

Environmental Noise Assessment

CCL05091 AT&T Cellular Facility

Brentwood, California

BAC Job # 2021-056

RECEIVED

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Prepared For:

CITY OF BRENTWOOD
COMMUNITY DEVELOPMENT DEPT

Complete Wireless Consulting

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Introduction

The CCL05091 AT&T Wireless Unmanned Telecommunications Facility Project (project) proposes the installation of cellular equipment within a lease area located at 1800 Concord Avenue in Brentwood, California (APN: 010-050-002-4). The outdoor equipment cabinets and an emergency standby diesel generator have been identified as the primary noise sources associated with the project. The project site location is shown on Figure 1. The studied site drawings are dated March 16, 2021.

Bollard Acoustical Consultants, Inc. 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 outdoor equipment cabinets and emergency generator.

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

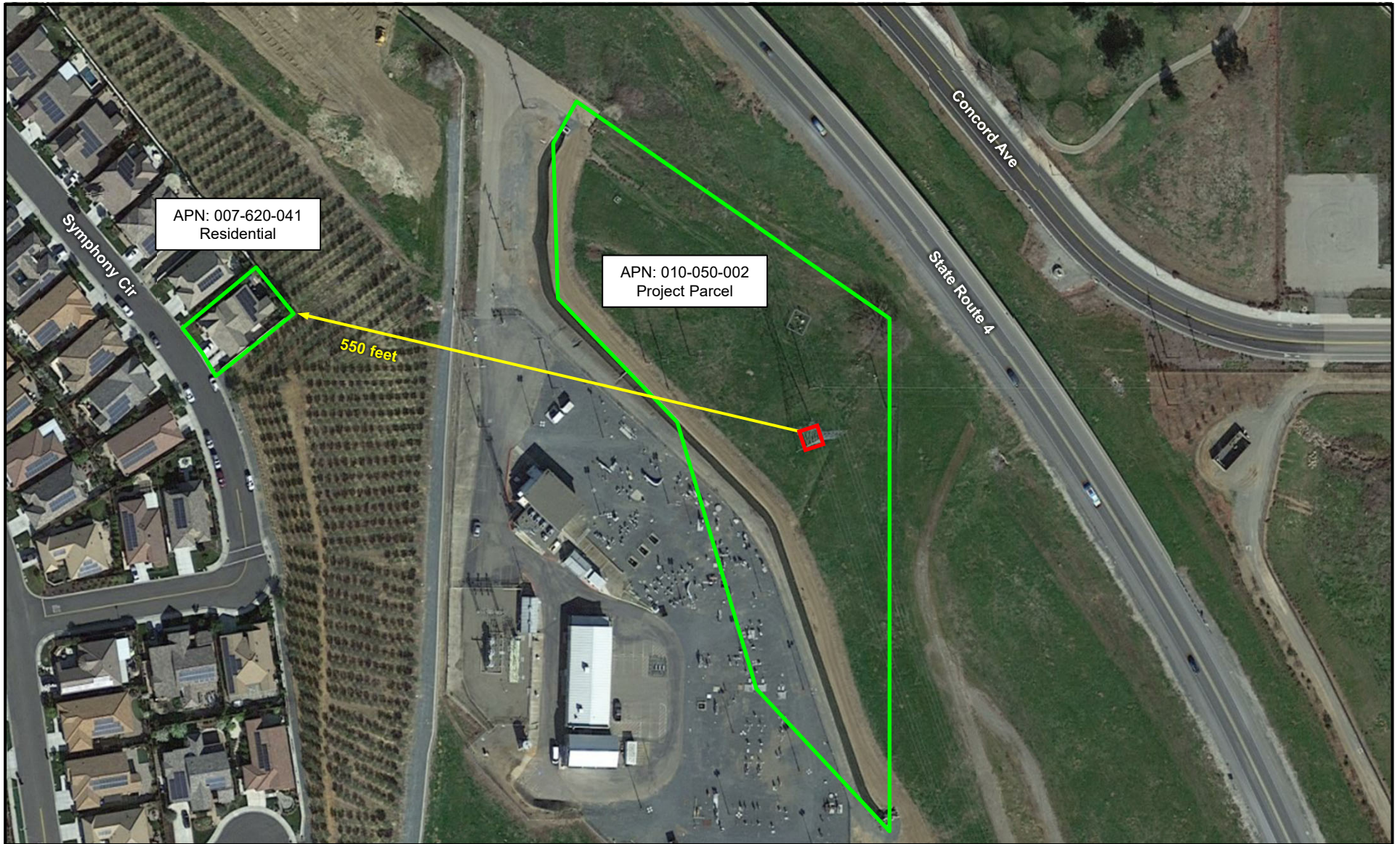
Criteria for Acceptable Noise Exposure

Brentwood Municipal Code

Section 9.32.030 of the Brentwood Municipal Code provides exterior noise limits for residential, commercial, and industrial uses affected by stationary noise sources, such as those proposed by the project. The nearest noise-sensitive uses have been identified as residential to the west of the project. The exterior noise limits contained in Section 9.32.030 are applied at the property line of the receiving land use and are graduated depending on the duration of the intruding noise source. The Municipal Code's exterior noise level limits applicable to residential uses affected by stationary noise sources are summarized below in Table 1.

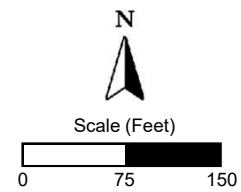
Table 1
Summary of Brentwood Municipal Code Exterior Noise Standards – Residential Uses

Duration Exceeded (min.)	Statistical Descriptor	Exterior Noise Level (dBA)	
		Daytime (7 AM – 7 PM)	Nighttime (10 PM – 7 AM)
30	L ₅₀	60	45
15	L ₂₅	65	50
5	L ₈	70	55
1	L ₂	75	60
Any	L _{max}	80	65
Source: Brentwood Municipal Code, Chapter 9.32 Noise Regulations			



Legend

- Proposed AT&T Cellular Equipment Lease Area (Approximate)
- Parcel Boundaries (Approximate)



CCL05091 AT&T Cellular Facility
Brentwood, California

Proposed Cellular Facility Lease Area
& Nearest Residential Use

Figure 1



Exemptions to the Brentwood Municipal Code Noise Regulations

Section 9.32.070 of the Brentwood Municipal Code provides exemptions to the noise regulations provided in Table 1. Specifically, Section 9.32.070(A) provides an exemption to the emission of sound in the performance of emergency work. Section 9.32.020(F) defines “emergency work” as, “work made necessary to protect, provide or restore safe conditions in the community or for the citizenry, or work required to protect persons or property from an imminent exposure to danger, or **work by public or private utilities to restore utility service.**” [Emphasis added].

Because the project cellular equipment would operate using City power, the specific purpose of the generator proposed as part of this project is to provide power to the system during an emergency power outage, thereby allowing the system to provide vital communications during the power outage.

Noise Standards Applied to the Project

Equipment Cabinets

Noise would be generated by this project in two ways. The first is the ongoing operation of the cellular equipment cabinets’ cooling systems. These systems utilize fans to circulate cooling air through the electric circuitry. During warmer periods, the cooling requirements will be greater, and the fans will run continuously. During cooler periods, however, the heat transfer requirements are diminished, and the fans will run intermittently as needed. Because the fan operation is a normal aspect of the project, and because the fans could run continuously during warm nighttime hours (i.e., more than 30 minutes per hour), the noise standards applied to the project equipment cabinets are as follows:

- 60 dB L₅₀ – residential noise level limit during daytime hours (Table 1)
- 45 dB L₅₀ – residential noise level limit during nighttime hours (Table 1)

Satisfaction with the City’s nighttime noise level standard would ensure compliance with the City’s less restrictive daytime noise level standard. As a result, the following analysis of project-generated equipment cabinet noise exposure focuses on achieving compliance with the City’s nighttime noise standard of 45 dB L₅₀ at nearest residential property line. Satisfaction with the City’s noise level limit at the nearest residential use would ensure for satisfaction of the City’s criterion at residential uses located farther away.

Emergency Generator

The function of the emergency generator is to provide ongoing communications support during emergencies resulting in power outages. As a result, the emergency generator would operate only during routine testing and emergency power outages.

With respect to testing, the emergency generator would be tested during daytime hours only, twice per month, for a duration not exceeding 15 minutes during each test. The purpose of this routine testing is to ensure that the generator will be properly lubricated and in good working order in the event of an emergency resulting in a power outage. Because this routine testing would occur for a period of 15 minutes per hour, and only during daytime hours, the noise generation of

this aspect of the project should be evaluated relative to the Municipal Code daytime noise level standard of 65 dB L₂₅.

Aside from routine daytime testing described above, the emergency generator would only operate during emergencies resulting in power outages. As discussed previously, Section 9.32.070 of the Brentwood Municipal Code exempts the generator while it's performing emergency work. As a result, the following analysis of generator noise level exposure focuses on achieving compliance with the City's daytime noise level standard of 65 dB L₂₅, as operation of the generator during emergency conditions resulting in power outages are identified as being exempt in the Municipal Code.

Project Noise Generation

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

Equipment Cabinet Noise Sources and Reference Noise Levels

The project proposes the installation of three (3) equipment cabinets within the lease area shown on Figure 1. Based on the project site drawings, the cabinets assumed for the project are as follows: two (2) Purcell Systems FLX12WS (GR-487 rated) cabinets, and one (1) Vertiv (Emerson) NetSure 512 DC 48V Power System cabinet. The cabinets and their respective reference noise levels are provided below in Table 2. The manufacturer's noise level data specification sheets for the proposed cabinets are provided as Appendix C.

Table 2
Reference Noise Level Data of Proposed Equipment Cabinets¹

Equipment	Number of Cabinets	Reference Noise Level (dB)	Reference Distance (ft)
Purcell Systems FLX12WS	2	65	5
Vertiv NetSure 512 48V DC Power System	1	65	5

¹ Manufacturer specification sheets provided as Appendix C.

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 drawings, a Generac Industrial Power Systems Model SD030 is proposed at this site. It is assumed that the proposed generator will be equipped with the Level 2 Acoustic Enclosure resulting 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.

Predicted Facility Noise Levels at the Nearest Residential Property Line

As indicated in Figure 1, the proposed cellular facility lease area maintains a separation of approximately 550 feet from the nearest residential parcel, APN: 007-620-041. Assuming standard spherical spreading loss (-6 dB per doubling of distance), project equipment noise exposure at the closest residential property line was calculated and the results of those calculations are presented in Table 3.

The site drawings indicate that an 8' CMU wall is proposed to be constructed along the perimeter of the cellular facility lease area. To account for the shielding that would be provided by the proposed 8' solid noise barrier, the predicted project equipment noise levels provided in Table 3 have been adjusted by -7 dB.

Table 3
Project-Related Noise Exposure at the Nearest Residential Property Line

APN ¹	Distance from Facility Lease Area (ft) ²	Predicted Equipment Noise Levels (dBA) ³	
		Cabinets	Generator
007-620-041	550	22	33
¹ Parcel boundaries are illustrated on Figure 1. ² Distance was scaled from the proposed cellular facility lease area to the property line of APN: 007-620-041 using the Contra Costa County Parcel Viewer online application measurement tool. ³ Predicted equipment noise levels include consideration of shielding provided by a proposed 8' CMU wall along the perimeter of the facility lease area and have been adjusted by -7 dB.			

The equipment cabinets were conservatively assumed to be in operation concurrently for the duration of an hour during nighttime hours. According to the Brentwood Municipal Code, the corresponding noise level standard given an hour of *nighttime* operation would be 45 dB L₅₀ (Table 1). As shown in Table 3, the predicted (combined) equipment cabinet noise level of 22 dB L₅₀ at the nearest residential property line would satisfy the Brentwood Municipal Code 45 dB L₅₀ nighttime noise level standard by a wide margin. As a result, no further consideration of project equipment cabinet noise mitigation measures would be warranted for the project.

Project representatives have indicated that the proposed generator would be in operation for routine testing and maintenance twice a month during *daytime* hours for no more than 15 minutes. The corresponding Brentwood Municipal Code noise level standard given less than 15 minutes of operation during *daytime* hours would be 65 dB L₂₅ (Table 1). As shown in Table 3, the predicted generator noise level of 33 dB L₂₅ at the nearest residential property line would satisfy the 65 dB L₂₅ daytime noise level standard by a wide margin. As a result, no further consideration of project emergency generator noise mitigation measures would be warranted for the project.

Conclusions

Based on the equipment noise level data and analyses presented above, project-related equipment noise exposure is expected to satisfy the applicable City of Brentwood noise exposure limits at the closest residential uses. As a result, no further consideration of project equipment noise mitigation measures would be warranted for this project.

This concludes our environmental noise assessment for the proposed CCL05091 AT&T Cellular Facility in Brentwood, California. Please contact BAC at (916) 663-0500 or dariog@bacnoise.com with any questions or requests for additional information.

Appendix A

Acoustical Terminology

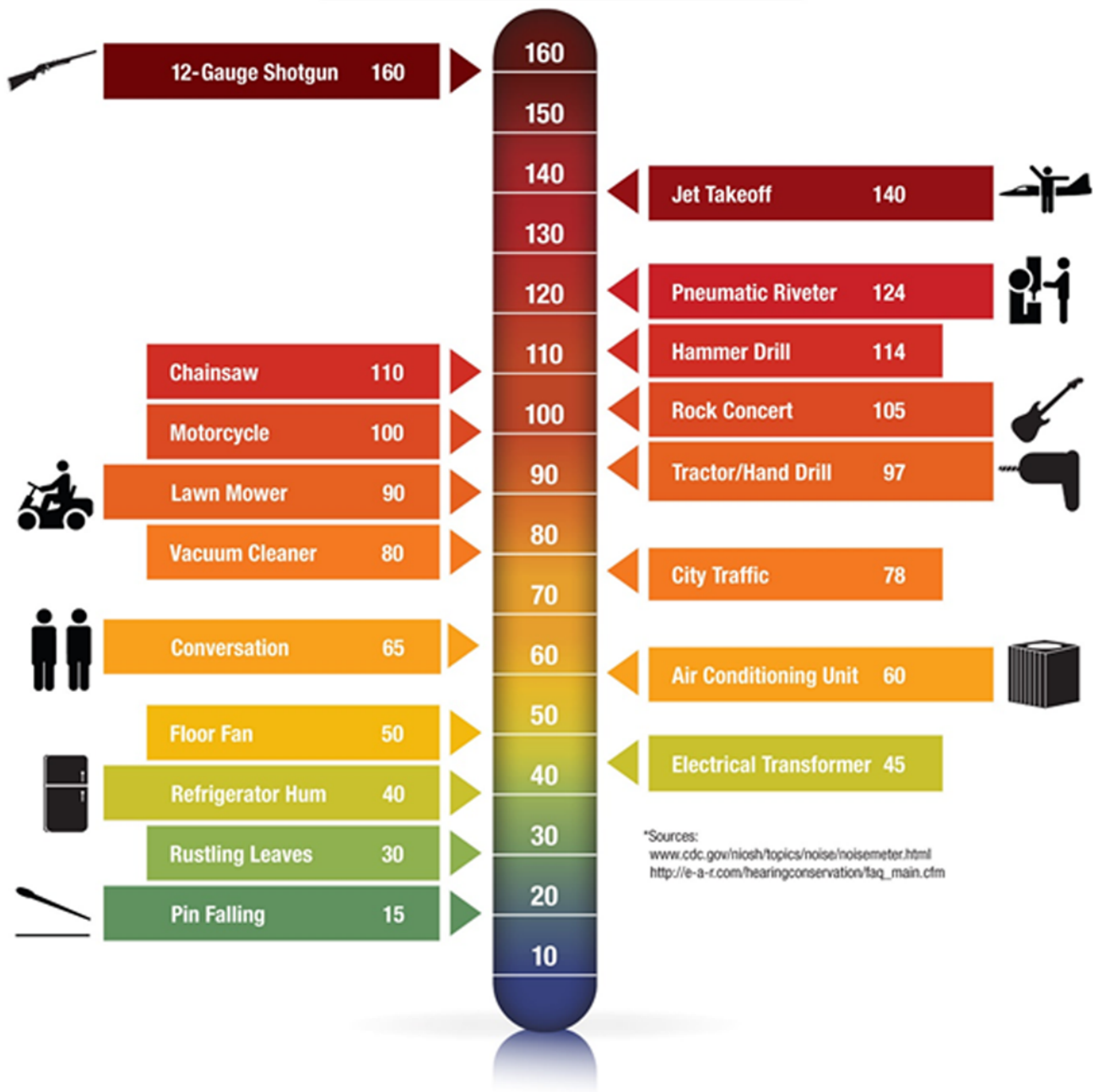
Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
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.
IIC	Impact Insulation Class (IIC): A single-number representation of a floor/ceiling partition's impact generated noise insulation performance. The field-measured version of this number is the FIIC.
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.
RT₆₀	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
STC	Sound Transmission Class (STC): A single-number representation of a partition's noise insulation performance. This number is based on laboratory-measured, 16-band (1/3-octave) transmission loss (TL) data of the subject partition. The field-measured version of this number is the FSTC.



Appendix B

Typical A-Weighted Sound Levels of Common Noise Sources

Decibel Scale (dBA)*



*Sources:
www.cdc.gov/niosh/topics/noise/noisemeter.html
http://e-a-r.com/hearingconservation/faq_main.cfm

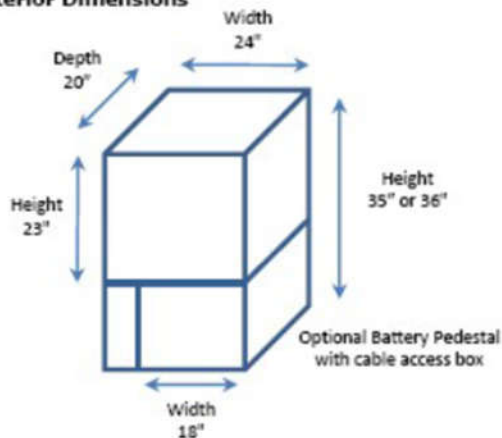
Appendix C-1

FlexSure®

FLX12WS

GR-487 Certified for Wireless Data Broadband Backhaul Applications

Exterior Dimensions



Interior Dimensions

- 22"H x 23"W x 18"D

Construction Materials

- Material: Aluminum (lightweight, corrosion-resistant)
- Paint: GR-487 tested & certified power coat

Door/Side Panel Construction

- Doors: Front door with door alarm and optional air conditioner, heat exchanger, or thermoelectric cooler
- Latches: Two-point latched, pad lockable
- Rear hatch or door option available

Equipment Mounting

- 12RU 19" rails, front to back adjustable

Environmental Options

- Heat Exchanger: Up to 39W/ °C heat exchanger, +24VDC or -48VDC
- Air Conditioner: Up to 2,000 BTU/hr air conditioner with heater
- Thermoelectric Cooler: 400W @ 0°dT, +24VDC, -48VDC, or 120VAC

Battery Pedestal

- 12"H pedestal accommodates up to 60Ahr batteries
- 13"H pedestal accommodates up to 92Ahr batteries

* 65 dBA at five (5) feet (according to the Purcell Systems)

Cable Entry

- (3) 1/2"; (3) 1"; (1) 2"; (2) 3 1/2" or 2" knockouts

AC Power Options

- 30A-main power with optional Surge Suppression Device; 15A generator connection cable
- 6-position 19" rack-mounted (1RU) or 12-position (2U) AC load centers available in various configurations- can be equipped with surge protection devices (120V or 240V configurations). Optional DIN-mounted SPD
- 15A GFCI dual outlet receptacle convenience outlet

Mounting Options

- 4" plinth
- 14" plinth
- Pole mount kits
- Wall mount kits
- Vertical cabinet-on-cabinet stacking (up to 3 cabinets high; 150lbs per cabinet with installed equipment)

Warranty

- 5 years enclosure/1 year thermal system



FLX12WS shown with 39W/C heat exchanger; vertically stacked on a 14" plinth

Purcell Systems, Inc.

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Phone: 509.755.0341 www.purcellsystems.com

FLX12WS-2012-03-02

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Appendix C-2



OSP00743N
AT&T 48V Fusion Power and Battery Cabinet
Acoustical Noise Emission Test
TR00002174A - Design Verification / Validation Test Plan Details

Test Requirements:

Per GR-487-CORE Issue 3 of April 2009 - Generic Requirements for Electronic Equipment Cabinets, Paragraph R3-222 – Acoustical Noise Emission Test:

R3-222 [157] Cabinets equipped with telecommunications equipment and associated cooling fans shall suppress acoustical noise to a level of less than 65 dBA at every measurement point at a distance of 1.5 m (5 ft) from the cabinet with the doors closed during times of maximum noise generation within the cabinet. Measurements are made via sound pressure.

Table 9.1: Test Result for Sample P1.1 – PASSED

AT&T 48V Fusion Power and Battery Cabinet
OSP743N Sample P1.1
Final Data

	Measurement 1 (LASmax)	Measurement 2 (LASmax)
Amb	23.9	23.7
0°	64.6	64.7
45°	63.8	64.0
90°	58.4	58.6
135°	55.6	55.6
180°	56.9	56.8
225°	59.5	59.2
270°	58.7	58.7
315°	64.5	64.5

- Internal Fans - 3250 rpm
- External Fans - 4250 rpm
- Battery Fan - Full Speed
- Rectifiers and Converters - Full Speed

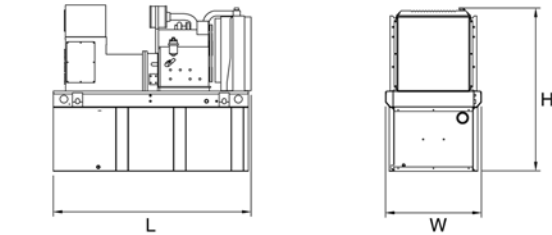


Figure 9.1a: Acoustic Test at 0°

Appendix D

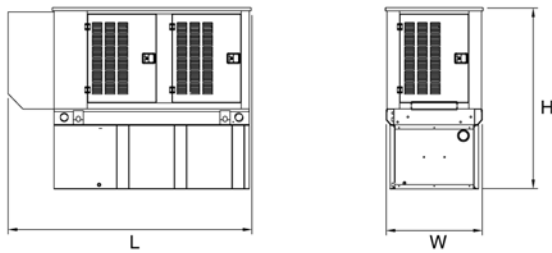
SD030

dimensions, weights and sound levels



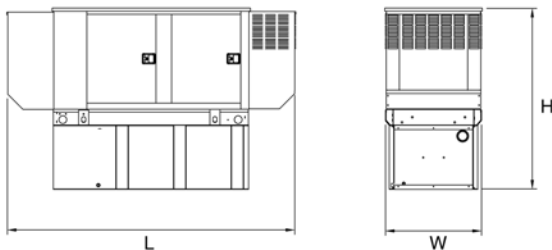
OPEN SET

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	



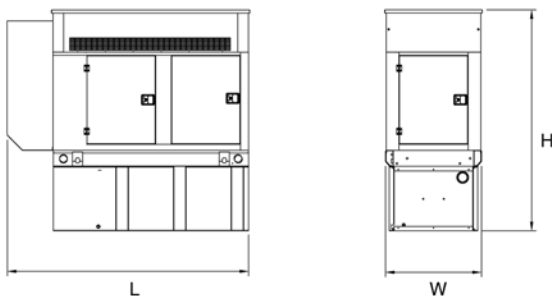
STANDARD ENCLOSURE

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

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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.

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