Environmental Noise Assessment

CCL06435 AT&T Cellular Facility

Santa Rosa, California

BAC Job # 2024-080

Prepared For:

Complete Wireless Consulting

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Introduction

The CCL06435 AT&T Wireless Unmanned Telecommunications Facility (project) proposes the installation of cellular equipment within a lease area located at 1350 Bennett Valley Road in the City of Santa Rosa, California (APN: 009-371-010). The outdoor walk-up cabinet (WUC) and an emergency diesel standby generator have been identified as the primary noise sources associated with the project. The project site location with aerial imagery is shown in Figure 1. The studied site drawings are dated April 1, 2024.

Bollard Acoustical Consultants, Inc. (BAC) has been contracted by Complete Wireless Consulting, Inc. to complete an environmental noise assessment regarding the proposed project cellular equipment operations. Specifically, the following assessment addresses daily noise production and exposure associated with operation of the project emergency generator and WUC equipment.

Please refer to Appendix A for definitions of acoustical terminology used in this report. Appendix B illustrates common noise levels associated with various sources.

Criteria for Acceptable Noise Exposure

Santa Rosa City Code

Chapter 17-16 of the Santa Rosa City Code provides noise level criteria applicable to this project. The City Code assumes a base ambient noise level, depending on the zoning of the receiving land use, from which noise levels can be compared. City Code Section 17-16.030 is reproduced below as Table 1.

Table 1
Ambient Base Noise Level Criteria

Zone	Time	Base Ambient Sound Level (dBA)
R1 and R2	10 p.m. to 7 a.m.	45
R1 and R2	7 p.m. to 10 p.m.	50
R1 and R2	7 a.m. to 7 p.m.	55
Multi-family	10 p.m. to 7 a.m.	50
Multi-family	7 a.m. to 10 p.m.	55
Office & Commercial	10 p.m. to 7 a.m.	55
Office & Commercial	7 a.m. to 10 p.m.	60
Intensive Commercial	10 p.m. to 7 a.m.	55
Intensive Commercial	7 a.m. to 10 p.m.	65
Industrial	Anytime	70

Source: Santa Rosa City Code, Chapter 17-16 Noise, Section 17-16.030

Legend

- Proposed AT&T Cellular Equipment Lease Area (Approximate)
- # Noise-Sensitive Receiver (Residence)

N

Scale (Feet)

0 100 200

CCL06435 AT&T Cellular Facility

Santa Rosa, California

Proposed Cellular Facility Lease Area
& Nearest Residential Uses

Figure 1

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In addition, Section 17-16.120 of the City Code, which applies to machinery and equipment, states that, "*It is unlawful for any person to operate any machinery, equipment, pump, fan, air-conditioning apparatus or similar mechanical device in any manner so as to create any noise which would cause the noise level at the property line of any property to exceed the ambient base noise level by more than five decibels*."

Noise Level Limits Applied to the Project

Because the project proposes noise-generating mechanical equipment, Section 17-16.120 would be applicable to this project. Section 17-16.120 states that noise generated from machinery not exceed the ambient base noise level by more than five (5) decibels at the property line of the receiving land use. The ambient base noise level depends on the zoning of the receiving land use.

According to the City of Santa Rosa parcel viewer, the project parcel and adjacent (adjoining) properties are zoned Public/Institutional (PI). The Santa Rosa City Code does not contain noise level criteria for public/institutional uses. The closest existing noise-sensitive uses have been identified as single-family (low-density, R1/R2) residences located southeast and southwest of the project, as identified in Figure 1. After application of the five-decibel increase pursuant to Section 17-16.120, the noise level limits of 55 dB (daytime hours) and 50 (nighttime hours) were applied to the project equipment and assessed at the closest identified residences.

Project Noise Generation

As discussed previously, there are two project noise sources which are considered in this evaluation: the WUC equipment cooling system and the emergency generator. The evaluation of potential noise impacts associated with the operation of each noise source is evaluated separately as follows:

Walk-Up Equipment Cabinet (WUC) Noise Source and Reference Noise Level

The site plans indicate that the project proposes the installation of a walk-up cabinet (WUC) within the lease area illustrated in Figure 1. Based on the project site drawings, the WUC assumed for installation at this site is a Delta Electronics Model ESOF030-HCU01. According to the manufacturer's noise level data specification sheet, provided as Appendix C, the specific cabinet model has a reference noise level of 65 dB at a distance of 5 feet.

Generator Noise Source and Reference Noise Level

The project also proposes the installation of an emergency standby diesel generator within the lease area to maintain cellular service during emergency power outages. Based on the project site plans, a Generac Industrial Power Systems Model SD030 is assumed for installation at this site. It is further assumed that the proposed generator will be equipped with the Level 2 Acoustic Enclosure, which results in a reference noise level of 68 dB at a distance of 23 feet. The manufacturer's noise level data specification sheet for the proposed generator and acoustical enclosure is provided as Appendix D.

The generator which is proposed at this site would only operate during emergencies (power outages) and brief daytime periods for periodic maintenance/lubrication. According to the project applicant, testing of the generator would occur twice per month, during daytime hours, for a duration of approximately 15 minutes. The emergency generator would not operate at night, except during power outages. It is expected that nighttime operation of the project emergency generator would be exempt from the City's exterior noise exposure criteria due to the need for continuous cellular service provided by the project equipment.

Predicted Facility Noise Levels at the Nearest Existing Residential Uses

The nearest existing residences are identified as receivers 1 and 2 in Figure 1. Assuming standard spherical spreading loss (-6 dB per doubling of distance from a stationary noise source), project equipment noise exposure at the nearest residences was calculated and the results of those calculations are presented in Table 2.

Table 2
Project Equipment Noise Exposure at the Nearest Existing Residential Uses

Receiver[1]	Distance from Lease Area (ft)[2]	Predicted Noise Levels (dBA)		City Noise Level Limit (dBA)[3]	
		WUC	Generator	Daytime	Nighttime
1 – Single-Family Residence	550	24	40	**55**	**50**
2 – Single-Family Residence	500	25	41		

[1] Receiver locations are illustrated in Figure 1.
[2] Distances scaled using the provided site plans and the City of Santa Rosa online parcel viewer.
[3] Noise level limits based on Santa Rosa City Code Section 17-16.120 criteria (i.e., ambient +5 dBA).

Source: BAC 2024

As indicated in Table 2, predicted project equipment noise level exposure would satisfy the applicable Santa Rosa City Code daytime and nighttime noise level limits at the nearest existing single-family residences (receivers 1 and 2). Satisfaction of the City's noise level limits at the closest residential uses would ensure for compliance at more distant residential uses. As a result, additional consideration of noise mitigation measures for the identified equipment would not be warranted for this project.

Conclusions

Based on the analysis presented in this report, project-related equipment noise exposure is expected to satisfy the applicable Santa Rosa City Code noise exposure limits at the closest identified existing noise-sensitive uses (i.e., single-family residences). As a result, additional consideration of noise mitigation measures would not be warranted for this project.

This concludes our environmental noise assessment for the proposed CCL06435 AT&T Cellular Facility in Santa Rosa, California. Please contact BAC at (530) 537-2328 or dariog@bacnoise.com with any questions or requests for additional information.

Appendix A

Acoustical Terminology

Acoustics The science of sound.

Ambient Noise The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.

Attenuation The reduction of an acoustic signal.

A-Weighting A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.

Decibel or dB Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.

CNEL Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.

Frequency The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.

Ldn Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.

Leq Equivalent or energy-averaged sound level.

Lmax The highest root-mean-square (RMS) sound level measured over a given period of time.

Loudness A subjective term for the sensation of the magnitude of sound.

Masking The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound.

Noise Unwanted sound.

Peak Noise The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the Maximum level, which is the highest RMS level.

RT_{60} The time it takes reverberant sound to decay by 60 dB once the source has been removed.

Sabin The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 sabin.

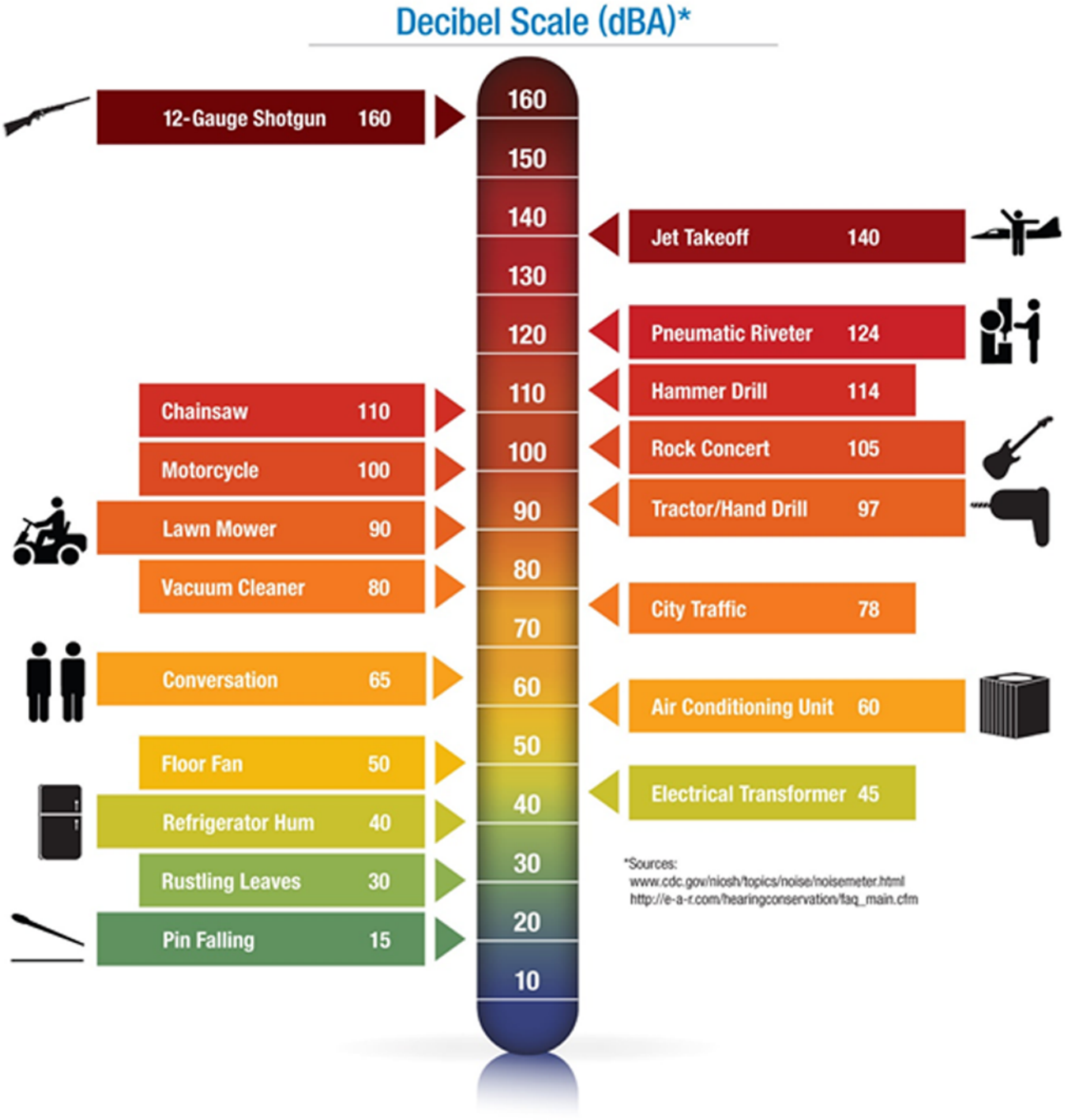
SEL A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy of the event into a 1-s time period.

Threshold of Hearing The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.

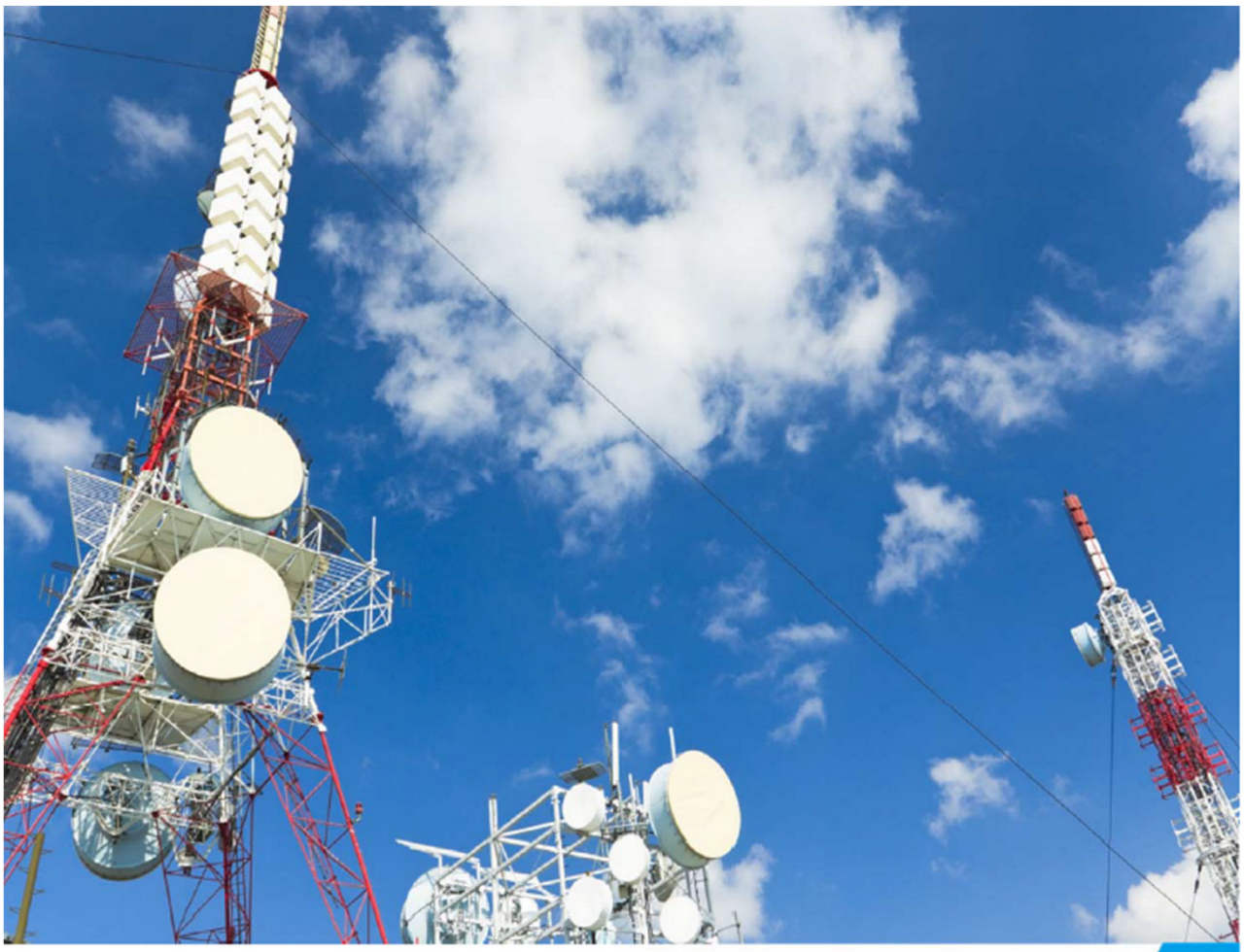
Threshold of Pain Approximately 120 dB above the threshold of hearing.

Appendix B

Typical A-Weighted Sound Levels of Common Noise Sources



Appendix C-1



Walk Up To Cabinet (WUC) ESOF030-HCU01 Installation and Operation Manual

www.deltaww.com Rev 11.1

DELTA

Appendix C-2

2 Cabinet Overview

This document describes installation and maintenance practices for the Delta Multi-bay OutD power cabinets ESOF030-HCU01.

The topics reviewed in this document include the following:

- Cabinet Configuration
- Cabinet Installation
- Thermal Management System
- Maintenance and Troubleshooting

2.1 Description

ESOF030-HCU01 is an aluminium construction cabinet arranged third-party AC Load Center, DC Power System, Batteries, and Load Equipment.

- 3-bay cabinet
- 88RU Equipment Space
- 14RU Power System space
- 3 Battery Trays
- 9.1kW capacity door mounted Thermosiphon HEX cooling
- Rear access hatches
- 6kW capacity DC heaters

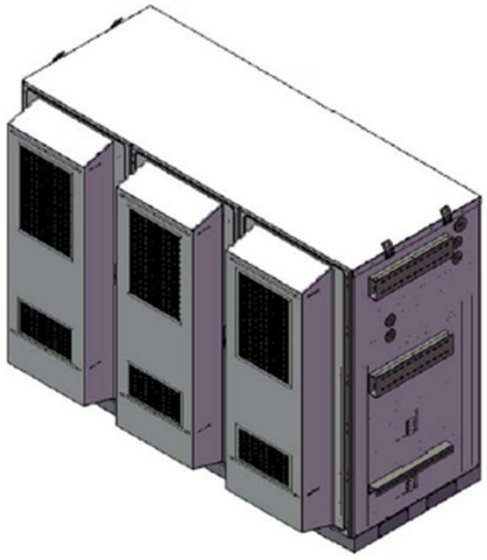
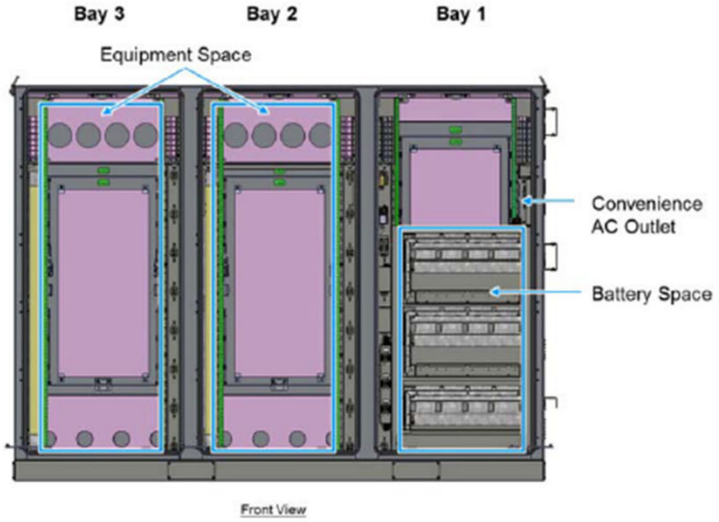


Figure 2-1 Multi-Bay Cabinet

Appendix C-3

2.2 System Configuration



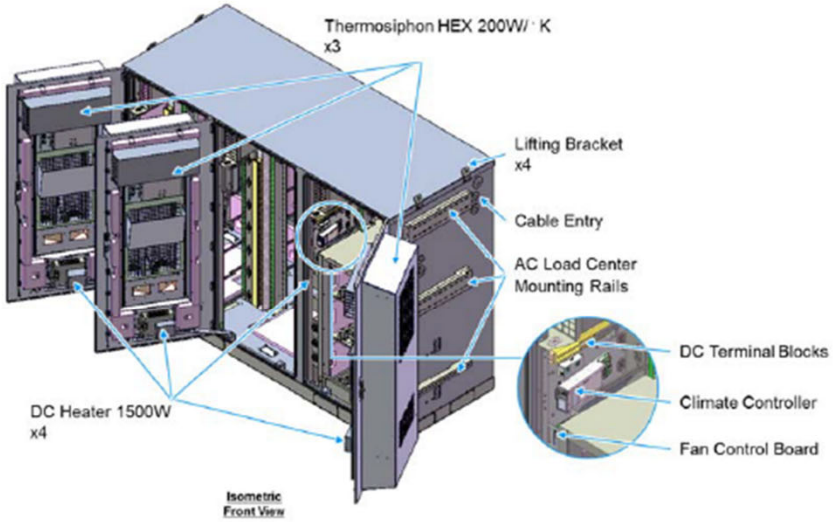


Figure 2-2 Multi-Bay Cabinet (Front View)

Appendix C-4

2.3 Cabinet Specifications

The cabinet is arranged for installation of a Delta or third-party AC Load Center and front access DC Power System. Table 2-1 below contains the input power specifications.

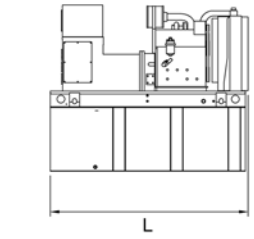
Table 2-1 Cabinet Specifications

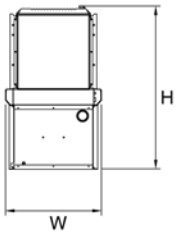
Item	Specification/Function
AC Input Range	
AC Input Voltage	1W+N+FG 100~120V_{AC}
AC Input Current (maximum)	12A (Max.)
AC Input Frequency	50/60Hz
DC Input Range	
DC Input Voltage	40 - 60V_{DC} (54V typical)
DC Input Current Rating	224A (max)
Battery Section	
Battery Trays	(3) Trays arranged for -48V battery strings, designed for: GNB Marathon M12V180FT Enersys SBS190F Enersys SBS170F
Climate Control	
Control & Supervisor Unit	Delta controller
Cooling	(3) 200W/°K Thermosiphon HEX Cooling Capacity 9.1kW Maintains equipment inlet <65°C with exterior ambient <46°C
Heating	(4) 1500W DC Heaters
Environmental	
Operating Temperature	-40°C to +46°C (-40°F to +115°F)
Storage Temperature	-40°C to +75°C (-40°F to +167°F)
Relative Humidity	0~95% Relative Humidity, Non-Condensing
Altitude	-100 feet to +10,000 feet
Acoustic noise	≤ 65dBA @ +40°C equipment inlet
Protection Class	IP55 (EN 60529) NEBS III (GR-487)

Appendix D

GENERAC | INDUSTRIAL POWER

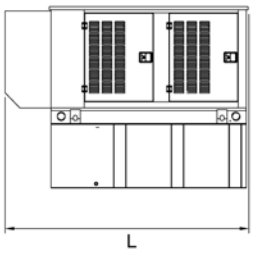
SD030 dimensions, weights and sound levels

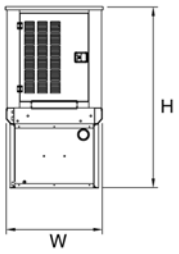




OPEN SET

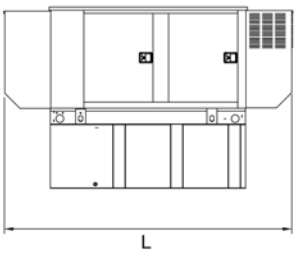
RUN TIME HOURS	USABLE CAPACITY (GAL)	L	W	H	WT	dBA*
NO TANK	-	76	38	46	2060	82
20	54	76	38	59	2540	
48	132	76	38	71	2770	
77	211	76	38	83	2979	
109	300	93	38	87	3042	

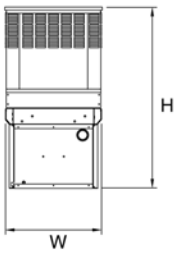




STANDARD ENCLOSURE

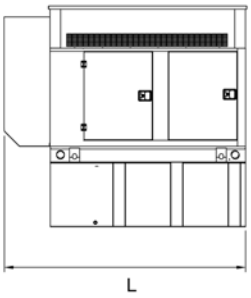
RUN TIME HOURS	USABLE CAPACITY (GAL)	L	W	H	WT	dBA*
NO TANK	-	95	38	50	2362	77
20	54	95	38	63	2842	
48	132	95	38	75	3072	
77	211	95	38	87	3281	
109	300	95	38	91	3344	

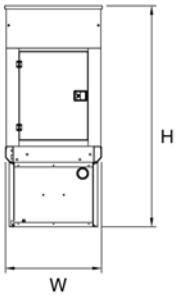




LEVEL 1 ACOUSTIC ENCLOSURE

RUN TIME HOURS	USABLE CAPACITY (GAL)	L	W	H	WT	dBA*
NO TANK	-	113	38	50	2515	70
20	54	113	38	63	2995	
48	132	113	38	75	3225	
77	211	113	38	87	3434	
109	300	113	38	91	3497	





LEVEL 2 ACOUSTIC ENCLOSURE

RUN TIME HOURS	USABLE CAPACITY (GAL)	L	W	H	WT	dBA*
NO TANK	-	95	38	62	2520	68
20	54	95	38	75	3000	
48	132	95	38	87	3230	
77	211	95	38	99	3439	
109	300	95	38	103	3502	

*All measurements are approximate and for estimation purposes only. Weights are without fuel in tank. Sound levels measured at 23ft (7m) and does not account for ambient site conditions.

Tank Options

○	MDEQ	OPT
○	Florida DERM/DEP	OPT
○	Chicago Fire Code	OPT
○	IFC Certification	CALL
○	ULC	CALL

Other Custom Options Available from your Generac Industrial Power Dealer

YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER

Specification characteristics may change without notice. Dimensions and weights are for preliminary purposes only. Please consult a Generac Power Systems Industrial Dealer for detailed installation drawings.