NOISE STUDY

Hope Avenue
Residential Development
Carlsbad, CA

Project Proponent:

Wermers Properties
5120 Shoreham Place, #150
San Diego, CA 92122

Prepared by:

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GLOSSARY OF COMMON TERMS

Sound Pressure Level (SPL): a ratio of one sound pressure to a reference pressure (L_{ref}) of 20 µPa. Because of the dynamic range of the human ear, the ratio is calculated logarithmically by 20 log (L/L_{ref})

A-weighted Sound Pressure Level (dBA): Some frequencies of noise are more noticeable than others. To compensate for this fact, different sound frequencies are weighted more.

Minimum Sound Level (L_{min}): Minimum SPL or the lowest SPL measured over the time interval using the A-weighted network and slow time weighting.

Maximum Sound Level (L_{max}): Maximum SPL or the highest SPL measured over the time interval the A-weighted network and slow time weighting.

Equivalent sound level (L_{eq}): the true equivalent sound level measured over the run time. Leq is the A-weighted steady sound level that contains the same total acoustical energy as the actual fluctuating sound level.

Day Night Sound Level (LDN): Representing the Day/Night sound level, this measurement is a 24 –hour average sound level where 10 dB is added to all the readings that occur between 10 pm and 7 am. This is primarily used in community noise regulations where there is a 10 dB "Penalty" for night time noise. Typically LDN's are measured using A weighting.

Community Noise Exposure Level (CNEL): The accumulated exposure to sound measured in a 24-hour sampling interval and artificially boosted during certain hours. For CNEL, samples taken between 7 pm and 10 pm are boosted by 5 dB; samples taken between 10 pm and 7 am are boosted by 10 dB.

Octave Band: An octave band is defined as a frequency band whose upper band-edge frequency is twice the lower band frequency.

Third-Octave Band: A third-octave band is defined as a frequency band whose upper band-edge frequency is 1.26 times the lower band frequency.

Response Time (F,S,I): The response time is a standardized exponential time weighting of the input signal according to fast (F), slow (S) or impulse (I) time response relationships. Time response can be described with a time constant. The time constants for fast, slow and impulse responses are 1.0 seconds, 0.125 seconds and 0.35 milliseconds, respectively.

EXECUTIVE SUMMARY

This noise study has been completed to determine the noise impacts associated with the development of the proposed residential project. The project known as Hope Avenue Apartments Residential Development consists of a four-story, 156 unit multi-family apartment building. The project site is located west of Interstate 5 (I-5) and north of the intersection of Carlsbad Village Drive and Hope Avenue in the City of Carlsbad CA.

The project proposes to provide outdoor usable area within interior courtyard areas. Due to the shielding of the building, all residential units will comply with the City's 60 dBA CNEL standard.

The Project does not create a noise increase of more than 3 dBA CNEL on any of the analyzed roadway segments. Therefore, the Project's contributions to off-site roadway noise increases will not cause any significant impacts to any existing or future noise sensitive land uses.

Additionally, a preliminary interior noise assessment was conducted for all units since the building facades noise levels are above 60 dBA CNEL. The Project is proposing a minimum sound transmission class (STC) ratings of 28 or higher on the glass assemblies. It was confirmed that an STC rating of 28 or higher for all glass assemblies would reduce the interior noise levels below 45 dBA CNEL. It should be noted: with a closed window condition, the units require a means of mechanical ventilation (e.g., air conditioning). Once the final architectural plans are available, a final interior noise study should be conducted to ensure interior noise reductions.

1.0 PROJECT INTRODUCTION

1.1 Purpose of this Study

The purpose of this Noise study is to determine potential onsite traffic noise impacts created from nearby Interstate 5 and adjacent roadways. Should impacts be determined, the intent of this study would be to recommend suitable mitigation measures to bring those impacts to a level that would be considered less then significant.

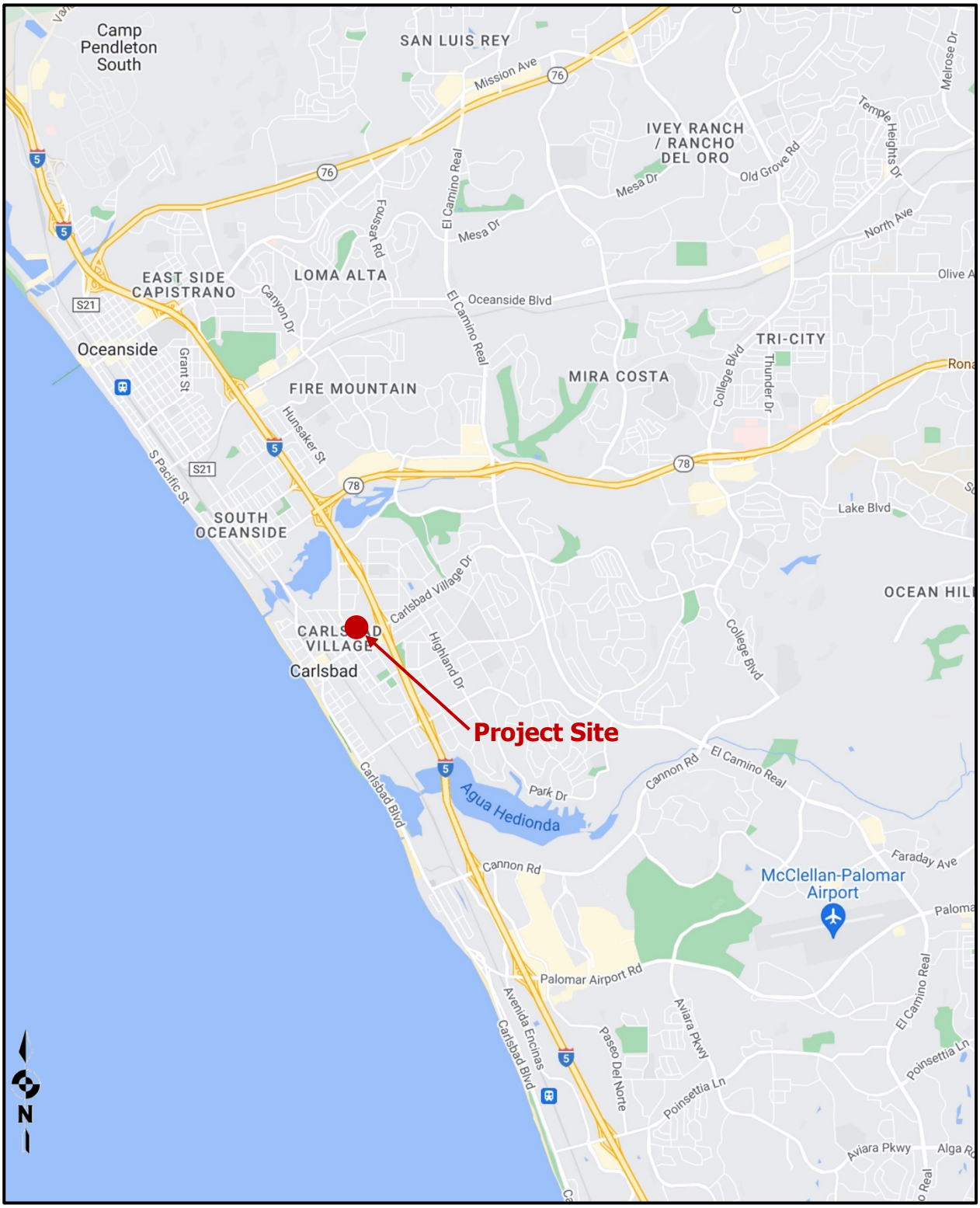
1.2 Project Location

The proposed project is located within the City of Carlsbad, CA. More specifically, the project site is located west of Interstate 5 (I-5) and north of the intersection of Carlsbad Village Drive and Hope Avenue. Access to the project site is from Carlsbad Village Drive. A general project vicinity map is shown in Figure 1-A.

1.3 Project Setting

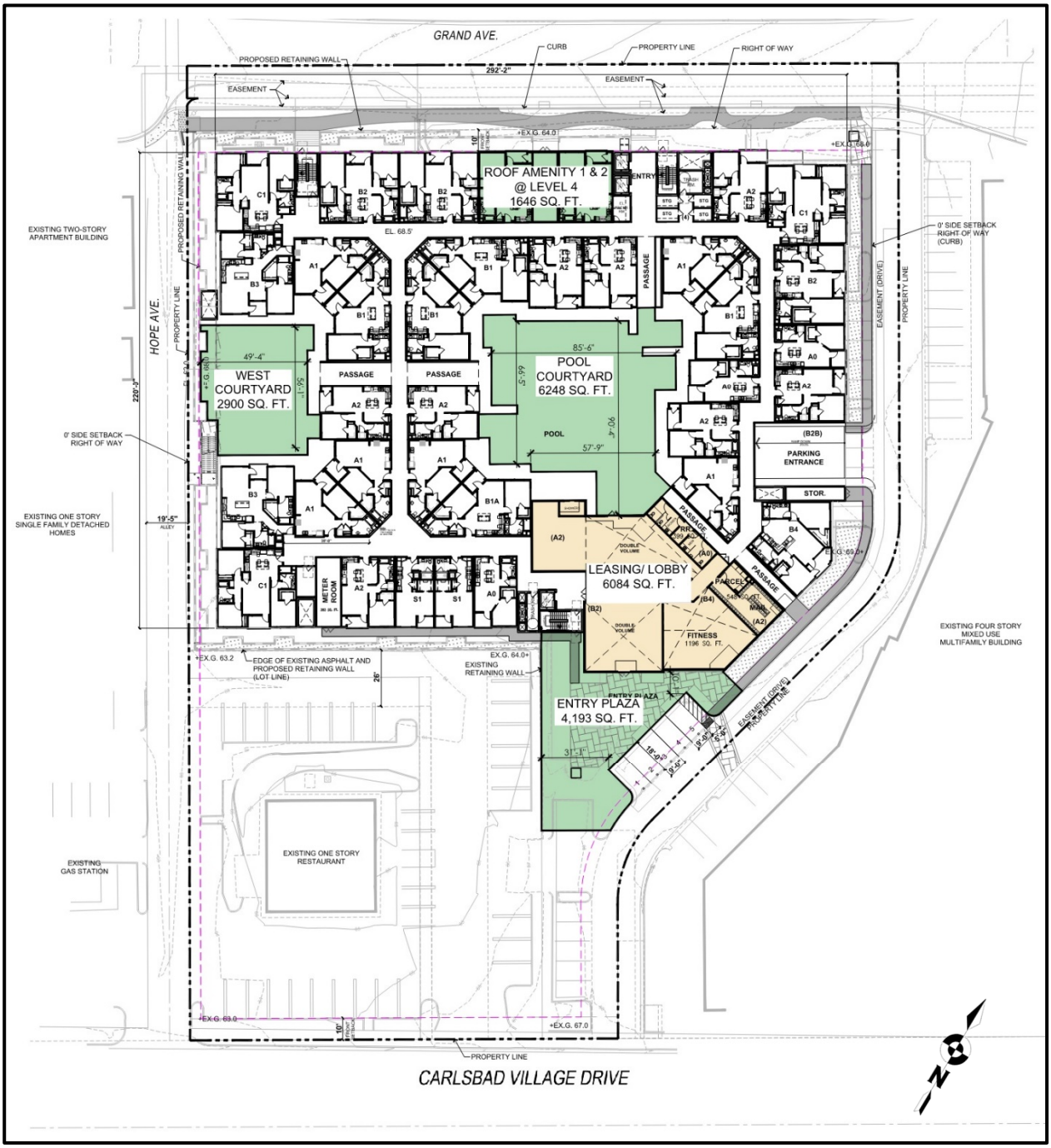
The project consists of 156 multi-family apartment units, fitness center, community pool, and an existing fast-food restaurant to remain. The existing site conditions are characterized as disturbed land that is currently utilized as a Motel and Carl's Jr fast-food restaurant. Three existing single-family residences located in the northwest corner are to be removed along with the motel. Residential uses existing to the east, north, and west and existing retail uses are located to the west and south across Carlsbad Village Drive. Interstate 5 is located approximately 370 feet to the east. A project site plan for the project is shown in Figure 1-B.

Figure 1-A: Project Vicinity Map



Source: Google Maps, 2022

Figure 1-B: Project Site Plan



Source: (Pasco Laret Suiter & Associates, Inc., 2022)

2.0 ACOUSTICAL FUNDAMENTALS

Noise is defined as unwanted or annoying sound which interferes with or disrupts normal activities. Exposure to high noise levels has been demonstrated to cause hearing loss. The individual human response to environmental noise is based on the sensitivity of that individual, the type of noise that occurs and when the noise occurs. Sound is measured on a logarithmic scale consisting of sound pressure levels known as a decibel (dB). The sounds heard by humans typically do not consist of a single frequency but of a broadband of frequencies having different sound pressure levels. The method for evaluating all the frequencies of the sound is to apply an A-weighting to reflect how the human ear responds to the different sound levels at different frequencies. The A-weighted sound level adequately describes the instantaneous noise whereas the equivalent sound level depicted as Leq represents a steady sound level containing the same total acoustical energy as the actual fluctuating sound level over a given time interval.

The Community Noise Equivalent Level (CNEL) is the 24 hour A-weighted average for sound, with corrections for evening and nighttime hours. The corrections require an addition of 5 decibels to sound levels in the evening hours between 7 p.m. and 10 p.m. and an addition of 10 decibels to sound levels at nighttime hours between 10 p.m. and 7 a.m. These additions are made to account for the increased sensitivity during the evening and nighttime hours when sound appears louder.

A vehicles noise level is from a combination of the noise produced by the engine, exhaust and tires. The cumulative traffic noise levels along a roadway segment are based on three primary factors: the amount of traffic, travel speed, and the vehicle mix ratio or number of medium and heavy trucks. The intensity of traffic noise is increased by higher traffic volumes, greater speeds and increased number of trucks.

Because mobile/traffic noise levels are calculated on a logarithmic scale, a doubling of the traffic noise or acoustical energy results in a noise level increase of 3 dBA. Therefore the doubling of the traffic volume, without changing the vehicle speeds or mix ratio, results in a noise increase of 3 dBA. Mobile noise levels radiant in an almost oblique fashion from the source and drop off at a rate of 3 dBA for each doubling of distance under hard site conditions and at a rate of 4.5 dBA for soft site conditions. Hard site conditions consist of concrete, asphalt and hard pack dirt while soft site conditions exist in areas having grade changes, landscaped areas and vegetation. On the other hand, fixed sources radiate outward uniformly as it travels away from the source. Their sound levels attenuate or drop off at a rate of 6 dBA for each doubling of distance.

The most effective noise reduction methods consist of controlling the noise at the source, blocking the noise transmission with barriers or relocating the receiver. Any or all of these methods may be required to reduce noise levels to an acceptable level.

3.0 SIGNIFICANCE THRESHOLDS AND STANDARDS

The City of Carlsbad's Noise Guidelines Manual (City of Carlsbad, 2013) requires that all exterior sensitive areas shall limit noise exposure. For noise sensitive residential land uses, the City has adopted a policy which has established a "normally acceptable" exterior noise level goal of 60 dBA CNEL for the outdoor areas and an interior noise level of less than 45 dBA CNEL. For residential properties identified as requiring a noise study, the study shall document the projected maximum exterior noise level and mitigate the projected exterior noise level to a maximum allowable noise level as identified in the Noise Guideline Manual. If the acoustical study shows that exterior noise levels cannot be mitigated to the level allowable as identified in this policy or less, the development should not be approved without one or more of the following findings:

(1) Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect (noise).

(2) Changes or alterations to avoid or substantially lessen the significant environmental effect (noise) are within the responsibility and jurisdiction of another public agency and not the City of Carlsbad. Such changes have been adopted by such other agency or can and should be adopted by such other agency.

(3) Specific economic, social, or other considerations make infeasible the mitigation measures or project alternatives to avoid or substantially lessen the significant environmental effect (noise).

If a project is approved with exterior noise levels exceeding the level allowable pursuant to this policy, all purchasers of the impacted property shall be notified in writing prior to purchase, and by deed disclosure in writing, that the property they are purchasing is, or will be, noise impacted and does not meet Carlsbad noise standards for residential property.

California Noise Insulation Standards (California Code of Regulations, Title 24) and the City of Carlsbad Noise Element establish an interior noise standard of 45 dBA for residential structures. Acoustical studies must be prepared for residential structures that are proposed to be located within the Community Noise Equivalent Level (CNEL) noise contours of 60 dBA or greater. In addition, the City requires residential structures located within the CNEL noise contours of 60 or greater to prepare an acoustical study. The studies must demonstrate that the building is designed to reduce interior noise to 45 dBA or lower (CNEL).

4.0 NOISE ENVIRONMENT

4.1 Existing Noise Environment Onsite

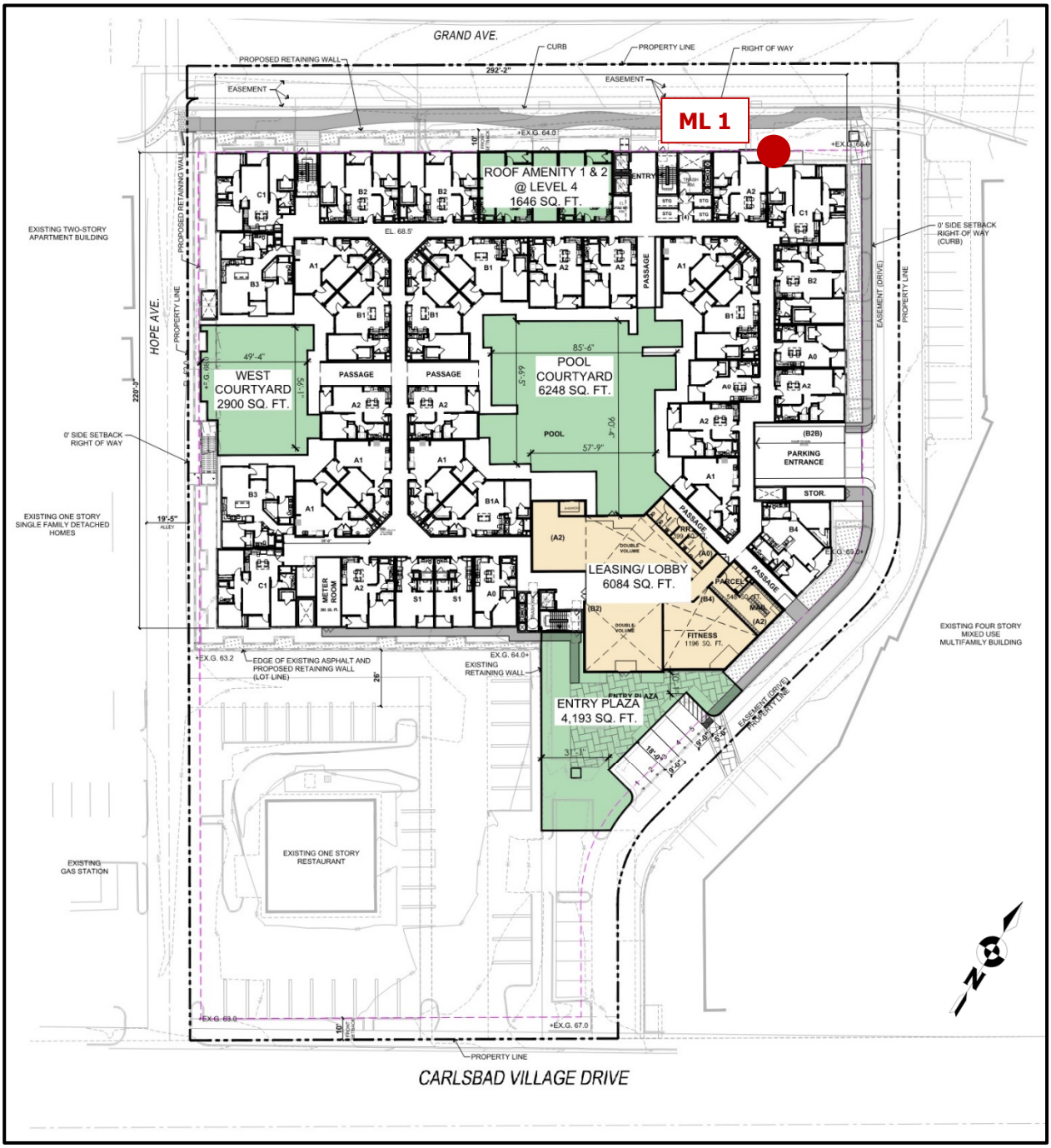
A noise measurement was taken using a Larson-Davis Model LxT Type 1 precision sound level meter, programmed, in "slow" mode, to record noise levels in "A" weighted form. The sound level meter and microphone were mounted on a tripod, five feet above the ground and equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200.

Monitoring location 1 (ML1) was located at the northeast corner of the project site facing Interstate 5 and was the worst-case noise condition based on the proximity to the freeway. The results of the noise level measurements are presented in Table 4-1. The noise measurement was monitored for a time period of 15 minutes during normal traffic conditions. The existing noise levels in the project area consisted primarily of traffic from Interstate 5 and Carlsbad Village Drive. The ambient Leq noise levels measured in the area of the Project during the afternoon hours was found to be roughly 65 dBA. The statistical indicators Lmax, Lmin, L10, L50 and L90, are given for the monitoring location. As can be seen from the L90 data, 90% of the time the noise level is approximately 62 dBA from Interstate 5. The noise monitoring location is provided graphically in Figure 4-A.

Table 4-1: Measured Ambient Noise Levels

Measurement Identification	Description	Time	Noise Levels (dBA)					
			Leq	Lmax	Lmin	L10	L50	L90
ML1	Northeast Corner	1:00 p.m. - 1:15 p.m.	64.7	71.2	59.5	66.3	64.5	62.1
Source: Ldn Consulting, Inc. 4/6/22								

Figure 4-A: Ambient Monitoring Location



4.2 Future Noise Prediction Methodology

The required coordinate information necessary for the Sound32 traffic noise prediction model input was taken from the preliminary site plans provided by Pasco Laret Suiter & Associates, June 2021. To determine the future noise levels the preliminary site plans were used to identify the pad elevations, the roadway elevations, and the relationship between the noise source(s) and the receptor areas. To evaluate the future potential noise impacts on the proposed development, outdoor observers were located in the interior courtyards on the ground floor. Second floor modeled receptors were placed 15 feet above finished floor elevation. In addition, the top of slopes along with the roadways were modeled to adjust for grade separation and the natural shielding from the roadways.

To determine the future noise environment and impact potentials the Sound32 model was utilized. The critical model input parameters, which determine the projected vehicular traffic noise levels, include vehicle travel speeds, the percentages of automobiles, medium trucks and heavy trucks in the roadway volume, the site conditions and the peak hour traffic volume. The peak hour traffic volumes range between 6-12% of the average daily traffic (ADT) and 10% is generally acceptable for noise modeling.

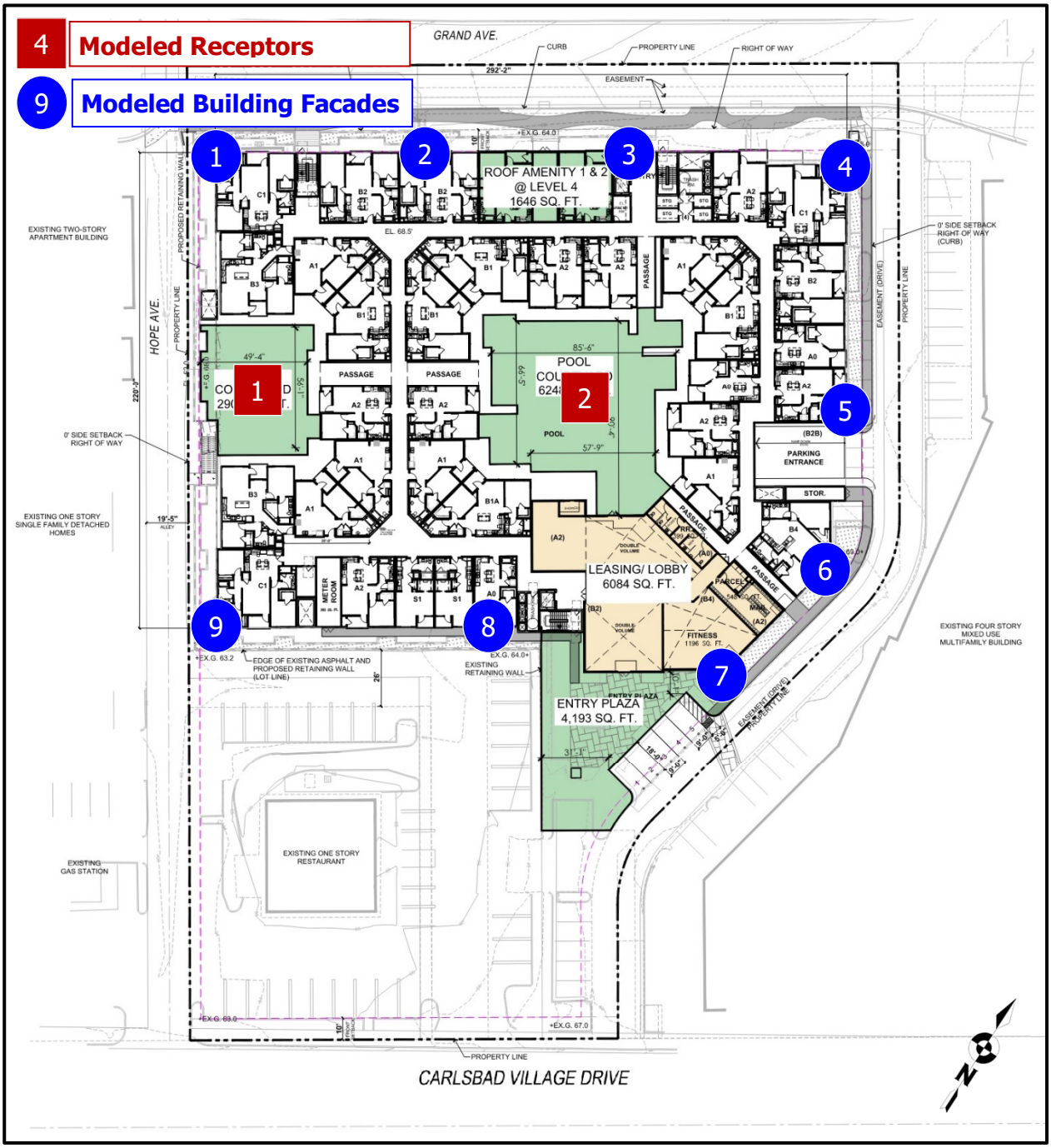
Table 4-2 presents the roadway parameters used in the analysis including the peak traffic volumes, vehicle speeds and the hourly traffic flow distribution (vehicle mix). The vehicle mix provides the hourly distribution percentages of automobile, medium trucks and heavy trucks for input into the Sound32 Model. The Buildout conditions include the future traffic volume forecasts provided in the Caltrans Noise Study Report for I-5 North Coast Corridor Widening Project. The traffic was broken into lane segments for the main lanes and HOV lanes based on the ultimate Buildout configuration. The Buildout conditions for Carlsbad Village Drive include the future year traffic volume forecasts provided in the SANDAG Series ABM2+/2021 RP Traffic Forecast Year 2035. The modeled observer locations are presented in Figure 4-B.

Table 4-2: Future Traffic Parameters

Roadway	Lane Description	Peak Hour Volumes[1]	Modeled Speeds (MPH)	Vehicle Mix %[1]		
				Auto	Medium Trucks	Heavy Trucks
I-5 North and South Bound	Main Lanes	9,000[1]	65	94.3	2.4	3.3
	HOV Lanes	1,500[1]	65	100	0	0
Carlsbad Village Drive	All Lanes	22,500[2]	25	96	2	2

[1] Source: Caltrans
[2] Source: SANDAG Series ABM2+/2021 RP Traffic Forecast Year 2035

Figure 4-B: Modeled Receptor Locations



4.3 Project Related Off-Site Transportation Noise

To determine if direct or cumulative off-site noise level increases associated with the development of the proposed project would create noise impacts, the traffic volumes for the existing conditions were compared with the traffic volume increase of existing plus the proposed project. According to the traffic impact analysis provided by Urban Systems Associates, Inc., the project is estimated to only generate 936 daily trips with a peak hour volume of 94 trips (Urban Systems Associates, Inc., 2023). According to the traffic impact analysis, the existing average daily traffic (ADT) volumes on adjacent Carlsbad Village Drive is 23,414 ADT. The existing average daily traffic (ADT) volumes on adjacent Grand Avenue is 1,630 ADT. Typically, it requires a project to double (or add 100%) the traffic volumes to have a direct impact of 3 dBA CNEL or be a major contributor to the cumulative traffic volumes. The project will add less than a 1% increase to Carlsbad Village Drive volumes and less than a 3% increase to Grand Avenue volumes. Therefore, no direct or cumulative impacts are anticipated.

5.0 FINDINGS AND MITIGATION

The Buildout analysis was modeled utilizing the roadway parameters described above in Section 4 and shown in Table 4-2 for the future conditions. The project proposes to provide outdoor usable area within two interior courtyard areas. Due to the shielding of the building, all residential units will comply with the City's 60 dBA CNEL standard.

As can be seen in Table 5-1, the outdoor usable areas would not exceed the 60 dBA CNEL threshold. The S32 models input parameters and output files for the future conditions with and without the mitigation are also provided in ***Attachment A***.

Table 5-1: Future Exterior Noise Levels

Exterior Common Use Area Receptor Number	First Floor Unmitigated Noise Level (dBA CNEL)	Building Facade Receptor Number	First Floor Building Façade Noise Levels (dBA CNEL)	Second Floor Building Façade Noise Levels (dBA CNEL)	Third Floor Building Façade Noise Levels (dBA CNEL)	Fourth Floor Building Façade Noise Levels (dBA CNEL)
1	58	1	67	68	68	68
2	56	2	68	68	69	69
-	-	3	69	70	70	70
-	-	4	71	71	71	72
-	-	5	66	67	67	69
-	-	6	64	65	66	68
-	-	7	61	62	64	67
-	-	8	66	66	67	68
-	-	9	68	68	68	68
Interior Noise Study required if noise level is above 60 dBA CNEL per City Guidelines.						

Interior Noise Levels

The methodology used to determine the interior noise levels is based on the exterior noise level minus the sound transmission loss as identified in the American Society of Testing and Materials (ASTM) guidelines: E413 & E90. Standard building construction will provide a noise reduction of approximately 12-15 dBA with a windows open conditions and minimum 20 dBA noise reduction with the windows closed. The exterior noise levels at the proposed structures calculated in terms of dBA are converted to the six octave band sound pressure levels between: 125 Hertz - 4000 Hertz.

Acoustical modeling of the proposed project's future building dwelling units was performed in accordance with the above guidelines and included combining the transmission loss for each of

the building components that will reduce the interior noise levels. Building components typically include the windows, exterior doors, and exterior walls. The total noise reduction is dependent upon the transmission loss of each building component, their subsequent surface area, quality of the building/construction materials, a building façade and angle correction.

The interior noise level is also dependent on the acoustical energy absorbed within the room based upon the Noise Reduction Coefficients (NRC). NRC is a scalar representation of the amount of sound energy absorbed upon striking a particular surface and the arithmetic average of sound absorption coefficients indicating a material's ability to absorb sound. The absorption coefficients for individual surface areas such as carpet (if installed), drywall and furnishings are used to calculate the interior room effects. The calculated building noise reduction includes both the room absorption characteristics and the transmission loss from the exterior wall assembly.

The interior noise reduction calculations were performed using Ldn's interior noise model. The model converts the exterior sound level to octave band frequencies and accounts for the transmission loss, correction factors and room absorption. The preliminary floor plans used for this analysis were provided by Architects Orange, 2022. The following construction details were utilized for each of the building assemblies to determine the noise reduction characteristics:

Exterior walls and roof assemblies typically have a Sound Transmission Class (STC) rating of 46 or better. Exterior walls with this rating consist of 2"x 4" studs or larger, spaced 16" o.c. with R-13 insulation minimum and an exterior surface of 7/8" cement plaster (stucco). Interior wall and ceiling surfaces shall be at least 1/2" thick gypsum or plaster. Roof assemblies should have a minimum of 1/2" sheathing, R-19 insulation and sealed to prevent noise leaks. Exterior entry doors should be of solid core construction typically have a minimum STC rating of 28.

Glass assemblies should be dual-paned and sealant applied around the exterior edges. Typical dual-paned glass assemblies have an STC rating of 26 or higher depending on the manufacturer. The window assemblies are generally the weakest noise reducing component but are the most convenient and cost effective elements to change if additional attenuation is needed. Based on the conceptual plans, the project is proposing glass assemblies with a minimum STC rating of 28 as a design feature.

Closets and corridors are not required to meet the 45 dBA CNEL standard and therefore were not modeled. All living areas where lower noise levels are essential for conversation and sleep typically have carpeting installed (i.e., bedrooms). These rooms and were modeled to determine the interior noise reductions. If the modeled interior noise levels were found to be higher than 45 dBA CNEL in the living areas with the minimum assembly requirements described above additional modeling was performed to determine the needed STC ratings for the glass assemblies to further reduce interior noise levels below the acceptable interior threshold of 45 dBA CNEL.

Basic calculations show that a windows open condition will only reduce the interior noise levels 15 dBA CNEL and not provide adequate interior noise mitigation at all units. Therefore a closed window condition is required for all units above 60 dBA CNEL to reduce interior noise levels to comply with CCR Title 24 and City of Carlsbad requirements. The windows closed condition requires that mechanical ventilation be installed to move air within the structure.

Modeling was conducted for each unit type and floor plan based upon the worst-case exterior noise levels of 72 dBA CNEL, as identified in the exterior noise assessment, to determine the required STC rating for the windows. To meet the 45 dBA CNEL interior noise standard, an overall minimum interior noise level reduction of 27 dBA CNEL is needed for the proposed project. Therefore, a closed window condition is required to reduce interior noise levels to comply with CCR Title 24 and City of Carlsbad requirements. The windows/doors closed condition does not require the windows or doors to be non-operable but does requires that mechanical ventilation is installed to move air within the structure and control temperatures when the windows are closed. The mechanical ventilation must meet the jurisdictional requirements for these dwelling units.

Based on the preliminary plans, it was confirmed that an STC rating of 28 or higher for all glass assemblies would reduce the interior noise levels below 45 dBA CNEL. The necessary Sound Transmission Class and transmission losses for the glass assemblies are provided in Table 5-2. The modeled results with an anticipated interior noise level of 45 dBA CNEL or less are provided as an ***Attachment B***. Once the final architectural plans are available, a final interior noise study should be conducted to ensure interior noise reductions.

Table 5-2: Sound Transmission Class Ratings

Assembly	STC Rating[1]	Octave Band Transmission Loss (Hz)					
		125	250	500	1000	2000	4000
Windows	**28**	21	17	25	32	37	38
Fixed Windows	**28**	17	16	22	31	35	27
Glass Doors	**28**	21	24	27	27	24	28

[1] *STC Ratings used in Model*

6.0 SUMMARY OF PROJECT IMPACTS & CONCLUSIONS

The project proposes to provide outdoor usable area within interior courtyard areas. Due to the shielding of the building, all residential units will comply with the City's 60 dBA CNEL standard.

The Project does not create a noise increase of more than 3 dBA CNEL on any of the analyzed roadway segments. Therefore, the Project's contributions to off-site roadway noise increases will not cause any significant impacts to any existing or future noise sensitive land uses.

Additionally, a preliminary interior noise assessment was conducted for all units since the building facades noise levels are above 60 dBA CNEL. It was confirmed that an STC rating of 28 or higher for all glass assemblies would reduce the interior noise levels below 45 dBA CNEL. It should be noted: with a closed window condition, the units require a means of mechanical ventilation (e.g., air conditioning). Once the final architectural plans are available, a final interior noise study should be conducted to ensure interior noise reductions.

7.0 REFERENCES

City of Carlsbad. (2013). *Noise Guidelines Manual*. Retrieved from https://www.carlsbadca.gov/home/showpublisheddocument/238/637425974092370000

Pasco Laret Suiter & Associates, Inc. (2022).

SANDAG. (n.d.). *Transportation Forecast Information Center Series ABM2+/2021 RP.*

Urban Systems Associates, Inc. (2023). *Traffic Impact Analysis.* Retrieved from https://www.jurupavalley.org/DocumentCenter/View/1979/Appendix-N_Noise-Impact-Analysis?bidId=

ATTACHMENT A

FUTURE NOISE MODEL INPUT
AND OUTPUT FILES

Hope Avenue Apartments - Ground Level Unmitigated
T-PEAK HOUR TRAFFIC CONDITIONS,1
8480,65,220,65,305,65
T-PEAK HOUR TRAFFIC CONDITIONS,2
3000,65,0,65,0,65
T-PEAK HOUR TRAFFIC CONDITIONS,3
8480,65,220,65,305,65
T-PEAK HOUR TRAFFIC CONDITIONS, 4
3000,65,0,65,0,65
T-PEAK HOUR TRAFFIC CONDITIONS,5
624,45,13,45,13,45
T-PEAK HOUR TRAFFIC CONDITIONS,6
586,45,12,45,12,45
T-PEAK HOUR TRAFFIC CONDITIONS,7
2160,25,45,25,45,25
T-PEAK HOUR TRAFFIC CONDITIONS,8
1843,25,38,25,38,25
L-I-5 SB,1
N,661,87,92,
N,850,1019,94,
N,1061,2058,86,
N,1129,2391,85,
L-I-5 SB HOV,2
N,704,78,92,
N,893,1010,94,
N,1105,2049,86,
N,1172,2382,85,
L-I-5 NB,3
N,795,59,92,
N,984,992,94,
N,1196,2031,86,
N,1263,2363,85,
L-I-5 NB HOV,4
N,755,68,92,
N,945,1000,94,
N,1157,2039,86,
N,1225,2371,85,
L-I-5 OFF-RAMP,5
N,720,1034,73,
N,848,1424,79,
N,1010,1966,87,
L-I-5 ON-RAMP,6
N,623,94,92,
N,691,637,80,
N,713,963,73,
L-CVD WEST,7
N,-190,1004,68,
N,69,1004,70,
N,914,1004,74,
L-CVD EAST,8
N,916,1004,74,
N,1135,1004,75,
B-I-5 KRAIL,1,2,0,0
726,74,92,95,
915,1006,94,97,
1127,2045,86,89,
1194,2377,85,88,
B-EX BLDG,2,2,0,0
682,1456,72,112,

742,1454,72,112,
783,1441,72,112,
758,1361,72,112,
627,1065,72,112,
609,1073,72,112,
486,1073,72,112,
B-PROP BLDG,3,2,0,0
254,1381,69,109,
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544,1451,69,109,
543,1289,69,109,
535,1260,69,109,
486,1210,69,109,
421,1210,69,109,
390,1234,69,109,
253,1234,69,109,
251,1306,69,109,
R,1,65,10
250,1456,74,R1
R,2,65,10
347,1458,74,R2
R,3,65,10
451,1456,74,R3
R,4,65,10
550,1451,74,R4
R,5,65,10
550,1332,74,R5
R,6,65,10
548,1283,74,R6
R,7,65,10
492,1204,74,R7
R,8,65,10
386,1226,74,R8
R,9,65,10
250,1230,74,R9
R,10,65,10
277,1343,74,Courtyard
R,11,65,10
426,1344,74,Courtyard
C,C

SOUND32 - RELEASE 07/30/91

Hope Avenue Apartments - Ground Level Unmitigated

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	R1	65.	10.	67.4
2	R2	65.	10.	68.2
3	R3	65.	10.	69.4
4	R4	65.	10.	70.6
5	R5	65.	10.	66.2
6	R6	65.	10.	64.2
7	R7	65.	10.	61.1
8	R8	65.	10.	66.1
9	R9	65.	10.	67.5
10	Courtyar	65.	10.	57.5
11	Courtyar	65.	10.	56.0

Hope Avenue Apartments - Second Level Facade
T-PEAK HOUR TRAFFIC CONDITIONS, 1
 8480 , 65 , 220 , 65 , 305 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 2
 3000 , 65 , 0 , 65 , 0 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 3
 8480 , 65 , 220 , 65 , 305 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 4
 3000 , 65 , 0 , 65 , 0 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 5
 624 , 45 , 13 , 45 , 13 , 45
T-PEAK HOUR TRAFFIC CONDITIONS, 6
 586 , 45 , 12 , 45 , 12 , 45
T-PEAK HOUR TRAFFIC CONDITIONS, 7
 2160 , 25 , 45 , 25 , 45 , 25
T-PEAK HOUR TRAFFIC CONDITIONS, 8
 1843 , 25 , 38 , 25 , 38 , 25
L-I-5 SB, 1
N,661,87,92,
N,850,1019,94,
N,1061,2058,86,
N,1129,2391,85,
L-I-5 SB HOV, 2
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N,893,1010,94,
N,1105,2049,86,
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L-I-5 NB, 3
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N,848,1424,79,
N,1010,1966,87,
L-I-5 ON-RAMP, 6
N,623,94,92,
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N,713,963,73,
L-CVD WEST, 7
N,-190,1004,68,
N,69,1004,70,
N,914,1004,74,
L-CVD EAST, 8
N,916,1004,74,
N,1135,1004,75,
B-I-5 KRAIL, 1 , 2 , 0 ,0
726,74,92,95,
915,1006,94,97,
1127,2045,86,89,
1194,2377,85,88,
B-EX BLDG, 2 , 2 , 0 ,0
682,1456,72,112,

742,1454,72,112,
783,1441,72,112,
758,1361,72,112,
627,1065,72,112,
609,1073,72,112,
486,1073,72,112,
B-PROP BLDG, 3 , 2 , 0 ,0
254,1381,69,109,
253,1452,69,109,
544,1451,69,109,
543,1289,69,109,
535,1260,69,109,
486,1210,69,109,
421,1210,69,109,
390,1234,69,109,
253,1234,69,109,
251,1306,69,109,
R, 1 , 65 ,10
250,1456,84.,R1
R, 2 , 65 ,10
347,1458,84.,R2
R, 3 , 65 ,10
451,1456,84.,R3
R, 4 , 65 ,10
550,1451,84.,R4
R, 5 , 65 ,10
550,1332,84.,R5
R, 6 , 65 ,10
548,1283,84.,R6
R, 7 , 65 ,10
492,1204,84.,R7
R, 8 , 65 ,10
386,1226,84.,R8
R, 9 , 65 ,10
250,1230,84.,R9
C,C

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Hope Avenue Apartments - Second Level Facade

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	R1	65.	10.	67.5
2	R2	65.	10.	68.3
3	R3	65.	10.	69.5
4	R4	65.	10.	70.8
5	R5	65.	10.	66.6
6	R6	65.	10.	64.8
7	R7	65.	10.	62.1
8	R8	65.	10.	66.2
9	R9	65.	10.	67.7

Hope Avenue Apartments - Third Level Facade
T-PEAK HOUR TRAFFIC CONDITIONS, 1
 8480 , 65 , 220 , 65 , 305 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 2
 3000 , 65 , 0 , 65 , 0 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 3
 8480 , 65 , 220 , 65 , 305 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 4
 3000 , 65 , 0 , 65 , 0 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 5
 624 , 45 , 13 , 45 , 13 , 45
T-PEAK HOUR TRAFFIC CONDITIONS, 6
 586 , 45 , 12 , 45 , 12 , 45
T-PEAK HOUR TRAFFIC CONDITIONS, 7
 2160 , 25 , 45 , 25 , 45 , 25
T-PEAK HOUR TRAFFIC CONDITIONS, 8
 1843 , 25 , 38 , 25 , 38 , 25
L-I-5 SB, 1
N,661,87,92,
N,850,1019,94,
N,1061,2058,86,
N,1129,2391,85,
L-I-5 SB HOV, 2
N,704,78,92,
N,893,1010,94,
N,1105,2049,86,
N,1172,2382,85,
L-I-5 NB, 3
N,795,59,92,
N,984,992,94,
N,1196,2031,86,
N,1263,2363,85,
L-I-5 NB HOV, 4
N,755,68,92,
N,945,1000,94,
N,1157,2039,86,
N,1225,2371,85,
L-I-5 OFF-RAMP, 5
N,720,1034,73,
N,848,1424,79,
N,1010,1966,87,
L-I-5 ON-RAMP, 6
N,623,94,92,
N,691,637,80,
N,713,963,73,
L-CVD WEST, 7
N,-190,1004,68,
N,69,1004,70,
N,914,1004,74,
L-CVD EAST, 8
N,916,1004,74,
N,1135,1004,75,
B-I-5 KRAIL, 1 , 2 , 0 ,0
726,74,92,95,
915,1006,94,97,
1127,2045,86,89,
1194,2377,85,88,
B-EX BLDG, 2 , 2 , 0 ,0
682,1456,72,112,

742,1454,72,112,
783,1441,72,112,
758,1361,72,112,
627,1065,72,112,
609,1073,72,112,
486,1073,72,112,
B-PROP BLDG, 3 , 2 , 0 ,0
254,1381,69,109,
253,1452,69,109,
544,1451,69,109,
543,1289,69,109,
535,1260,69,109,
486,1210,69,109,
421,1210,69,109,
390,1234,69,109,
253,1234,69,109,
251,1306,69,109,
R, 1 , 65 ,10
250,1456,94.,R1
R, 2 , 65 ,10
347,1458,94.,R2
R, 3 , 65 ,10
451,1456,94.,R3
R, 4 , 65 ,10
550,1451,94.,R4
R, 5 , 65 ,10
550,1332,94.,R5
R, 6 , 65 ,10
548,1283,94.,R6
R, 7 , 65 ,10
492,1204,94.,R7
R, 8 , 65 ,10
386,1226,94.,R8
R, 9 , 65 ,10
250,1230,94.,R9
C,C

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Hope Avenue Apartments - Third Level Facade

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	R1	65.	10.	67.7
2	R2	65.	10.	68.5
3	R3	65.	10.	69.7
4	R4	65.	10.	71.2
5	R5	65.	10.	67.3
6	R6	65.	10.	65.8
7	R7	65.	10.	63.8
8	R8	65.	10.	66.5
9	R9	65.	10.	67.9

Hope Avenue Apartments - Fourth Level Facade
T-PEAK HOUR TRAFFIC CONDITIONS, 1
 8480 , 65 , 220 , 65 , 305 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 2
 3000 , 65 , 0 , 65 , 0 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 3
 8480 , 65 , 220 , 65 , 305 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 4
 3000 , 65 , 0 , 65 , 0 , 65
T-PEAK HOUR TRAFFIC CONDITIONS, 5
 624 , 45 , 13 , 45 , 13 , 45
T-PEAK HOUR TRAFFIC CONDITIONS, 6
 586 , 45 , 12 , 45 , 12 , 45
T-PEAK HOUR TRAFFIC CONDITIONS, 7
 2160 , 25 , 45 , 25 , 45 , 25
T-PEAK HOUR TRAFFIC CONDITIONS, 8
 1843 , 25 , 38 , 25 , 38 , 25
L-I-5 SB, 1
N,661,87,92,
N,850,1019,94,
N,1061,2058,86,
N,1129,2391,85,
L-I-5 SB HOV, 2
N,704,78,92,
N,893,1010,94,
N,1105,2049,86,
N,1172,2382,85,
L-I-5 NB, 3
N,795,59,92,
N,984,992,94,
N,1196,2031,86,
N,1263,2363,85,
L-I-5 NB HOV, 4
N,755,68,92,
N,945,1000,94,
N,1157,2039,86,
N,1225,2371,85,
L-I-5 OFF-RAMP, 5
N,720,1034,73,
N,848,1424,79,
N,1010,1966,87,
L-I-5 ON-RAMP, 6
N,623,94,92,
N,691,637,80,
N,713,963,73,
L-CVD WEST, 7
N,-190,1004,68,
N,69,1004,70,
N,914,1004,74,
L-CVD EAST, 8
N,916,1004,74,
N,1135,1004,75,
B-I-5 KRAIL, 1 , 2 , 0 ,0
726,74,92,95,
915,1006,94,97,
1127,2045,86,89,
1194,2377,85,88,
B-EX BLDG, 2 , 2 , 0 ,0
682,1456,72,112,

742,1454,72,112,
783,1441,72,112,
758,1361,72,112,
627,1065,72,112,
609,1073,72,112,
486,1073,72,112,
B-PROP BLDG, 3 , 2 , 0 ,0
254,1381,69,109,
253,1452,69,109,
544,1451,69,109,
543,1289,69,109,
535,1260,69,109,
486,1210,69,109,
421,1210,69,109,
390,1234,69,109,
253,1234,69,109,
251,1306,69,109,
R, 1 , 65 ,10
250,1456,104.,R1
R, 2 , 65 ,10
347,1458,104.,R2
R, 3 , 65 ,10
451,1456,104.,R3
R, 4 , 65 ,10
550,1451,104.,R4
R, 5 , 65 ,10
550,1332,104.,R5
R, 6 , 65 ,10
548,1283,104.,R6
R, 7 , 65 ,10
492,1204,104.,R7
R, 8 , 65 ,10
386,1226,104.,R8
R, 9 , 65 ,10
250,1230,104.,R9
C,C

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Hope Avenue Apartments - Fourth Level Facade

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	R1	65.	10.	68.1
2	R2	65.	10.	69.0
3	R3	65.	10.	70.1
4	R4	65.	10.	71.7
5	R5	65.	10.	68.6
6	R6	65.	10.	67.8
7	R7	65.	10.	66.6
8	R8	65.	10.	67.7
9	R9	65.	10.	68.4

ATTACHMENT B

INTERIOR NOISE MODELING
RESULTS

INTERIOR NOISE CALCULATIONS

Project Name:	Hope Avenue		Ldn Consulting, Inc.
Building (s)	All		
Floor Level	All	Date:	4/15/22
Arch Plan:	A		
Room Type:	Living/Dining	Project #	22-41

Exterior Noise Levels

		Frequency (Hz.)					
	dBA CNEL*	***125***	***250***	***500***	***1000***	***2000***	***4000***
Exterior Noise Level (Traffic Spectrum)	72.0	58.0	62.7	65.5	67.8	64.7	59.0

Transmission Loss (TL)

				Transmission Loss (dB)					
				Frequency (Hz.)					
Exterior Assembly	***Source***	***Area***	***STC***	***125***	***250***	***500***	***1000***	***2000***	***4000***
Stucco	NBS W-50-71	90	46	27	42	44	46	49	54
Windows	Greenworld	25	28	19	20	22	32	37	38
Fixed Window	Greenworld	0	28	21	15	25	35	41	28
Glass Doors	Greenworld	24	28	19	17	26	33	39	29
Exterior Door	NBS Monograph 77	0	26	16	14	23	30	36	26

Room Absorption (RA)

				Absorption Coefficients					
				Frequency (Hz.)					
Interior Characteristics	***Source***		***NRC***	***125***	***250***	***500***	***1000***	***2000***	***4000***
Carpet	Army TM 5-805-4		0.28	0.15	0.17	0.12	0.32	0.52	0.30
Furnishings	Army TM 5-805-4		0.45	0.32	0.29	0.42	0.58	0.60	0.48
Drywall	Netwell		0.07	0.09	0.08	0.05	0.03	0.06	0.09
Overall Absorption Factor (Furnished Room)			0.8	0.56	0.54	0.59	0.93	1.18	0.87

Noise Reduction

	125	***250***	***500***	***1000***	***2000***	***4000***
Noise Reduction from Absorption based upon Floor Area	-24.3	-24.3	-24.3	-24.3	-24.3	-24.3
Noise Level Increase for Defects and Exposed Surface Area	16.8	16.8	16.8	16.8	16.8	16.8
Overall Reduction from Tranmission Loss + Room Absorption - Surface Exposure						28.2
Building Façade Noise Level (dBA CNEL)						72.0
Resultant Interior Noise Level (dBA CNEL)						**44**

* Corrections for Façade Level was accounted for in the modeling.

INTERIOR NOISE CALCULATIONS

Project Name:	Hope Avenue		Ldn Consulting, Inc.
Building (s)	All		
Floor Level	All	Date:	4/15/22
Arch Plan:	A		
Room Type:	Bedroom	Project #	22-41

Exterior Noise Levels

		Frequency (Hz.)					
	dBA CNEL*	***125***	***250***	***500***	***1000***	***2000***	***4000***
Exterior Noise Level (Traffic Spectrum)	72.0	58.0	62.7	65.5	67.8	64.7	59.0

Transmission Loss (TL)

				Transmission Loss (dB)					
				Frequency (Hz.)					
Exterior Assembly	***Source***	***Area***	***STC***	***125***	***250***	***500***	***1000***	***2000***	***4000***
Stucco	NBS W-50-71	162	46	27	42	44	46	49	54
Windows	Greenworld	30	28	19	20	22	32	37	38
Fixed Window	Greenworld	0	28	21	15	25	35	41	28
Glass Doors	Greenworld	0	28	19	17	26	33	39	29
Exterior Door	NBS Monograph 77	0	26	16	14	23	30	36	26

Room Absorption (RA)

				Absorption Coefficients					
				Frequency (Hz.)					
Interior Characteristics	***Source***		***NRC***	***125***	***250***	***500***	***1000***	***2000***	***4000***
Carpet	Army TM 5-805-4		0.28	0.15	0.17	0.12	0.32	0.52	0.30
Furnishings	Army TM 5-805-4		0.45	0.32	0.29	0.42	0.58	0.60	0.48
Drywall	Netwell		0.07	0.09	0.08	0.05	0.03	0.06	0.09
Overall Absorption Factor (Furnished Room)			0.8	0.56	0.54	0.59	0.93	1.18	0.87

Noise Reduction

	125	***250***	***500***	***1000***	***2000***	***4000***
Noise Reduction from Absorption based upon Floor Area	-20.1	-20.1	-20.1	-20.1	-20.1	-20.1
Noise Level Increase for Defects and Exposed Surface Area	15.7	15.7	15.7	15.7	15.7	15.7
Overall Reduction from Tranmission Loss + Room Absorption - Surface Exposure						29.4
Building Façade Noise Level (dBA CNEL)						72.0
Resultant Interior Noise Level (dBA CNEL)						**43**

* Corrections for Façade Level was accounted for in the modeling.

INTERIOR NOISE CALCULATIONS

Project Name:	Hope Avenue		Ldn Consulting, Inc.
Building (s)	All		
Floor Level	All	Date:	4/15/22
Arch Plan:	B		
Room Type:	Living/Dining	Project #	22-41

Exterior Noise Levels

		Frequency (Hz.)					
	dBA CNEL*	***125***	***250***	***500***	***1000***	***2000***	***4000***
Exterior Noise Level (Traffic Spectrum)	72.0	58.0	62.7	65.5	67.8	64.7	59.0

Transmission Loss (TL)

				Transmission Loss (dB)					
				Frequency (Hz.)					
Exterior Assembly	***Source***	***Area***	***STC***	***125***	***250***	***500***	***1000***	***2000***	***4000***
Stucco	NBS W-50-71	117	46	27	42	44	46	49	54
Windows	Greenworld	30	28	19	20	22	32	37	38
Fixed Window	Greenworld	0	28	21	15	25	35	41	28
Glass Doors	Greenworld	24	28	19	17	26	33	39	29
Exterior Door	NBS Monograph 77	0	26	16	14	23	30	36	26

Room Absorption (RA)

				Absorption Coefficients					
				Frequency (Hz.)					
Interior Characteristics	***Source***		***NRC***	***125***	***250***	***500***	***1000***	***2000***	***4000***
Carpet	Army TM 5-805-4		0.28	0.15	0.17	0.12	0.32	0.52	0.30
Furnishings	Army TM 5-805-4		0.45	0.32	0.29	0.42	0.58	0.60	0.48
Drywall	Netwell		0.07	0.09	0.08	0.05	0.03	0.06	0.09
Overall Absorption Factor (Furnished Room)			0.8	0.56	0.54	0.59	0.93	1.18	0.87

Noise Reduction

	125	***250***	***500***	***1000***	***2000***	***4000***
Noise Reduction from Absorption based upon Floor Area	-23.9	-23.9	-23.9	-23.9	-23.9	-23.9
Noise Level Increase for Defects and Exposed Surface Area	16.9	16.9	16.9	16.9	16.9	16.9
Overall Reduction from Tranmission Loss + Room Absorption - Surface Exposure						27.3
Building Façade Noise Level (dBA CNEL)						72.0
Resultant Interior Noise Level (dBA CNEL)						**45**

* Corrections for Façade Level was accounted for in the modeling.

INTERIOR NOISE CALCULATIONS

Project Name:	Hope Avenue		Ldn Consulting, Inc.
Building (s)	All		
Floor Level	All	Date:	4/15/22
Arch Plan:	B		
Room Type:	Bedroom	Project #	22-41

Exterior Noise Levels

		Frequency (Hz.)					
	dBA CNEL*	***125***	***250***	***500***	***1000***	***2000***	***4000***
Exterior Noise Level (Traffic Spectrum)	72.0	58.0	62.7	65.5	67.8	64.7	59.0

Transmission Loss (TL)

				Transmission Loss (dB)					
				Frequency (Hz.)					
Exterior Assembly	***Source***	***Area***	***STC***	***125***	***250***	***500***	***1000***	***2000***	***4000***
Stucco	NBS W-50-71	180	46	27	42	44	46	49	54
Windows	Greenworld	30	28	19	20	22	32	37	38
Fixed Window	Greenworld	0	28	21	15	25	35	41	28
Glass Doors	Greenworld	24	28	19	17	26	33	39	29
Exterior Door	NBS Monograph 77	0	26	16	14	23	30	36	26

Room Absorption (RA)

				Absorption Coefficients					
				Frequency (Hz.)					
Interior Characteristics	***Source***		***NRC***	***125***	***250***	***500***	***1000***	***2000***	***4000***
Carpet	Army TM 5-805-4		0.28	0.15	0.17	0.12	0.32	0.52	0.30
Furnishings	Army TM 5-805-4		0.45	0.32	0.29	0.42	0.58	0.60	0.48
Drywall	Netwell		0.07	0.09	0.08	0.05	0.03	0.06	0.09
Overall Absorption Factor (Furnished Room)			0.8	0.56	0.54	0.59	0.93	1.18	0.87

Noise Reduction

	125	***250***	***500***	***1000***	***2000***	***4000***
Noise Reduction from Absorption based upon Floor Area	-20.6	-20.6	-20.6	-20.6	-20.6	-20.6
Noise Level Increase for Defects and Exposed Surface Area	17.1	17.1	17.1	17.1	17.1	17.1
Overall Reduction from Tranmission Loss + Room Absorption - Surface Exposure						26.8
Building Façade Noise Level (dBA CNEL)						72.0
Resultant Interior Noise Level (dBA CNEL)						**45**

* Corrections for Façade Level was accounted for in the modeling.

INTERIOR NOISE CALCULATIONS

Project Name:	Hope Avenue		Ldn Consulting, Inc.
Building (s)	All		
Floor Level	All	Date:	4/15/22
Arch Plan:	C		
Room Type:	Living/Dining	Project #	22-41

Exterior Noise Levels

	dBA CNEL*	Frequency (Hz.) 125	250	500	1000	2000	4000
Exterior Noise Level (Traffic Spectrum)	72.0	58.0	62.7	65.5	67.8	64.7	59.0

Transmission Loss (TL)

Exterior Assembly	Source	Area	STC	Transmission Loss (dB) Frequency (Hz.) 125	250	500	1000	2000	4000
Stucco	NBS W-50-71	90	46	27	42	44	46	49	54
Windows	Greenworld	25	28	19	20	22	32	37	38
Fixed Window	Greenworld	0	28	21	15	25	35	41	28
Glass Doors	Greenworld	24	28	19	17	26	33	39	29
Exterior Door	NBS Monograph 77	0	26	16	14	23	30	36	26

Room Absorption (RA)

Interior Characteristics	Source		NRC	Absorption Coefficients Frequency (Hz.) 125	250	500	1000	2000	4000
Carpet	Army TM 5-805-4		0.28	0.15	0.17	0.12	0.32	0.52	0.30
Furnishings	Army TM 5-805-4		0.45	0.32	0.29	0.42	0.58	0.60	0.48
Drywall	Netwell		0.07	0.09	0.08	0.05	0.03	0.06	0.09
Overall Absorption Factor (Furnished Room)			0.8	0.56	0.54	0.59	0.93	1.18	0.87

Noise Reduction

	125	250	500	1000	2000	4000
Noise Reduction from Absorption based upon Floor Area	-24.4	-24.4	-24.4	-24.4	-24.4	-24.4
Noise Level Increase for Defects and Exposed Surface Area	16.8	16.8	16.8	16.8	16.8	16.8
Overall Reduction from Tranmission Loss + Room Absorption - Surface Exposure						28.3
Building Façade Noise Level (dBA CNEL)						72.0
Resultant Interior Noise Level (dBA CNEL)						**44**

* Corrections for Façade Level was accounted for in the modeling.

INTERIOR NOISE CALCULATIONS

Project Name:	Hope Avenue		Ldn Consulting, Inc.
Building (s)	All		
Floor Level	All	Date:	4/15/22
Arch Plan:	C		
Room Type:	Bedroom	Project #	22-41

Exterior Noise Levels

		Frequency (Hz.)					
	dBA CNEL*	***125***	***250***	***500***	***1000***	***2000***	***4000***
Exterior Noise Level (Traffic Spectrum)	72.0	58.0	62.7	65.5	67.8	64.7	59.0

Transmission Loss (TL)

				Transmission Loss (dB)					
				Frequency (Hz.)					
Exterior Assembly	***Source***	***Area***	***STC***	***125***	***250***	***500***	***1000***	***2000***	***4000***
Stucco	NBS W-50-71	180	46	27	42	44	46	49	54
Windows	Greenworld	30	28	19	20	22	32	37	38
Fixed Window	Greenworld	0	28	21	15	25	35	41	28
Glass Doors	Greenworld	0	28	19	17	26	33	39	29
Exterior Door	NBS Monograph 77	0	26	16	14	23	30	36	26

Room Absorption (RA)

				Absorption Coefficients					
				Frequency (Hz.)					
Interior Characteristics	***Source***		***NRC***	***125***	***250***	***500***	***1000***	***2000***	***4000***
Carpet	Army TM 5-805-4		0.28	0.15	0.17	0.12	0.32	0.52	0.30
Furnishings	Army TM 5-805-4		0.45	0.32	0.29	0.42	0.58	0.60	0.48
Drywall	Netwell		0.07	0.09	0.08	0.05	0.03	0.06	0.09
Overall Absorption Factor (Furnished Room)			0.8	0.56	0.54	0.59	0.93	1.18	0.87

Noise Reduction

	125	***250***	***500***	***1000***	***2000***	***4000***
Noise Reduction from Absorption based upon Floor Area	-19.4	-19.4	-19.4	-19.4	-19.4	-19.4
Noise Level Increase for Defects and Exposed Surface Area	15.7	15.7	15.7	15.7	15.7	15.7
Overall Reduction from Tranmission Loss + Room Absorption - Surface Exposure						28.6
Building Façade Noise Level (dBA CNEL)						72.0
Resultant Interior Noise Level (dBA CNEL)						**43**

* Corrections for Façade Level was accounted for in the modeling.