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September 1, 2020

Mr. Matt Borba
Knights' Electric, Inc.
11410 Old Redwood Hwy.
Windsor, CA. 95492
VIA E-Mail: matt@knightselectric.com
CC: rocky.smith@harrisingroupltd.com

**SUBJECT: Emergency Generator Noise Analysis
The Lodge at Sonoma, Sonoma, CA**

Dear Matt:

Illingworth & Rodkin, Inc. (I&R) has been retained by Knights' Electric, Inc. to evaluate noise from the emergency generator proposed at the Lodge at Sonoma to determine whether the noise emissions from the required testing and emergency operation of this generator will comply with the City of Sonoma's Noise Guidelines. The following letter report describes the City's Noise requirements relevant to this assessment and presents the results of our analysis of noise produced by the operation of the proposed generator at adjacent residential property lines versus the City's Noise Standards.

REGULATORY BACKGROUND

City of Sonoma Municipal Code

Chapter 9.56 of the City of Sonoma Municipal Code establishes General Noise Limits that are also applicable in this noise assessment. The project property is zoned Gateway Commercial, and the General Noise Limits in the Municipal Code establish limits of 65 dBA for intermittent sounds and 55 dBA for constant sounds at this land use. The Municipal Code defines the terms "Constant" and "Intermittent" as follows:

- *"Constant" noise means a continuous noise produced where there is no noticeable change in the level of the noise source. Examples would include such noises as those associated with air conditioners and pool equipment.*
- *"Intermittent" noise means repetitive noises where there is a distinction between the onset and decay of the sound. Examples would include hammering and dog barking.*

Based on the above definitions, emergency generator noise would be characterized as "constant" when considering that the noise does not noticeably change once the generator is operational.

I&R understands that on August 3, 2020 the Sonoma City Council approved a 5 dBA allowance to these limits for emergency generators, thus the limit for constant noise from the proposed emergency generators would be 60 dBA.

City of Sonoma General Plan

The Noise Element regulates stationary noise sources from new commercial and industrial development as it could potentially affect noise-sensitive adjacent land uses. The standards establish maximum operational levels of 70 dBA daytime (7:00 AM to 10:00 PM) and 60 dBA nighttime (10:00 PM to 7:00 AM), and hourly average noise level (L_{eq}) of 50 dBA daytime and 40 dBA during the nighttime. The Sonoma City Council's approval of a 5 dBA allowance for emergency generators would increase these limits to hourly average noise level (L_{eq}) of 55 dBA daytime and 45 dBA during the nighttime.

ANALYSIS OF EMERGENCY GENERATOR NOISE

The Lodge is proposing to install an emergency generator in the service and receiving dock area on the south side of Clay Street west of the loading dock entrance. The closest off-site noise sensitive receptors are the existing single-family residence at 1290 Bragg Street and the future multifamily residences at the Altamira Family Apartments project currently under construction opposite Clay Street from the Lodge. At the direction of City Staff, I&R has evaluated the noise produced by the operation of the emergency generator on the north side of the Lodge's property line, facing the adjacent noise sensitive receptor.

The equipment specification (dated 6-5-2020) calls for a Kohler model 500REOZJ diesel generator installed in a GPC Weather House level four sound attenuated enclosure and Internally Mounted Extreme Series Exhaust Silencer on a 21" high Sub-base fuel tank. These specifications indicate that the top of the Generator Enclosure on the fuel tank subbase will be at 10'-7" above grade, and the engine exhaust outlet will be at 12'-9 ³/₄" above grade.

An equipment specific sound report for this generator, enclosure and exhaust silencer combination issued by Global Power Components (see attached), establishes an overall sound level produced by the generator of 66.4 dBA at 10 feet, an exhaust outlet sound level of 65.4 dBA, and enclosure radiated sound levels of between 59.9 to 63.8 dBA. The proposed generator will be used for emergency, not back up power.

The project plans call for the generator to be installed 4'-5" south of a 10-foot high wall. This wall is a 6-foot high masonry wall with a 4-foot high solid wood wall above the masonry structure and has the mass and solidity to act as a barrier to noise. This portion of the wall is in-line with the view of the generator from the property lines of the Altamira Family Apartments. However, immediately west of the generator installation and in-line with the view of the generator from the property line of the single-family residence at 1290 Bragg Street, the 4-foot high solid wood portion of the wall becomes a 4-foot high open trellis wall.

Given these wall heights, the heights of the generator enclosure and exhaust outlet, the heights and placement of the property line walls, and the geometries of the site and surrounding land uses, we have determined that the operation of the proposed emergency generator will result in sound levels at receiving points 5 feet above grade (the ear height of an average person) on the property line or on the sidewalk nearest the property line as shown in Table 1 (following).

Table 1: Generator Sound Levels at (or near) Project Property Line

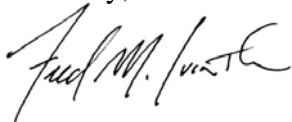
Location of 5-foot high receiver	Reported Generator (Source) Sound levels at 10 feet (dBA)			
	Average Enclosure (66.4 dBA)	Exhaust Outlet (65.4 dBA)	Inlet (62.8 dBA)	Outlet (63.8 dBA)
	Source Sound level at receiver (dBA)			
Within 1 foot of Property Line	55.9 dBA	54.2 dBA	48.3 dBA	49.3 dBA
On Sidewalk opposite the property (~10 feet to property line).	58.8 dBA	57.8 dBA	55.2 dBA	56.2 dBA

To ensure that the generator will operate as needed during an emergency, it will need to be run 15 minutes per week to ensure that it will operate as needed during an emergency. All testing will be done during weekday daytime hours. Based on testing for 15 minutes per hour, the hourly L_{eq} resulting from testing will be 6 dBA lower than the constant operational noise levels presented in Table 1. Considering this, the hourly L_{eq} noise levels produce by generator testing would be 52.8 dBA or less at the Lodge's property line or the sidewalk adjacent to it.

Based on this and the noise modeling results shown in Table 1, we find that the operation and testing on the propose emergency generator would comply with the City of Sonoma General Plan and Municipal Code Noise Standards at and near the project property line.

This concludes I&R's evaluation of noise from the emergency generator proposed at the Lodge at Sonoma to determine whether the noise emissions from the required testing and mergence operation of this generator will comply with the City of Sonoma's Noise Guidelines. Please do not hesitate to call with any questions or concerns.

Sincerely,



Fred M. Svinth, INCE, Assoc., AIA
 Principal, Senior Consultant
Illingworth & Rodkin, Inc.

Sound Level Report					
Created By:	Juhua Peng			Job Number #:	45-33744
Date:	7/31/2020			Quote #:	815939
Enclosure Outlet Velocity(fpm)	1000			Customer:	Bay City Etc.
Genset Model	KOLR 500REOZJB 50C	Correction Factor	1.04	Sales Person:	Greg Lampert
Number of Units	1	Elevation (ft)	1000		
Intake Opening Style	NONE	Min. Open Size	84 X 70	Intake Sound Baffles PD (in wg)	0.23
Exhaust Opening Style	NONE	Min. Open Size	74X 64	Discharge Sound Baffles PD (in wg)	0.25
Enclosure Body Length(in)	172	Max. Genset (L)	142.9	Intake Hood/Screen PD (in wg)	0.01
Enclosure Body Width(in)	90	Max. Genset (W)	66.1	Discharge Hood/Screen PD (in wg)	0.01
Enclosure Body Height(in)	106	Clearance (ft)	78.5		
Radiator Width(in)	42.6	Genset Weight (lbs)	8660	Total PD (in wg)	0.60
Radiator Height(in)	51			(Exhaust Hooded (H) or screen installation)	
Radiator Velocity (fpm)	1524	CFM at 1000 ft	26316	Engine/Alternator Heat Rejection (btu/min)	5890.00
Wall Insulation (in)	6	CFM at Sea Level	24342	Integral Silencer Heat Rejection (btu/min)	355.76
Discharge Plenum Length(in)	62	Designed (L)	62	Pipe Heat Rejection (btu/min)	3484.00
Intake Hood Length(in)	67	Designed (W)	67	Other Heat Rejection (btu/min)	100.00
Radiator (cfm)	23000	Exhaust Flowrate (CFM)	3433.0	Total System Heat Rejection (btu/min)	9829.76
Combustion (cfm)	1342	Exhaust Temp. (F)	975.0	Required CFM (cfm)	24948
Sound Target dBA	65	Exhaust Back Pressure (in Hg)	3.00	Temp. Rise (F)	23.00
Sound Data Source	Manufacturer Data Sheet	Exhaust Velocity (ft/s)	104.9	RAN Ambient (F)	50.00
Sound Data Format	Octave Bands	Silencer Size (in)	10.0	Max. Pkg Ambient (F)	109
Factory Log/Average	94.8		0	119.5	
Sound Data Units	dBA		0	dBA	dBA
Hz	Genset	Radiator/Fan(if isolated)	Raw Exhaust	Silencer #2	Silencer #1
31	53.00	0.00	84.00	0	0
63	63.90	0.00	94.70	0	41
125	73.10	0.00	101.90	0	48
250	85.30	0.00	106.70	0	50
500	84.40	0.00	107.40	0	50
1000	88.30	0.00	109.40	0	48
2000	90.60	0.00	114.10	0	47
4000	85.00	0.00	114.40	0	47
8000	83.60	0.00	111.10	0	47
Sound data Measured distance [ft]	23	0	3.3		
Final Distance @ Required Sound Level	10	0	10	GPC SLIM LINE 10"	
Body Wall Treatment	5in Insulation+Barrier+SB	OK per Sound Target		59.8	WALLS
		OK per Sound Target			
PERF IN MAIN BODY	YES	Perf is Required with this Insulation			
Intake Acoustical Louver	NONE	OK per Sound Target		62.8	INLET
Intake Silencer Bank	HP-36 (30% OP) -1000	OK per Sound Target			
Intake Scoop Treatment	5in Insulation+Barrier+SB (Hood)	OK per Sound Target			
Discharge Acoustical Louver	NONE	OK per Sound Target		63.8	OUTLET
Discharge Silencer Bank	HP-36 (30% OP) +1000	OK per Sound Target			
Discharge Plenum Treatment	5in Insulation+Barrier+SB (Hood)	OK per Sound Target			
Silencer Type 1	GPC Extreme Slim Line	INCREASE SILENCER		65.4	EXHAUST
Silencer Type 2	NONE	INCREASE SILENCER			
Log Addition Sound Level (Average)		66.4	dBA at 10 feet Free Field		
Global Power Components					
Computed noise levels at each distance and frequency is based on a free field condition. Site conditions have not been taken into account in acoustic predictions. The ambient sound level must be at least 10 dBA below the requested sound target. Sound Pressure Level estimates are +/- 2dBA.					