the generator engine and exhaust in the noise model. We have assumed a worst-case condition of 100% load.

f) Data provided by US Motors (copy of data sheet attached in Appendix C) has been used to represent the noise spectrum of each pump motor. For the purposes of our analysis, we have assumed that there will be no significant noise contributions from the pumps themselves, because they will be enclosed and located underground. The 3D nature of the SoundPLAN model has allowed us to accurately represent the effect of the pump canopy – with noise radiating from the open sides – rather than relying on a simple "point source" calculation. We have assumed a worst-case scenario of all three pumps operating simultaneously.

g) In our analysis, we have focused on three receiver points around the project site, selected to represent the closest residential uses, as shown in Figure 2. In each case, we have considered a receiver 5-feet above the ground. In addition, we have used the SoundPLAN software to generate noise maps for the various noise sources scenarios, which are attached as Appendix B to this report.

Figure 2: Site Vicinity Plan



6. Noise Impact of New vs Existing Pumps

a) Noise Map 1 shows noise contours calculated by SoundPLAN for a present-day scenario in which pump Trains C and D are operating simultaneously. Table 3 summarizes the received noise levels for this scenario.

Table 3: Present-day noise levels when pump Trains C & D operate simultaneously		
Receiver Location		Noise Level (dBA)
1	Homes on Coalfax Court	50.2
2	Homes at corner of Avenida de las Flores and Erbes Road	46.6
3	Homes on Erbes Road	44.3

b) Noise Map 2 shows noise contours calculated by SoundPLAN for a future scenario where all three new pumps are operating simultaneously. Table 4 summarizes the received noise levels for this scenario.

Table 4: Future noise levels when all three new pumps are operating simultaneously		
Receiver Location		Noise Level (dBA)
1	Homes on Coalfax Court	46.1
2	Homes at corner of Avenida de las Flores and Erbes Road	44.0
3	Homes on Erbes Road	42.5

c) As Table 4 shows, predicted noise levels when all three new pumps operate simultaneously are lower than those when existing pump trains C and D are operating. This is consistent with Calleguas' noise control goal for the new pumps.

7. Noise Impact of the New Generator

a) Noise Map 3 in Appendix B shows noise contours calculated by SoundPLAN for a future scenario in which the new generator and all three new pumps are operating simultaneously. In this scenario, the generator engine is exposed and there is no silencer on the exhaust. Table 5 summarizes the overall dBA levels at the closest residential receivers.

Table 5: Received noise levels due to the future generator + pumps (NO ATTENUATION)		
Receiver Location		Noise Level (dBA)
1	Homes on Coalfax Court	82.4
2	Homes at corner of Avenida de las Flores and Erbes Road	77.1
3	Homes on Erbes Road	74.7

b) As Table 6 shows, without an enclosure for the engine or a silencer on the exhaust, the generator would result in noise levels at the nearby homes that significantly exceed Calleguas' proposed 60 dBA limit.

c) Noise Map 2 shows noise contours for a scenario in which the engine of the new generator is enclosed in a sound-attenuating enclosure (including attenuated air inlet and outlet openings, sealed doors etc.) and the exhaust is fitted with a "super-critical" grade silencer. Table 6 summarizes the overall dBA levels in this scenario at the closest residential receivers and shows that the attenuated generator set meets Calleguas' self-imposed 60 dBA noise limit at all three receiver locations.

Table 6: Received noise levels due to the future generator in a sound enclosure, exhaust fitted with super-critical grade silencer

Receiver Location		Noise Level (dBA)
1	Homes on Coalfax Court	59.3
2	Homes at corner of Avenida de las Flores and Erbes Road	54.1
3	Homes on Erbes Road	52.2

d) Performance specifications for the generator enclosure are provided in the Conclusions section of this report.

8. Conclusions & Recommendations

a) Replacement Pumps

Based on the available manufacturer's noise data, we predict that the proposed pumps and open-sided equipment canopy would also result in noise levels at the neighboring homes that are lower than those produced by existing pumps. We therefore conclude that the replacement pump portion of the project – as currently designed – meets Calleguas' noise control goal and no additional noise mitigation measures are required to meet that goal.

b) New Generator

For the new back-up generator, Calleguas' has set a noise control goal of 60 dBA or less at the surrounding residential uses. In order to meet the 60 dBA goal, the new generator will require a sound-attenuating enclosure for the engine, in addition to a critical-class silencer for the exhaust.

We recommend that the generator enclosure be designed and constructed in such a way as to limit noise levels when the generator is running under 100% load to the values in Table 7. These noise limits apply at a distance of 23-feet (7 meters) from the generator in all directions – including above – and meeting them will require specially treated ventilation openings and sealed acoustical doors as well as wall and roof assemblies capable of the required level sound-attenuation.

Table 7: GENERATOR ENCLOSURE
Recommended noise limits measured at a distance of 23-feet (7m) from the enclosed generator, over a reflective plane, in all directions - including above

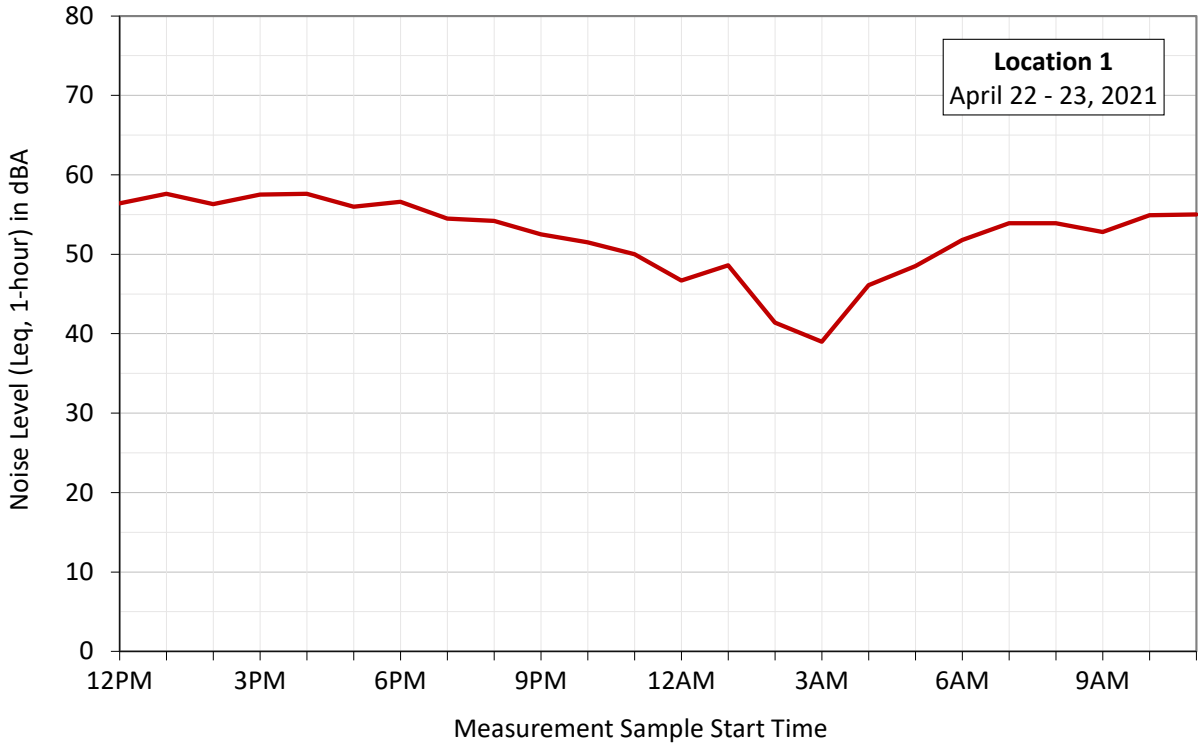
Maximum Unweighted Sound Pressure Level (dB re 20 microPascals) at Octave Band Center Frequency (Hz)								Maximum dBA Level
63	125	250	500	1k	2k	4k	8k	
87	91	86	76	71	68	67	67	81

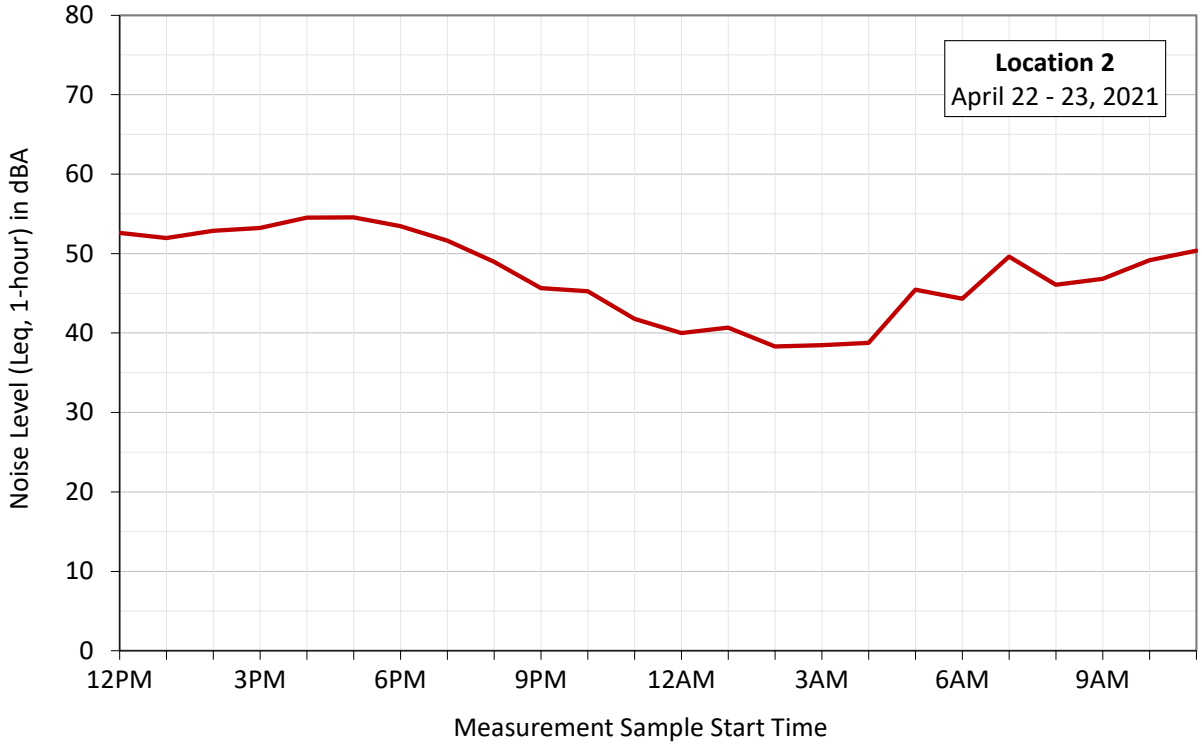
The critical-class silencer for the exhaust should deliver the minimum insertion loss values shown in Table 8. Suitable critical-class silencers are available from GT Exhaust/Silex; a data sheet for a suitable silencer selection is included in Appendix C.

Table 8: SUPER-CRITICAL EXHAUST SILENCER
Recommended insertion loss performance

Minimum Insertion Loss (dB re 20 microPascals) at Octave Band Center Frequency (Hz)							
63	125	250	500	1k	2k	4k	8k
32	42	39	39	36	34	36	38

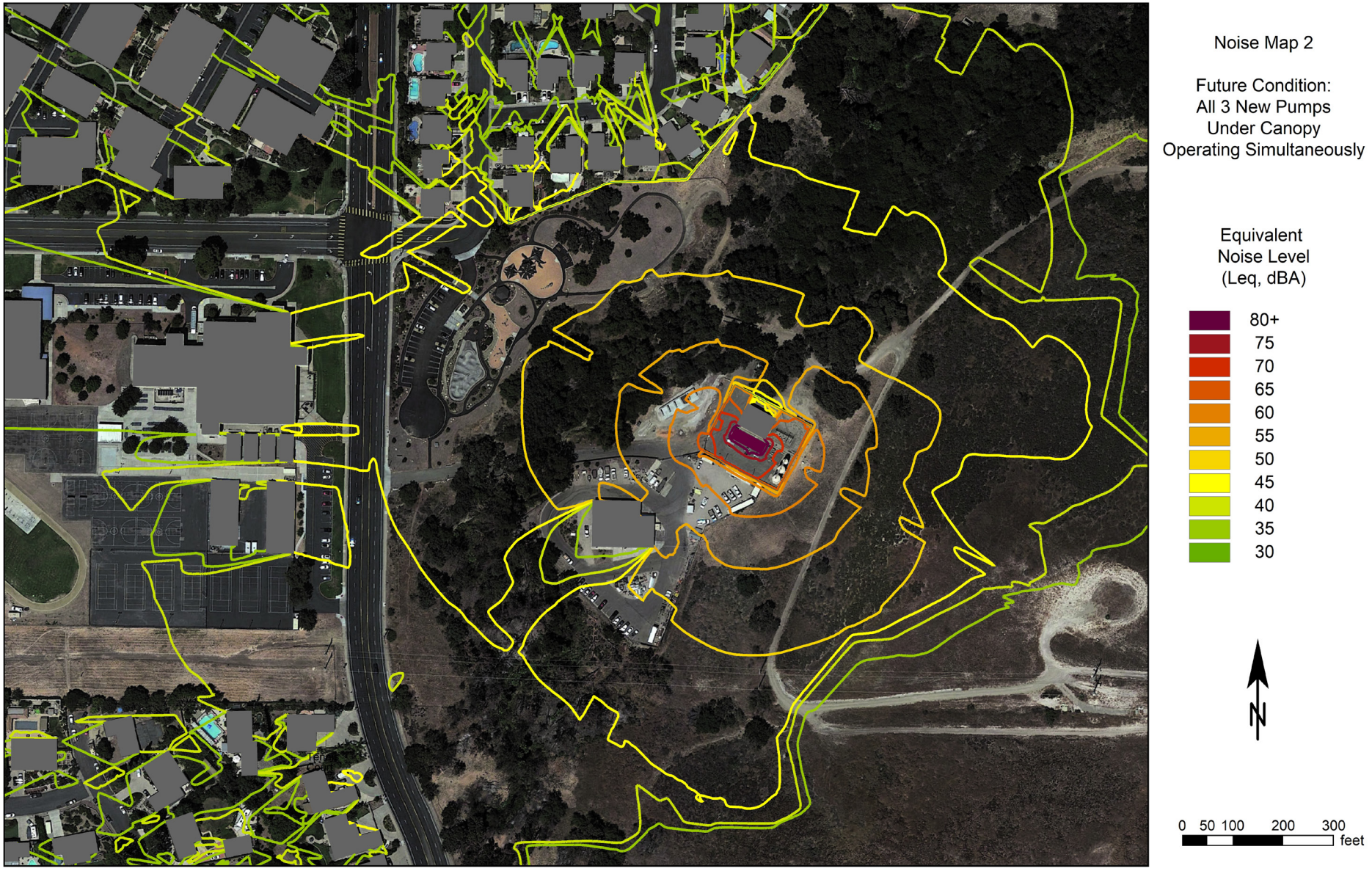
APPENDIX A: 24-hour Noise Monitoring Results

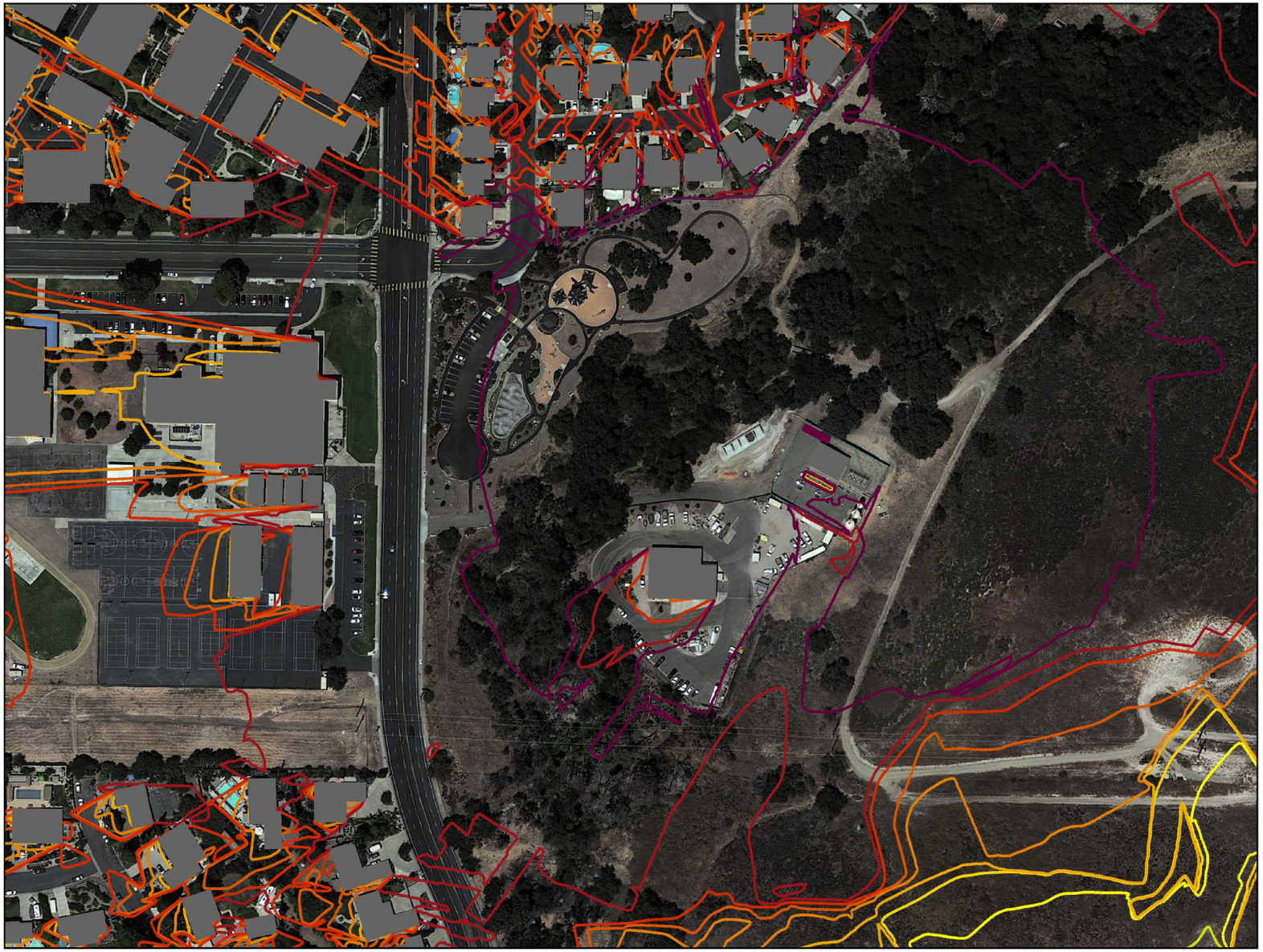




APPENDIX B: SoundPLAN Noise Maps


Noise Map 1
Present Day:
Pump Trains C & D
Operating Simultaneously
Equivalent
Noise Level
(Leq, dBA)
80+
75
70
65
60
55
50
45
40
35
30
N
0 50 100 200 300
feet


Noise Map 2
Future Condition:
All 3 New Pumps
Under Canopy
Operating Simultaneously
Equivalent
Noise Level
(Leq, dBA)
80+
75
70
65
60
55
50
45
40
35
30
N
0 50 100 200 300
feet


Noise Map 3
Future Condition:
Unattenuated
Generator & Exhaust
Plus 3 New Pumps
Equivalent
Noise Level
(Leq, dBA)
80+
75
70
65
60
55
50
45
40
35
30
N
0 50 100 200 300
feet

PACKAGE DATA [DM8448]

NOVEMBER 02, 2020

For Help Desk Phone Numbers Click here

Feature Code:	175DRB5	**Rating Type:**	STANDBY	**Sales model Package:**	C175-16
Engine Sales Model:	C175	**Engine Arrangement Number:**	5683569	**Hertz:**	60
EKW W/F:	3000.0	**Noise Reduction:**	0 dBA	**Back Pressure:**	26.92 inH2O

Engine Package Information

Engine Package Data

This is mechanical sound with exhaust isolated

Package Cooling Information

Data not available.

Package Sound Information

Sound Comments :

Open Sound Data

Distance: 3.3 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
3000.0	100.0	110.69	95.36	106.1	105.58	106.5	102.86	102.07	98.02	103.38
2250.0	75.0	108.63	95.51	106.0	105.18	105.88	102.32	100.41	96.83	103.1
1500.0	50.0	107.51	95.85	105.25	105.08	106.32	101.55	99.12	95.64	96.51
750.0	25.0	106.81	95.53	106.02	104.73	105.76	101.12	98.12	94.41	94.56

Distance: 23.0 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
3000.0	100.0	101.44	90.21	99.76	95.51	95.02	93.98	93.82	88.22	93.74
2250.0	75.0	98.85	90.7	98.39	94.76	94.44	92.65	92.11	87.38	93.08
1500.0	50.0	97.82	91.09	98.35	94.61	94.06	92.44	91.12	86.7	85.9
750.0	25.0	96.49	90.29	98.23	94.07	93.66	91.44	88.85	84.75	82.36

Distance: 49.2 Feet

EKW W/F	% LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
3000.0	100.0	96.43	85.81	95.82	92.07	93.5	89.1	87.21	82.28	87.89
2250.0	75.0	94.54	85.61	94.89	91.97	94.17	87.93	85.8	81.25	86.27
1500.0	50.0	93.49	85.95	93.51	91.26	93.41	87.32	84.62	80.55	80.06
750.0	25.0	92.9	85.53	93.35	91.04	93.32	86.39	83.64	79.46	76.66

This data is for exhaust only - does not include radiator

Cat 3000

PERFORMANCE DATA [DM8448]

MARCH 12, 2015

For Help Desk Phone Numbers Click here

Perf No: DM8448 **Change Level: 06**

General | Heat Rejection | Sound | Emissions | Regulatory | Altitude Derate | Cross Reference | Perf Param Ref

View PDF

SALES MODEL:	C175-16	**COMBUSTION:**	DI
ENGINE POWER (BHP):	4,423	**ENGINE SPEED (RPM):**	1,800
GEN POWER WITH FAN (EKW):	3,000.0	**HERTZ:**	60
COMPRESSION RATIO:	15.3	**FAN POWER (HP):**	187.7
RATING LEVEL:	STANDBY	**ASPIRATION:**	TA
PUMP QUANTITY:	2	**AFTERCOOLER TYPE:**	SCAC
FUEL TYPE:	DIESEL	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC+1AC, 2AC
MANIFOLD TYPE:	DRY	**AFTERCOOLER TEMP (F):**	115
GOVERNOR TYPE:	ADEM4	**JACKET WATER TEMP (F):**	210.2
ELECTRONICS TYPE:	ADEM4	**TURBO CONFIGURATION:**	PARALLEL
CAMSHAFT TYPE:	STANDARD	**TURBO QUANTITY:**	4
IGNITION TYPE:	CI	**TURBOCHARGER MODEL:**	GTB6251BN-48T-1.38
INJECTOR TYPE:	CR	**CERTIFICATION YEAR:**	2008
FUEL INJECTOR:	3198470	**CRANKCASE BLOWBY RATE (FT3/HR):**	2,436.4
REF EXH STACK DIAMETER (IN):	14	**FUEL RATE (RATED RPM) NO LOAD (GAL/HR):**	25.1
		PISTON SPD @ RATED ENG SPD (FT/MIN):	2,598.4

INDUSTRY	SUB INDUSTRY	APPLICATION
ELECTRIC POWER	STANDARD	PACKAGED GENSET

General Performance Data Top

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
EKW	%	BHP	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	IN-HG	DEG F
3,000.0	100	4,423	377	0.339	214.2	91.5	131.3	1,229.8	64.3	891.9
2,700.0	90	3,999	341	0.338	192.9	81.4	129.6	1,193.4	56.5	879.2
2,400.0	80	3,576	305	0.340	173.9	73.0	128.3	1,163.0	50.0	869.4
2,250.0	75	3,364	286	0.344	165.3	69.5	127.8	1,150.7	47.5	865.8
2,100.0	70	3,152	268	0.351	158.2	67.1	127.6	1,142.6	45.8	864.2
1,800.0	60	2,729	232	0.371	144.5	62.7	127.3	1,127.7	42.8	861.6
1,500.0	50	2,305	196	0.396	130.4	57.5	126.9	1,109.9	39.5	858.0
1,200.0	40	1,882	160	0.417	112.2	46.4	125.8	1,083.9	32.9	848.4
900.0	30	1,458	124	0.440	91.6	34.8	124.5	1,041.6	25.3	834.7
750.0	25	1,246	106	0.453	80.6	29.0	123.8	1,014.2	21.3	826.5
600.0	20	1,035	88	0.467	69.1	23.2	123.2	961.6	17.6	797.3
300.0	10	611	52	0.514	44.9	11.7	122.1	752.4	10.6	649.3

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
EKW	%	BHP	IN-HG	DEG F	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
3,000.0	100	4,423	92	451.5	9,772.2	25,620.0	42,761.1	44,259.6	9,320.0	8,667.2
2,700.0	90	3,999	82	414.6	8,943.0	23,086.1	38,888.2	40,238.8	8,477.9	7,889.0
2,400.0	80	3,576	74	384.7	8,243.6	20,980.8	35,642.2	36,860.0	7,761.6	7,230.7
2,250.0	75	3,364	70	373.0	7,953.8	20,121.0	34,304.6	35,462.7	7,463.6	6,958.6
2,100.0	70	3,152	68	366.1	7,753.3	19,531.3	33,379.1	34,486.9	7,254.0	6,770.2
1,800.0	60	2,729	65	354.0	7,382.3	18,480.5	31,695.8	32,707.6	6,876.9	6,433.3
1,500.0	50	2,305	60	339.0	6,952.0	17,314.7	29,788.0	30,700.3	6,460.8	6,059.1
1,200.0	40	1,882	50	308.0	6,076.8	15,264.4	25,920.8	26,704.4	5,737.4	5,392.5
900.0	30	1,458	39	267.2	5,160.3	12,786.8	21,909.9	22,550.1	4,857.0	4,574.5
750.0	25	1,246	33	243.5	4,701.8	11,409.7	19,919.4	20,483.0	4,361.8	4,112.2
600.0	20	1,035	27	217.8	4,243.2	9,964.4	17,938.9	18,422.6	3,897.7	3,682.5
300.0	10	611	14	160.9	3,325.6	6,901.7	14,007.7	14,322.1	3,060.0	2,917.8

Heat Rejection Data Top

Note(s)

PUMP POWER IS INCLUDED IN HEAT REJECTION BALANCE, BUT IS NOT SHOWN.

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHUAST RECOVERY TO 350F	FROM OIL COOLER	FROM 2ND STAGE AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
EKW	%	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
3,000.0	100	4,423	78,436	8,336	179,063	101,475	24,486	28,224	187,548	459,719	489,716
2,700.0	90	3,999	70,525	7,773	161,695	89,988	22,085	23,040	169,590	414,639	441,694
2,400.0	80	3,576	63,777	7,308	147,071	80,799	19,915	18,972	151,631	373,899	398,296
2,250.0	75	3,364	60,840	7,112	140,788	77,146	18,917	17,358	142,651	355,157	378,331
2,100.0	70	3,152	58,599	6,984	136,398	74,726	18,070	16,328	133,672	339,264	361,402
1,800.0	60	2,729	54,754	6,750	128,972	70,419	16,496	14,928	115,714	309,709	329,917
1,500.0	50	2,305	50,870	6,524	120,720	65,533	14,875	13,738	97,755	279,270	297,493
1,200.0	40	1,882	45,639	6,304	106,679	55,828	12,823	11,188	79,796	240,744	256,453
900.0	30	1,458	38,952	6,092	88,655	45,754	10,475	8,227	61,838	196,664	209,497
750.0	25	1,246	35,102	5,988	78,431	40,805	9,211	6,848	52,858	172,945	184,229
600.0	20	1,035	30,773	5,789	67,509	34,336	7,896	5,681	43,879	148,253	157,927
300.0	10	611	20,277	4,828	43,873	17,588	5,132	4,028	25,920	96,361	102,649

Sound Data Top

Note(s)

SOUND DATA REPRESENTATIVE OF NOISE PRODUCED BY THE "ENGINE ONLY"

EXHAUST: Sound Power (1/3 Octave Frequencies)

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	OVERALL SOUND	100 HZ	125 HZ	160 HZ	200 HZ	250 HZ	315 HZ	400 HZ	500 HZ	630 HZ	800 HZ
EKW	%	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
3,000.0	100	4,423	134.5	109.7	115.8	113.7	115.5	116.0	119.0	119.9	121.5	120.4	121.2
2,700.0	90	3,999	133.2	110.2	116.1	112.6	114.3	114.5	117.3	118.4	120.1	118.3	119.5
2,400.0	80	3,576	132.0	111.6	116.6	111.0	112.7	113.0	115.6	116.9	118.4	116.5	117.7
2,250.0	75	3,364	131.4	112.4	116.8	110.2	111.9	112.3	114.8	116.2	117.6	115.6	116.8
2,100.0	70	3,152	130.7	113.2	117.1	109.3	111.1	111.6	114.0	115.5	116.8	114.7	115.9
1,800.0	60	2,729	129.5	114.8	117.6	107.5	109.4	110.2	112.3	114.1	115.1	113.0	114.0
1,500.0	50	2,305	128.2	116.3	118.1	105.8	107.8	108.7	110.6	112.6	113.4	111.2	112.2
1,200.0	40	1,882	127.0	117.9	118.6	104.1	106.1	107.3	108.9	111.2	111.8	109.5	110.3
900.0	30	1,458	125.7	119.5	119.1	102.3	104.4	105.9	107.3	109.8	110.1	107.7	108.5
750.0	25	1,246	125.1	120.2	119.3	101.4	103.6	105.2	106.4	109.1	109.3	106.8	107.6
600.0	20	1,035	124.4	121.0	119.6	100.6	102.8	104.5	105.6	108.4	108.4	105.9	106.7
300.0	10	611	123.2	122.6	120.0	98.8	101.1	103.0	103.9	106.9	106.8	104.2	104.8

EXHAUST: Sound Power (1/3 Octave Frequencies)

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	1000 HZ	1250 HZ	1600 HZ	2000 HZ	2500 HZ	3150 HZ	4000 HZ	5000 HZ	6300 HZ	8000 HZ	10000 HZ
EKW	%	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
3,000.0	100	4,423	122.2	122.6	123.5	124.9	124.7	123.1	122.4	121.6	120.1	119.0	123.4
2,700.0	90	3,999	120.7	121.0	122.2	123.5	123.2	121.5	120.8	120.0	118.7	117.8	123.8
2,400.0	80	3,576	119.4	119.7	120.8	122.5	121.9	120.4	119.8	119.0	117.7	117.1	123.5
2,250.0	75	3,364	118.8	119.1	120.1	122.0	121.3	119.9	119.4	118.6	117.2	116.8	123.3
2,100.0	70	3,152	118.1	118.5	119.4	121.5	120.6	119.3	119.0	118.2	116.7	116.5	123.1
1,800.0	60	2,729	116.9	117.3	118.0	120.4	119.4	118.3	118.1	117.3	115.6	115.9	122.6
1,500.0	50	2,305	115.6	116.2	116.6	119.4	118.1	117.3	117.2	116.4	114.6	115.3	122.1
1,200.0	40	1,882	114.3	115.0	115.1	118.4	116.8	116.3	116.4	115.6	113.6	114.7	121.6
900.0	30	1,458	113.1	113.8	113.7	117.4	115.6	115.3	115.5	114.7	112.6	114.1	121.1
750.0	25	1,246	112.4	113.2	113.0	116.9	114.9	114.8	115.1	114.3	112.1	113.8	120.9
600.0	20	1,035	111.8	112.6	112.3	116.4	114.3	114.2	114.7	113.9	111.6	113.5	120.7
300.0	10	611	110.5	111.4	110.9	115.4	113.8	113.2	113.8	113.0	110.6	112.9	120.2

MECHANICAL: Sound Power (1/3 Octave Frequencies)

106,4 110.3 117.2

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	OVERALL SOUND	100 HZ	125 HZ	160 HZ	200 HZ	250 HZ	315 HZ	400 HZ	500 HZ	630 HZ	800 HZ
EKW	%	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
3,000.0	100	4,423	125.9	89.8	105.6	98.4	100.6	104.5	108.3	111.6	113.3	112.5	114.1
2,700.0	90	3,999	125.8	89.4	105.5	97.9	100.9	103.3	108.7	111.1	112.7	112.2	113.8
2,400.0	80	3,576	126.0	89.0	105.0	97.8	99.8	102.4	108.0	111.0	111.8	111.9	113.0
2,250.0	75	3,364	126.1	88.8	104.7	97.8	99.1	102.1	107.5	111.0	111.3	111.7	112.6
2,100.0	70	3,152	126.2	88.5	104.3	97.8	98.4	101.7	107.0	111.0	110.8	111.6	112.2
1,800.0	60	2,729	126.5	88.1	103.7	97.8	96.9	100.9	106.0	111.0	109.8	111.2	111.4
1,500.0	50	2,305	126.7	87.7	103.0	97.8	95.4	100.2	105.1	111.0	108.8	110.9	110.5
1,200.0	40	1,882	127.0	87.3	102.4	97.7	94.0	99.4	104.1	110.9	107.8	110.6	109.7
900.0	30	1,458	127.2	86.9	101.7	97.7	92.5	98.6	103.1	110.9	106.8	110.2	108.9
750.0	25	1,246	127.3	86.7	101.4	97.7	91.8	98.2	102.6	110.9	106.3	110.1	108.5
600.0	20	1,035	127.4	86.4	101.0	97.7	91.0	97.9	102.1	110.9	105.8	109.9	108.1
300.0	10	611	127.4	86.0	100.4	97.7	89.6	97.1	101.2	110.9	104.8	109.6	107.2

MECHANICAL: Sound Power (1/3 Octave Frequencies)

118.3 119.7 116.6 120.3

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	1000 HZ	1250 HZ	1600 HZ	2000 HZ	2500 HZ	3150 HZ	4000 HZ	5000 HZ	6300 HZ	8000 HZ	10000 HZ
EKW	%	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
3,000.0	100	4,423	112.7	113.9	114.6	115.3	115.0	112.7	110.9	111.9	114.3	113.4	117.8
2,700.0	90	3,999	112.5	113.7	114.5	115.0	114.5	112.3	110.4	111.1	113.6	112.9	119.2
2,400.0	80	3,576	112.2	113.2	113.8	114.4	114.2	111.9	110.0	110.7	113.2	112.6	121.4
2,250.0	75	3,364	112.0	112.9	113.4	114.0	114.2	111.7	109.8	110.5	112.9	112.6	122.6
2,100.0	70	3,152	111.8	112.6	113.0	113.7	114.1	111.4	109.6	110.3	112.7	112.5	123.8
1,800.0	60	2,729	111.3	112.1	112.2	113.1	113.9	111.0	109.3	110.0	112.3	112.3	126.2
1,500.0	50	2,305	110.9	111.5	111.4	112.4	113.7	110.6	109.0	109.6	111.9	112.1	128.6
1,200.0	40	1,882	110.5	110.9	110.5	111.7	113.5	110.2	108.6	109.3	111.5	111.9	131.0
900.0	30	1,458	110.1	110.3	109.7	111.1	113.4	109.8	108.3	109.0	111.0	111.8	133.4
750.0	25	1,246	109.9	110.0	109.3	110.7	113.3	109.6	108.1	108.8	110.8	111.7	134.6
600.0	20	1,035	109.7	109.7	108.9	110.4	113.2	109.3	107.9	108.6	110.6	111.6	135.8
300.0	10	611	109.3	109.2	108.1	109.7	113.0	108.9	107.6	108.3	110.2	111.4	138.2

Emissions Data Top

Units Filter All Units

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN / ENGINE POWER / PERCENT LOAD			EKW	3,000.0	2,250.0	1,500.0	750.0	300.0
			BHP	4,423	3,364	2,305	1,246	611
			%	100	75	50	25	10
TOTAL NOX (AS NO2)			G/HR	32,004	21,429	9,376	3,795	3,518
TOTAL CO			G/HR	5,743	6,479	3,534	5,489	3,566
TOTAL HC			G/HR	647	597	1,048	1,031	1,300
PART MATTER			G/HR	210.2	221.1	203.5	409.7	343.1
TOTAL NOX (AS NO2)		(CORR 5% O2)	MG/NM3	3,736.7	3,329.4	1,866.7	1,263.6	2,259.3
TOTAL CO		(CORR 5% O2)	MG/NM3	586.2	854.4	602.3	1,594.3	1,701.1
TOTAL HC		(CORR 5% O2)	MG/NM3	54.2	69.1	157.2	265.0	625.2
PART MATTER		(CORR 5% O2)	MG/NM3	18.2	25.6	31.4	103.5	158.0
TOTAL NOX (AS NO2)		(CORR 5% O2)	PPM	1,820	1,621	909	616	1,101
TOTAL CO		(CORR 5% O2)	PPM	469	684	482	1,275	1,361
TOTAL HC		(CORR 5% O2)	PPM	101	129	294	495	1,167
TOTAL NOX (AS NO2)			G/HP-HR	7.28	6.40	4.08	3.05	5.76
TOTAL CO			G/HP-HR	1.31	1.93	1.54	4.41	5.84
TOTAL HC			G/HP-HR	0.15	0.18	0.46	0.83	2.13
PART MATTER			G/HP-HR	0.05	0.07	0.09	0.33	0.56
TOTAL NOX (AS NO2)			LB/HR	70.56	47.24	20.67	8.37	7.75
TOTAL CO			LB/HR	12.66	14.28	7.79	12.10	7.86
TOTAL HC			LB/HR	1.43	1.32	2.31	2.27	2.87
PART MATTER			LB/HR	0.46	0.49	0.45	0.90	0.76

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN		EKW	3,000.0	2,250.0	1,500.0	750.0	300.0
ENGINE POWER		BHP	4,423	3,364	2,305	1,246	611
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		G/HR	26,670	17,858	7,813	3,162	2,931
TOTAL CO		G/HR	3,190	3,599	1,963	3,050	1,981
TOTAL HC		G/HR	486	449	788	776	977
TOTAL CO2		KG/HR	2,143	1,609	1,236	751	416
PART MATTER		G/HR	150.1	157.9	145.3	292.7	245.1
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	3,113.9	2,774.5	1,555.6	1,053.0	1,882.8
TOTAL CO	(CORR 5% O2)	MG/NM3	325.6	474.7	334.6	885.7	945.0
TOTAL HC	(CORR 5% O2)	MG/NM3	40.7	51.9	118.2	199.3	470.1
PART MATTER	(CORR 5% O2)	MG/NM3	13.0	18.3	22.5	73.9	112.8
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,517	1,351	758	513	917
TOTAL CO	(CORR 5% O2)	PPM	261	380	268	709	756
TOTAL HC	(CORR 5% O2)	PPM	76	97	221	372	878
TOTAL NOX (AS NO2)		G/HP-HR	6.07	5.33	3.40	2.54	4.80
TOTAL CO		G/HP-HR	0.73	1.07	0.85	2.45	3.24
TOTAL HC		G/HP-HR	0.11	0.13	0.34	0.62	1.60
PART MATTER		G/HP-HR	0.03	0.05	0.06	0.24	0.40
TOTAL NOX (AS NO2)		LB/HR	58.80	39.37	17.22	6.97	6.46
TOTAL CO		LB/HR	7.03	7.94	4.33	6.72	4.37
TOTAL HC		LB/HR	1.07	0.99	1.74	1.71	2.15
TOTAL CO2		LB/HR	4,723	3,547	2,724	1,655	917
PART MATTER		LB/HR	0.33	0.35	0.32	0.65	0.54
OXYGEN IN EXH		%	9.9	10.6	11.8	12.6	14.4
DRY SMOKE OPACITY		%	0.5	0.7	0.6	4.8	4.7
BOSCH SMOKE NUMBER			0.19	0.28	0.24	1.25	1.24

Regulatory Information Top

EPA TIER 2 — **2006 - 2010**

GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 89 SUBPART D AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	NON-ROAD	TIER 2	CO: 3.5 NOx + HC: 6.4 PM: 0.20

EPA EMERGENCY STATIONARY — **2011 - ----**

GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE EMERGENCY STATIONARY REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	STATIONARY	EMERGENCY STATIONARY	CO: 3.5 NOx + HC: 6.4 PM: 0.20

Altitude Derate Data Top

Note(s)

ALTITUDE DERATE DATA IS BASED ON THE ASSUMPTION OF A 20 DEGREES CELSIUS(36 DEGREES FAHRENHEIT) DIFFERENCE BETWEEN AMBIENT OPERATING TEMPERATURE AND ENGINE INLET MANIFOLD TEMPERATURE (IMAT). AMBIENT OPERATING TEMPERATURE IS DEFINED AS THE AIR TEMPERATURE MEASURED AT THE TURBOCHARGER COMPRESSOR INLET.

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	30	40	50	60	70	80	90	100	110	120	130	140	NORMAL
ALTITUDE (FT)													
0	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,413	4,423
1,000	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,362	4,423
2,000	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,423	4,382	4,323	4,233	4,423
3,000	4,360	4,360	4,360	4,360	4,360	4,360	4,360	4,360	4,359	4,294	4,200	4,107	4,360
4,000	4,185	4,185	4,185	4,185	4,185	4,185	4,184	4,182	4,181	4,139	4,080	4,021	4,185
5,000	4,019	4,019	4,019	4,019	4,019	4,019	4,018	4,015	4,013	3,992	3,963	3,935	4,019
6,000	3,867	3,867	3,867	3,867	3,867	3,867	3,866	3,862	3,858	3,853	3,846	3,839	3,867
7,000	3,746	3,746	3,746	3,746	3,746	3,746	3,745	3,741	3,737	3,731	3,725	3,718	3,746
8,000	3,626	3,626	3,626	3,626	3,626	3,626	3,624	3,620	3,615	3,610	3,604	3,597	3,626
9,000	3,511	3,511	3,511	3,511	3,511	3,511	3,509	3,505	3,500	3,495	3,489	3,483	3,511
10,000	3,401	3,401	3,401	3,401	3,401	3,401	3,399	3,394	3,390	3,384	3,379	3,373	3,401
11,000	3,290	3,290	3,290	3,290	3,290	3,290	3,288	3,284	3,279	3,274	3,269	3,264	3,290
12,000	3,180	3,180	3,180	3,180	3,180	3,180	3,178	3,173	3,169	3,164	3,159	3,154	3,180
13,000	3,080	3,080	3,080	3,080	3,080	3,080	3,079	3,075	3,071	3,067	3,063	3,059	3,080
14,000	2,982	2,982	2,982	2,982	2,982	2,982	2,981	2,978	2,976	2,973	2,970	2,967	2,982
15,000	2,885	2,885	2,885	2,885	2,885	2,885	2,884	2,882	2,881	2,879	2,877	2,876	2,885

Cross Reference Top

Engine Arrangement

Arrangement Number	Effective Serial Number	Engineering Model	Engineering Model Version
3079788	WYB00001	GS265	-

Test Specification Data

Test Spec	Setting	Effective Serial Number	Engine Arrangement	Governor Type	Default Low Idle Speed	Default High Idle Speed
0K8532	LL6018	WYB00001	3079788	ADEM4		

Performance Parameter Reference Top

Parameters Reference: DM9600 - 06

PERFORMANCE DEFINITIONS

PERFORMANCE DEFINITIONS DM9600

APPLICATION:
Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional

TECHNICAL INFORMATION BULLETIN

Generator Set Sound Data Sheet

			Sound Pressure Data in dB(A)	
Generator Set Model	**Hz**	**Load**	**Raw Exhaust**	**Open Unit, Isolated Exhaust**
KD3000	60	100% Load	120.4	99.1
		No Load	111.2	98.7

Note: Sound pressure data is the logarithmic average of eight perimeter measurement points at a distance of 7 m (23 ft.), except Raw Exhaust data which is a single measurement point at 1 m (3.3 ft.) from the mouth of a straight pipe exhaust.

KD3000	**60 Hz**

				Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)		Measurement Clock Position	Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
100% Load	7 (23)	Open Unit, Isolated Exhaust	3:00	68.6	86.3	89.1	92.5	94.8	94.3	91.2	87.4	100.4
			1:30	61.8	85.1	88.2	92.8	93.5	92.0	88.4	84.2	98.9
			12:00 - Engine	65.9	92.9	90.8	94.1	95.7	93.3	87.1	77.4	100.9
			10:30	62.9	91.9	92.2	94.0	95.1	93.7	89.1	84.4	101.0
			9:00	71.7	88.1	87.9	90.9	93.2	92.3	89.4	85.7	98.9
			7:30	65.7	91.3	88.5	89.8	90.5	91.0	87.2	82.0	97.9
			6:00 - Alternator	67.0	87.1	89.9	87.3	87.8	87.7	83.3	77.0	95.4
			4:30	65.4	90.5	88.0	89.0	89.0	89.1	84.2	77.8	96.6
			8 - pos. log avg.	67.2	89.9	89.6	91.9	93.2	92.1	88.1	83.5	99.1

			Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Exhaust	Octave Band Center Frequency (Hz)								Overall Level
			63	125	250	500	1000	2000	4000	8000	
100% Load	1 (3.3)	Raw Exhaust (No Silencer)	90.1	113.1	112.9	111.9	111.1	111.0	112.7	108.9	120.4

KOHLER CO., Kohler, Wisconsin 53044 USA
Phone 920-457-4441, Fax 920-459-1646
For the nearest sales and service outlet in the US and Canada, phone 1-800-544-2444
KOHLERPower.com

KD3000	60 Hz

Load	Distance, m (ft)		Measurement Clock Position	Sound Pressure Levels, dB(A)								
				Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
No Load	7 (23)	Open Unit, Isolated Exhaust	3:00	63.9	83.7	86.0	94.2	95.0	93.6	88.7	80.4	99.8
			1:30	59.5	86.4	86.2	93.4	93.7	91.3	86.2	77.2	98.6
			12:00 - Engine	63.0	94.0	89.9	93.8	96.0	93.1	86.8	75.6	100.9
			10:30	61.4	91.4	90.1	93.4	95.8	93.0	87.6	77.6	100.4
			9:00	63.0	85.5	86.6	91.6	94.7	91.4	87.0	78.7	98.6
			7:30	63.3	91.8	84.2	91.5	91.5	89.7	84.5	75.2	97.7
			6:00 - Alternator	62.1	86.0	83.6	87.5	87.5	86.8	81.1	71.9	93.8
			4:30	62.2	90.7	83.9	90.2	89.5	87.3	80.6	70.7	96.0
			8 - pos. log avg.	62.5	90.0	87.0	92.4	93.8	91.4	86.1	76.9	98.7

Load	Distance, m (ft)	Exhaust	Sound Pressure Levels, dB(A)								
			Octave Band Center Frequency (Hz)								Overall Level
			63	125	250	500	1000	2000	4000	8000	
No Load	1 (3.3)	Raw Exhaust (No Silencer)	81.8	104.7	103.8	103.0	104.5	103.0	98.5	90.6	111.2

Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler® generator set distributor for availability.

MOTOR NOISE QUOTATION

MODEL NO.	CATALOG NO.	ORDER NO.	LINE NO.	PHASE	TYPE	FRAME
		1506575	100	3	HVE4	6808

OCTAVE BAND CENTER FREQUENCY (HERTZ)	SOUND PRESSURE LEVELS MEASURED IN A REVERBERANT SOUND ROOM PER IEEE 85, CORRECTED TO FREE FIELD CONDITIONS REFERENCE: .0002 DYNES/CM² WEIGHTING NETWORK 'A'	
	295159	MPI (Ref)
	900	HP
	6	POLES
	60	HZ
31.5	---	DECIBELS
63	45.0	DECIBELS
125	57.5	DECIBELS
250	69.9	DECIBELS
500	78.2	DECIBELS
1000	81.5	DECIBELS
2000	78.4	DECIBELS
4000	73.9	DECIBELS
8000	66.1	DECIBELS
OVERALL	85.0	DECIBELS

DISTANCE FROM MAJOR MOTOR SURFACES 1 Meter

DATA IS TYPICAL UNDER NO LOAD,
IN A FREE FIELD PER ANSI S12.51 AND NEMA MG-1

DATE: 5/4/2021

SUPER CRITICAL GRADE SILENCER

32 to 42 dBA Noise Reduction • EGSA Class 6

A201-6100

APPLICATION

Super critical grade silencer providing a premium level of performance where ambient noise levels are very low and optimal attenuation is mandatory. Recommended for all marine, stationary and mobile, power applications where noise attenuation is critical.

CONSTRUCTION

Sizes 6" and below come standard with ID Cuff/OD Tube connections. Sizes 6" and above come standard with ANSI pattern flanged connections. Additional connections available, consult factory for details.

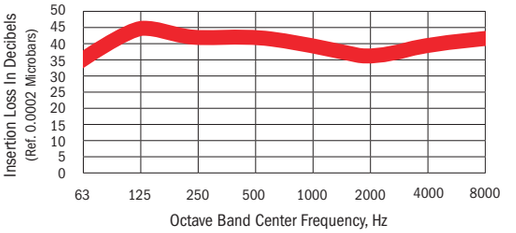
FINISH AND OPTIONAL MATERIALS

Standard aluminzed steel constructions with high temperature, oven cured black paint. Silencers also available in optional colors and stainless steel. Consult with Product Specialist for details.

OPTIONS

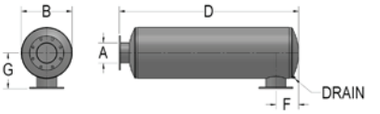
- Aluminized steel, 304L or 316L stainless steel
- Dual inlet or custom inlet/outlet configurations
- Thermal insulation blankets to suit all configurations
- Mounting brackets, gussets and lifting lugs

TYPICAL ATTENUATION CURVE

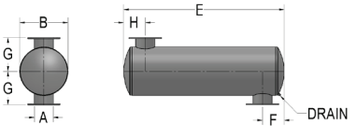


TYPICAL ORIENTATIONS

STYLE 1



STYLE 2



STYLE 3

DIMENSIONS

Part Number	A Inlet Size	B Diameter	C OAL - 1	D OAL - 2	E OAL - 3	F Min	F Max	G Flange Center	H Min	H Max	WT
SIZES 6" AND BELOW COME STANDARD WITH ID CUFF/OD TUBE CONNECTIONS											
A201-6102	2	10	30	27	24	4	8	8	4	7	33
A201-61025	2.5	10	42	39	36	5	15	8	5	11	46
A201-6103	3	12	43	40	37	5	15	9	5	11	58
A201-61035	3.5	14	55	52	49	6	21	10	6	16	92
A201-6104	4	14	55	52	49	6	21	11	6	16	92
A201-6105	5	16	62	58	54	7	23	12	7	17	118
A201-6106	6	20	75	71	67	8	30	14	8	22	184
SIZES 8" AND ABOVE COME STANDARD WITH ANSI PATTERN FLANGED CONNECTIONS											
A201-6108	8	24	76	72	68	10	30	16	10	21	283
A201-6110	10	28	100	96	93	11	42	18	11	22	499
A201-6112	12	36	102	99	95	14	40	22	14	33	749
A201-6114	14	36	138	135	132	15	61	22	15	46	1021
A201-6116	16	42	140	137	133	16	60	25	16	46	1325
A201-6118	18	48	142	139	135	18	59	29	18	46	1541
A201-6120	20	48	165	162	159	19	72	29	19	55	1773
A201-6122	22	54	166	163	161	21	71	32	21	52	2045
A201-6124	24	60	167	164	162	23	70	35	23	55	2335

All spatial dimensions are in inches. Inlet sizes available up to 30 inches.
Additional connections available. **See silencer price book for breakdown of A200 part number.**
F MAX is for inlet only. H MAX is for outlet only. All weights are in pounds. All weights are approximate.
Use diameter to find bracket sizes. Example: A201-6108 (24" dia) would require 3ACI-28-2400 brackets (or similar 29 brackets).