

Exhibit J

**ACOUSTICAL ANALYSIS**

**LINCOLN PARK APARTMENTS  
FRESNO, CALIFORNIA**

**WJVA Project No. 20-04**

**PREPARED FOR**

**LANDVALUE MANAGEMENT, LLC  
155 EAST SHAW AVENUE, SUITE 307  
FRESNO, CA 93710**

**PREPARED BY**

**WJV ACOUSTICS, INC.  
VISALIA, CALIFORNIA**



**wjv acoustics**

**JANUARY 14, 2021**

## INTRODUCTION

The project (Lincoln Park Apartments) is a proposed 88-unit multi-family residential development to be located at the northeast corner of the intersection of West Herndon Avenue and North Prospect Avenue/North Valentine Avenue, in Fresno, California. The project site is bordered by West Herndon Avenue (a 6-lane arterial roadway) to the south. The City of Fresno has requested an acoustical analysis to quantify project site noise exposure. This analysis, prepared by WJV Acoustics, Inc. (WJVA), is based upon a project site plan and exterior elevation drawings (dated 12-01-20), traffic data provided by the Fresno Council of Governments (Fresno COG) and the findings of on-site noise level measurements. Revisions to the site plan may affect the findings and recommendations of this report. The site plan is provided as Figure 1.

Appendix A provides a description of the acoustical terminology used in this report. Unless otherwise stated, all sound levels reported are in A-weighted decibels (dB). A-weighting de-emphasizes the very low and very high frequencies of sound in a manner similar to the human ear. Most community noise standards utilize A-weighting, as it provides a high degree of correlation with human annoyance and health effects. Appendix B provides typical A-weighted sound levels for common noise sources.

# NOISE EXPOSURE CRITERIA

## General Plan Noise Element

The City of Fresno Noise Element of the General Plan (adopted 12/18/14) sets noise compatibility standards for transportation noise sources in terms of the Day-Night Average Level ( $L_{dn}$ ). Implementing Policy NS-1-a of the noise element establishes a land use compatibility criterion as 65 dB  $L_{dn}$  for exterior noise exposure within outdoor activity areas of residential land uses. Outdoor activity areas generally include backyards of single-family residences, individual patios, balconies or decks of multi-family developments and common outdoor recreation areas of multi-family developments. The intent of the exterior noise level requirement is to provide an acceptable noise environment for outdoor activities and recreation.

Additionally, Implementing Policy NS-1-h of the noise element requires that interior noise levels attributable to exterior transportation noise sources not exceed 45 dB  $L_{dn}$ . The intent of the interior noise level standard is to provide an acceptable noise environment for indoor communication and sleep.

## Municipal Code

Section 15-2506 of the City of Fresno Municipal code establishes hourly acoustical performance standards for non-transportation (stationary) noise sources. The standards, provided in Table I, are made more restrictive during the nighttime hours of 10:00 p.m. to 7:00 a.m. Additionally, the municipal code states that when ambient noise levels exceed or equal the levels described in Table I, mitigation shall only be required to limit noise to the existing ambient noise levels, plus five (5) dB. Section 15-2506 of the Municipal Code is consistent with Implementing Policy NS-1-1 of the Noise Element of the City of Fresno General Plan (adopted 12/18/14).

TABLE I			
NON-TRANSPORTATION NOISE LEVEL STANDARDS, dBA			
CITY OF FRESNO MUNICIPAL CODE, SECTION 15-2506			
Daytime (7 a.m.-10 p.m.)		Nighttime (10 p.m.-7 a.m.)	
$L_{eq}$	$L_{max}$	$L_{eq}$	$L_{max}$
50	70	45	60

Source: City of Fresno Municipal Code

Additional guidance is provided in Section 10-102(b) of the City’s Municipal Code. Section 10 provides existing ambient noise levels to be applied to various districts, further divided into various hours of the day. Table II describes the assumed minimum ambient noise levels by district and time. Section 10-102(b) states *“For the purpose of this ordinance, ambient noise level is the level obtained when the noise level is averaged over a period of fifteen minutes, without inclusion*

of the offending noise, at the location and time of day at which a comparison with the offending noise is to be made. Where the ambient noise level is less than that designated in this section, however, the noise level specified herein shall be deemed to be the ambient noise level for that location”.

<b>TABLE II</b> <b>ASSUMED MINIMUM AMBIENT NOISE LEVEL, dBA</b> <b>CITY OF FRESNO MUNICIPAL CODE, SECTION 10-102(B)</b>		
DISTRICT	TIME	SOUND LEVEL, dB L <sub>eq</sub>
RESIDENTIAL	10 PM TO 7 AM	50
RESIDENTIAL	7 PM TO 10 PM	55
RESIDENTIAL	7 AM TO 7 PM	60
COMMERCIAL	10 PM TO 7 AM	60
COMMERCIAL	7 AM TO 10 PM	65
INDUSTRIAL	ANYTIME	70

Source: City of Fresno Municipal Code

Section 10-106 (Prima Facie Violation) States “Any noise or sound exceeding the ambient noise level at the properly line of any person offended thereby, or, if a condominium or apartment house, within any adjoining living unit, by more than five decibels shall be deemed to prima facie evidence of a violation of Section 8-305.”

## PROJECT SITE NOISE EXPOSURE

The project site is located at northeast corner of the intersection of West Herndon Avenue and North Prospect Avenue/North Valentine Avenue, in Fresno. The project site is currently exposed traffic noise. The distance from the closest proposed building setback to the centerline of W. Herndon Avenue is approximately 105 feet. The proposed multi-family residential buildings would include individual patios and balconies at the front of the proposed building facing toward W. Herndon Avenue. Additionally, the project would include a centrally-located common use area that would include a swimming pool, arbors and BBQ areas. These areas are typically considered “outdoor activity areas” and are subject to the City’s exterior noise level standards.

### **Traffic Noise Exposure**

Noise exposure from traffic on W. Herndon Avenue was calculated for existing and future (2035) conditions using the FHWA Traffic Noise Model and traffic data obtained from Fresno COG and the findings of on-site noise level measurements.

WJVA utilized the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA Model is a standard analytical method used for roadway traffic noise calculations. The model is based upon reference energy emission levels for automobiles, medium trucks (2 axles) and heavy trucks (3 or more axles), with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model was developed to predict hourly  $L_{eq}$  values for free-flowing traffic conditions, and is generally considered to be accurate within  $\pm 1.5$  dB. To predict  $L_{dn}$  values, it is necessary to determine the hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Noise level measurements and concurrent traffic counts were conducted by WJVA staff within the project site on January 8, 2021. The purpose of the measurements was to evaluate the accuracy of the FHWA Model in describing traffic noise exposure within the project site. The measurement site was located within the project site at a distance of approximately 100 feet from the centerline of W. Herndon Avenue. The speed limit posted in the project vicinity for W. Herndon Avenue was 50 mph (miles per hour). The project vicinity and noise monitoring site location are provided as Figure 2. A photograph showing the noise measurement site is provided as Figure 3.

Noise monitoring equipment consisted of Larson-Davis Laboratories Model LDL-820 sound level analyzer equipped with a B&K Type 4176 1/2” microphone. The equipment complies with the specifications of the American National Standards Institute (ANSI) for Type I (Precision) sound level meters. The meter was calibrated in the field prior to use with a B&K Type 4230 acoustic calibrator to ensure the accuracy of the measurements. The microphone was located on a tripod at 5 feet above the ground. The project site presently consists of undeveloped land.

Noise measurements were conducted in terms of the equivalent energy sound level ( $L_{eq}$ ). Measured  $L_{eq}$  values were compared to  $L_{eq}$  values calculated (predicted) by the FHWA Model using as inputs the traffic volumes, truck mix and vehicle speed observed during the noise measurements. The results of the comparison are shown in Table III.

From Table III it may be determined that the traffic noise levels predicted by the FHWA Model were 1.0 dB lower than those measured for the traffic conditions observed at the time of the noise measurements for W. Herndon Avenue. This is considered to be reasonable agreement with the model and therefore no adjustments to the model are necessary.

TABLE III COMPARISON OF MEASURED AND PREDICTED (FHWA MODEL) NOISE LEVELS LINCOLN PARK APARTMENTS, FRESNO	
	W. Herndon Ave.
Measurement Start Time	11:30 a.m.
Observed # Autos/Hr.	1,968
Observed # Medium Trucks/Hr.	60
Observed # Heavy Trucks/Hr.	0
Observed Speed (MPH)	50
Distance, ft. (from center of roadway)	100
$L_{eq}$ , dBA (Measured)	67.9
$L_{eq}$ , dBA (Predicted)	66.9
<b>Difference between Measured and Predicted <math>L_{eq}</math>, dBA</b>	<b>+1.0</b>

Note: FHWA "soft" site assumed for calculations.  
Source: WJV Acoustics, Inc.

## **Exterior Noise Exposure**

Annual Average Daily Traffic (AADT) data for W. Herndon Avenue in the project vicinity were obtained from Fresno COG. Truck percentages and the day/night distribution of traffic were estimated by WJVA, based upon previous studies conducted in the project vicinity since project-specific data were not available from government sources. Table IV summarizes annual average traffic data used to model noise exposure within the project site.

TABLE IV		
TRAFFIC NOISE MODELING ASSUMPTIONS LINCOLN PARK APARTMENTS, FRESNO		
	W. Herndon Avenue	
	Existing	2035
Annual Avenue Daily Traffic (AADT)	50,692	60,284
Day/Night Split (%)	90/10	
Assumed Vehicle Speed (mph)	50	
% Medium Trucks (% AADT)	2	
% Heavy Trucks (% AADT)	1	

Sources: Fresno COG  
WJV Acoustics, Inc.

Using data from Table IV and the FHWA Model, annual average traffic noise exposure was calculated for the closest proposed residential setbacks to W. Herndon Avenue. The calculated noise exposures for existing and future (2035) traffic conditions for the closest proposed building setbacks to W. Herndon Avenue were approximately 69 dB L<sub>dn</sub> and 70 dB L<sub>dn</sub>, respectively.

The noise levels calculated for the closest residential setback distances to W. Herndon Avenue exceed the City’s 65 dB L<sub>dn</sub> exterior noise level standard. The exterior noise level standard applies to outdoor activity areas, including individual patios and balconies of multi-family residential developments and outdoor common use areas. The closest calculated setback distances also represent the closest outdoor activity areas as the proposed building facing W. Herndon Avenue (Building 5D) includes individual patios and balconies.

Exterior noise levels within individual unit patios and balconies would be expected to be approximately 70 dB L<sub>dn</sub> (2035 traffic conditions) at the south facing units of Building 5D only, and mitigation must be considered. It should be noted, exterior noise levels within individual balconies and patios of all remaining units would not exceed the City’s exterior noise level standard of 65 dB L<sub>dn</sub>.

The outdoor common use areas, consisting of a swimming pool, arbor areas and BBQ areas, would be located at a distance of approximately 400 feet from W. Herndon Avenue. Additionally, project buildings (3B, 5D, 6F, 7G) would provide significant levels of acoustical shielding to these common use outdoor activity areas. Exterior noise level exposure within these outdoor common use areas would be expected to be in the range of approximately 50-55 dB L<sub>dn</sub>. Such levels do not exceed the City’s exterior noise level standard of 65 dB L<sub>dn</sub>. Further mitigation measures is not required for these outdoor common use area.



## **Exterior Noise Mitigation**

The City of Fresno Noise Element of the General Plan establishes a 65 dB  $L_{dn}$  standard within outdoor activity areas (individual patios and balconies as well as outdoor common use areas of multi-family residential land uses). The project site traffic noise exposure for future (2035) traffic conditions was calculated to be approximately 70 dB  $L_{dn}$  within the closest residential setbacks (and individual patios and balconies) of Building 5D. Such noise exposure levels exceed the City of Fresno exterior noise level standard and mitigation must be considered. It should be noted, exterior noise levels of all other unit patios and balconies, as well as the outdoor common use area (pool, arbors, BBQ areas, etc.) would be below the City's exterior noise level standard without the need for additional mitigation measures.

Due to the nature of individual balconies and patios, mitigation of all south-facing units of Building 5D, by means of acoustical shielding (sound wall), is not feasible. Sound walls are generally effective at first-floor receivers only. WJVA calculated the necessary sound wall height that would be required to reduce exterior noise levels at first-floor south-facing (facing W. Herndon Avenue) patios of Building 5D.

A sound wall insertion loss program based on the FHWA Model was used to calculate the insertion loss (noise reduction) required to mitigate first-floor patios of south-facing units of Building 5D. The model calculates the insertion loss of a wall of given height based on the effective height of the noise source, height of the receiver, distance from the receiver to the wall, and distance from the noise source to the wall. The standard assumptions used in the sound wall calculations are effective source heights of 8, 2 and 0 feet above the roadway for heavy trucks, medium trucks and automobiles, respectively. The standard height of a residential receiver is five feet above the ground elevation. It was assumed by WJVA that the building pad elevations at the closest proposed homes to W. Herndon Avenue would be approximately the same elevation as the roadway pavement.

Based upon the above-described assumptions and method of analysis, the noise level insertion loss values for sound walls of various heights were calculated. The calculations indicated that a sound wall along W. Herndon Avenue, constructed to a minimum height of six (6) feet relative to the closest building pad elevations would reduce traffic noise exposure within individual first-floor south-facing patios of Building 5D by approximately 6 dB, resulting in a noise exposure of approximately 64 dB  $L_{dn}$  at these patios.

As stated, the above-described sound wall would be effective at first-floor receiver locations only, and would not provide acoustical shielding to any proposed second- or third-floor balconies. Therefore, exterior noise levels at the upper floor south-facing balconies (facing toward W. Herndon Avenue) of Building 5D would remain approximately 70 dB  $L_{dn}$ .

### **Interior Noise Exposure:**

The City of Fresno interior noise level standard is 45 dB  $L_{dn}$ . The worst-case future noise exposure within the proposed residential development would be approximately 70 dB  $L_{dn}$  at building 5D. This means that the proposed residential construction must be capable of providing a minimum outdoor-to-indoor noise level reduction (NLR) of approximately 25 dB ( $70-45=25$ ).

A specific analysis of interior noise levels was not performed. However, it may be assumed that residential construction methods complying with current building code requirements will reduce exterior noise levels by at least 25 dB if windows and doors are closed. This will be sufficient for compliance with the City's 45 dB  $L_{dn}$  interior standard at all proposed multi-family residential units. Requiring that it be possible for windows and doors to remain closed for sound insulation means that air conditioning or mechanical ventilation will be required.

## CONCLUSIONS

### **Exterior Noise Exposure**

Traffic noise exposure levels associated with vehicle traffic along W. Herndon Avenue would be expected to be approximately 70 dB  $L_{dn}$  at the closest proposed residential setbacks to W. Herndon Avenue (Building 5D). Noise levels at individual patios and balconies at south-facing units of Building 5D (facing toward W. Herndon Avenue) would exceed the City's 65 dB  $L_{dn}$  exterior noise level standard.

A sound wall constructed along the project site property line with W. Herndon Avenue, constructed to a minimum height of 6 feet above project grade elevation would reduce exterior noise levels within first-floor patios to approximately 64 dB  $L_{dn}$ , below the City's 65 dB  $L_{dn}$  exterior noise level standard. However, this sound wall would be effective at first-floor receiver locations only, and individual south-facing balconies of Building 5D at second- and third-floor locations would exceed the City's exterior noise level standard. There would be no feasible way to mitigate these upper floor balconies.

Exterior noise levels at individual patios and balconies at all remaining multi-family residential units would not exceed the City's exterior noise level standard. Additionally, exterior noise levels at the proposed outdoor common use areas (swimming pool, arbor areas, BBQ and picnic areas) would not exceed the City's exterior noise level standard.

### **Interior Noise Levels**

All proposed multi-family residential units will comply with the City of Fresno interior noise level standard of 45 dB  $L_{dn}$  without the need for additional mitigation measures, providing mechanical ventilation or air conditioning is provided for all units so that windows and doors can remain closed for sound insulation purposes.

The conclusions and recommendations of this acoustical analysis are based upon the best information known to WJV Acoustics Inc. (WJVA) at the time the analysis was prepared concerning the proposed site plan, traffic volumes and roadway configurations. Any significant changes in these factors will require a reevaluation of the findings of this report. Additionally, any significant future changes in motor vehicle technology, noise regulations or other factors beyond WJVA's control may result in long-term noise results different from those described by this analysis.

Respectfully submitted,

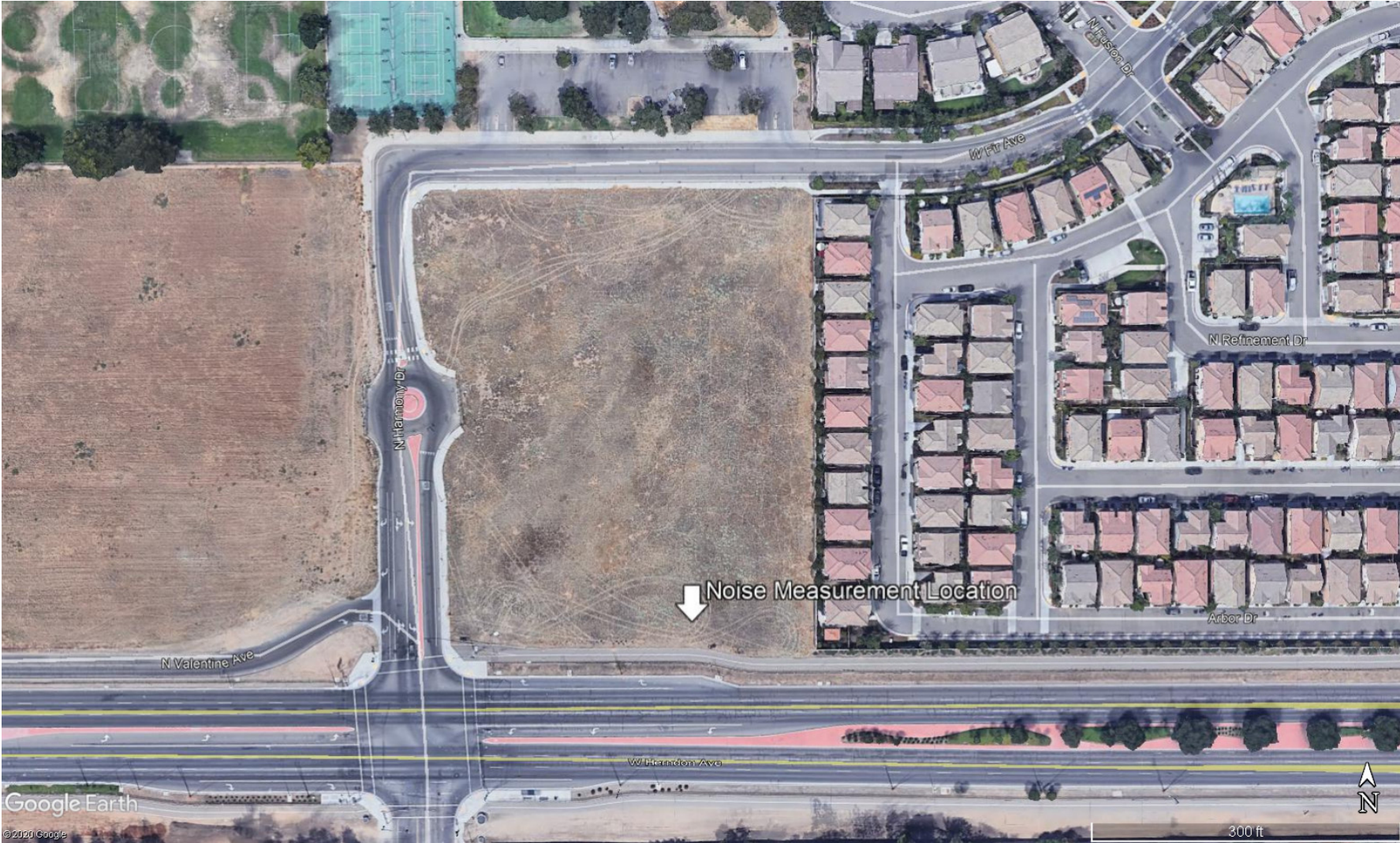
A handwritten signature in black ink, appearing to read "Walter J. Van Groningen". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Walter J. Van Groningen  
President

WJV:wjv



**FIGURE 2: PROJECT SITE VICINITY AND NOISE MEASUREMENT LOCATION**



**FIGURE 3: WEST HERNDON AVENUE NOISE MEASUREMENT SITE**



## APPENDIX A

### ACOUSTICAL TERMINOLOGY

<b>AMBIENT NOISE LEVEL:</b>	The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.
<b>CNEL:</b>	Community Noise Equivalent Level. The average equivalent sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.
<b>DECIBEL, dB:</b>	A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
<b>DNL/L<sub>dn</sub>:</b>	Day/Night Average Sound Level. The average equivalent sound level during a 24-hour day, obtained after addition of ten decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m.
<b>L<sub>eq</sub>:</b>	Equivalent Sound Level. The sound level containing the same total energy as a time varying signal over a given sample period. L <sub>eq</sub> is typically computed over 1, 8 and 24-hour sample periods.
<b>NOTE:</b>	The CNEL and DNL represent daily levels of noise exposure averaged on an annual basis, while L <sub>eq</sub> represents the average noise exposure for a shorter time period, typically one hour.
<b>L<sub>max</sub>:</b>	The maximum noise level recorded during a noise event.
<b>L<sub>n</sub>:</b>	The sound level exceeded "n" percent of the time during a sample interval (L <sub>90</sub> , L <sub>50</sub> , L <sub>10</sub> , etc.). For example, L <sub>10</sub> equals the level exceeded 10 percent of the time.



## A-2

### ACOUSTICAL TERMINOLOGY

#### **NOISE EXPOSURE**

##### **CONTOURS:**

Lines drawn about a noise source indicating constant levels of noise exposure. CNEL and  $L_{dn}$  contours are frequently utilized to describe community exposure to noise.

#### **NOISE LEVEL**

##### **REDUCTION (NLR):**

The noise reduction between indoor and outdoor environments or between two rooms that is the numerical difference, in decibels, of the average sound pressure levels in those areas or rooms. A measurement of “noise level reduction” combines the effect of the transmission loss performance of the structure plus the effect of acoustic absorption present in the receiving room.

##### **SEL or SENEL:**

Sound Exposure Level or Single Event Noise Exposure Level. The level of noise accumulated during a single noise event, such as an aircraft overflight, with reference to a duration of one second. More specifically, it is the time-integrated A-weighted squared sound pressure for a stated time interval or event, based on a reference pressure of 20 micropascals and a reference duration of one second.

##### **SOUND LEVEL:**

The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.

#### **SOUND TRANSMISSION**

##### **CLASS (STC):**

The single-number rating of sound transmission loss for a construction element (window, door, etc.) over a frequency range where speech intelligibility largely occurs.

APPENDIX B  
EXAMPLES OF SOUND LEVELS

NOISE SOURCE	SOUND LEVEL	SUBJECTIVE DESCRIPTION
AMPLIFIED ROCK 'N ROLL ▶	120 dB	DEAFENING
JET TAKEOFF @ 200 FT ▶		
	100 dB	VERY LOUD
BUSY URBAN STREET ▶		
	80 dB	LOUD
FREEWAY TRAFFIC @ 50 FT ▶		
	60 dB	MODERATE
CONVERSATION @ 6 FT ▶		
TYPICAL OFFICE INTERIOR ▶		FAINT
SOFT RADIO MUSIC ▶	40 dB	
RESIDENTIAL INTERIOR ▶		VERY FAINT
WHISPER @ 6 FT ▶	20 dB	
HUMAN BREATHING ▶	0 dB	