Attachment 6

ROSSMOOR WALNUT CREEK EVENT CENTER PICKLEBALL NOISE STUDY

JUNE 3, 2024

PREPARED FOR:
ROSSMOOR WALNUT CREEK

PREPARED BY:
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ROSSMOOR WALNUT CREEK EVENT CENTER PICKLEBALL NOISE STUDY

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EXECUTIVE SUMMARY

Acoustics Group, Inc., (AGI) was retained by Rossmoor Walnut Creek to evaluate the pickleball noise levels associated with adding six (6) pickleball courts at their facility located at 1021 Stanley Dollar Drive in Walnut Creek, CA. AGI has reviewed the City of Walnut Creek's Municipal Code Noise Standard, conducted ambient and pickleball noise level measurements, analyzed pickleball noise, assessed the impact of the pickleball courts, and evaluated noise control measures for reducing the noise from the proposed pickleball courts at the nearby residential homes.

The predicted noise level from the proposed pickleball activity will be 37.6, 38.1, 49.5, 36.5, and 40.2 dBA at receivers NM1 through NM5, respectively. At NM3, the pickleball noise level would exceed ambient noise levels throughout many of the operating hours. Although there is an exceedance at NM3, the receptor is a clubhouse and does not need to be held to the same noise standards as residences. Pickleball noise would not be considered an impact at residences represented by NM1, NM2, NM4, and NM5. Additionally, the impulsive character of the pickleball noise could be audible at receptors NM3, NM4 and NM5 and could be a source of annoyance to sensitive individuals, especially when the ambient background noise level is lower or when there are lulls in traffic noise. Noise control measures are identified to reduce pickleball noise when considered practical.

The reverberation time (RT60) with the Project Design's acoustical finishes will be 1.2 to 3.2 seconds. Without any addition of acoustical absorption in the interior spaces, the RT60 at the program rooms exceeds the Industry RT60 Criteria of 1.0 to 1.5 seconds. Additional noise control was evaluated to reduce reverberation time within the building.

This report has been organized into multiple sections for ease of reference. Section 1 introduces the Project and provides a general discussion on the Project Components. Section 2 discusses Noise Fundamentals. Section 3 presents the City of Walnut Creek Noise Standards. Section 4 discusses the Ambient Noise Survey, Section 5 discusses the Impact Assessment. Section 6 presents the Noise Control Analysis, including Recommendations. Section 7 discusses the Conclusion.

INTRODUCTION

Acoustics Group, Inc., (AGI) was retained by Rossmoor Walnut Creek to evaluate the noise levels associated with the pickleball court project at 1021 Stanley Dollar Drive in Walnut Creek, CA. The club is proposing adding six pickleball courts near the event center. The Rossmoor Walnut Creek Board of Directors and some of the community's residents are concerned about the increase in noise from the future pickleball operations. Figure 1 shows the location of the future pickleball courts within a building structure with respect to the surrounding residential homes. Figure 2 shows the pickleball court layout. Figure 3 shows the proposed building elevations.

Figure 1. Location of Proposed Pickleball Courts

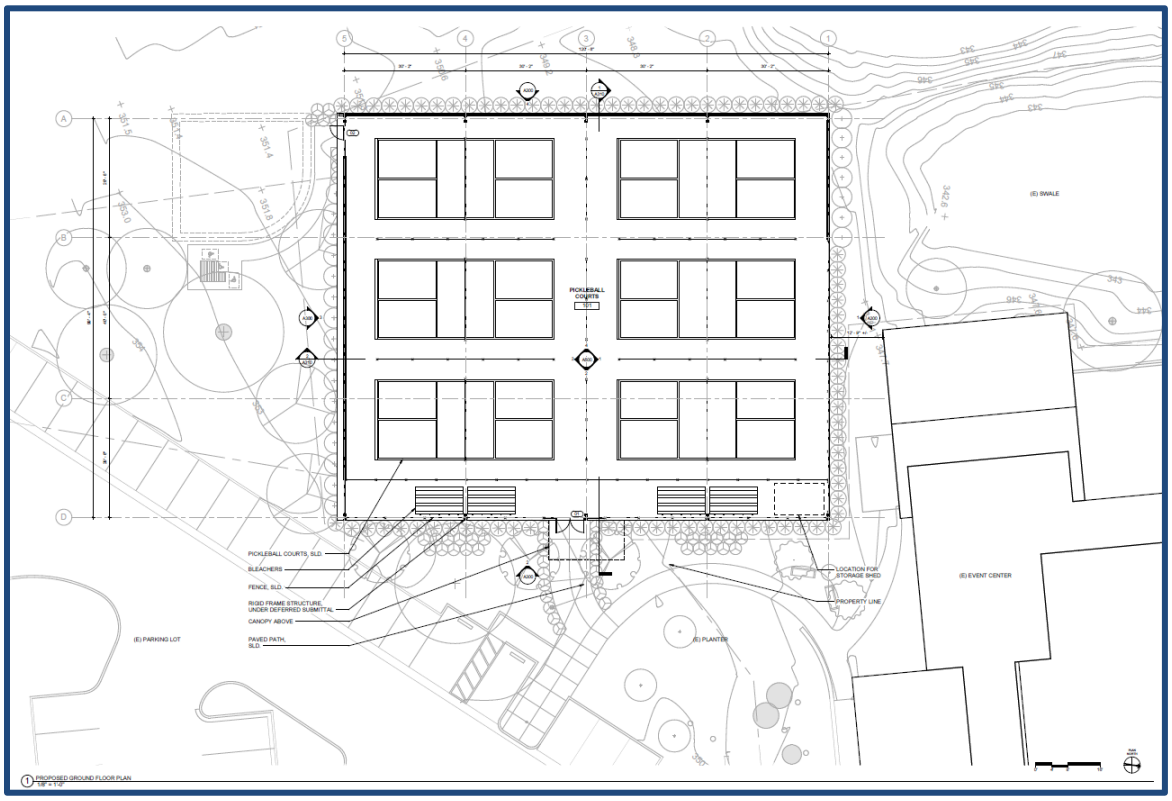


Figure 2. Proposed Pickleball Court Layout

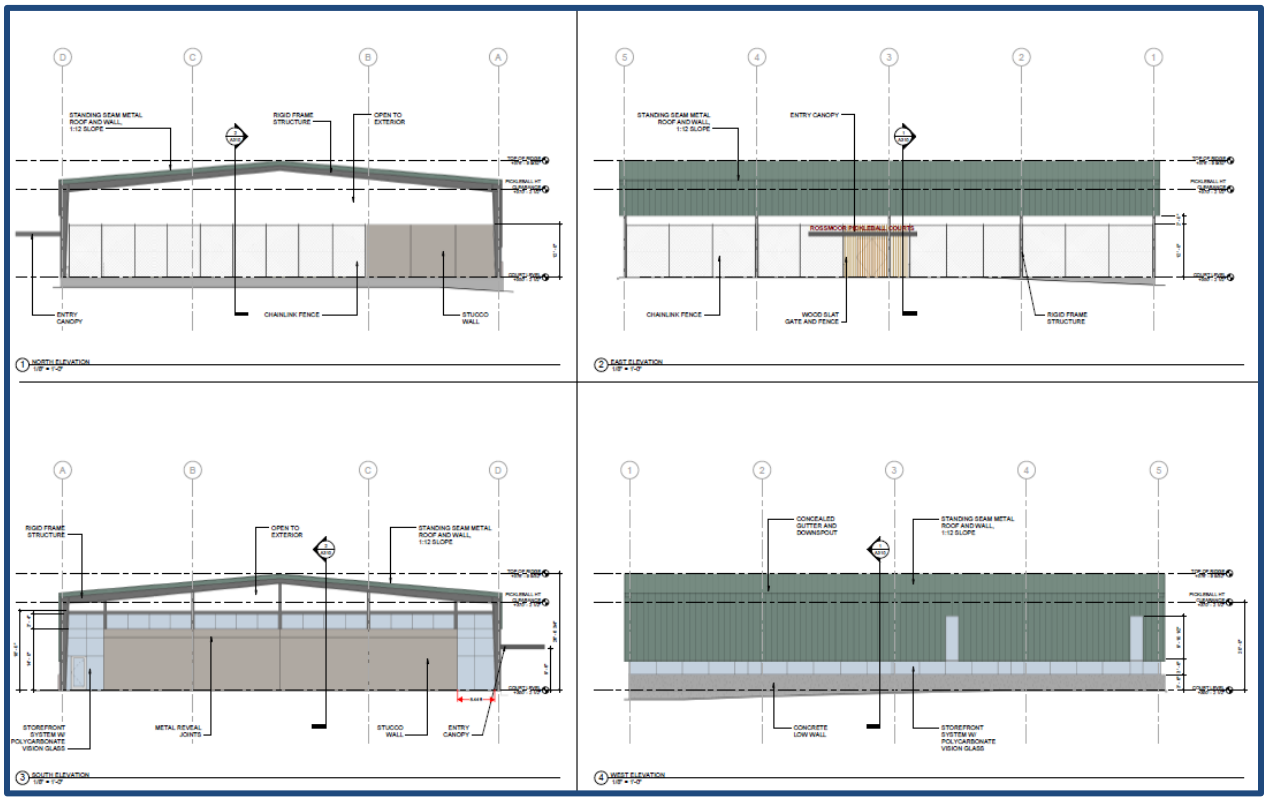


Figure 3. Pickleball Courts Building Elevations

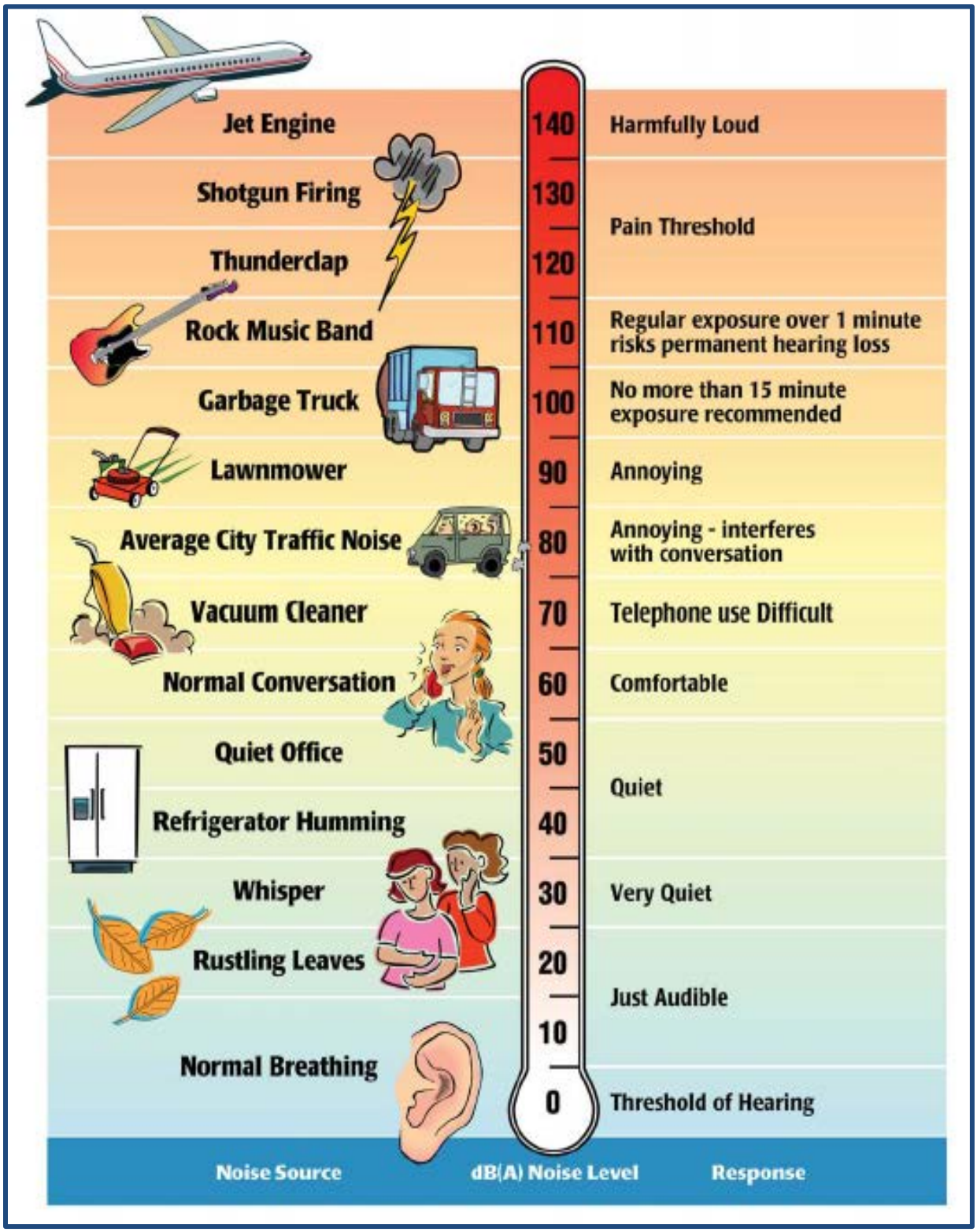
NOISE FUNDAMENTALS

Noise is most often defined as unwanted sound. Although sound can be easily measured, the perceptibility is subjective and the physical response to sound complicates the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as “noisiness” or “loudness.” Sound pressure magnitude is measured and quantified using a logarithmic ratio of pressures, the scale of which gives the level of sound in decibels (dB).

The human hearing system is not equally sensitive to sound at all frequencies. Therefore, to approximate this human, frequency-dependent response, the A-weighting filter system is used to adjust measured sound levels. The A-weighted sound level is expressed in "dBA" or "dB(A)". Figure 4 provides typical A-weighted sound levels measured for various sources, as well as people’s responses to these levels.

When sound is measured for distinct time intervals, the statistical distribution of the overall sound level can be obtained during that period. The energy-equivalent sound level (Leq) is the most common parameter associated with such measurements. The Leq metric is a single-number noise descriptor which represents the average sound level over a given period of time, where the actual sound level varies with time. Lmax, Lmin, and Lxx are also common noise descriptors. Lmax and Lmin are the maximum and minimum noise levels, respectively, and Lxx, known as a statistical sound level, is the time-varying noise level which would be exceeded xx percent of the time. For example, L50 is the average noise level that is exceeded 50% of the measurement duration or for 30-minutes in a 60-minute period.

Reverberation is the prolongation of sound after the source has stopped. Reverberation time (RT60), for a given frequency, is the number of seconds it takes for the average sound pressure level in a room (originally in a steady state) to decrease 60 dB after the source is stopped. RT60 is a measure of the amount of absorption within a space or the “liveliness” of the room.



Source: Melville Branch and R. Beland, 1970. EPA/ONAC 550/9-74-004, March 1974.

Figure 4. Typical A-weighted Noise Levels

NOISE STANDARDS

The City of Walnut Creek Municipal Code (Section 4-6.204) does not specifically adopt noise standards or limits to regulate intrusive noise. However, as per CEQA Guidelines, an appropriate noise level increase of greater than 3 dB above measured ambient noise levels would be considered the threshold of significance for determining noise impact. The acceptance of any noise guideline would be subject to the approval of the board; however, the greater than 3 dB increase criteria is suggested for this project to determine project noise impacts. Due to the logarithmic nature of decibels, pickleball noise levels should not exceed ambient noise levels which is reflective of a 3 dB increase from the project when added to the ambient background. Refer to the Appendix for the City of Walnut Creek Municipal Code.

Reverberation Time

An RT60 guideline for gymnasium or sports use is 1 to 1.5 seconds. Up to 2 seconds can be acceptable if good speech intelligibility is not required. Refer to Table 1 for a summary of the recommended RT60 criteria.

Table 1. Reverberation Time Requirements

Type of occupancy/activity	Reverberation Time, seconds[1]
Gymnasium or Sports Complex	1 to 1.5 (ideal) <2 (acceptable)

Source: ASHRAE Performance Measurement Protocols for Commercial Buildings 2010

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AMBIENT NOISE SURVEY

AGI conducted an ambient noise survey on July 12 through 13, 2022, to document baseline ambient noise levels. Refer to Figure 5 for the locations of the noise monitors.

Figure 5. Long-Term Noise Monitoring Locations

Methodology

Five (5) Brüel & Kjær Model 2270 Acoustical Analyzers were used to conduct the noise measurements. The analyzers are precision Type 1 instruments that were calibrated to laboratory standards. The instrument systems were field calibrated before and after the measurements to ensure accuracy and were operated per manufacturer's recommendations.

Ambient Survey

At NM1, the measured ambient Leq ranged from 41.9 to 54.2 dBA. At NM2, the measured ambient Leq ranged from 35.5 to 58.8 dBA. At NM3, the measured ambient Leq ranged from 39.6 to 59.6 dBA. At NM4, the measured ambient Leq ranged from 32.7 to 61.9 dBA. At NM5, the measured ambient Leq ranged from 35.1 to 68.6 dBA. Noise sources from vehicular traffic (including backup beepers), aircraft, wildlife (birds), and typical community noises (including gardeners and sprinklers) contributed to the noise measurement data. Table 2 summarizes the ambient noise measurement data. During the 8AM to 9AM and 1PM to 2PM hours, noise levels were higher due to typical gardening at locations NM3, NM4, and NM5.

Table 2. Existing Ambient Noise Levels

Receiver		Existing Ambient Noise Levels, dBA				Description
		Time	Leq	Lmin	Lmax	
NM1	Nearest Residence to the North or Northwest	7/12/22 2:00 PM – 7/13/22 2:00 PM	41.9 – 54.2	26.7	73.6	Vehicular Traffic, Birds Chirping, Gardeners, Sprinklers
NM2	Nearest Residence to the East	7/12/22 2:00 PM – 7/13/22 2:00 PM	35.5 – 58.8	32.3	77.0	Vehicular Traffic, Sprinklers,
NM3	Clubhouse	7/12/22 2:00 PM – 7/13/22 2:00 PM	39.6 - 59.6	38.7	76.7	Community Noise, Sprinklers, Gardeners
NM4	Nearest Residence to the South or Southwest	7/12/22 2:00 PM – 7/13/22 2:00 PM	32.7 – 61.9	28.8	87.5	Birds Chirping, Aircraft, Sprinklers, Backup Alarm, Gardeners
NM5	Nearest Residences to the West	7/12/22 2:00 PM – 7/13/22 2:00 PM	35.1 – 68.6	30.8	90.0	Vehicular traffic, aircraft, community noise, squirrels, gardeners

NOISE ANALYSIS AND IMPACT ASSESSMENT

Methodology

The methodology used to analyze and predict operations noise involved the use of the CadnaA computer noise model. CadnaA can simulate the physical environment by factoring in x, y, and z geometrics of a particular site to simulate the buildings, obstacles, and typography. The model uses industry recognized algorithms (ISO 9613) to perform acoustical analyses. The noise generated by future pickleball courts was calculated by inputting acoustical sources at the project site. AGI's measurement data from the pickleball noise measurements at other locations at Rossmoor Walnut Creek were used for the modeling inputs and calibration. The CadnaA Noise Model was also used to evaluate noise control options.

Exterior Project Design Pickleball Noise

The predicted noise level from the proposed pickleball activity will be 37.6, 38.1, 49.5, 36.5, and 40.2 dBA at receivers NM1 through NM5, respectively. At NM3, the pickleball noise level would exceed ambient noise levels throughout many of the operating hours. Although there is an exceedance at NM3, the receptor is a clubhouse and does not need to be held to the same noise standards as residences. Pickleball noise would not be considered an impact at residences represented by NM1, NM2, NM4, and NM5. The impulsive character of the pickleball noise could be audible at receptors NM3, NM4 and NM5 and could be a source of annoyance to sensitive individuals, especially when the ambient background noise level is lower or when there are lulls in traffic noise.

Table 3 summarizes the assessment of the future pickleball noise levels from Project Design with the ambient background and the recommended noise guideline. Tables 4 through 8 summarize the assessment of the pickleball noise levels from Project Design with the ambient background and the recommended noise guideline at NM1 through NM5, respectively. Figures 6 to 10 show a comparison of the future combined pickleball and ambient noise levels from Project Design with the ambient noise level and recommended noise guideline.

Table 3. Summary of Impact Assessment of Pickleball Noise- Project Design

Receptor		Range in Ambient Noise Level during Pickleball Operating Hours, dBA[1]	Recommended Noise Guideline, dBA[2]	Project Design Pickleball Noise Level, dBA	Assessment
NM1	Nearest Residence to the North or Northwest	48.4 - 52.2	51.4 - 55.2	37.6	Compliance
NM2	Nearest Residence to the East	56.3 - 58.8	59.3 - 61.8	38.1	Compliance
NM3	Clubhouse	44.4 - 55.6	47.4 - 58.6	49.5[3]	Exceedance[3]
NM4	Nearest Residence to the South or Southwest	40.2 - 61.9	43.2 - 64.9	36.5	Compliance
NM5	Nearest Residences to the West	46.2 - 68.6	49.2 - 71.6	45.0[4]	Compliance

Note: [1]Pickleball will operate during the daytime hours of 8AM to 6PM
[2]The Recommended Noise Guideline is the lowest ambient noise level during the hour period. Pickleball noise levels should not exceed ambient noise levels which is reflective of a 3 dB increase from the project when added to the ambient background.
[3]Although there is an exceedance at NM3, the receptor is a clubhouse and does not need to be held to the same noise standards as residences.
[4]Although the noise level directly at NM5 does not exceed ambient levels, the project design building structure only provides a shielding effect for the residences directly west of the courts. Residences southwest of the courts do not experience as much shielding and would experience noise levels as high as 45.0 dB.

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Table 4. Impact Assessment of Pickleball Noise from Project Design at NM1

Hour Start Time	Pickleball Noise Level, Leq, dBA	Ambient Noise, Leq, dBA[1]	Pickleball + Ambient Noise, dBA	Recommended Noise Guideline, Leq, dBA[2]	Assessment
8:00:00 AM	37.6	52.2	52.4	55.2	Compliance
9:00:00 AM	37.6	51.4	51.6	54.4	Compliance
10:00:00 AM	37.6	50.8	51.0	53.8	Compliance
11:00:00 AM	37.6	51.8	52.0	54.8	Compliance
12:00:00 PM	37.6	51.4	51.5	54.4	Compliance
1:00:00 PM	37.6	48.8	49.1	51.8	Compliance
2:00:00 PM	37.6	49.3	49.6	52.3	Compliance
3:00:00 PM	37.6	49.2	49.5	52.2	Compliance
4:00:00 PM	37.6	48.4	48.7	51.4	Compliance
5:00:00 PM	37.6	49.0	49.3	52.0	Compliance

Note: [1]Pickleball will operate during the daytime hours of 8AM to 6PM
[2]The Recommended Noise Guideline is the lowest ambient noise level during the hour period.

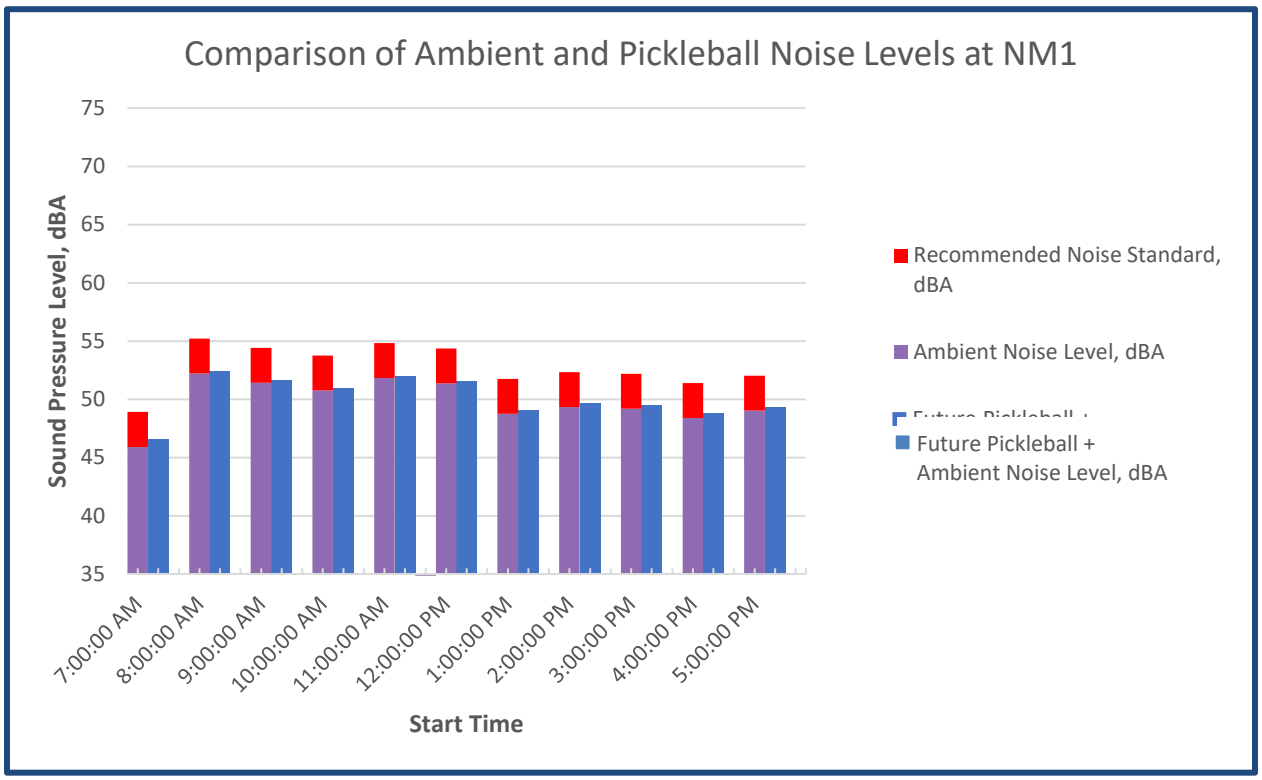

Figure 6. Comparison of Future Noise from Project Design with Ambient Noise and Noise Guideline at NM1

Table 5. Impact Assessment of Pickleball Noise from Project Design at NM2

Hour Start Time	Pickleball Noise Level, Leq, dBA	Ambient Noise, Leq, dBA[1]	Pickleball + Ambient Noise, dBA	Recommended Noise Guideline, Leq, dBA[2]	Assessment
8:00:00 AM	38.1	56.3	56.3	59.3	Compliance
9:00:00 AM	38.1	57.3	57.4	60.3	Compliance
10:00:00 AM	38.1	57.2	57.2	60.2	Compliance
11:00:00 AM	38.1	57.0	57.1	60.0	Compliance
12:00:00 PM	38.1	57.3	57.3	60.3	Compliance
1:00:00 PM	38.1	58.3	58.3	61.3	Compliance
2:00:00 PM	38.1	58.8	58.8	61.8	Compliance
3:00:00 PM	38.1	57.5	57.5	60.5	Compliance
4:00:00 PM	38.1	57.1	57.1	60.1	Compliance
5:00:00 PM	38.1	56.8	56.9	59.8	Compliance

Note: [1]Pickleball will operate during the daytime hours of 8AM to 6PM
[2]The Recommended Noise Guideline is the lowest ambient noise level during the hour period.

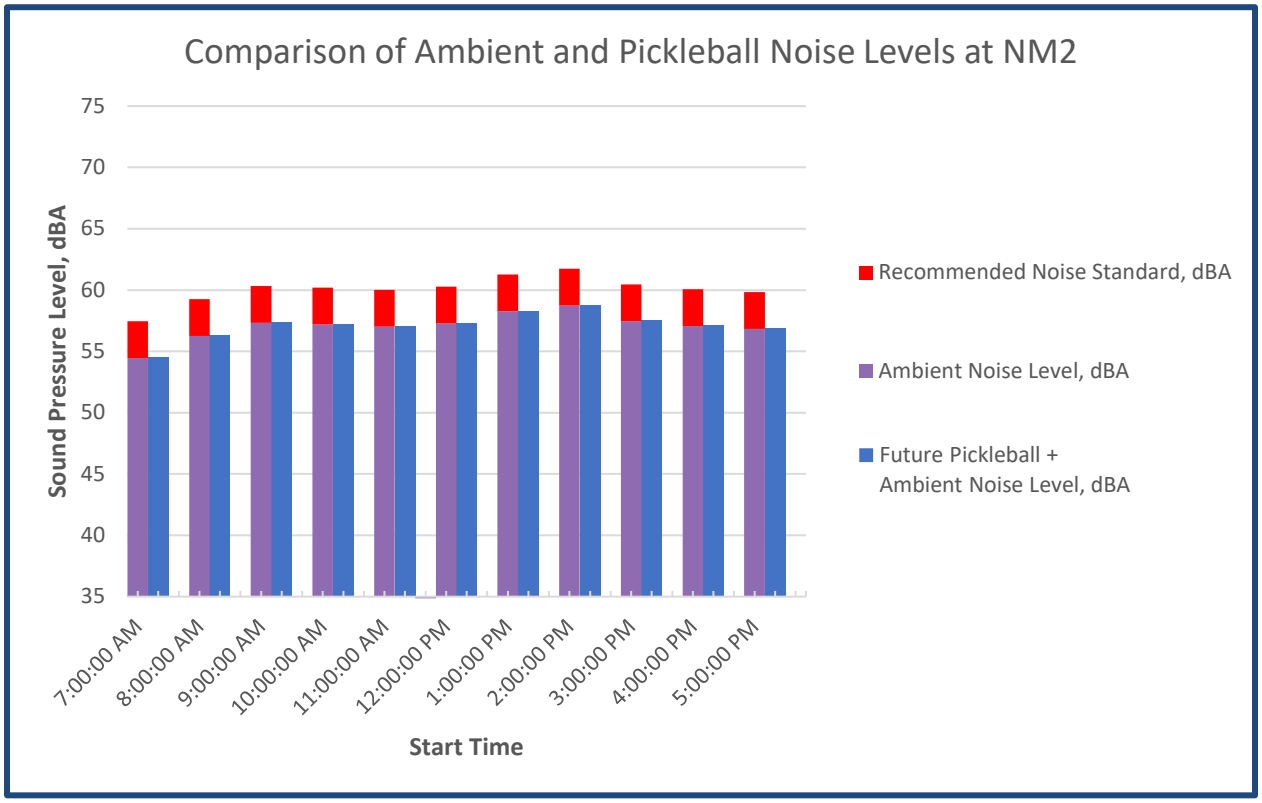

Figure 7. Comparison of Future Noise from Project Design with Ambient Noise and Noise Guideline at NM2

Table 6. Impact Assessment of Pickleball Noise from Project Design at NM3

Hour Start Time	Pickleball Noise Level, Leq, dBA	Ambient Noise, Leq, dBA[1]	Pickleball + Ambient Noise, dBA	Recommended Noise Guideline, Leq, dBA[2]	Assessment
8:00:00 AM	49.5	55.6	56.5	58.6	Compliance
9:00:00 AM	49.5	45.7	51.0	48.7	Exceedance[3]
10:00:00 AM	49.5	46.7	51.3	49.7	Exceedance[3]
11:00:00 AM	49.5	46.6	51.3	49.6	Exceedance[3]
12:00:00 PM	49.5	46.7	51.3	49.7	Exceedance[3]
1:00:00 PM	49.5	49.7	52.6	52.7	Compliance
2:00:00 PM	49.5	47.5	51.6	50.5	Exceedance[3]
3:00:00 PM	49.5	46.9	51.4	49.9	Exceedance[3]
4:00:00 PM	49.5	47.4	51.6	50.4	Exceedance[3]
5:00:00 PM	49.5	44.4	50.7	47.4	Exceedance[3]

Note: [1]Pickleball will operate during the daytime hours of 8AM to 6PM
[2]The Recommended Noise Guideline is the lowest ambient noise level during the hour period.
[3]Although there is an exceedance at NM3, the receptor is a clubhouse and does not need to be held to the same noise standards as residences.

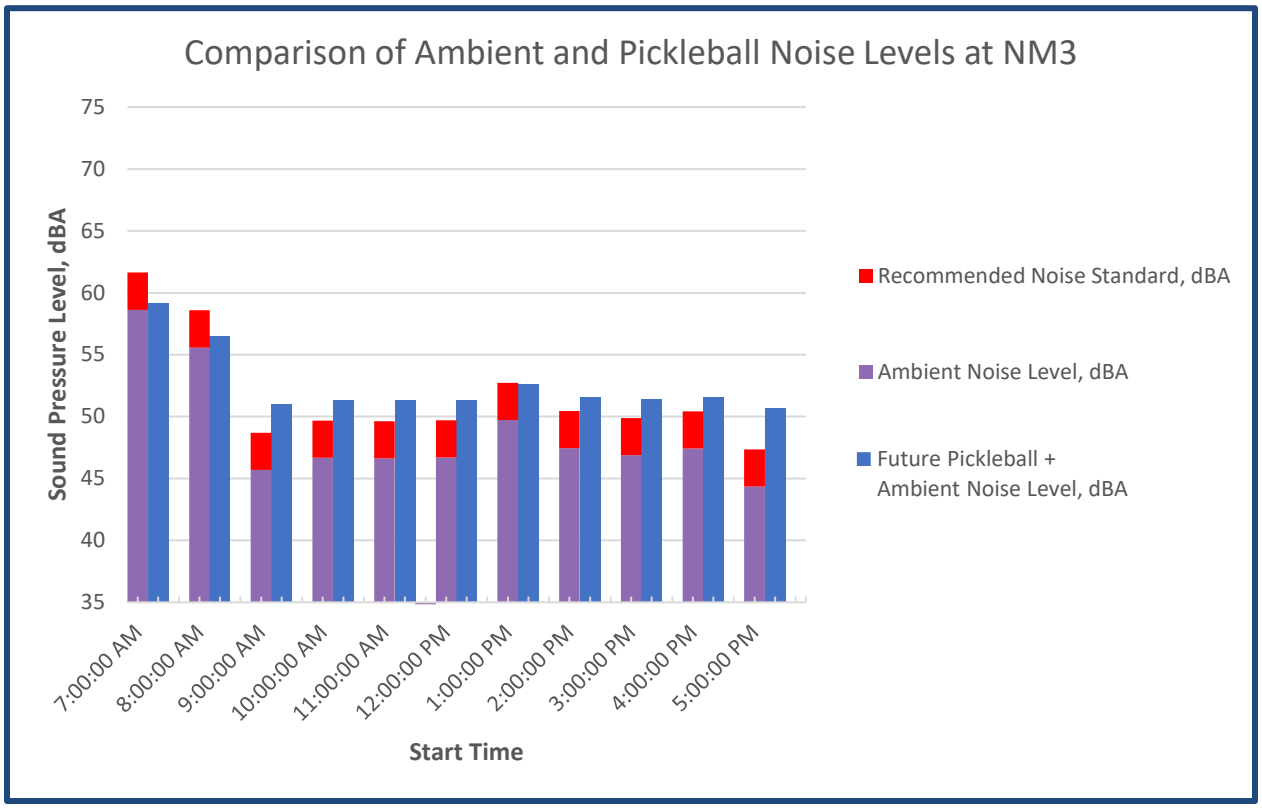

Figure 8. Comparison of Pickleball Noise from Project Design with Ambient Noise and Noise Guideline at NM3

Table 7. Impact Assessment of Pickleball Noise from Project Design at NM4

Hour Start Time	Pickleball Noise Level, Leq, dBA	Ambient Noise, Leq, dBA[1]	Pickleball + Ambient Noise, dBA	Recommended Noise Guideline, Leq, dBA[2]	Assessment
8:00:00 AM	36.5	61.9	61.9	64.9	Compliance
9:00:00 AM	36.5	52.1	52.2	55.1	Compliance
10:00:00 AM	36.5	46.1	46.6	49.1	Compliance
11:00:00 AM	36.5	46.8	47.2	49.8	Compliance
12:00:00 PM	36.5	49.2	49.4	52.2	Compliance
1:00:00 PM	36.5	60.4	60.4	63.4	Compliance
2:00:00 PM	36.5	49.1	49.3	52.1	Compliance
3:00:00 PM	36.5	44.3	45.0	47.3	Compliance
4:00:00 PM	36.5	44.0	44.7	47.0	Compliance
5:00:00 PM	36.5	40.2	41.8	43.2	Compliance

Note: [1]Pickleball will operate during the daytime hours of 8AM to 6PM
[2]The Recommended Noise Guideline is the lowest ambient noise level during the hour period.

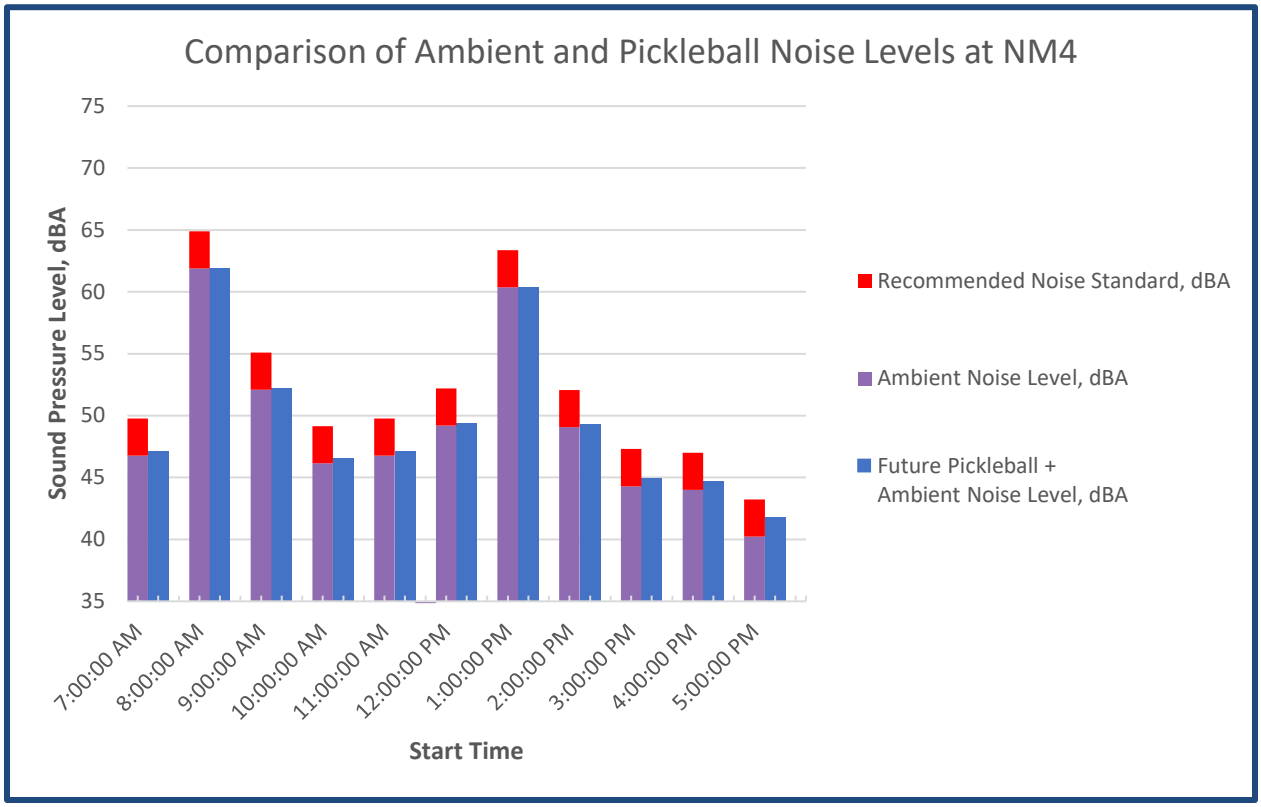

Figure 9. Comparison of Pickleball Noise from Project Design with Ambient Noise and Noise Guideline at NM4

Table 8. Impact Assessment of Pickleball Noise from Project Design at NM5

Hour Start Time	Pickleball Noise Level, Leq, dBA	Ambient Noise, Leq, dBA[1]	Pickleball + Ambient Noise, dBA	Recommended Noise Guideline, Leq, dBA[2]	Assessment
8:00:00 AM	45.0[3]	68.6	68.6	71.6	Compliance
9:00:00 AM	45.0[3]	47.2	49.3	50.2	Compliance
10:00:00 AM	45.0[3]	46.8	49.0	49.8	Compliance
11:00:00 AM	45.0[3]	47.8	49.7	50.8	Compliance
12:00:00 PM	45.0[3]	50.0	51.2	53.0	Compliance
1:00:00 PM	45.0[3]	58.2	58.4	61.2	Compliance
2:00:00 PM	45.0[3]	46.9	49.1	49.9	Compliance
3:00:00 PM	45.0[3]	47.0	49.1	50.0	Compliance
4:00:00 PM	45.0[3]	47.3	49.3	50.3	Compliance
5:00:00 PM	45.0[3]	46.2	48.7	49.2	Compliance

Note: [1]Pickleball will operate during the daytime hours of 8AM to 6PM
[2]The Recommended Noise Guideline is the lowest ambient noise level during the hour period.
[3]Residences northwest and southwest of the courts do not experience any shielding and would experience noise levels as high as 45.0 dB.

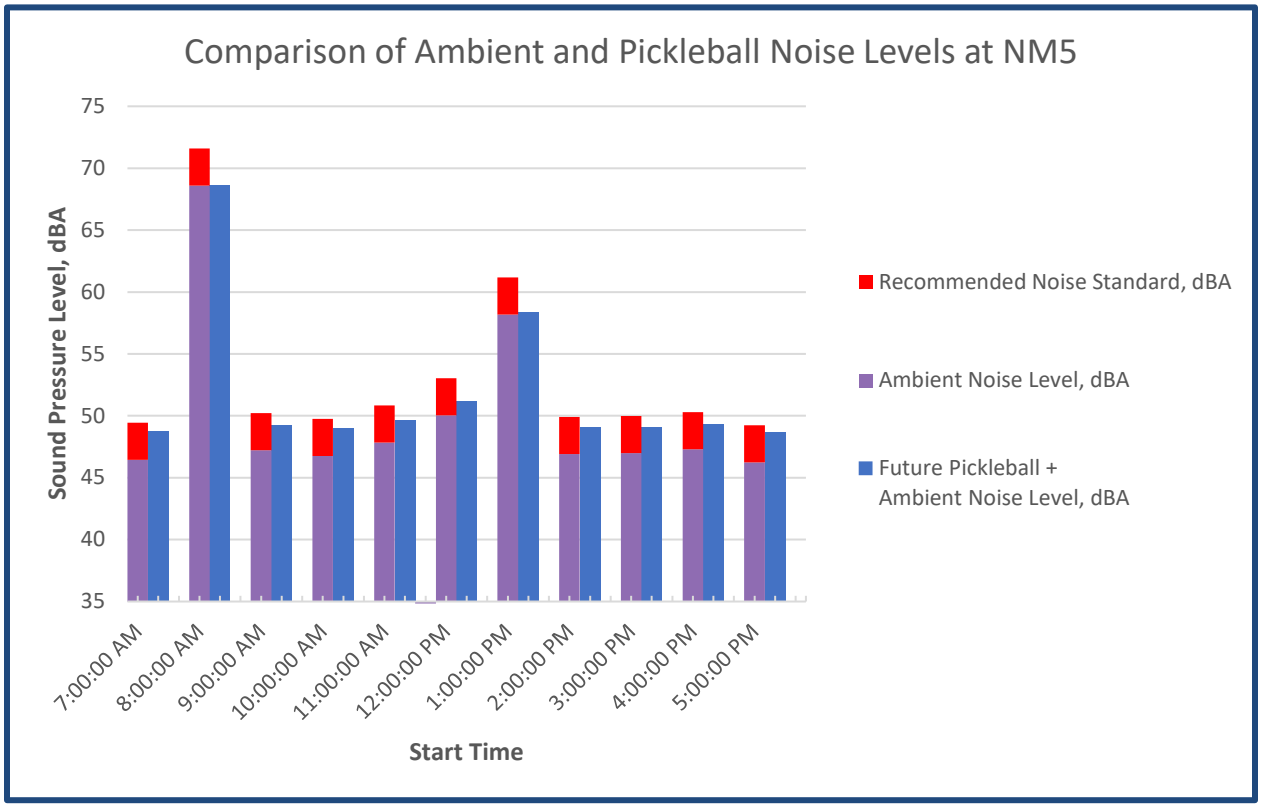

Figure 10. Comparison of Pickleball Noise from Project Design with Ambient Noise and Noise Guideline at NM5

Interior Project Reverberation Time

The analysis of the reverberation time with the initial Project Design's acoustical finishes was performed. The reverberation time (RT60) with the Project Design's acoustical finishes will be 1.2 to 3.2 seconds. Without any addition of acoustical absorption in the interior spaces, the RT60 exceeds the Industry RT60 Criteria of 1.0 to 1.5 seconds. Additional noise control was evaluated to reduce reverberation time within the building. Table 9 summarizes the assessment of the predicted RT60 conditions.

Table 9. Assessment of Absorption Analysis – Project Design

Description	Reverberation Time (RT60), seconds at Octave Band Center Frequency, Hz						RT60 Criteria, seconds[1]	Assessment
	125	250	500	1k	2k	4k		
Pickleball Building with Project Design (Unfinished Interior)	1.24	2.63	2.58	2.50	2.71	3.21	1 to 1.5	Excessive

Note: :[1]Industry RT60 Criteria

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NOISE CONTROL ANALYSIS

General Noise Control Options

The following noise control measures are identified to reduce pickleball noise when considered practical:

1. Encourage the use of low noise pickleball equipment whenever possible.
2. Consider quiet days or hours.
3. Consider the use of quiet foam balls during the nighttime hours.

Interior Reverberation Time Noise Control

As an alternative option 1, the addition of Sound Silencer Ceiling Tiles (NRC 0.55) on the ceiling of the proposed Project design was evaluated. Refer to Table 10 for the minimum absorption coefficients. The reverberation time (RT60) with the addition of a minimum 9,000 square feet of the Sound Silencer Ceiling Tiles (NRC 0.55) will be reduced to 0.9 to 1.5 seconds. The RT60 would be significantly improved and will comply with the RT60 Industry Guideline Criteria 1 to 1.5 seconds. Table 11 summarizes the assessment of the predicted RT60 conditions with the recommended noise control.

Table 10. Minimum Absorption Coefficient

Frequency, Hz	Octave Band Center Frequency, Hz					
	125	250	500	1k	2k	4k
1" Sound Silencer Ceiling Tile (9,000 sqft) or Acoustical Equivalent						
Minimum Absorption Coefficient (0.55 NRC)	0.46	.59	.44	.49	.76	.86

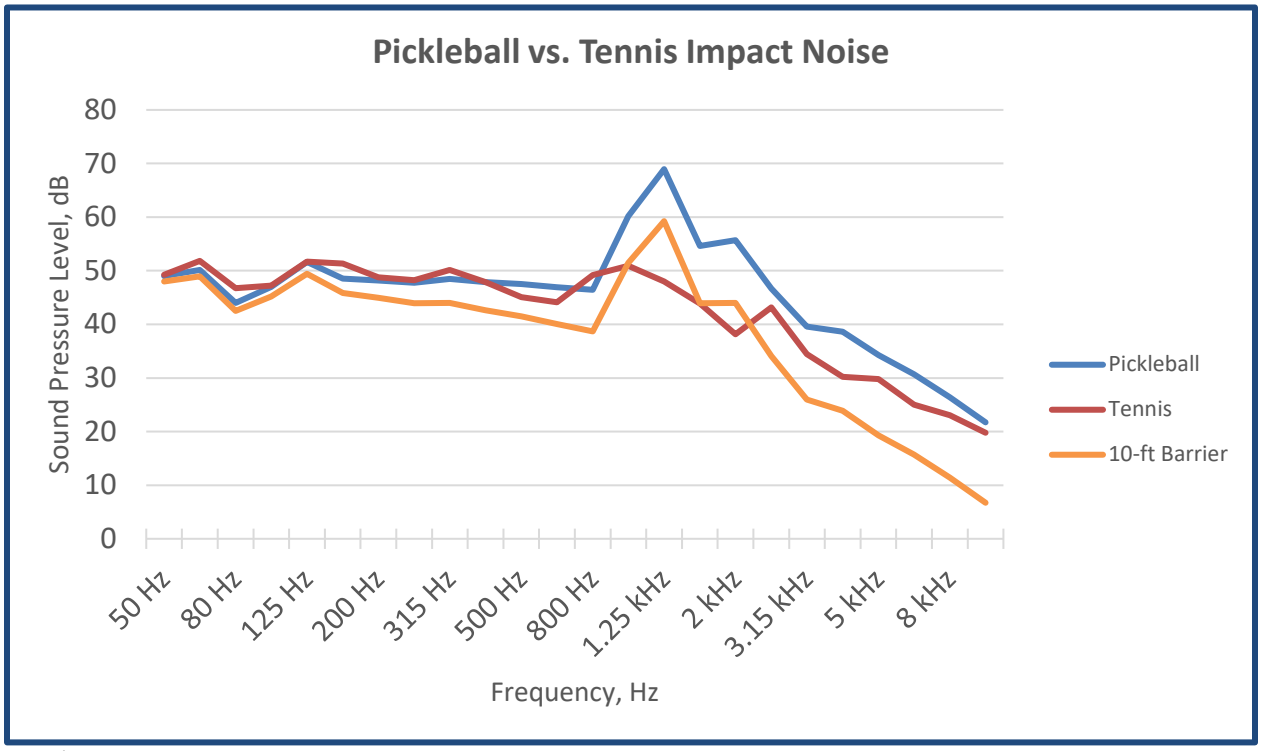
Table 11. Assessment of Absorption Analysis – Project Design

Description	Reverberation Time (RT60), seconds at Octave Band Center Frequency, Hz						RT60 Criteria, seconds[1]	Assessment
	125	250	500	1k	2k	4k		
Pickleball Building with 9,000 sqft of 1" Sound Silencer Ceiling Tile	.8	1.5	1.4	1.1	1.1	1.5	1 to 1.5	Compliance

Note: [1]Industry RT60 Criteria

FREQUENCY CONTENT OF TENNIS AND PICKLEBALL NOISE

The sound produced by the impact between a pickleball and paddle is characterized by a sudden onset and brief duration. The spectral content of the paddle impact is narrowband with a center frequency typically between 800 and 2,000 Hertz. Due to the frequency content of a pickleball strike, and the quantity of impact events, the impulsive character of the noise could remain audible and may still be a source of annoyance to sensitive individuals. Figure 11 displays the frequency plot of tennis, pickleball noise (no noise control), and pickleball noise with a 10-ft barrier at approximatley 50-ft from the court. The impact sound of pickleball and its frequency characteristics can be reduced with the use of padded paddles and to a greater extent foam balls.



Note: [1]Taken from noise measurement location at approximately 50-ft from court.

Figure 11. Frequency Content of Pickleball vs Tennis Strike

CONCLUSION

Acoustics Group, Inc., (AGI) was retained by Rossmoor Walnut Creek to evaluate the pickleball noise levels associated with adding six (6) pickleball courts at their facility located at 1021 Stanley Dollar Drive in Walnut Creek, CA. AGI has reviewed the City of Walnut Creek's Municipal Code Noise Standard, conducted ambient and pickleball noise level measurements, analyzed pickleball noise, assessed the impact of the pickleball courts, and evaluated noise control measures for reducing the noise from the proposed pickleball courts at the nearby residential homes.

The predicted noise level from the proposed pickleball activity will be 37.6, 38.1, 49.5, 36.5, and 40.2 dBA at receivers NM1 through NM5, respectively. At NM3, the pickleball noise level would exceed ambient noise levels throughout many of the operating hours. Although there is an exceedance at NM3, the receptor is a clubhouse and does not need to be held to the same noise standards as residences. Pickleball noise would not be considered an impact at residences represented by NM1, NM2, NM4, and NM5. Additionally, the impulsive character of the pickleball noise could be audible at receptors NM3, NM4 and NM5 and could be a source of annoyance to sensitive individuals, especially when the ambient background noise level is lower or when there are lulls in traffic noise. Noise control measures are identified to reduce pickleball noise when considered practical.

The reverberation time (RT60) with the Project Design's acoustical finishes will be 1.2 to 3.2 seconds. Without any addition of acoustical absorption in the interior spaces, the RT60 at the program rooms exceeds the Industry RT60 Criteria of 1.0 to 1.5 seconds. Additional noise control was evaluated to reduce reverberation time within the building.

APPENDIX

FIELD DATA SHEETS

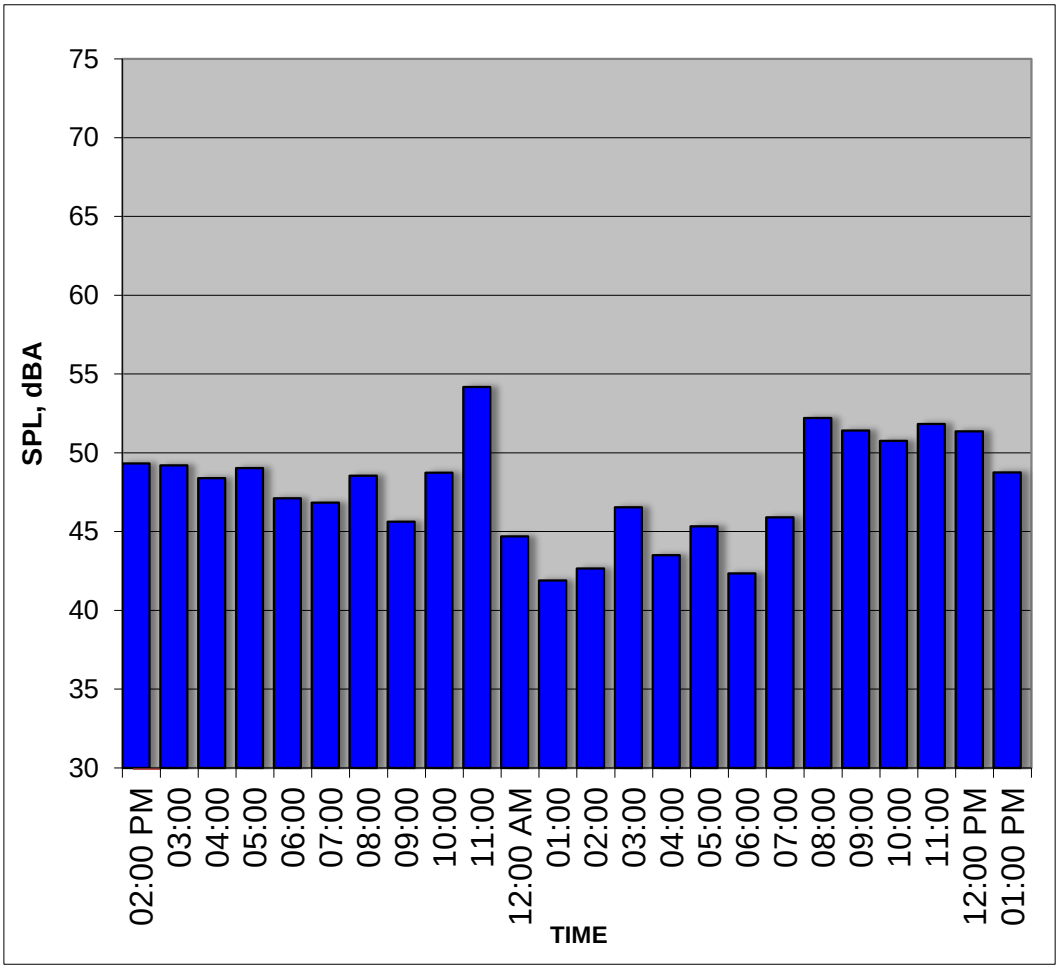
CITY OF WALNUT CREEK MUNICIPAL CODE

NOISE MODELING INPUT/OUTPUT

FIELD DATA SHEETS

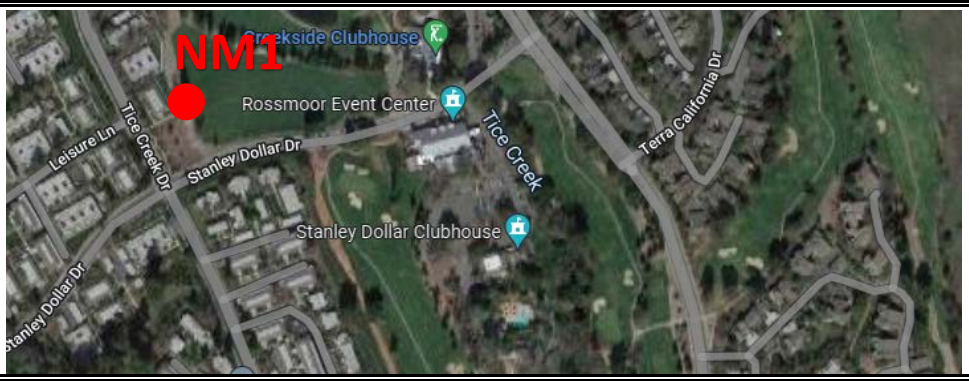
MEASUREMENT DATA - HOURLY NOISE LEVELS

Project:	**Rossmoor Event Center Ambient Survey**		
Address:	**2600 Tice Creek Dr, Walnut Creek, CA 94595**	**Date:**	**7/12/2022**
Location:	East Side of Building		**- 7/13/2022**
Noise		**Position:**	**NM1**
Sources:	**Vehicular Traffic, Birds Chirping, Gardeners, Sprinklers**		



TIME	*HNL, dB(A)*
02:00 - 03:00 PM	*49.3*
03:00 - 04:00 PM	*49.2*
04:00 - 05:00 PM	*48.4*
05:00 - 06:00 PM	*49.0*
06:00 - 07:00 PM	*47.1*
07:00 - 08:00 PM	*46.8*
08:00 - 09:00 PM	*48.5*
09:00 - 10:00 PM	*45.6*
10:00 - 11:00 PM	*48.7*
11:00 - 12:00 AM	*54.2*
12:00 - 01:00 AM	*44.7*
01:00 - 02:00 AM	*41.9*
02:00 - 03:00 AM	*42.7*
03:00 - 04:00 AM	*46.6*
04:00 - 05:00 AM	*43.5*
05:00 - 06:00 AM	*45.3*
06:00 - 07:00 AM	*42.3*
07:00 - 08:00 AM	*45.9*
08:00 - 09:00 AM	*52.2*
09:00 - 10:00 AM	*51.4*
10:00 - 11:00 AM	*50.8*
11:00 - 12:00 PM	*51.8*
12:00 - 01:00 PM	*51.4*
01:00 - 02:00 PM	*48.8*
CNEL:	***54.6***

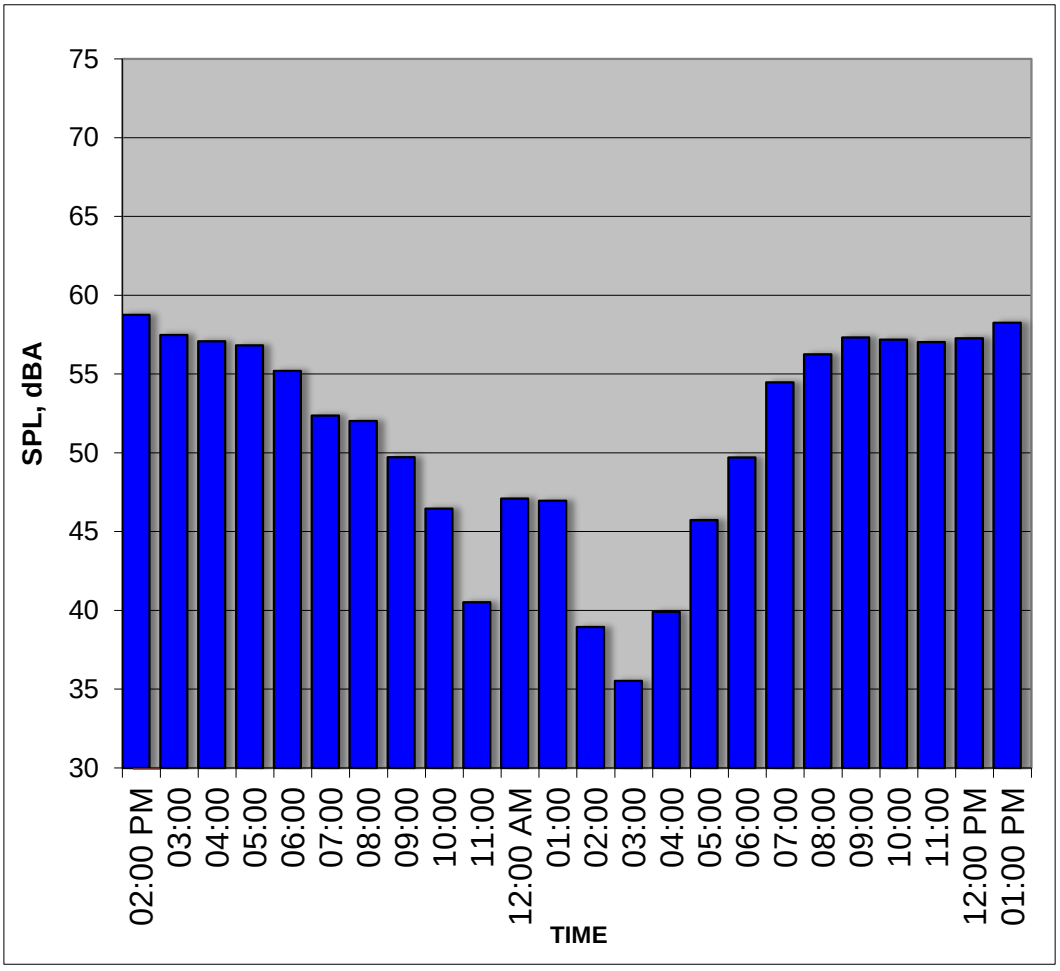
Notes:



Source: Acoustics Group, Inc.

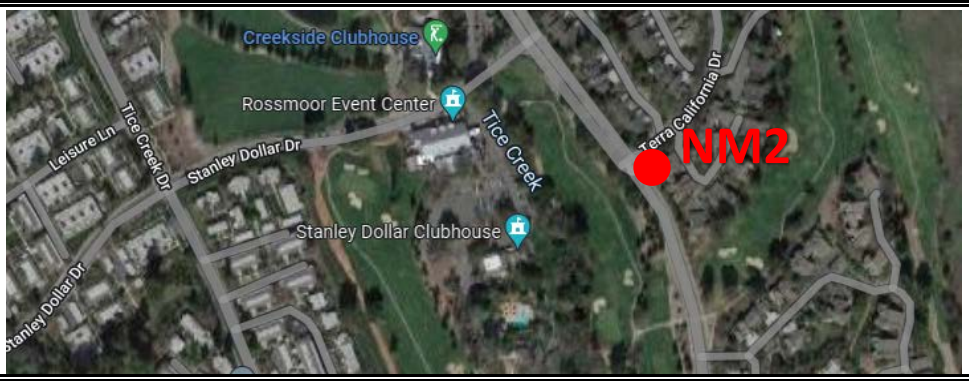
MEASUREMENT DATA - HOURLY NOISE LEVELS

Project:	**Rossmoor Event Center Ambient Survey**		
Address:	**600 Terra California Dr, Walnut Creek, CA 94595**	**Date:**	**7/12/2022**
Location:	West Side of Building		**- 7/13/2022**
Noise		**Position:**	**NM2**
Sources:	**Vehicular Traffic, Sprinklers,**		



TIME	*HNL, dB(A)*
02:00 - 03:00 PM	*58.8*
03:00 - 04:00 PM	*57.5*
04:00 - 05:00 PM	*57.1*
05:00 - 06:00 PM	*56.8*
06:00 - 07:00 PM	*55.2*
07:00 - 08:00 PM	*52.4*
08:00 - 09:00 PM	*52.0*
09:00 - 10:00 PM	*49.7*
10:00 - 11:00 PM	*46.5*
11:00 - 12:00 AM	*40.5*
12:00 - 01:00 AM	*47.1*
01:00 - 02:00 AM	*47.0*
02:00 - 03:00 AM	*39.0*
03:00 - 04:00 AM	*35.5*
04:00 - 05:00 AM	*39.9*
05:00 - 06:00 AM	*45.7*
06:00 - 07:00 AM	*49.7*
07:00 - 08:00 AM	*54.5*
08:00 - 09:00 AM	*56.3*
09:00 - 10:00 AM	*57.3*
10:00 - 11:00 AM	*57.2*
11:00 - 12:00 PM	*57.0*
12:00 - 01:00 PM	*57.3*
01:00 - 02:00 PM	*58.3*
CNEL:	*56.4*

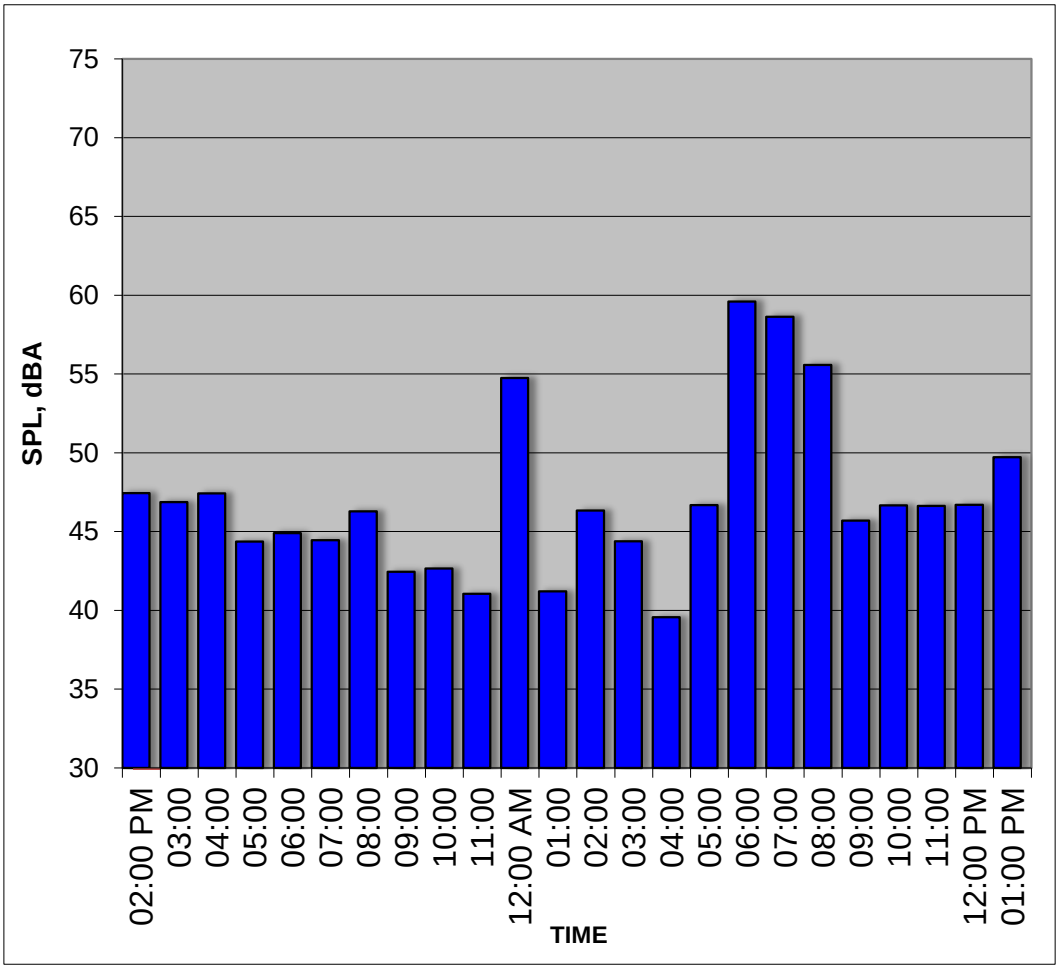
Notes:



Source: Acoustics Group, Inc.

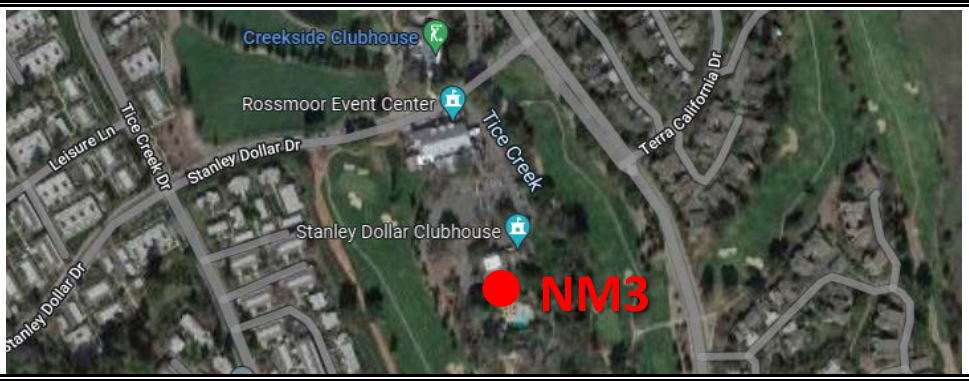
MEASUREMENT DATA - HOURLY NOISE LEVELS

Project:	**Rossmoor Event Center Ambient Survey**		
Address:	**Stanley Dollar Clubhouse, Walnut Creek, CA 94595**	**Date:**	**7/12/2022**
Location:	Between Clubhouse and Pool Area		**- 7/13/2022**
Noise		**Position:**	**NM3**
Sources:	**Community Noise, Sprinklers, Gardeners**		



TIME	*HNL, dB(A)*
02:00 - 03:00 PM	*47.5*
03:00 - 04:00 PM	*46.9*
04:00 - 05:00 PM	*47.4*
05:00 - 06:00 PM	*44.4*
06:00 - 07:00 PM	*44.9*
07:00 - 08:00 PM	*44.5*
08:00 - 09:00 PM	*46.3*
09:00 - 10:00 PM	*42.5*
10:00 - 11:00 PM	*42.7*
11:00 - 12:00 AM	*41.1*
12:00 - 01:00 AM	*54.7*
01:00 - 02:00 AM	*41.2*
02:00 - 03:00 AM	*46.3*
03:00 - 04:00 AM	*44.4*
04:00 - 05:00 AM	*39.6*
05:00 - 06:00 AM	*46.7*
06:00 - 07:00 AM	*59.6*
07:00 - 08:00 AM	*58.6*
08:00 - 09:00 AM	*55.6*
09:00 - 10:00 AM	*45.7*
10:00 - 11:00 AM	*46.7*
11:00 - 12:00 PM	*46.6*
12:00 - 01:00 PM	*46.7*
01:00 - 02:00 PM	*49.7*
CNEL:	*58.1*

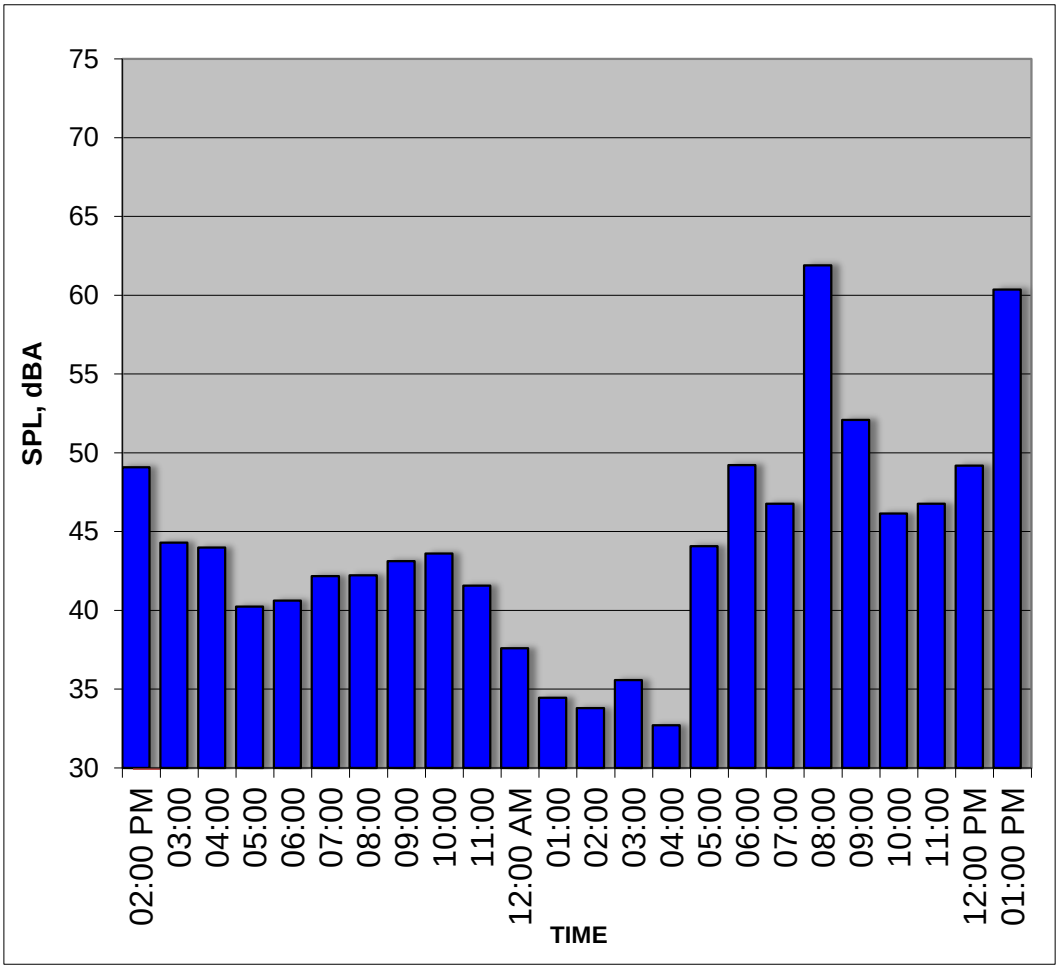
Notes:



Source: Acoustics Group, Inc.

MEASUREMENT DATA - HOURLY NOISE LEVELS

Project:	**Rossmoor Event Center Ambient Survey**		
Address:	**2864 Tice Creek Dr, Walnut Creek, CA 94595**	**Date:**	**7/12/2022**
Location:	East Side of Building		**- 7/13/2022**
Noise		**Position:**	**NM4**
Sources:	**Birds Chirping, Aircrafts, Sprinklers, Backup Alarm, Gardeners**		



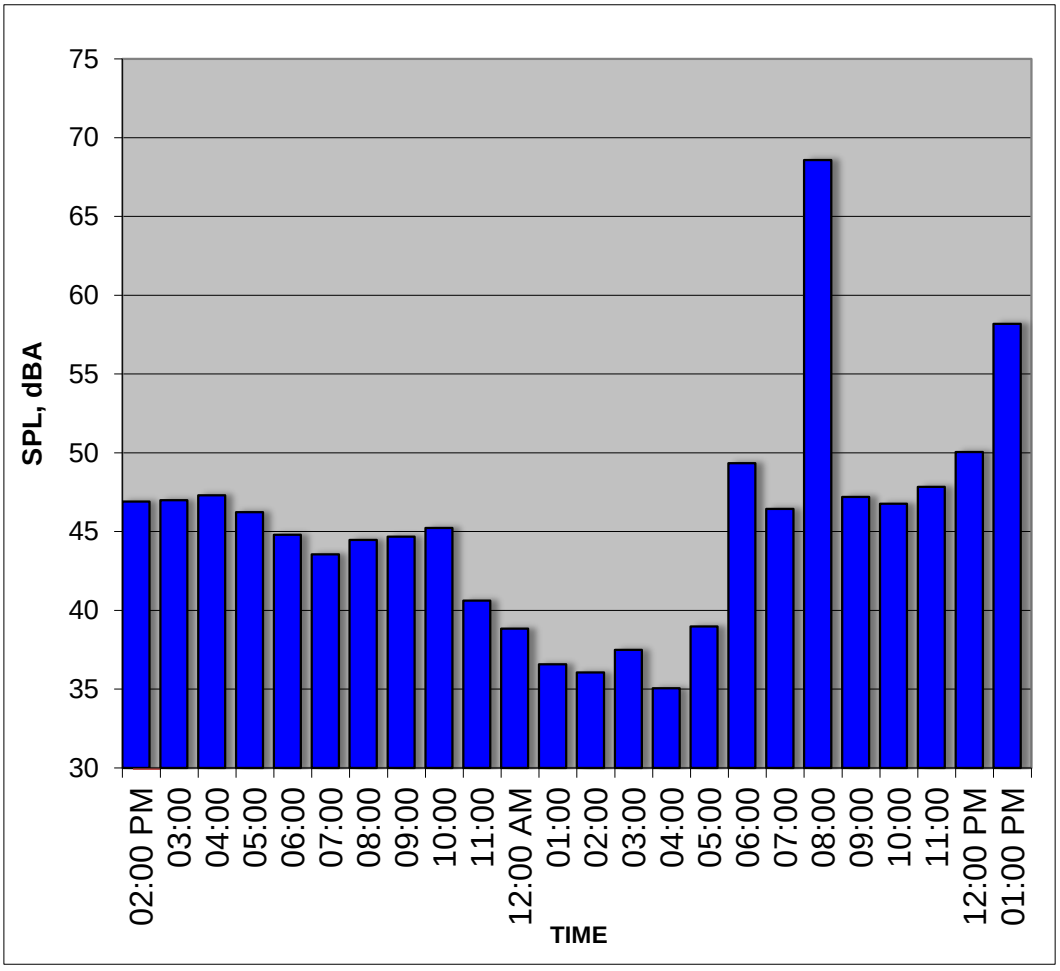
TIME	*HNL, dB(A)*
02:00 - 03:00 PM	*49.1*
03:00 - 04:00 PM	*44.3*
04:00 - 05:00 PM	*44.0*
05:00 - 06:00 PM	*40.2*
06:00 - 07:00 PM	*40.6*
07:00 - 08:00 PM	*42.2*
08:00 - 09:00 PM	*42.2*
09:00 - 10:00 PM	*43.1*
10:00 - 11:00 PM	*43.6*
11:00 - 12:00 AM	*41.6*
12:00 - 01:00 AM	*37.6*
01:00 - 02:00 AM	*34.4*
02:00 - 03:00 AM	*33.8*
03:00 - 04:00 AM	*35.6*
04:00 - 05:00 AM	*32.7*
05:00 - 06:00 AM	*44.1*
06:00 - 07:00 AM	*49.2*
07:00 - 08:00 AM	*46.8*
08:00 - 09:00 AM	*61.9*
09:00 - 10:00 AM	*52.1*
10:00 - 11:00 AM	*46.1*
11:00 - 12:00 PM	*46.8*
12:00 - 01:00 PM	*49.2*
01:00 - 02:00 PM	*60.4*
CNEL:	*53.2*

Notes:

Source: Acoustics Group, Inc.

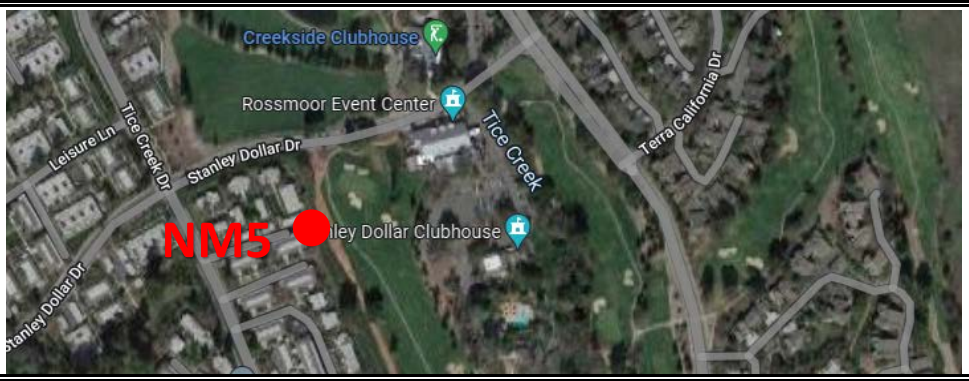
MEASUREMENT DATA - HOURLY NOISE LEVELS

Project:	**Rossmoor Event Center Ambient Survey**		
Address:	**2772 Tice Creek Dr, Walnut Creek, CA 94595**	**Date:**	**7/12/2022**
Location:	East Side of Building		**- 7/13/2022**
Noise		**Position:**	**NM5**
Sources:	**Vehicular traffic, aircraft, community noise, squirrels, gardeners**		



TIME	*HNL, dB(A)*
02:00 - 03:00 PM	*46.9*
03:00 - 04:00 PM	*47.0*
04:00 - 05:00 PM	*47.3*
05:00 - 06:00 PM	*46.2*
06:00 - 07:00 PM	*44.8*
07:00 - 08:00 PM	*43.5*
08:00 - 09:00 PM	*44.5*
09:00 - 10:00 PM	*44.7*
10:00 - 11:00 PM	*45.2*
11:00 - 12:00 AM	*40.6*
12:00 - 01:00 AM	*38.8*
01:00 - 02:00 AM	*36.6*
02:00 - 03:00 AM	*36.1*
03:00 - 04:00 AM	*37.5*
04:00 - 05:00 AM	*35.1*
05:00 - 06:00 AM	*39.0*
06:00 - 07:00 AM	*49.3*
07:00 - 08:00 AM	*46.4*
08:00 - 09:00 AM	*68.6*
09:00 - 10:00 AM	*47.2*
10:00 - 11:00 AM	*46.8*
11:00 - 12:00 PM	*47.8*
12:00 - 01:00 PM	*50.0*
01:00 - 02:00 PM	*58.2*
CNEL:	*56.3*

Notes:



Source: Acoustics Group, Inc.

CITY OF WALNUT CREEK MUNICIPAL CODE

CHAPTER 6. NUISANCES

Article 1. Handbill Distribution.

4-6.101 Definitions.
For the purposes of this Article, the following terms shall have the following meanings:

a. Handbill means any unsolicited dodger, circular, leaflet, pamphlet, paper, booklet or other printed or written material regardless of whether the text, if any, of the material is commercial or non-commercial.

b. Person means any individual, firm partnership, or association, corporation company or organization of any kind. (5400, as amended by §1, Ord. 1785, eff. April 9, 1992, and by §1, Ord. 1885, eff. April, 4, 1996)

4-6.102 Deposit on Vehicles.
No person shall place or deposit any handbill in or upon any vehicle. (5401, as amended by §4, Ord. 1712, eff. December 1, 1988, by §1, Ord. 1785, eff. April 9, 1992 and by §1, Ord. 1885, eff. April 4, 1996)

4-6.103 Violations.
Any person who violates any provision of §4-6.102 shall be deemed guilty of a misdemeanor or an infraction. Each deposit of a handbill in violation of this Article shall be deemed a separate violation.

a. If charged as an infraction the penalty upon conviction of such person shall be a fine as set forth in §1-2.01 of this Code.

b. If charged as a misdemeanor, the penalty upon conviction of such person shall be imprisonment in the county jail for a period not to exceed six months, or by a fine not exceeding $1,000, or by both such fine and imprisonment. (§1, Ord. 1785, eff. April 9, 1992, as amended by §1, Ord. 1885, eff. April 4, 1996)

Article 2. Noise

4-6.201 Purpose of Provision.
It is hereby found and declared that:

a. The creation or maintenance of excessive noise or vibration which is prolonged or unreasonable in its time, place and use is deemed to be a serious detriment to the public health, safety and quality of life of the residents of the City; and

b. Therefore, it is the intent of the City to control and, in some instances, prohibit noise and vibration which may impact the health, safety or welfare of the citizens of Walnut Creek. (5410 and by §1, Ord. 1753, eff. 11/8/90)

4-6.202 Definitions.
Loud Noise is defined as excessive or unreasonable noise, sound or vibration which endangers the comfort, repose, health, peace or safety of others within the limits of the City. The determination of whether a noise is unreasonable shall be based on, among other things, consideration of the hour, place, nature, and circumstances of the emission or transmission of any loud noise.

Holidays are those days enumerated in the resolution of the City Council entitled "Resolution Enumerating Holidays" on file in the office of the City Clerk. (5411 and by §1, Ord. 1753, eff. November 8, 1990)

4-6.203 Prohibited Noises Enumerated.
As used in this article, loud, excessive or unreasonable noise shall include, but not be limited to, the following:

a. Radios, Phonographs, etc. The use, operation or maintenance of sound, from any radio, musical instrument, phonograph or other device designed for the production or reproduction of sound in such a manner as to disturb the peace, quiet and comfort of individuals on a public street, or in or near a residence, business or other such occupied structure. The creation or maintenance of such noise in such a manner so as to be plainly audible at a distance of fifty feet (50') from the source of such noise shall be prima facie evidence of a violation of this Section.

b. Loudspeakers and Amplifiers for Advertising. The use, operation, or maintenance of any loudspeaker, sound amplifier or other machine or device used for the production or reproduction of sound which is directed toward, or cast upon or across, a residential or commercial property line for the purposes of commercial advertising unless a permit for such sound is secured from the Chief of Police. The Chief of Police may issue a permit, subject to reasonable restrictions.

Such restrictions shall be based upon the area in which the proposed broadcast is to occur, the hours of the proposed broadcast, and the method by which such amplification or broadcast shall occur. In residential zones, a permit shall be granted only for broadcast during the hours of 8 a.m. and 6 p.m. on weekdays which are not holidays and between the hours of 9 a.m. and 5 p.m. on weekends and holidays but such amplification shall not be plainly audible from a distance of more than 50' (fifty feet) from the source of such amplification. In all other zones, a permit shall be granted only for broadcast during the hours of 8 a.m. and 9 p.m. on weekdays, weekends and holidays but such amplification shall not be plainly audible from a distance of more than 50' (fifty feet) from the source of such amplification.

The applicant for such a permit, if the same is denied for cause, may appeal this denial to the City Manager. The City Manager shall thereupon issue or deny the permit. Any permit issued by the Chief of Police may be revoked by either the City Manager or the Chief of Police if the applicant violates any of the conditions set forth in the permit.

c. Distraction of Drivers of Motor Vehicles. The use, operation, or maintenance of any horn, radio, machine or device used for the production or reproduction of sound which is directed to, or cast upon, public streets or highways which distracts, or is intended to distract, the attention of drivers of motor vehicles, unless operated to request assistance or warn of a hazardous situation. This section does not apply to authorized emergency vehicles or vehicles operated by gas, electric, communications, water, or other such public utilities.

d. Yelling, Shouting, etc. Yelling, shouting, hooting, whistling, or singing on a public street at any time or place with the intent to annoy or disturb the quiet, comfort or repose of a person or persons in any dwelling, office, building or structure, or of any person or persons in the vicinity.

e. Animals, Birds, etc. The keeping of any animal or bird, as pet or livestock, which, by causing frequent or continuous noise disturbs the comfort or repose of any persons in the vicinity. The creation or maintenance of noise by animals in such a manner as to be plainly audible at a distance of 50' (fifty feet) from the source of such noise shall be prima facie evidence of a violation of this Section.

f. Construction or Repair of Buildings. The erection, construction, demolition, alteration or repair of any building, structure or residence that requires a permit, or the excavation of any earth, fill, streets or highways that requires a grading permit, other than between the hours of 7:00 a.m. and 6:00 p.m. on weekdays which are not holidays, or those precise hours of operation enumerated in individual building and grading permits.

If the Chief of Code Enforcement determines that the public health, safety and welfare will not be impaired by the erection, construction, demolition, alteration or repair of any building, structure or residence during hours other than permitted in the preceding paragraph, and if he or she further determines that loss or inconvenience would result to any person in interest, he or she may grant permission for such work to be done, the specific hours and days of operation to be enumerated in the permit.

If the City Engineer determines that the public health, safety and welfare will not be impaired by the excavation of any earth, fill, streets or highways during the hours of the first paragraph of this subsection and if he or she further determines that loss or inconvenience would result to any person in interest, he or she may grant permission for such work to be done, the specific hours and days of operation to be enumerated in the permit.

In case of urgent necessity in the interest of public health and safety, the Chief of Code Enforcement or the City Engineer may issue a permit to conduct such emergency work for a period not to exceed three (3) days or less while the emergency continues. Such permit may be renewed for periods of three (3) days or less while the emergency continues.

This Section shall not be construed to require a permit for a public utility engaged in any of the aforementioned activities provided reasonable effort is made to minimize noise disturbance while such work is in progress.

g. Maintenance Equipment. The use and operation of any noise-creating commercial or residential landscaping or home maintenance equipment or tools including, but not limited to, hammers, blowers, trimmers, mowers, chainsaws, power fans or any engine, the operation of which causes noise due to the explosion of operating gases or fluids, other than between the hours of 8:00 a.m. and 7:00 p.m. on weekdays and 9:00 a.m. and 7:00 p.m. on weekends and holidays. (§1, Ord. 1753, eff. November 8, 1990)

4-6.204 Loud Noises Prohibited.
No person shall make, continue or cause to be made or continued, any loud, excessive or unreasonable noise or sound within the limits of the City. (§1, Ord. 1753, eff. November 8, 1990)

4-6.205 Exemptions.
a. The provisions of this article shall not apply in actual or threatened emergency situations such as those caused by natural or man-made disasters.

b. Businesses and individuals using maintenance equipment in the Core Area and in business parks may commence at 7:00 a.m. on weekdays which are not holidays but are otherwise subject to the limitations set forth above.

c. Schools within the City’s limits using maintenance equipment may commence at 7:00 a.m. on weekdays which are not holidays but are otherwise subject to the limitations set forth above. (§1, Ord. 1753, eff. November 8, 1990)

d. If the Community Development Director determines that the public health, safety and welfare will not be impaired by the operation of golf course maintenance equipment, expressly for the purpose of preparing greens and sand trap areas prior to a course being opened for play, he or she may allow such operations to occur prior to the normal operating hour limitations as set forth in Section 4-6.203 (g) of the Municipal Code, but in no instance prior to 30 minutes before sunrise or 6:00 A.M., whichever is later. In granting such an exemption, the Community Development Director may impose any conditions as deemed necessary to ensure that the operation of golf course maintenance equipment prior to the normally permitted operating hours will not unreasonably disturb the occupants of residences located adjacent to the golf course requesting the exemption. Exemptions granted by the Community Development Director can be revoked at any time. Decisions by the Community Development Director shall be final. (§1, Ord. 1920, eff. 2/19/98.)

4-6.207 Penalty; Misdemeanor or Infraction.
Any person who violates any provision of §§4-6.203 through 4-6.204 shall be deemed guilty of a misdemeanor or an infraction.

a. If charged as an infraction, the penalty upon conviction of such person shall be a fine as set forth in §1-2.01 of this Code.

b. If charged as a misdemeanor, the penalty upon conviction of such person shall be imprisonment in the county jail for a period not to exceed six months, or by a fine not exceeding $1000.00, or by both fine and imprisonment. (§1, Ord. 1753, eff. November 8, 1990)

4-6.208 Abatement of Noise as Nuisance.
Any noise maintained in violation of any provision of this article shall additionally be deemed a public nuisance. Such public nuisance may be abated by the Chief of Police, the Community Development Director, or his or her designees, in accordance with the procedures authorized by this Code. (§1, Ord. 1753, eff. November 8, 1990)

Article 3. Parking on Private Property

4-6.301 Private Parking Signing.
a. No person shall drive or park a motor vehicle upon land or premises where the owner or the person occupying or having possession, or the agents thereof, have posted on such property or premises a notice in substantially the following form, and where the permission therein referred to shall not have been granted:

1. A statement that parking is restricted and to whom it applies:

Examples: "Parking for XXX customers only";
"This space reserved for XXX";
"Parking for tenants only";
"No parking in this area";
"Parking by permit holders only";

2. A statement that violators may or will be cited:

Examples: "Violators will be cited by Walnut Creek Police";
"Unauthorized vehicles will be cited or towed at owner’s expense";

3. A reference to this Municipal Code section:

Examples: "Sec. 4-6.301 Walnut Creek Muni. Code";
"Section 4-6.301 W.C.M.C."

Lettering shall be on a contrasting background and of such size and so placed as to be reasonably visible to all persons entering the private parking area. If the parking area is shared by more than one business or firm, those stalls for the private use by each shall be clearly identified.

Nothing in this section shall be construed as placing a requirement upon the Police Department to patrol such private property for violations and no enforcement action shall be taken except upon specific request by an authorized agent, owner or person in lawful possession or control thereof.

b. Where parking meters are used, signs on the parking meters that are consistent with the signs on the parking meters placed on the public streets or public parking lots shall be deemed to meet the requirements of subsection (a). (5420, as amended by §1, Ord. 1270, eff. April 7, 1976, and by §1, Ord. 1965, eff 8/10/00.)

4-6.302 Interference With Use of Property.
No person, without permission of the owner or person entitled to the possession thereof, shall park any motor vehicle in or upon any private property so as to interfere with the use thereof. (5421)

NOISE MODELING INPUT/OUTPUT

CadnaA Input Output
Project: Rossmoor Pickleball Event Center

Receiver

Name	M.	ID	Level Lr Day (dBA)	Level Lr Night (dBA)	Limit. Value Day (dBA)	Limit. Value Night (dBA)	Land Use Type	Land Use Auto	Noise Type	Height (m)		Coordinates X (m)	Y (m)	Z (m)
NM1			37.6	37.6	0	0	x		Total	1.5	r	390.1	401.4	108.57
NM2			38.1	38.1	0	0	x		Total	1.5	r	808.61	347.6	114.16
NM3			49.5	49.5	0	0	x		Total	1.5	r	669.12	235.08	116.06
NM4			36.5	36.5	0	0	x		Total	1.5	r	580.81	118.08	123.11
NM5			40.2	40.2	0	0	x		Total	1.5	r	504.95	304.57	115.49
NM5 - N			43.3	43.3	0	0	x		Total	1.5	r	496.55	342.49	111.24
NM5 - S			45	45	0	0	x		Total	1.5	r	522.04	247.99	121.11

Area Source

Name	M.	ID	Result. PWL Day (dBA)	Result. PWL Evening (dBA)	Result. PWL Night (dBA)	Result. PWL'' Day (dBA)	Result. PWL'' Evening (dBA)	Result. PWL'' Night (dBA)	Lw / Li Type	Value	norm.	Correction Day dB(A)	Correction Evening dB(A)	Correction Night dB(A)	Sound Reduction R	Area (m^2)	Attenuatio	Operating Time Day (min)	Operating Time Special (min)	Operating Time Night (min)	K0 (dB)	Freq. (Hz)	Direct.	Moving Pt. Src Number Day	Moving Pt. Src Number Evening	Moving Pt. Src Number Night
	1		102.5	102.5	102.5	80.5	80.5	80.5	Lw"	P		0	0	0								0	(none)			
	2		102.5	102.5	102.5	80.5	80.5	80.5	Lw"	P		0	0	0								0	(none)			
	3		102.5	102.5	102.5	80.5	80.5	80.5	Lw"	P		0	0	0								0	(none)			
	4		102.5	102.5	102.5	80.5	80.5	80.5	Lw"	P		0	0	0								0	(none)			
	5		102.5	102.5	102.5	80.5	80.5	80.5	Lw"	P		0	0	0								0	(none)			
	6		102.5	102.5	102.5	80.5	80.5	80.5	Lw"	P		0	0	0								0	(none)			

Barrier

Name	M.	ID	Absorption left	Absorption right	Z-Ext. (m)	Cantilever horz. (m)	Cantilever vert. (m)	Height Begin (m)	Height End (m)
N			0.37	0.37					
W			0.37	0.37					
W Roof			0.37	0.37		13.8	1.83		
S			0.37	0.37					
E			0.37	0.37	1.22				
E Roof			0.37	0.37		13.9	1.83		

Receiver Name	ID	Land Use	Limiting Value Day dB(A)	Limiting Value Night dB(A)	rel. Axis Station m	Distance m	Height m	Lr w/o Noise Control Day dB(A)	Lr w/o Noise Control Night dB(A)	dL req. Day dB(A)	dL req. Night dB(A)	Lr w/ Noise Control Day dB(A)	Lr w/ Noise Control Night dB(A)	Exceeding Day dB(A)	Exceeding Night dB(A)	passive NC dB(A)
NM1			0	0				37.6	37.6	37.6	37.6	0	0	-	-	-
NM2			0	0				38.1	38.1	38.1	38.1	0	0	-	-	-
NM3			0	0				49.5	49.5	49.5	49.5	0	0	-	-	-
NM4			0	0				36.5	36.5	36.5	36.5	0	0	-	-	-
NM5			0	0				40.2	40.2	40.2	40.2	0	0	-	-	-
NM5 - N			0	0				43.3	43.3	43.3	43.3	0	0	-	-	-
NM5 - S			0	0				45	45	45	45	0	0	-	-	-

Table 1. Calculation of RT60 from Room Finishes

Client: Rossmoor
Case: RT60

Project No.
Date: 07/12/23

ABSORPTION:

Type	Area	Material
11	11986	Concrete or Terrazo Floor
38	12073	Steel
38	2715	Steel
15	1024	1/4" Glass, Sealed, Large Panes
21	1468	Plaster, Gypsum, Lime (Smooth)
33	3650	Opened Window
3	0	Carpet, 1/8" Pile Height
3	0	Carpet, 1/8" Pile Height

Room Dimensions, feet

Length	120.66	Ft
Width	99.33	Ft
Height	23	Ft
Volume	275658.6294	Cu. Ft

Freq.	Absorption, Sabins	RT60 Seconds
100 Hz	10879	1.24
125 Hz	**10879**	1.24
160 Hz	8962	1.51
200 Hz	7044	1.92
250 Hz	**5126**	2.63
315 Hz	5164	2.62
400 Hz	5202	2.60
500 Hz	**5240**	2.58
630 Hz	5297	2.55
800 Hz	5354	2.52
1000 Hz	**5411**	2.50
1250 Hz	5267	2.56
1600 Hz	5122	2.64
2000 Hz	**4978**	2.71
2500 Hz	4723	2.86
3150 Hz	4468	3.02
4000 Hz	**4214**	3.21
5000 Hz	4214	3.21

* Room absorption calculated from absorption data includes 3 dB reduction for window to room center correction.

CHARLESTON ROOM ANALYSIS

Room: **Rossmoor Event Center**
Test Date: **7/12/2023**

Nominal Room Dimensions:

Length, ft:	**121**		
Width, ft:	**99**		
Height, ft:	**23**		
Surface Area, ft:	32916		
Room Volume, cu ft:	275659	New Wall Panels Area, sq ft:	**0**
		New Ceiling Panel Area, sq ft:	**9000**

	Octave Band Center Frequency								Average	Improvement, dB
Frequency:	63	125	250	500	1000	2000	4000	8000		
Existing Conditions										
RT60 Average:	**1.2**	**1.2**	**2.6**	**2.6**	**2.5**	**2.7**	**3.2**	**3.2**	**2.7**	
Absorption, Ft Sabines: A=0.049*(Volume/RT60)	10893.0	10893.0	5135.8	5235.4	5402.9	4984.2	4207.9	4221.0		
Average Absorption Coefficient: (A/Surface Area)	0.331	0.331	0.156	0.159	0.164	0.151	0.128	0.128		
Alternative Option 1: Sound Silencer Ceiling Tiles										
New Ceiling Panels Absorptive Coefficient:	**0.46**	**0.59**	**0.44**	**0.49**	**0.76**	**0.86**	**0.55**	**0.5**		
New Ceiling Panels Absorption, Ft Sabines:	4140.0	5310.0	3960.0	4410.0	6840.0	7740.0	4950.0	4500.0		
Old Room Absorption Ft Sabines:	10893.0	10893.0	5135.8	5235.4	5402.9	4984.2	4207.9	4221.0		
Total New Room Absorption Ft, Sabines:	15033.0	16203.0	9095.8	9645.4	12242.9	12724.2	9157.9	8721.0		
Option 1 RT60:	**0.9**	**0.8**	**1.5**	**1.4**	**1.1**	**1.1**	**1.5**	**1.5**	**1.3**	**3.2**