

Environmental Noise Assessment

StorQuest Self Storage

Sacramento County, California

BAC Job # 2023-070

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Introduction

The proposed StorQuest Self Storage (project) is located at 3438 Watt Avenue in the Arden Arcade community of Sacramento County, California. Existing land uses in the immediate project vicinity include commercial/shopping center to the north, south and west, church to the northeast, and residential to the southeast. The project area with aerial imagery is shown in Figure 1. The project site plan is presented in Figure 2.

The project consists of the development of a 91,878 ft² four-story building, surface parking, and landscaping. The 1st floor will be approximately 31,332 ft², and floors 2, 3, and 4 will be 20,182 ft² each. The climate-controlled building will include 90,908 ft² of storage uses in 906 storage units. All storage units will be accessible from inside the building, and indoor elevators will provide customer access to upper-floor units. A 970 ft² customer service/leasing office will be near the building's southwest corner entry, accessible from the front. A canopy-covered loading area will be on the east side of the building for customers to access the building and move large items. No outdoor storage (e.g., automobiles, boats, or recreational vehicles) is proposed. The project does not include an on-site manager's residence. Finally, the project also consists of the demolition of an existing 20,854 ft² commercial building, asphalt parking lot, pylon sign base, and fence segments.

Due to the proximity of the project to nearby single-family residential uses to the southeast, Bollard Acoustical Consultants, Inc. (BAC) was retained to prepare this noise assessment. Specifically, the purposes of this assessment are to quantify noise generated by project on-site operations, project construction and demolition activities, and to compare those noise levels against the applicable Sacramento County noise level standards for single-family residential uses.

Noise Fundamentals and Terminology

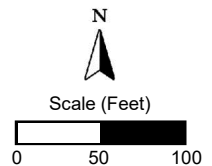
Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard, and thus are called sound. Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in levels (dB) correspond closely to human perception of relative loudness. Appendix A contains definitions of Acoustical Terminology. Figure 3 shows common noise levels associated with various sources.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighing the frequency response of a sound level meter by means of the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. All noise levels reported in this section are in terms of A-weighted levels in decibels.



Legend

- - - Project Parcel Boundary (Approximate)
- - - Residential Property Boundaries (Approximate)
- Ambient Noise Level Survey Location

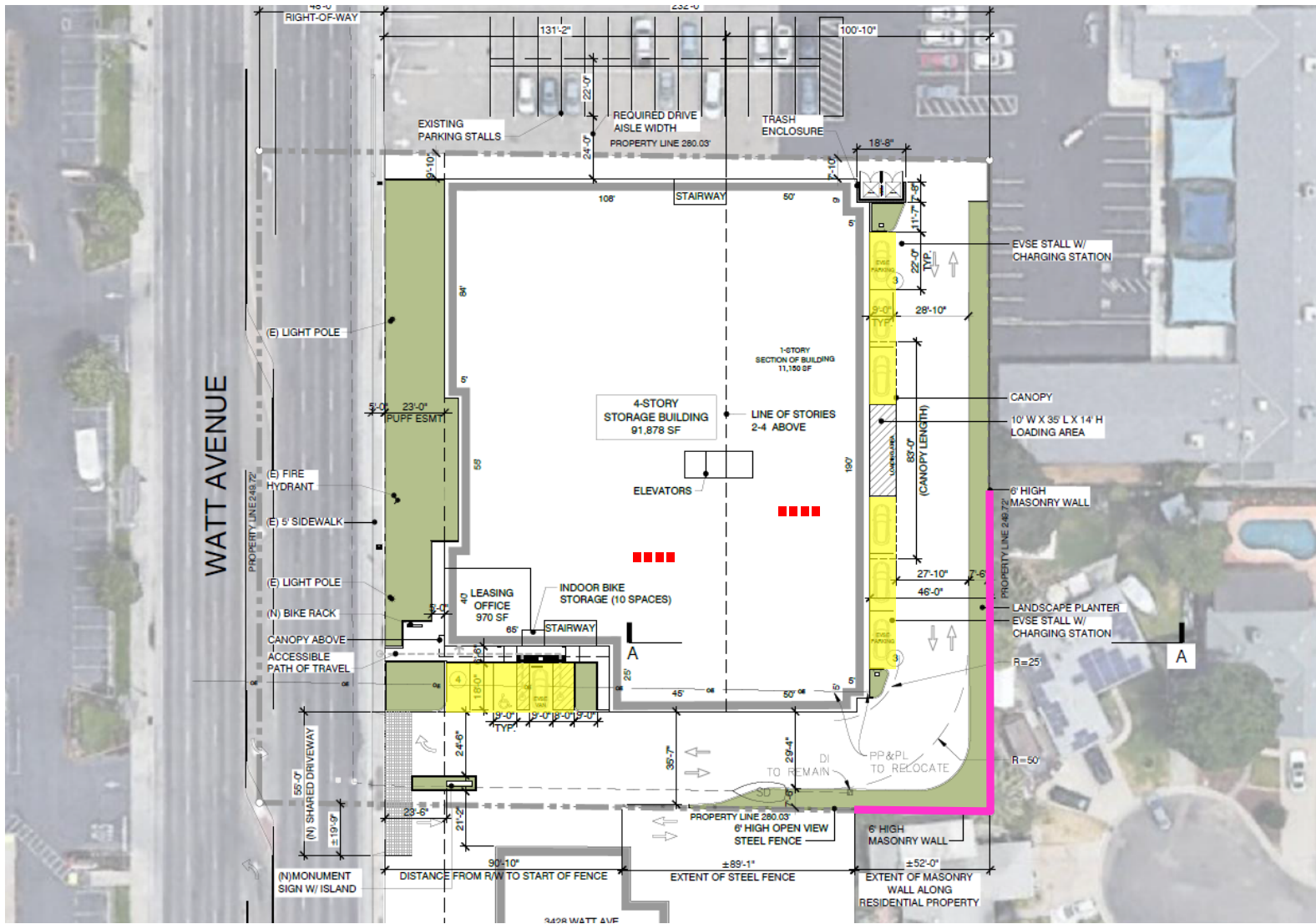


StorQuest Self Storage
Sacramento County, California

Project Area

Figure 1





Legend

- Proposed 6' Masonry Wall
- Proposed Parking Stalls
- Proposed HVAC Condenser Units

StorQuest Self Storage
Sacramento County, California

Project Site Plan

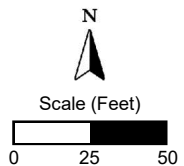
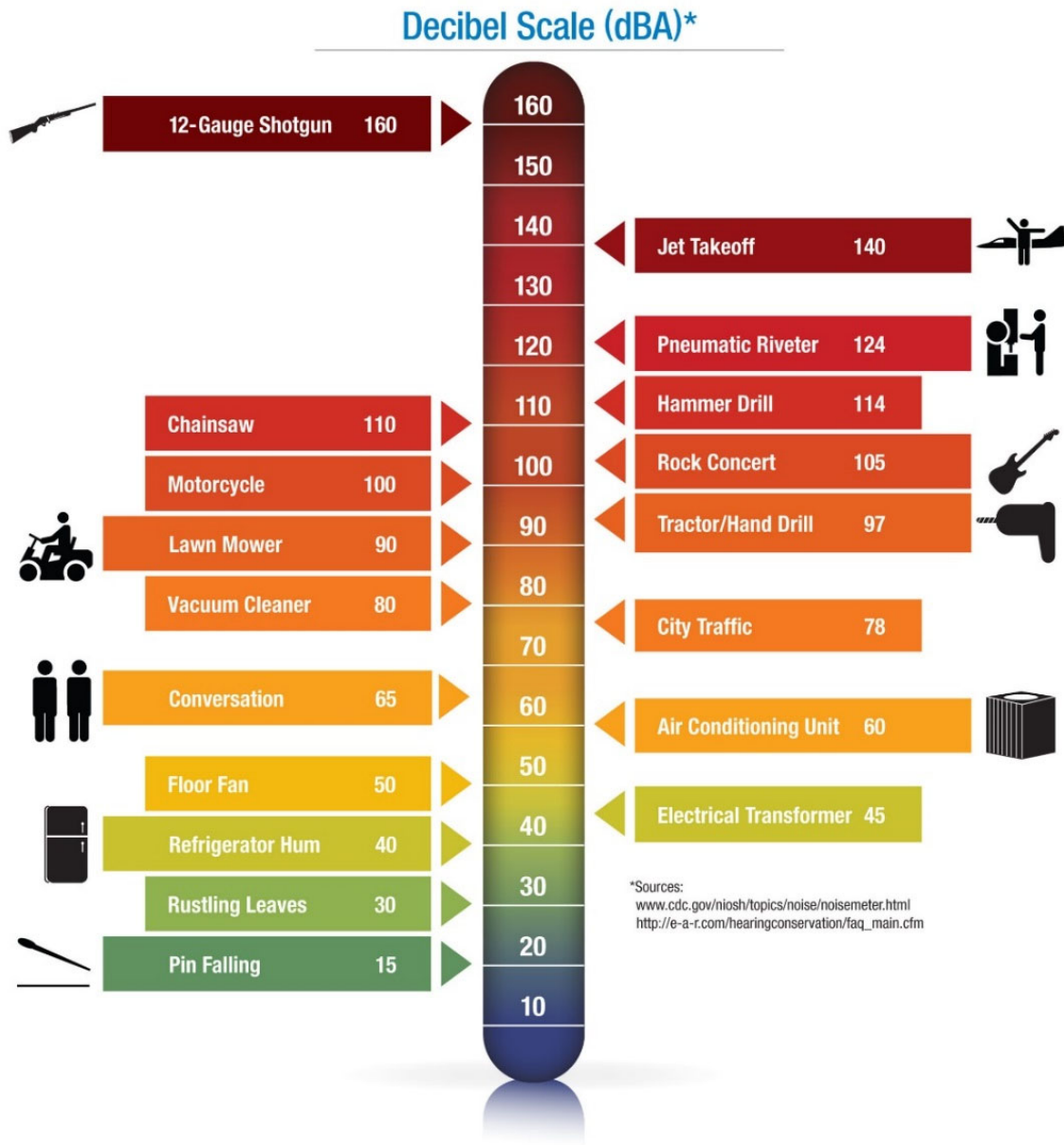


Figure 2



**Figure 3
Noise Levels Associated with Common Noise Sources**



Community noise is commonly described in terms of the “ambient” noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}) over a given time period (usually one hour). The L_{eq} is the foundation of the Day-Night Average Level noise descriptor, DNL or L_{dn} , and shows very good correlation with community response to noise.

The Day-Night Average Level (DNL or L_{dn}) is based upon the average noise level over a 24-hour day, with a +10-decibel weighting applied to noise occurring during nighttime (10:00 p.m. to 7:00

a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because DNL represents a 24-hour average, it tends to disguise short-term variations in the noise environment. DNL-based noise standards are commonly used to assess noise impacts associated with traffic, railroad, and aircraft noise sources.

Existing Ambient Noise Environment within Project Vicinity

The existing ambient noise environment in the immediate project vicinity is defined primarily by traffic on Watt Avenue. To generally quantify the existing ambient noise level environment within the project vicinity, BAC conducted long-term (48-hour) noise level measurements July 12-13, 2023. The noise survey location is shown in Figure 1. Photographs of the noise level survey location are provided in Appendix B.

A Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meter was used for the ambient noise level survey. The meter was calibrated immediately before and after use with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4). The results of the long-term ambient noise level survey are shown numerically and graphically in Appendices C and D (respectively) and are summarized below in Table 1.

Table 1
Summary of Long-Term Ambient Noise Measurement Results – July 12-13, 2023¹

Site Description ²	Date	DNL (dB)	Average Measured Hourly Noise Levels (dB)			
			Daytime ³		Nighttime ⁴	
			L ₅₀	L _{max}	L ₅₀	L _{max}
Southeast end of project	7/12/23	63	56	76	51	73
parcel near residential uses	7/13/23	63	56	75	51	74

¹ Detailed summaries of the noise monitoring results are provided in Appendices C and D.
² Long-term ambient noise monitoring location identified in Figure 1.
³ Daytime: 7:00 a.m. to 10:00 p.m.
⁴ Nighttime: 10:00 p.m. to 7:00 a.m.

Source: BAC 2023.

As indicated in Table 1, average measured hourly noise levels at the BAC ambient noise measurement location were consistent throughout the 48-hour monitoring period (i.e., small range of measured levels).

Criteria for Acceptable Noise Exposure

Sacramento County General Plan

The Noise Element of the Sacramento County General Plan contains noise standards for non-transportation or “stationary” noise sources, which are provided in Table 2. The noise level standards for residential uses shown in Table 2 would be applicable to project on-site operations.

Table 2
Non-Transportation Noise Standards – Median (L₅₀) / Maximum (L_{max})¹

Receiving Land Use	Outdoor Areas ²		Interior Areas ³	Notes
	Daytime	Nighttime	Day & Night	
Residential	55 / 75	50 / 70	35 / 55	
Transient lodging	55 / 75	--	35 / 55	4
Hospitals, nursing homes	55 / 75	--	35 / 55	5, 6
Theaters & auditoriums	--	--	30 / 50	6
Churches, schools, libraries	55 / 75	--	35 / 60	6
Office buildings	60 / 75	--	45 / 65	6
Commercial buildings	--	--	45 / 65	6
Playgrounds, parks	65 / 75	--	--	6
Industry	60 / 80	--	50 / 70	6

¹ The Table 1 standards shall be reduced by 5 dB for sounds consisting primarily of speech or music, and for recurring impulsive sounds. If the existing ambient noise level exceeds the standards of Table 1, then the noise level standards shall be increased at 5 dB increments to encompass the ambient.

² Sensitive areas are defined in the acoustic terminology section.

³ Interior noise level standards are applied within the noise-sensitive areas of the various land uses, with windows and doors in the closed positions.

⁴ Outdoor activity areas of transient lodging facilities area not commonly used during nighttime hours.

⁵ Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.

⁶ The outdoor activity areas of these uses (if any) are not typically utilized during nighttime hours.

⁷ Where median (L₅₀) noise level data is not available for a particular noise source, average (Leq) values may be substituted for the standards of this table provided the noise source in question operates for at least 30 minutes of an hour. If the source in question operates less than 30 minutes per hour, then the maximum noise level standards shown would apply.

Source: Sacramento County General Plan, Noise Element, Table 2.

Sacramento County Noise Ordinance

Section 6.68 of the Sacramento County Code (noise control) also establishes standards for acceptable noise exposure at residential uses. However, because the County Noise Ordinance standards are consistent with the County General Plan standards, compliance with the Table 2 standards would ensure satisfaction of both the General Plan and Noise Ordinance standards. Excluding the noise level standards contained in County Code Section 6.68, the following code sections would be applicable to project on-site operations and construction/demolition activities.

6.68.090 Exemptions

The following activities shall be exempted from the provisions of this chapter:

- e. Noise sources associated with construction, repair, remodeling, demolition, paving or grading of any real property, provided said activities do not take place between the hours of eight p.m. and six a.m. on weekdays and Friday commencing at eight p.m. through and including seven a.m. on Saturday; Saturdays commencing at eight p.m. through and including seven a.m. on the next following Sunday and on each Sunday after the hour of eight p.m. Provided, however, when an unforeseen or unavoidable condition occurs during a construction project and the nature of the project

necessitates that work in process be continued until a specific phase is completed, the contractor or owner shall be allowed to continue work after eight p.m. and to operate machinery and equipment necessary until completion of the specific work in progress can be brought to conclusion under conditions which will not jeopardize inspection acceptance or create undue financial hardships for the contractor or owner.

6.68.120 Machinery, Equipment, Fans and Air Conditioning

- a. It is unlawful for any person to operate any mechanical equipment, pump, fan, air conditioning apparatus, stationary pumps, stationary cooling towers, stationary compressors, similar mechanical devices, or any combination thereof installed after July 1, 1976 in any manner so as to create any noise which would cause the maximum noise level to exceed:
 1. 60 dBA at any point at least 1 foot inside the property line of the affected residential property and 3 to 5 feet above ground level;
 2. 55 dBA in the center of a neighboring patio 3 to 5 feet above ground level;
 3. 55 dBA outside of the neighboring living area window nearest the equipment location. Measurements shall be taken with the microphone not more than 3 feet from the window opening but at least 3 feet from any other surface.
- b. Equipment installed five years after July 1, 1976 must comply with a maximum limit of 55 dBA at any point at least 1 foot inside the property line of the affected residential property and 3 to 5 feet above ground level.
- c. Equipment installed before December 17, 1970 must comply with a limit of 65 dBA maximum in sound level at any point at least 1 foot inside the affected property line and 3 to 5 feet above ground level by January 1, 1977. Equipment installed between December 16, 1970 and July 1, 1976 must comply with a limit of 65 dBA maximum sound level at any point at least 1 foot inside the property line of the affected residential property and 3 to 5 feet above ground level.

County Noise Level Criteria Applied to the Project

The General Plan defines daytime hours as 7:00 a.m. to 10:00 p.m., and nighttime hours as 10:00 p.m. to 7:00 a.m. According to the provided project description, three employees will work at the StorQuest facility, with one employee remaining on-site during business hours. The leasing office will be open Monday through Saturday from 9:00 a.m. to 6:00 p.m. and Sunday from 10:00 a.m. to 5:00 p.m. Customers will have access to storage units daily from 6:00 a.m. to 9:00 p.m. Based on the information above, the County's daytime and nighttime noise level criteria was applied to the project.

The nearest residential uses are located to the southeast of the project, as identified in Figure 1. Pursuant to footnote 1 of Table 2, the County's exterior noise level standards shall be increased in 5 dB increments to encompass the ambient in cases where ambient noise levels already exceed the Table 2 standards. However, after comparison of the BAC ambient noise level data contained in Table 1 and the County's noise standards shown in Table 2, it was revealed that the

County's daytime and nighttime noise level criteria are currently being met or being slightly exceeded at the BAC measurement site, believed to be representative of the ambient noise level environment at the closest residential uses to the southeast. As a result, no adjustments for existing ambient conditions were applied to the County's daytime and nighttime exterior noise level standards. Finally, in addition to the County's exterior noise level limits, the County's interior noise level standards of 35 dB L₅₀ and 55 dB L_{max} for residential uses shown in Table 2 were also applied to project on-site operations noise.

Evaluation of Project Noise Generation

Self-storage facilities are not typically considered to be major noise-generating uses. This is because the unloading and loading of property to and from the storage unit generates minimal noise. As a result, the only appreciable noise generation occurs when customers are either arriving or departing the site, and such facilities do not generate appreciable daily traffic volumes. The only other noise sources other than traffic would be the operation of the building rooftop-mounted HVAC condenser units and project construction/demolition activities. As a result, this assessment focuses on the noise generation of project parking areas, rooftop HVAC condenser units, and project construction/demolition activities.

Noise generated by the above-identified project on-site operations were quantified through a combination of reference noise level measurements conducted by BAC, published reference noise level data, and application of accepted noise modeling techniques. Predicted noise levels resulting from each of the identified noise sources at the nearest residential uses to the southeast of the project (APN's: 255-0171-015 & 255-0171-016) are evaluated in the following sections. The County's noise level standards are to be applied at the outdoor activity areas (i.e., backyards) of single-family residential uses.

Finally, the following analyses of project-generated noise levels at the nearest existing residential uses include consideration of the attenuation that would be provided by a 6' masonry wall proposed to be constructed along the southeast project property line. The location of the proposed 6' noise barrier is illustrated in Figure 1. The proposed 6' masonry wall is calculated to provide approximately 5 dB of project-generated noise level reduction at the nearest existing residential uses.

Parking Area Activity Noise Generation

According to the provided site plans, the project proposes a total of 10 parking stalls. Specifically, the south side of the building will have four stalls, and six stalls will be provided on the building's east side. The locations of the parking areas are shown in Figure 2.

As a means of determining potential noise exposure due to event parking lot activities, BAC utilized specific parking lot noise level measurements conducted by BAC. Specifically, a series of individual noise measurements were conducted of multiple vehicle types arriving and departing a parking area, including engines starting and stopping, car doors opening and closing, and persons conversing as they entered and exited the vehicles. The results of those measurements revealed that individual parking lot movements generated mean noise levels of 70 dB SEL at a

reference distance of 50 feet. The maximum noise level associated with parking lot activity was 65 dB L_{max} at the same 50-foot reference distance.

To compute project parking noise levels relative to the County’s median (L_{50}) noise level descriptor, the approximate number of hourly operations in a given area and distance to the effective noise center of those activities is required. It is the understanding of BAC that a traffic noise study was not required for the project. However, according to a trip generation analysis for a self-storage facility BAC prepared a noise study for in 2019, a facility with 840 rental storage units was estimated to generate approximately 150 daily trips, including 16 PM peak hour trips. Given this information, and after consideration of the capacity of the StorQuest project (906 storage units proposed), it was conservatively assumed that the project would have 25 PM peak hour trips. Parking activity noise exposure was determined using the following equation:

$$Peak\ Hour\ L_{eq} = 70 + 10 * \log(N) - 35.6$$

Where 70 is the mean Sound Exposure Level (SEL) for an automobile parking lot arrival or departure, N is the number of parking lot operations in a given hour, and 35.6 is 10 times the logarithm of the number of seconds in an hour. Median (L_{50}) parking movement noise levels would be approximately 5 dB less than hourly average noise levels. Based on the information above, and assuming standard spherical spreading loss (-6 dB per doubling of distance), project parking noise exposure at the nearest residential uses was predicted (Tables 3 and 4).

Table 3
Predicted Parking Movement Noise Levels at Nearest Residential Uses – Median L_{50}

Residential APN ¹	Distance (ft) ²	Predicted Noise Level, L_{50} (dB) ³	County Exterior Noise Standards, L_{50} (dB)	
			Daytime	Nighttime
255-0171-015	45	39	55	50
255-0171-016	50	38		

¹ Location of residential parcels are shown in Figure 1.
² Distances scaled from nearest parking area/circulation lane to backyard of residential use.
³ Predicted noise levels include a -5 dB offset to account for attenuation from proposed 6' wall at property line.

Source: BAC 2023.

Table 4
Predicted Parking Area Movement Noise Levels at Nearest Residential Uses – Maximum L_{max}

Residential APN ¹	Distance (ft) ²	Predicted Noise Level, L_{max} (dB) ³	County Exterior Noise Standards, L_{max} (dB)	
			Daytime	Nighttime
255-0171-015	45	61	75	70
255-0171-016	50	60		

¹ Location of residential parcels are shown in Figure 1.
² Distances scaled from nearest parking area/circulation lane to backyard of residential use.
³ Predicted noise levels include a -5 dB offset to account for attenuation from proposed 6' wall at property line.

Source: BAC 2023.

As indicated in Tables 3 and 4, conservative estimates of project parking movement noise levels would satisfy the County's daytime and nighttime exterior noise level standards at the closest residential uses. Additionally, the predicted parking movement noise levels shown in Tables 3 and 4 would be below measured existing ambient conditions at the closest residential uses.

Standard residential construction (e.g., stucco siding, STC-27 windows, door weather-stripping, exterior wall insulation, composition plywood roof), typically results in an exterior to interior noise reduction of approximately 25 dB with windows closed and approximately 15 dB with windows open. Given the predicted noise levels presented in Tables 3 and 4, and after consideration of the aforementioned exterior to interior noise level reduction typically provided by standard residential construction, project parking movement noise levels are expected to comply with the County's residential interior noise level standards of 35 dB L₅₀ and 55 dB L_{max} within the nearest residences.

Based on the analysis and results provided above, additional consideration of parking movement noise mitigation measures would not be warranted for the project.

Rooftop HVAC Condenser Noise Generation

The project description states that the storage facility building will be climate controlled. Based on information obtained from the project applicant, the project proposes the installation of eight (8) Gree UMAT48HP230V1AO 48,000 BTU inverter heat pump condensing units on the rooftops of the 1st and 4th floors of the building. The locations of the proposed HVAC condenser units are shown in Figure 2.

According to equipment manufacturer specification sheet (provided as Appendix E), the proposed condenser unit has a reference sound power level of 59 dB. Because HVAC condenser noise is considered to be a steady-state noise source (i.e., negligible fluctuations of levels or continuous in nature), project HVAC condenser noise was appropriately assessed relative to the County's median (L₅₀) noise level descriptor. For the purpose of this analysis, it was assumed that all eight (8) of the proposed HVAC condensers would be in operation simultaneously (i.e., worst-case noise exposure).

Based on the cited reference noise level above, and assuming standard spherical spreading loss (-6 dB per doubling of distance), project HVAC condenser unit noise level exposure was predicted at the nearest residential uses and the results of those predictions are presented in Table 5.

**Table 5
Predicted HVAC Condenser Unit Noise Levels at Nearest Residential Uses – Median L₅₀**

Residential APN ¹	Distance (ft) ²	Predicted Noise Level, L ₅₀ (dB) ³	County Exterior Noise Standards, L ₅₀ (dB)	
			Daytime	Nighttime
255-0171-015	105	23	55	50
255-0171-016	130	21		

¹ Location of residential parcels are shown in Figure 1.
² Distances scaled from effective noise center of all rooftop condensers to ground level residential property lines.
³ Predicted noise levels include a -5 dB offset to account for attenuation from proposed 6' wall at property line.

Source: BAC 2023.

Table 5 data indicate that worst-case (combined) project HVAC condenser noise levels are predicted to satisfy the applied County daytime and nighttime exterior noise level standards at the closest residential uses. Additionally, the predicted HVAC equipment noise levels shown in Table 5 would be below measured existing ambient conditions at the closest residential uses.

Given the predicted noise levels in Table 5, and after consideration of the aforementioned exterior to interior noise level reduction typically provided by standard residential construction (approximately 25 dB with windows closed and approximately 15 dB with windows open), project HVAC condenser unit noise levels are expected to be below the County’s residential interior noise level standards of 35 dB L₅₀ and 55 dB L_{max} within the nearest residences. Finally, the predicted HVAC condenser unit noise levels presented in Table 5 would comply with the noise level criteria applicable to HVAC equipment contained in County Code Section 6.68.120.

Based on the analysis and results provided above, additional consideration of HVAC equipment noise mitigation measures would not be warranted for the project.

Construction & Demolition Noise Generation

During project construction/demolition, heavy equipment would be used for grading excavation, paving, and building construction, which would increase ambient noise levels when in use. Noise levels would vary depending on the type of equipment used, how it is operated, and how well it is maintained. Noise exposure at any single point outside the project work area would also vary depending upon the proximity of equipment activities to that point.

Table 6 includes the range of maximum noise levels for equipment commonly used in general construction projects at full-power operation at a distance of 50 feet. It should be noted that not all of these construction activities would be required of this project.

Table 6
Reference Noise Levels for Typical Construction Equipment

Equipment Description	Reference Noise Level at 50 Feet, L_{max} (dB)
Air compressor	80
Backhoe	80
Ballast equalizer	82
Ballast tamper	83
Compactor	82
Concrete mixer	85
Concrete pump	82
Concrete vibrator	76
Crane, mobile	83
Dozer	85
Excavator	85
Generator	82
Grader	85
Impact wrench	85
Loader	80
Paver	85
Pneumatic tool	85
Pump	77
Saw	76
Scarifier	83
Scraper	85
Shovel	82
Spike driver	77
Tie cutter	84
Tie handler	80
Tie inserter	85
Truck	84

Source: FTA Noise and Vibration Impact Assessment Manual, Table 7-1. 2018.

The nearest residential uses (APN's: 255-0171-015 and 255-0171-016) are located approximately 50 feet from where construction/demolition activities could potentially occur on the project site. As shown in Table 6, exterior noise levels from project construction equipment could approach 85 dB at a distance of 50 feet. In addition, a typical building can reduce noise levels by 25 dB with the windows closed, which would reduce the maximum noise level to 60 dB within the closest residential interior areas.

Sacramento County Code Section 6.68.090(e) exempts noise sources associated with construction, repair, remodeling, demolition, paving, and grading activities provided such activities do not occur between the hours of 8:00 p.m. and 6:00 a.m. on weekdays and Friday commencing at 8:00 p.m. through and including 7:00 a.m. on Saturday, Saturday s commencing at 8:00 p.m. through and including 7:00 a.m. on the next following Sunday, and on each Sunday after 8:00 p.m.

It is reasonably assumed for the purpose of this analysis that all on-site noise-generating project construction/demolition equipment and activities would occur pursuant to County Code Section

6.68.090(e), and would thereby be exempt from the County's noise level criteria. Nonetheless, to reduce the potential for annoyance at nearby existing residential uses, the following measures should be incorporated into project on-site construction operations:

- All on-site noise-generating construction/demolition activities shall occur pursuant to the hours and days specified in Sacramento County Code Section 6.68.090(e).
- All noise-producing project equipment and vehicles using internal-combustion engines shall be equipped with manufacturers-recommended mufflers and be maintained in good working condition.
- All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, state, or local agency shall comply with such regulations while in the course of project activity.
- Electrically powered equipment shall be used instead of pneumatic or internal-combustion-powered equipment, where feasible.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive uses.
- Project area and site access road speed limits shall be established and enforced during the construction period.
- Nearby residences shall be notified of construction schedules so that arrangements can be made, if desired, to limit their exposure to short-term increases in ambient noise levels.

Conclusions and Recommendations

Based on the analysis and results presented in this assessment, noise levels associated with on-site operations at the proposed StorQuest Self-Storage at 3438 Watt Avenue in Sacramento County, California are predicted to comply with the applicable Sacramento County noise level standards at the nearest residential uses. It should be noted that this predicted compliance includes consideration of attenuation that would be provided by a 6' masonry wall proposed for construction along the property lines of the adjacent residential uses. Therefore, it is recommended that the project design include the construction of the 6' masonry wall as proposed.

Sacramento County Code Section 6.68.090(e) exempts noise sources associated with construction, repair, remodeling, demolition, paving, and grading activities provided such activities do not occur between the hours and days outlined in the code section. It is reasonably assumed for the purpose of this analysis that all noise-generating project construction/demolition equipment and activities would occur pursuant to County Code Section 6.68.090(e) and would thereby be exempt from the County's noise level criteria. Nonetheless, to reduce the potential for annoyance at nearby existing residential uses, it is recommended that the noise abatement measures outlined in this report be incorporated into on-site project construction and demolition activities.

These conclusions are based on the site plan presented in Figure 2, BAC measurement data and operations assumptions, equipment manufacturer sound level data, and on noise reduction data for standard residential dwellings and typical STC rated window data. Deviations from the above-mentioned resources could cause actual noise levels to differ from those predicted in this

assessment. Bollard Acoustical Consultants, Inc. is not responsible for exceedance of County noise level limits caused by such deviations.

This concludes our environmental noise assessment for the StorQuest Self Storage project in Sacramento County, California. Please contact BAC at (530) 537-2328 or dariog@bacnoise.com with comments or questions regarding this evaluation.

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.
L_{dn}	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
L_{max}	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.





A



B

Legend

- A: Ambient noise monitoring location at southeast corner of project parcel, facing south
- B: Ambient noise monitoring location at southeast corner of project parcel, facing west

StorQuest Self Storage
Sacramento County, California

Noise Survey Photographs

Appendix B



Appendix C-1
Long-Term Ambient Noise Monitoring Results
StorQuest Self-Storage - Sacramento County, California
Wednesday, July 12, 2023

Hour	Leq	Lmax	L50	L90
12:00 AM	54	68	52	47
1:00 AM	52	78	47	42
2:00 AM	51	69	44	40
3:00 AM	52	71	47	43
4:00 AM	56	72	52	46
5:00 AM	61	84	57	50
6:00 AM	61	79	59	50
7:00 AM	61	79	59	51
8:00 AM	59	79	57	51
9:00 AM	59	76	57	48
10:00 AM	58	73	55	49
11:00 AM	59	86	56	49
12:00 PM	58	73	56	49
1:00 PM	58	71	55	49
2:00 PM	59	80	56	49
3:00 PM	59	82	56	49
4:00 PM	58	79	56	50
5:00 PM	57	75	55	50
6:00 PM	57	70	56	50
7:00 PM	57	73	55	49
8:00 PM	57	72	55	48
9:00 PM	57	77	55	49
10:00 PM	56	70	53	48
11:00 PM	55	70	52	48

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	61	57	58	61	51	57
Lmax (Maximum)	86	70	76	84	68	73
L50 (Median)	59	55	56	59	44	51
L90 (Background)	51	48	49	50	40	46

Computed DNL (dB)	63
% Daytime Energy	71%
% Nighttime Energy	29%

GPS Coordinates	38°37'38.29"N
	121°22'55.29"W

Appendix C-2
Long-Term Ambient Noise Monitoring Results
StorQuest Self-Storage - Sacramento County, California
Thursday, July 13, 2023

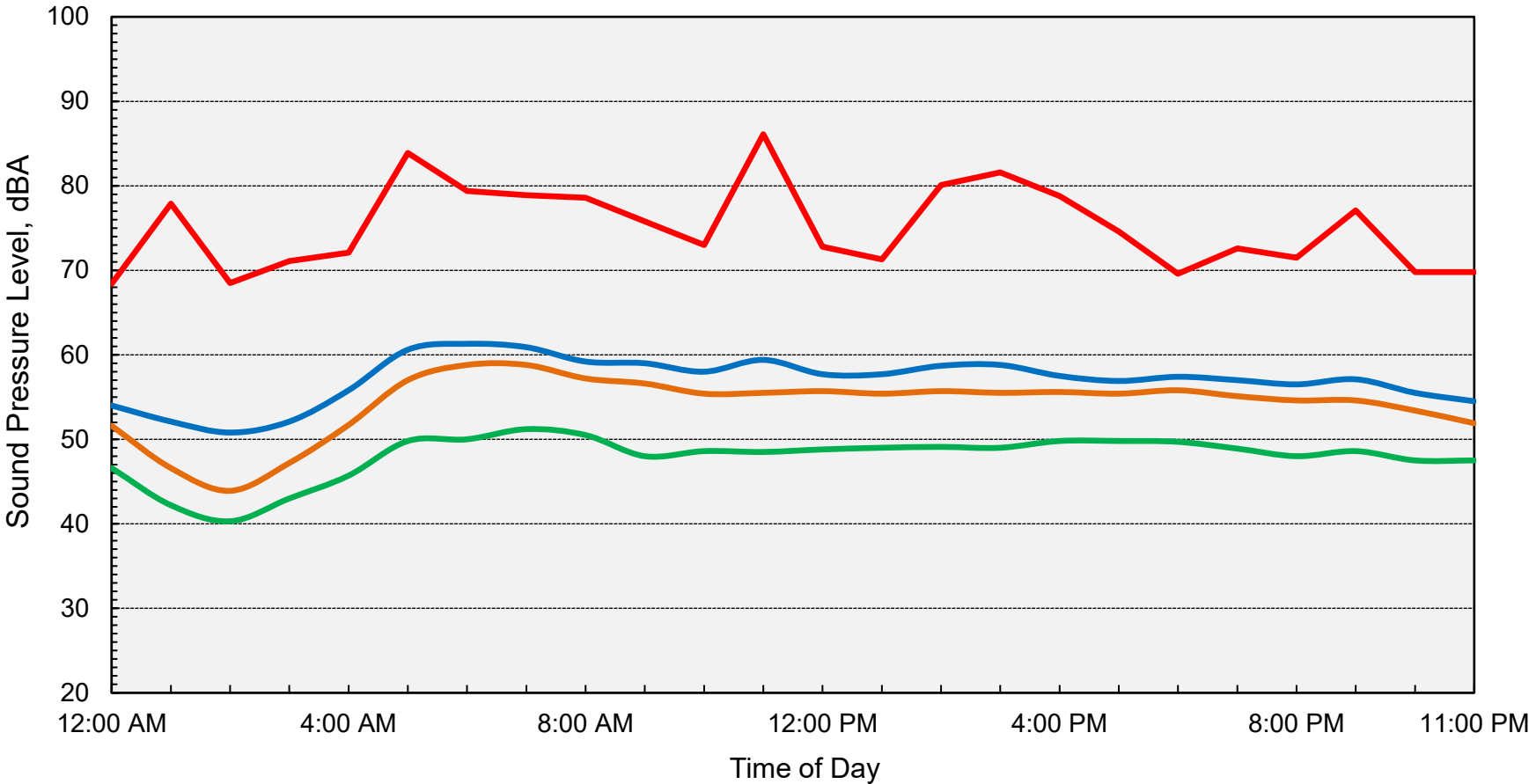
Hour	Leq	Lmax	L50	L90
12:00 AM	53	73	49	46
1:00 AM	51	67	47	44
2:00 AM	51	70	45	41
3:00 AM	52	67	46	42
4:00 AM	56	72	51	45
5:00 AM	59	74	56	49
6:00 AM	61	87	58	49
7:00 AM	61	77	58	49
8:00 AM	59	71	57	48
9:00 AM	58	72	56	47
10:00 AM	57	72	55	47
11:00 AM	58	74	56	49
12:00 PM	58	73	55	48
1:00 PM	58	77	55	48
2:00 PM	58	74	56	49
3:00 PM	59	85	55	49
4:00 PM	57	73	56	49
5:00 PM	58	76	56	50
6:00 PM	57	70	56	50
7:00 PM	58	78	56	49
8:00 PM	57	73	55	49
9:00 PM	59	81	56	50
10:00 PM	57	80	54	49
11:00 PM	55	79	53	49

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	61	57	58	61	51	56
Lmax (Maximum)	85	70	75	87	67	74
L50 (Median)	58	55	56	58	45	51
L90 (Background)	50	47	49	49	41	46

Computed DNL (dB)	63
% Daytime Energy	72%
% Nighttime Energy	28%

GPS Coordinates	38°37'38.29"N
	121°22'55.29"W

Appendix D-1
Long-Term Ambient Noise Monitoring Results
StorQuest Self-Storage - Sacramento County, California
Wednesday, July 12, 2023

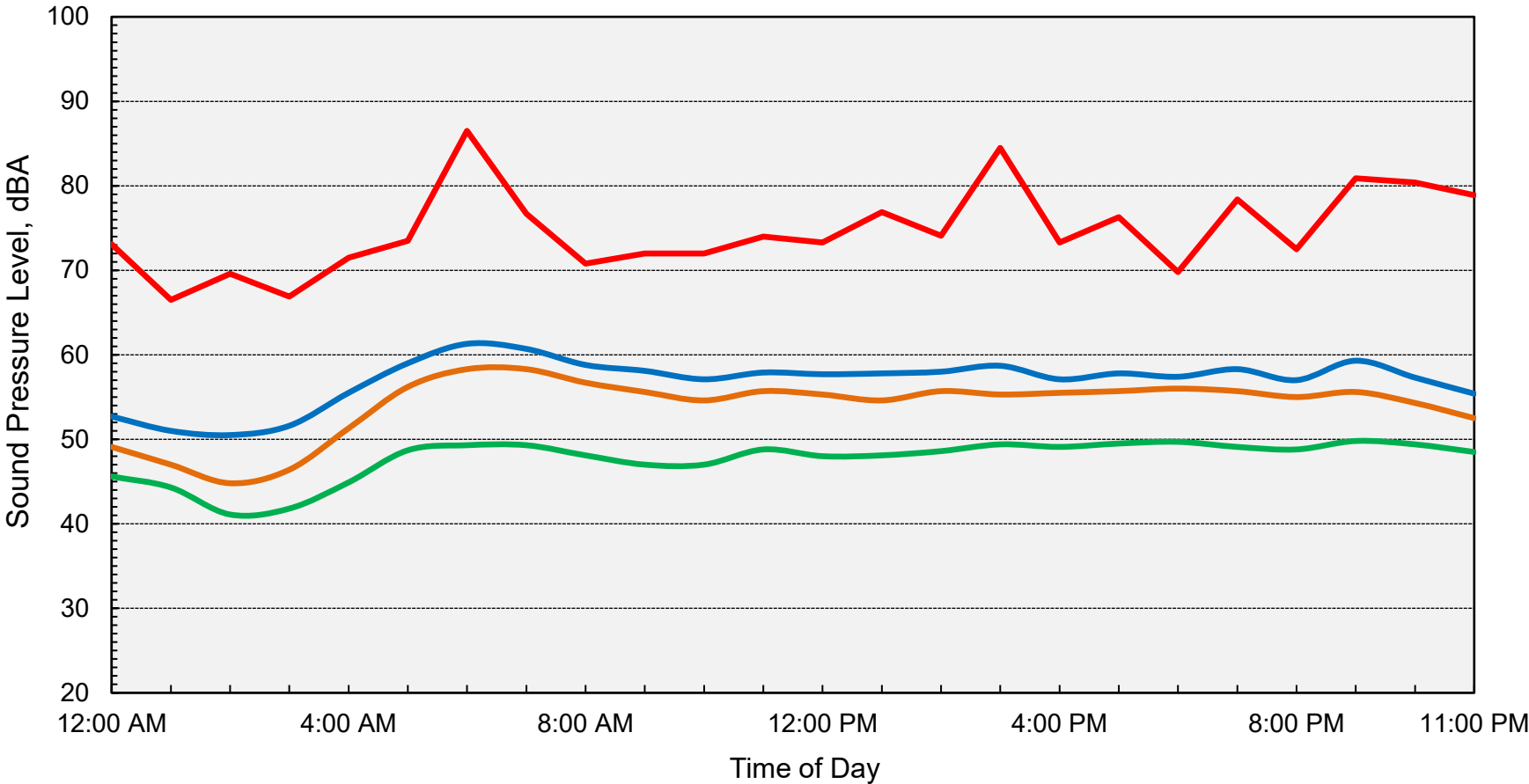


Average (Leq) Maximum (Lmax) Median (L50) Background (L90)

Computed DNL = 63 dB



Appendix D-2
Long-Term Ambient Noise Monitoring Results
StorQuest Self-Storage - Sacramento County, California
Thursday, July 13, 2023



Average (Leq) Maximum (Lmax) Median (L50) Background (L90)

Computed DNL = 63 dB



Appendix E



Submittal Data: UMAT48HP230V1AD 48,000 BTUH Slim Duct Heat Pump System

Job Name		Location		Date
Purchaser	StorQuest Express Self Storage	Engineer	Fairfield,	1/6/2023
Submitted To	Air Squared Mechanical	For	<input type="checkbox"/> Reference <input type="checkbox"/> Approval <input type="checkbox"/> Construction	
Unit Designation	Gary Walker	Schedule No.	X	

- GENERAL FEATURES**
- Multi-Speed Fan
 - Medium Static Pressure Capability
 - Return Air From Rear Only
 - Internal Condensate Drain Pump
 - Sentry Condensate Overflow Protection
 - XK60 Wired Remote Controllers
 - Acrylic Resin/Anti-Corrosion Fin Coating
 - 5 yr. Limited Parts Warranty
 - 7 year Limited Compressor Warranty



System Ratings

Cooling		
Rated Capacity		48,000 BTU/H
Capacity Range		20,400-49,500 BTU/H
Power Input (Max)		5,600 W
SEER		16.0
EER		9.3
Heating at 47° F		
Rated Capacity		54,500 BTU/H
Capacity Range		17,500-58,000 BTU/H
Power Input (Max)		5,500 W
HSPF		9.0
COP		3.1
Heating at 17° F		
Rated Capacity		30,600 BTU/H
Operating Range		
Cooling	(Max)	118°F (48°C)
	(Min)	0°F (-18°C)
Heating	(Max)	75°F (24°C)
	(Min)	0°F (-18°C)
Refrigerant Piping Data		
Gas Pipe Size (OD)		5/8-in
Liquid Pipe Size (OD)		3/8-in
Connection Method		Flared
Factory Charge		140.8 oz
Additional Charge		0.6 oz/ft
Pre-Charge Length		25-ft
MAX Refrigerant Pipe Length		230-ft
MIN Refrigerant Pipe Length		10-ft
MAX Refrigerant Pipe Elevation		49-ft

Indoor Unit Data

Fan Motor	Output Power	3/4HP
	FLA	4.0A
Airflow		
	Cooling Wet (Lo/Hi)	900/1470 CFM
	Heating Dry (Lo/Hi)	900/1470 CFM
Sound Level		
	Cooling (Min/Max)	41/53 dB(A)
	Heating (Min/Max)	41/53 dB(A)
Dehumidification		
		1.80 pt/hr
Condensate Drain Lift (Height)		
		33-in
Power Supply		
	Normal Operational Voltage	208/230 V, 1 Phase, 60 Hz
	Voltage Range	187 - 253 V
	Interconnecting Wire Size	18-2 AWG / 300V THHN
	MCA	5.0A
	MOCP/Breaker Size	15A

Outdoor Unit Data

Compressor		DC Inverter Driven Rotary
	RLA	35.5 A
Refrigerant Type		R410A
Fan Motor	Output Power	2 x 1/6HP
	FLA	2 x 2.0 A
Sound Level		
	Cooling/Heating	59/59 dB(A)
Power Supply		
	Normal Operational Voltage	208/230 V, 1 Phase, 60 Hz
	Voltage Range	187 - 253 V
	Main Supply Wire Size	8 AWG
	MCA	45.0A
	MOCP/Breaker Size	70 A



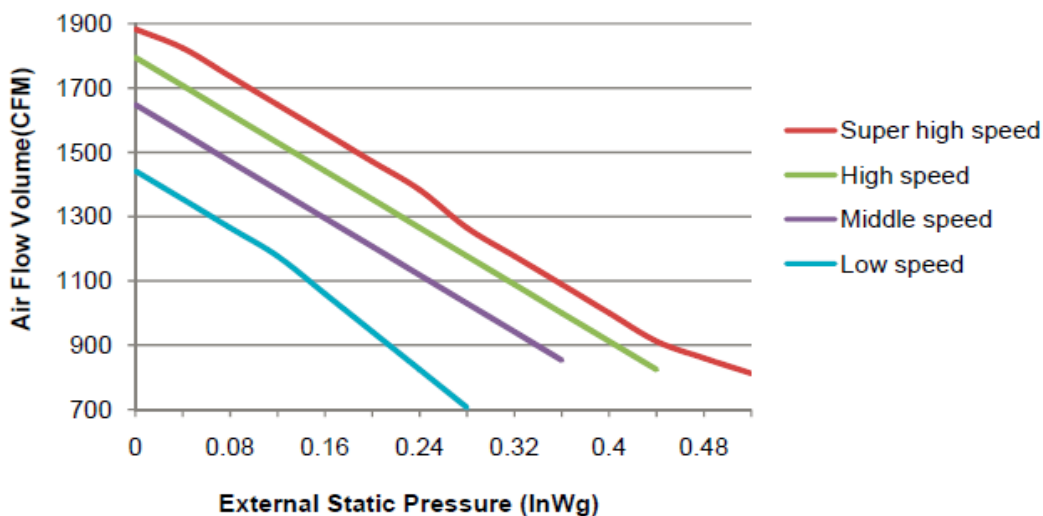
SYSTEM FEATURES

Inverter Type	G10
Ultra Low Frequency Torque Control	YES
Power Factor Correction	YES
Compressor Type	Rotary
Refrigerant Type	R410A
Basepan With Electric Heater	YES
Compressor With Electric Heater	NO
Outdoor Fin Coating	Acrylic Resin
Intelligent Defrosting	YES
Intelligent Preheating	YES
Low Voltage Startup	YES
Memory/Power Failure Recovery	YES
Self Diagnosis	YES
Low Ambient Cooling	YES
Internal Condensate Pump	YES
XK60 Wired Controller Interface	YES
Wi-Fi Interface	NO
Indoor Fan Type	Centrifugal
Multi Fan Speeds	3 Speeds
LED Display Indoor Unit	NO
Advance Filter	NO
Auxiliary Electrical Heater	NO
Ventilation (Outdoor Air)	Optional

WIRED CONTROLLER FUNCTIONS

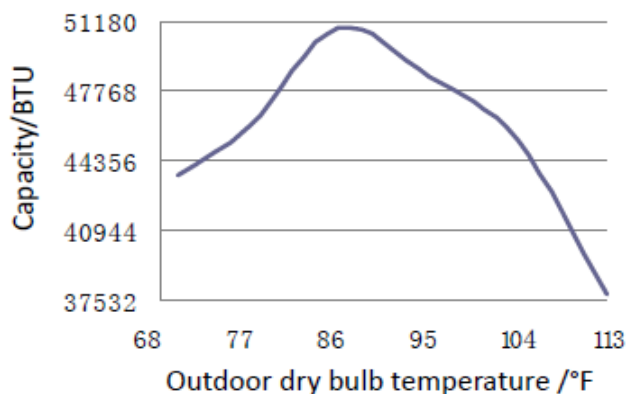
Auto Mode	YES
Auto Fan	YES
Auto Swing (Continuous Sweep)	NO
Adjustable Swing Louvers (5 pos.)	NO
Clock on Remote Controller	YES
Dry Mode	YES
Dry Anti-Mildew (X-Fan) Mode	YES
Energy Saving Mode	NO
Dirty Filter Alert	NO
I Feel Function	YES
Lock on Wired Controller	YES
Quiet Mode	NO
Room Temperature Display (5 sec.)	YES
Sleep Mode	YES
Timer Mode	YES
Turbo Mode	YES
Display On/Off Control	NO
Freeze Guard Mode	YES

FAN PERFORMANCE CURVES

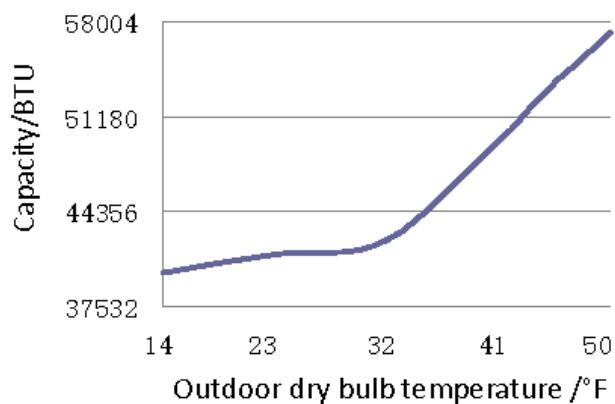


EXTENDED RATINGS

COOLING PERFORMANCE



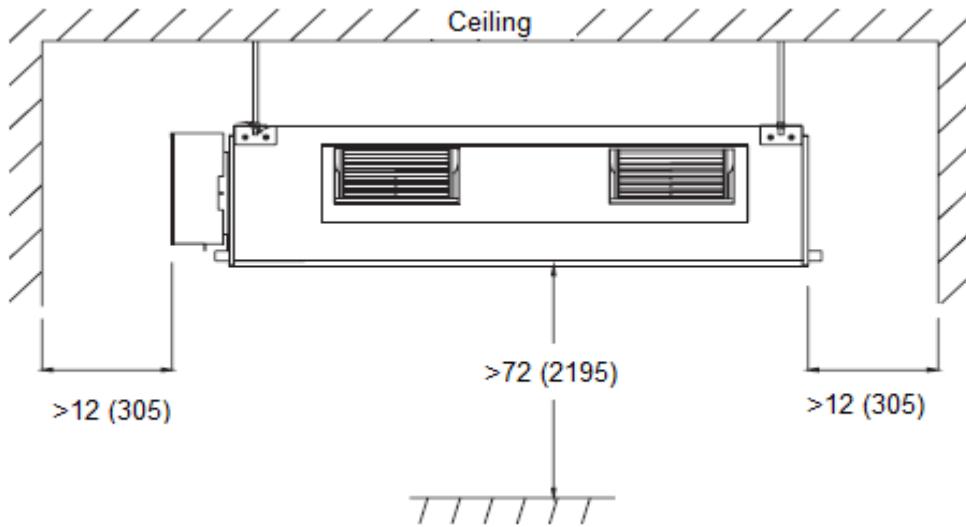
HEATING PERFORMANCE



MINIMUM SPACING REQUIREMENTS

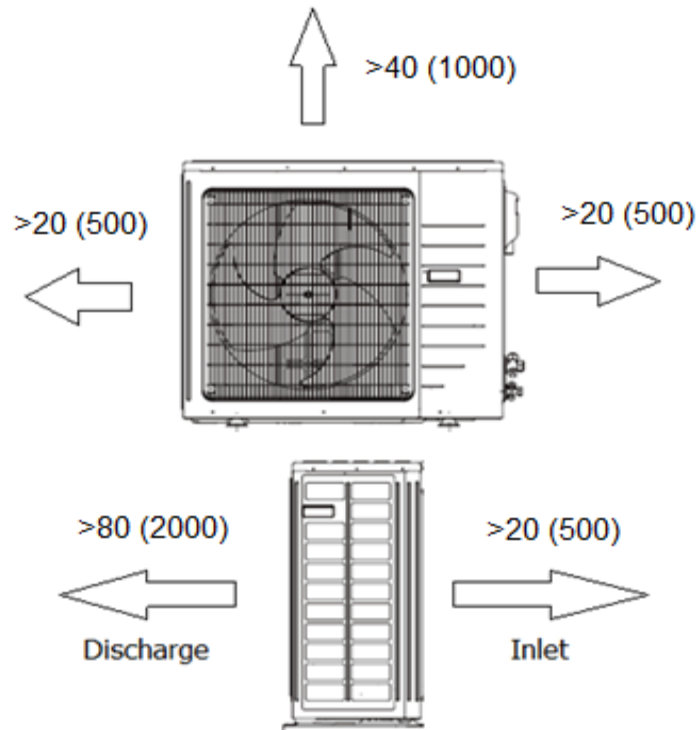
Units: inch (mm)

INDOOR



Units: inch (mm)

OUTDOOR

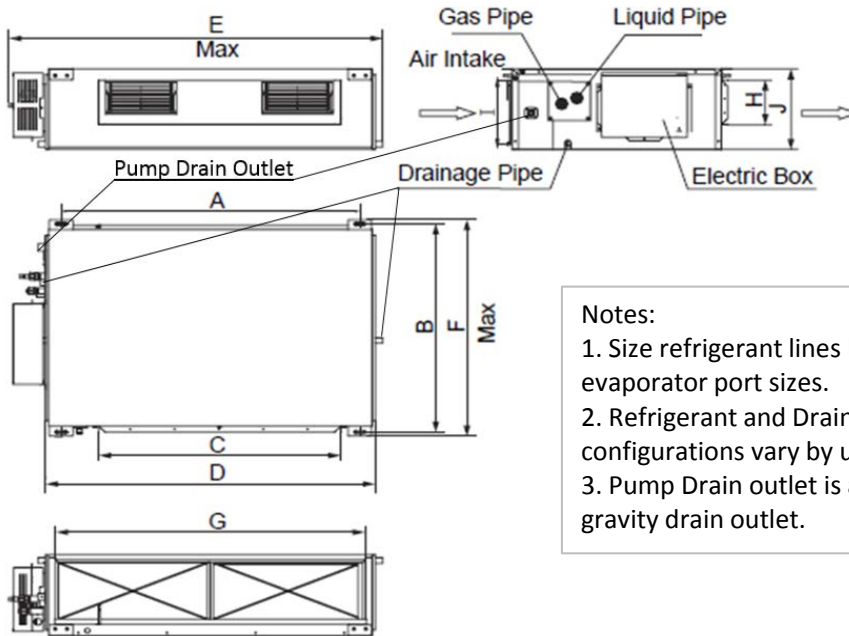


DIMENSIONAL SPECIFICATIONS

UMAT48HP230V1AD

INDOOR UNIT DIMENSIONS & WEIGHTS

Units: inch (mm)



- Notes:**
1. Size refrigerant lines based on evaporator port sizes.
 2. Refrigerant and Drain pipe configurations vary by unit size.
 3. Pump Drain outlet is above gravity drain outlet.

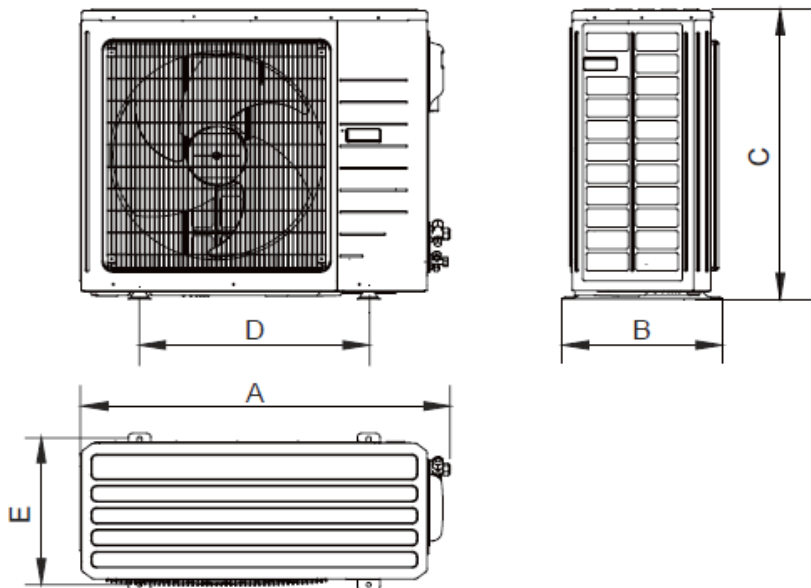
A	43.375	(1177)
B	25.375	(646)
C	33.5	(852)
D	45.25	(1150)
E	52.75	(1340)
F	29.5	(750)
G	37.5	(953)
H	7.5	(190)
I	12.5	(316)
J	13.75	(350)

Net Weight	123.2 lbs
Shipping Weight	154.0 lbs

Liquid Line Valve	3/8-in OD Flared
Gas Line Valve	5/8-in OD Flared
Drain Connector	13/16 in OD

OUTDOOR UNIT DIMENSIONS & WEIGHTS

Units: inch (mm)



A	37.75	(958)
B	16.25	(412)
C	53.125	(1349)
D	22.5	(572)
E	14.75	(376)

Net Weight	231.0 lbs
Shipping Weight	253.0 lbs

Liquid Line Valve	3/8-in OD Flared
Gas Line Valve	5/8-in OD Flared

- Notes:**
1. Recommended Communication Wire Type 18-2 AWG Stranded Copper THHN 300V Wire
 2. Power wiring size must comply with applicable national and local codes.
 3. Test conditions are based on AHRI 210/240.

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