63RD AND MONTEZUMA STUDENT HOUSING PROJECT

NOISE STUDY

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63rd AND MONTEZUMA STUDENT HOUSING PROJECT SAN DIEGO, CALIFORNIA

Noise Study

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63rd AND MONTEZUMA STUDENT HOUSING PROJECT SAN DIEGO, CALIFORNIA NOISE STUDY

This report is an analysis of the potential noise impacts associated with the proposed 63rd and Montezuma Student Housing Project (proposed project) in the City of San Diego. This report has been prepared by Birdseye Planning Group (BPG) under contract to KLR Planning, to support preparation of the environmental documentation pursuant to the California Environmental Quality Act (CEQA). This study analyzes the potential for permanent noise impacts associated with operation of the proposed project and temporary noise impacts associated with construction activity within proximity to the construction area.

PROJECT DESCRIPTION

The *63rd and Montezuma* project site encompasses approximately 0.43 acre and is currently developed with three single family dwelling units. The project site is situated on the south side of Montezuma Road and west of 63rd Street in the College Area Community of the City of San Diego. Mostly one-story residential developments surround the project site, with a five-story residential development bordering the project site to the west, and institutional uses (San Diego State University – SDSU) located nearby to the north and northwest.

Regional access to the site is provided by Interstate 8 (I-8), located approximately one mile north of the project site, Interstate 15 (I-15), located approximately three and a half miles to the west. Local access is provided via Montezuma Road immediately north of the project site and 63rd street immediately east of the project site. (See Figure 1, *63rd and Montezuma Project Location Map and Aerial*.)

The proposed project involves the demolition of approximately 18,751 square feet of buildings and related facilities and construction of a five-story multi-family residential development totaling 52,350 square feet. The project would develop 38 units with one level of subterranean parking (See Figure 2, *63rd and Montezuma Project Site Plan*).

The project proposes a Rezone to the RM 3-9 zone. Other discretionary actions associated with the proposed project include a Community Plan Amendment (CPA); a Neighborhood Development Permit (NDP) to allow for deviations from the applicable development regulations of the RM-3-9 zone, including a reduction in the amount of required personal storage space; and private exterior open space, and a Planned Development Permit (PDP).

The proposed project would begin construction in mid-2020 and be completed by late-2021. The site is shown in Figure 1 – Vicinity Map. A site plan is provided as Figure 2.

Figure 1 — 63rd and Montezuma Project Location Map and Aerial

- Project Site

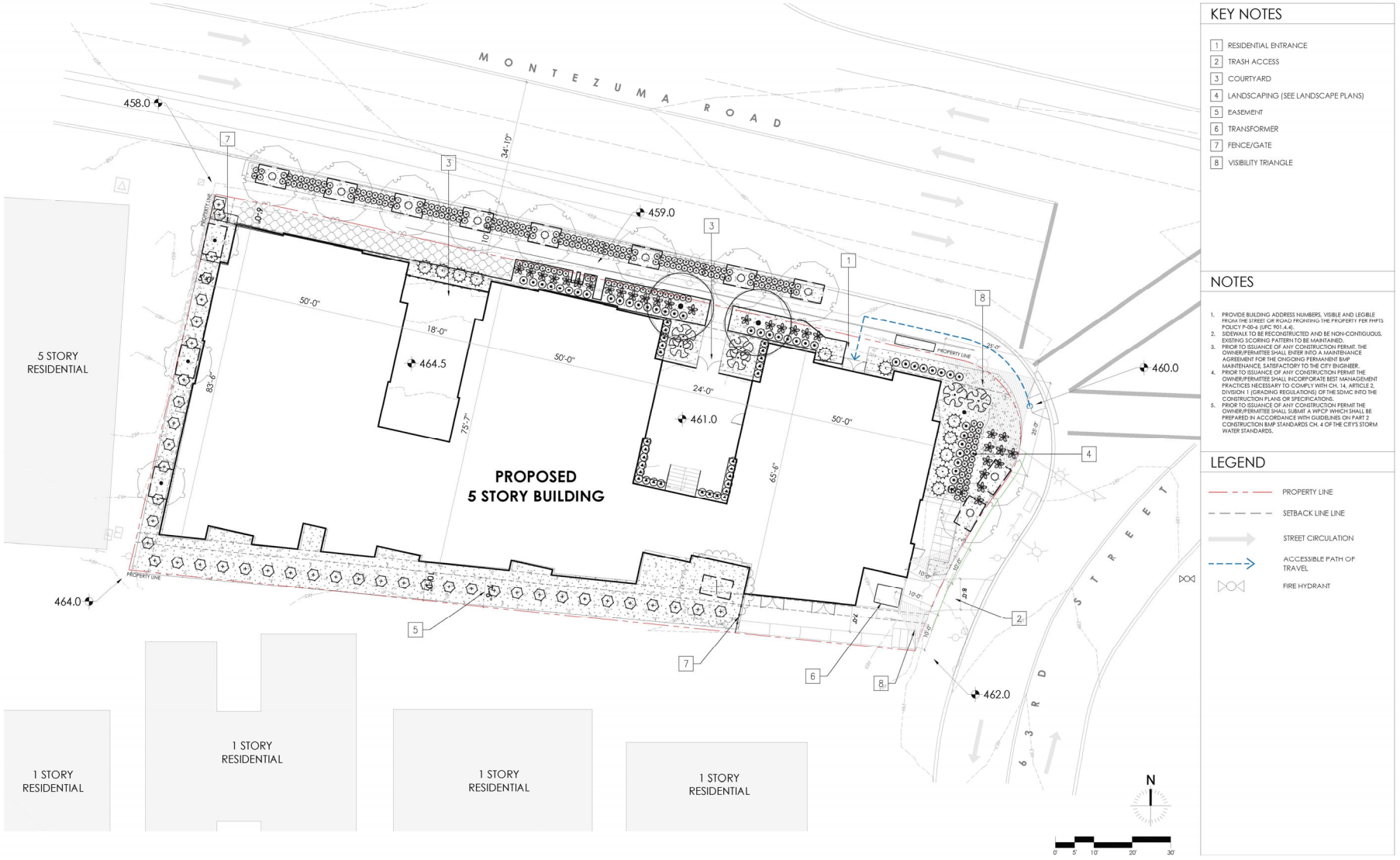

Figure 2— *63rd* and Montezuma Project Site Plan

SETTING

Overview of Sound Measurement

Noise level (or volume) is generally measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels to be consistent with that of human hearing response, which is most sensitive to frequencies around 4,000 Hertz (about the highest note on a piano) and less sensitive to low frequencies (below 100 Hertz). Sound pressure level is measured on a logarithmic scale with the 0 dB level based on the lowest detectable sound pressure level that people can perceive (an audible sound that is not zero sound pressure level). Based on the logarithmic scale, a doubling of sound energy is equivalent to an increase of 3 dBA, and a sound that is 10 dBA less than the ambient sound level has no effect on ambient noise. Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged as twice as loud. In general, a 3 dBA change in community noise levels is noticeable, while 1-2 dB changes generally are not perceived. Quiet suburban areas typically have noise levels in the range of 40-50 dBA, while arterial streets are in the 50-60+ dBA range. Normal conversational levels are in the 60-65 dBA range, and ambient noise levels greater than 65 dBA can interrupt conversations. Noise levels typically attenuate (or drop off) at a rate of 6 dBA per doubling of distance from point sources (i.e., industrial machinery). Noise from lightly traveled roads typically attenuates at a rate of about 4.5 dBA per doubling of distance. Noise from heavily traveled roads typically attenuates at about 3 dBA per doubling of distance. Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The manner in which older homes in California were constructed (approximately 30 years old or older) generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units and office buildings construction to California Energy Code standards is generally 30 dBA or more (Harris, Miller, Miller and Hanson, 2006).

In addition to the actual instantaneous measurement of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. One of the most frequently used noise metrics that considers both duration and sound power level is the equivalent noise level (Leq). The Leq is defined as the single steady A-weighted level that is equivalent to the same amount of energy as that contained in the actual fluctuating levels over a period of time (essentially, the average noise level). Typically, Leq is summed over a one-hour period. Lmax is the highest RMS (root mean squared) sound pressure level within the measuring period, and Lmin is the lowest RMS sound pressure level within the measuring period.

The time period in which noise occurs is also important since noise that occurs at night tends to be more disturbing than that which occurs during the day. Community noise is usually measured using Day-Night Average Level (Ldn), which is the 24-hour average noise level with a 10-dBA penalty for noise occurring during nighttime (10 p.m. to 7 a.m.) hours, or Community Noise Equivalent Level (CNEL), which is the 24-hour average noise level with a 5 dBA penalty for noise occurring from 7 p.m. to 10 p.m. and a 10 dBA penalty for noise occurring from 10 p.m. to 7 a.m. Noise levels described by Ldn and CNEL usually do not differ by more than 1 dB. Daytime Leq levels are louder than Ldn or CNEL levels; thus, if the Leq meets noise standards, the Ldn and CNEL are also met. Table 1 shows sounds levels of typical noise sources in Leq.

Sensitive Receptors

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with each of these uses. Urban areas contain a variety of land use and development types that are noise sensitive including residences, schools, churches, hospitals and convalescent care facilities. Nearby sensitive receptors are single- and multifamily residences located to the east, west and south of the site and along the north side of Montezuma Road. The project will also be a sensitive receptor at completion.

Project Site Setting

The project area is located in the urbanized College East community within the City of San Diego. Thus, the most common and primary sources of noise in the project site vicinity are motor vehicles (e.g., automobiles and trucks) on Montezuma Road and 63rd Street. Project-related noise will be generated by traffic operating on Montezuma Road and 63rd Street adjacent to and north of the project site. Traffic noise is of concern because where a high number of individual events occur, it can create a sustained noise level. Other noise sources in the area are primarily associated with pedestrian activity and neighboring commercial uses; however, these sources do not noticeably contribute to the ambient noise environment.

Table 1. Sound Levels of Typical Noise Sources and Noise Environments

Noise Source (at Given Distance)	Noise Environment	A-Weighted Sound Level (Decibels)	Human Judgment of Noise Loudness (Relative to Reference Loudness of 70 Decibels*)
Military Jet Takeoff with Afterburner (50 ft)	Carrier Flight Deck	140	128 times as loud
Civil Defense Siren (100 ft)		130	64 times as loud
Commercial Jet Take-off (200 ft)		120	32 times as loud **Threshold of Pain**

Pile Driver (50 ft)	Rock Music Concert Inside Subway Station (New York)	110	16 times as loud
Ambulance Siren (100 ft) Newspaper Press (5 ft) Gas Lawn Mower (3 ft)		100	8 times as loud **Very Loud**
Food Blender (3 ft) Propeller Plane Flyover (1,000 ft) Diesel Truck (150 ft)	Boiler Room Printing Press Plant	90	4 times as loud
Garbage Disposal (3 ft)	Noisy Urban Daytime	80	2 times as loud
Passenger Car, 65 mph (25 ft) Living Room Stereo (15 ft) Vacuum Cleaner (10 ft)	Commercial Areas	70	Reference Loudness **Moderately Loud**
Normal Speech (5 ft) Air Conditioning Unit (100 ft)	Data Processing Center Department Store	60	1/2 as loud
Light Traffic (100 ft)	Large Business Office Quiet Urban Daytime	50	1/4 as loud
Bird Calls (distant)	Quiet Urban Nighttime	40	1/8 as loud **Quiet**
Soft Whisper (5 ft)	Library and Bedroom at Night Quiet Rural Nighttime	30	1/16 as loud
	Broadcast and Recording Studio	20	1/32 as loud **Just Audible**
		0	1/64 as loud **Threshold of Hearing**

Source: Compiled by dBF Associates, Inc., 2016

To gather data on the general noise environment at the project site, a weekday morning 15-minute noise measurement was taken on June 10, 2019 at the Montezuma School parking lot located along the south side of Montezuma Road just east of the intersection with 63rd Street. The ambient noise levels are used for model calibration purposes and the traffic data collected are used to estimate baseline and with project noise conditions. The monitoring location is shown in Figure 3. The measurements were taken using an ANSI Type II integrating sound level meter. The predominant noise source was traffic. The temperature during monitoring was 65 degrees Fahrenheit with 98% cloud cover and >5-10 mile per hour wind.

During monitoring, 165 cars/light trucks, one medium (two-axles and six wheels) and zero heavy (18-wheel) trucks passed the site. Existing traffic noise is dominated by volumes on Montezuma Road. Traffic operates in a free flow condition (i.e., no traffic lights or stop signs) which contributes noticeably to ambient conditions at sensitive properties located in proximity to the site. Thus, measured noise is representative of noise levels occurring at the project site during a typical weekday peak hour. Table 2 identifies the noise measurement locations and

Figure 3 — Monitoring Location

- Project Site

measured noise levels. As shown, the Leq was 65.6 dBA. The monitoring data sheet is provided as Appendix A.

Table 2
Noise Monitoring Results

Measurement Location	Primary Noise Source	Sample Time	Leq (dBA)
1. Montezuma School parking lot – southwest corner of Montezuma Road and 64th Street.	Traffic and pedestrian activity	Weekday morning	65.6

Source: Field visit using ANSI Type II Integrating sound level meter.

Regulatory Setting

The Federal Noise Control Act (1972) addressed the issue of noise as a threat to human health and welfare. To implement the Federal Noise Control Act, the U.S. Environmental Protection Agency (EPA) undertook a number of studies related to community noise in the 1970s. The EPA found that 24-hour averaged noise levels less than 70 dBA would avoid measurable hearing loss, levels of less than 55 dBA outdoors and 45 dBA indoors would prevent activity interference and annoyance (EPA 1972).

The U.S. Department of Housing and Urban Development (HUD) published a Noise Guidebook for use in implementing the Department's noise policy. In general, HUD's goal is exterior noise levels that are less than or equal to 55 dBA Ldn. The goal for interior noise levels is 45 dBA Ldn. HUD suggests that attenuation be employed to achieve this level, where feasible, with a special focus on sensitive areas of homes, such as bedrooms (HUD 2009).

Title 24 of the California Code of Regulations (CCR) establishes standards governing interior noise levels that apply to all new single-family and multi-family residential units in California. These standards require that acoustical studies be performed before construction at building locations where the existing Ldn exceeds 60 dBA. Such acoustical studies are required to establish mitigation measures that will limit maximum Ldn levels to 45 dBA in any habitable room. Although there are no generally applicable interior noise standards pertinent to all uses, many communities in California have adopted an Ldn of 45 as an upper limit on interior noise in all residential units.

In addition, the State of California General Plan Guidelines (OPR 2017), provides guidance for noise compatibility. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

City of San Diego General Plan Noise Element

The City of San Diego requires new projects to meet exterior noise level standards as established in the Noise Element of the General Plan [City of San Diego 2008, Amended 2015:

Policy NE-A.4]. Sound levels up to 60 dBA CNEL are considered compatible with outdoor areas of frequent use (patios, balconies, parks, swimming pools, etc.). The building structure must attenuate exterior noise in occupied areas to 45 dBA CNEL or below. General Plan Noise Element Table NE-3: Land Use – Noise Compatibility Guidelines is presented as Table 3. For purposes of this analysis, the project site and neighboring habitable structures are evaluated herein.

CEQA Significance Thresholds

The California Environmental Quality Act (CEQA) Significance Determination Thresholds (City of San Diego 2016) addresses traffic noise, as specified in Table K-2: Traffic Noise Significance Thresholds (dB(A) CNEL). Relevant portions are reproduced in Table 4.

Noise Ordinance

City of San Diego Municipal Code Section 59.5.0401: Sound Level Limits states:

> (a) It shall be unlawful for any person to cause noise by any means to the extent that the one-hour average sound level exceeds the applicable limit given in the following table [reproduced as Table 5], at any location in the City of San Diego on or beyond the boundaries of the property on which the noise is produced. The noise subject to these limits is that part of the total noise at the specified location that is due solely to the action of said person.
>
> (b) The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts. Permissible construction noise level limits shall be governed by Section 59.5.0404 of this article.

City of San Diego Municipal Code Section 59.5.0404: Construction Noise (b) states:

> … it shall be unlawful for any person… to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00 a.m. to 7:00 p.m. (City of San Diego 2010).

Construction is prohibited on legal holidays and Sundays as specified in Section 21.04 of the San Diego Municipal Code.

Vibration Standards

Vibration is a unique form of noise as the energy is transmitted through buildings, structures and the ground whereas audible noise energy is transmitted through the air. Thus, vibration is generally felt rather than heard. The ground motion caused by vibration is measured as particle velocity in inches per second and is referenced as vibration decibels (VdB). The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels.

Table 3
City of San Diego Land Use – Noise Compatibility Guidelines

Land Use Category	Exterior Noise Exposure (dBA CNEL)				
	60	65	70	75	
Parks and Recreational					
Parks, Active and Passive Recreation					
Outdoor Spectator Sports, Golf Courses; Water Recreational Facilities; Indoor Recreation Facilities					
Agricultural					
Crop Raising and Farming; Community Garden, -Aquaculture, Dairies; Horticulture Nurseries & Greenhouses; Animal Raising, Maintain & Keeping; Commercial Stables					
Residential					
Single Dwelling Units; Mobile Homes		45			
Multiple Dwelling Units *For uses affected by aircraft noise, refer to Policies NE-D.2. & NE-D.3.		45	45*		
Institutional					
Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12 Educational Facilities; Libraries; Museums; Child Care Facilities		45			
Other Educational Facilities Including Vocational/Trade Schools; Colleges and Universities		45	45		
Cemeteries					
Retail Sales					
Building Supplies/Equipment; Food, Beverages & Groceries; Pets & Pet Supplies; Sundries, Pharmaceutical & Convenience Sales; Wearing Apparel & Accessories			50	50	
Commercial Services					
Building Services; Business Support; Eating & Drinking; Financial Institutions; Maintenance & Repair; Personal Services Assembly & Entertainment (includes public and religious assembly); Radio & Television Studios; Golf Course Support			50	50	
Visitor Accommodations		45	45	45	
Offices					
Business & Professional; Government; Medical, Dental & Health Practitioner; Regional & Corporate Headquarters					
Vehicle and Vehicular Equipment Sales and Service Use					
Commercial or Personal Vehicle Repair & Maintenance; Commercial or Personal Vehicle Sales & Rentals; Vehicle Equipment & Supplies Sales & Rentals; Vehicle Parking					

Land Use Category	Exterior Noise Exposure (dBA CNEL) 60	65	70	75
Wholesale, Distribution, Storage Use Category				
Equipment & Materials Storage Yards; Moving & Storage Facilities; Warehouse; Wholesale Distribution				
Industrial				
Heavy Manufacturing; Light Manufacturing; Marine Industry; Trucking & Transportation Terminals; Mining & Extractive Industries				
Research & Development				**50**

	Compatible	**Indoor Uses**	Standard constructions methods should attenuate exterior noise to an acceptable indoor noise level. Refer to Section I.
		Outdoor Uses	Activities associated with the land use may be carried out.
45, 50	**Conditionally Compatible**	**Indoor Uses**	Building structure must attenuate exterior noise to the indoor noise level indicated by the number (45 or 50) for occupied areas. Refer to Section I.
		Outdoor Uses	Feasible noise mitigation techniques should be analyzed and incorporated to make the outdoor activities acceptable. Refer to Section I.
	Incompatible	**Indoor Uses**	New construction should not be undertaken.
		Outdoor Uses	Sever noise interference makes outdoor activities unacceptable.

Source: General Plan Noise Element Table NE-3: Land Use – Noise Compatibility Guidelines amended 2015.

Table 4
City of San Diego Traffic Noise Significance Thresholds (dBA CNEL)

Structure or Proposed Use that would be impacted by Traffic Noise	Interior Space	Exterior Useable Space[1]
Single-family detached	45 dB	65 dB
Multi-family, schools, libraries, hospitals, day care, hotels, motels, parks, convalescent homes	Development Services Department (DSD) ensures 45 dB pursuant to Title 24	65 dB
Offices, Churches, Business, Professional Uses	n/a	70 dB
Commercial, Retail, Industrial, Outdoor Spectator Sports Uses	n/a	75 dB

Source: City of San Diego Traffic Noise Significance Thresholds, 2016

[1] If a project is currently at or exceeds the significance thresholds for traffic noise described above and noise levels would result in less than a 3-dB increase, then the impact is not considered significant.

Table 5
City of San Diego Applicable Limits

Land Use	Time of Day	One-Hour Average Sound Level (decibels)
1. Single Family Residential	7:00 a.m. to 7:00 p.m 7:00 p.m. to 10:00 p.m 10:00 p.m. to 7:00 a.m.	50 45 40
2. Multi-Family Residential (Up to a maximum density of 1/2000)	7:00 a.m. to 7:00 p.m 7:00 p.m. to 10:00 p.m 10:00 p.m. to 7:00 a.m.	55 50 45
3. All other Residential	7:00 a.m. to 7:00 p.m 7:00 p.m. to 10:00 p.m 10:00 p.m. to 7:00 a.m.	60 55 50
4. Commercial	7:00 a.m. to 7:00 p.m 7:00 p.m. to 10:00 p.m 10:00 p.m. to 7:00 a.m.	65 60 60
5. Industrial or Agricultural	any time	75

Source: City of San Diego Municipal Code Section 59.5.0401, 2010

The City of San Diego General Plan Noise Element and municipal code do not provide vibration standards. The Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment* (September 2018) uses a threshold of 65 VdB for buildings where low ambient vibration is essential for interior operations. These buildings include hospitals and recording studios. A threshold of 72 VdB is used for residences and buildings where people normally sleep (i.e., hotels and rest homes). A threshold of 75 VdB is used for institutional land uses where activities occur primarily during the daytime (i.e., churches and schools). The threshold used for the proposed project is 72 VdB.

Construction activities such as blasting, pile driving, demolition, excavation or drilling have the potential to generate ground vibrations near structures. With respect to ground-borne vibration impacts on structures, the FTA states that ground-borne vibration levels in excess of 100 VdB would damage fragile buildings and levels in excess of 95 VdB would damage extremely fragile historic buildings. No historic buildings are located within the project area; thus, 100 VdB is used to quantify potential vibration impacts to neighboring structures. Construction activities referenced above that would generate significant vibration levels are not proposed. However, to provide information for use in completing the CEQA evaluation, construction-related vibration impacts are evaluated using the above referenced criteria.

IMPACT ANALYSIS

Methodology and Significance Thresholds

Construction noise estimates are based upon noise levels reported by the FTA, Office of Planning and Environment, and the distance to nearby sensitive receptors. Reference noise levels from that document were used to estimate noise levels at nearby sensitive receptors based on a standard noise attenuation rate of 6 dB per doubling of distance (line-of-sight method of sound attenuation).

Trip generation for the project was calculated using trip rates from the City of San Diego *Trip Generation Manual*, May 2003. The project is calculated to generate 239 ADT with 19 AM peak hour trips (4 inbound and 15 outbound) and 22 PM peak hour trips (15 inbound and 7 outbound) (City of San Diego, 2003). Trip generation is conservative as the project is intended to house students and is located adjacent to the SDSU campus.

Traffic volumes would be concentrated on Montezuma Road and disperse to 63rd Street to the north and east and west along Montezuma Road. Metropolitan Transit System (MTS) provides bus service as Routes 11, 115, 856, 936 and 955 on Montezuma Road along the project frontage. Traffic noise related impacts are addressed herein based on the difference in volumes between existing conditions and when volumes associated with the proposed project are added to the baseline. Because the Leq meets or exceeds than the 65-dBA exterior standard for multifamily residences, potential impacts are determined based on whether project traffic would cause the current Leq along Montezuma Road to exceed 65 dBA or cause the Leq to increase by 3 or more dBA at receivers where the 65 dBA standard is not exceeded (Table 4).

Temporary Construction Noise

The main sources of noise during construction activities would include heavy machinery used during clearing the site, excavation for the subterranean parking garage as well as equipment used for demolition and construction. Initial construction activities would be associated with demolition and excavation. Table 6 shows the typical noise levels associated with heavy construction equipment. As shown, average noise levels associated with the use of heavy equipment at construction sites can range from about 81 to 95 dBA at 25 feet from the source, depending upon the types of equipment in operation at any given time and phase of construction.

As referenced above, the City of San Diego limits the average sound level from construction noise to 75 decibels at any property zoned residential during the 12-hour period from 7:00 a.m. to 7:00 p.m. Noise-sensitive uses near the project site are multifamily residences adjacent to the site along the north and south sides of Montezuma Road in proximity to the site. The average distance from the center of the site to the nearest receivers to the south of the site is approximately 80 feet. It is assumed demolition, excavation, grading and site preparation work

Table 6
Typical Construction Equipment Noise Levels

Equipment Onsite	Typical Level (dBA) 25 Feet from the Source	Typical Level (dBA) 50 Feet from the Source	Typical Level (dBA) 100 Feet from the Source
Air Compressor	84	78	64
Backhoe	84	78	64
Bobcat Tractor	84	78	64
Concrete Mixer	85	79	73
Bulldozer	88	82	76
Jack Hammer	95	89	83
Pavement Roller	86	80	74
Street Sweeper	88	82	76
Man Lift	81	75	69
Dump Truck	82	76	70

Source: Hanson, Towers and Meister, May 2006
Noise levels based on FHWA Roadway Construction Noise Model (2006) Users Guide Table 1.
Noise levels based on actual maximum measured noise levels at 50 feet (Lmax).
Noise levels assume a noise attenuation rate of 6 dBA per doubling of distance.

would require the use of heavy equipment including trucks to remove soil and debris. Building construction and finishing would utilize hand tools; however, equipment would also be required to deliver materials to the project site and work areas.

Based on EPA noise emissions, empirical data and the amount of equipment needed for construction of the proposed project, worst-case noise levels from the construction equipment would occur during demolition and grading activities. The anticipated equipment used on-site would include a dozer, backhoe/tractor and a grader. Due to size of the site (i.e., 0.43 acres) and related physical constraints and normal site preparation operations, the equipment will be spread out over the site and likely only used for specific operations. Construction operations are expected occur near the site boundaries which is approximately 20 feet from the adjacent residential receivers to the west and south.

Construction Noise Levels

The project site is 0.43 acres in size which limits the amount and type of equipment that can operate on the site at any one time. If during site preparation and grading, a bulldozer (82 dBA), a backhoe (78 dBA) and a dump truck (82 dBA) were working simultaneously generally in the center of the site over an 8-hour work day, the 8-hour Leq would be approximately 85 dBA at 50 feet and 72 dBA at 100 feet. For reference purposes, noise levels associated with the above construction scenario are shown at varying distances in Table 7.

Table 7
Typical Maximum Construction Noise Levels at Various Distances from Project Construction

Distance from Construction	Maximum Noise Level at Receptor (dBA)
25 feet	88
50 feet	85
100 feet	72
250 feet	66
500 feet	60
1,000 feet	54

As shown, noise levels would attenuate to 85 dBA or less at 50 feet or more from the active construction area. However, the location and intensity of construction activities will vary throughout the day and would typically be limited to an 8-hour workday. Further, the size of the site limits the number and type of equipment that can work simultaneously in proximity to adjacent residences. Thus, over the course of a 12-hour day, the 75-dBA noise standard would not be exceeded. Temporary construction noise impacts would **be less than significant.**

Temporary Construction-Related Vibration

Activities associated with a student housing project do not generate vibration. Thus, this discussion focuses on temporary vibration caused by construction. As referenced, the closest residences are located adjacent to and west and south of the site. The nearest sensitive receiver is located approximately 85 feet south of the center of the site. Table 8 shows construction equipment could reach 75 VdB at 100 feet from the source assuming a large bulldozer is used during grading. As referenced, 72 VdB is the threshold for human perception; thus, while construction activities would be temporary, vibration may be perceptible at adjacent receivers depending on the location and type of equipment in operation.

As referenced, construction activities such as blasting, pile driving, demolition, excavation and drilling have the potential to generate ground vibrations near structures. With respect to ground-borne vibration impacts on structures, the FTA states that ground-borne vibration levels in excess of 100 VdB would damage fragile buildings and levels in excess of 95 VdB would damage extremely fragile historic buildings. No historic buildings are located within the project area nor are construction activities that would generate significant vibration levels required for the proposed project. Construction would occur during daytime hours which would minimize sleep disturbance; however, to avoid perceptible vibration occurring at neighboring receivers, small dozers and similar equipment could be used in proximity to the receivers north and west of the site during demolition and grading. **Temporary vibration impacts would be less than significant.**

Table 8
Vibration Source Levels for Construction Equipment

Equipment	Approximate VdB				
	25 Feet	50 Feet	60 Feet	75 Feet	100 Feet
Large Bulldozer	87	81	79	77	75
Loaded Trucks	86	80	78	76	74
Jackhammer	79	73	71	69	67
Small Bulldozer	58	52	50	48	46

Source: Federal Railroad Administration, 1998

Long-Term Operational Noise Exposure

Long-term operation of the proposed project was evaluated for potential exterior traffic related impacts caused by increased traffic volumes associated with the project as well as interior noise levels caused by traffic. In addition, a discussion regarding potential noise levels associated with roof top Heating, Ventilation and Air Conditioning (HVAC) is provided.

Exterior Traffic Noise. Traffic is the primary noise source that would be generated by the proposed project. Existing measured noise levels are equal to or greater than the residential standard (65 dBA) at the residences located along Montezuma Road during the peak traffic hour. Whether a traffic-related noise impact would occur is based on whether project traffic, when added to the existing traffic, would cause the exterior Leq to exceed 65-dBA or cause a 3 dBA or greater increase in noise levels where the standard is currently exceeded as referenced in Table 4 above.

The roadway network adjacent to the project site (Montezuma Road and 63rd Street) was modeled using the Federal Highway Administration Traffic Noise Model (TNM) version 2.5 software (see Appendix A). The model calculates traffic noise at receiver locations based on traffic volumes, travel speed, mix of vehicle types operating on the roadways (i.e., cars/trucks, medium trucks and heavy trucks) and related factors. Traffic volumes and vehicle mix used to calibrate TNM were based on vehicle counts obtained during the monitoring period. The 15-minute counts were multiplied by four to obtain hourly traffic counts. The model was calibrated to calculate noise levels that are +/- 2 dBA those measured near the site and reported in Table 2.

Traffic volumes for peak hour existing and project operation were obtained based on trip generation rates for multifamily residences (City of San Diego Trip Generation Manual, May 2003). Morning (AM) peak hour project trips for existing conditions were modeled to determine baseline noise conditions. Project trips were then added to the baseline trips to determine whether the Leq at neighboring receivers would increase by 3 dBA or more as a result of project-related traffic. As referenced, the project is estimated to generate 239 ADT with 19 AM peak hour trips (4 inbound and 15 outbound) and 22 PM peak hour trips (15 inbound and 7 outbound) (City of

San Diego, 2003). Noise levels were calculated at the following receivers and are intended to represent conditions at multiple receivers within proximity to these locations:

1. Project site at 6253, 6263, and 6273 Montezuma Road;
2. Zuma Student Housing 6237 Montezuma Road (west of the site); and
3. Residences at the southeast corner of Montezuma Road and 63rd Street; and

The receiver locations are shown in Figure 4. As shown in Table 9, the daytime hourly average (Leq) equal but do not exceed the 65-dBA standard at the receivers modeled under baseline conditions.

Table 9
Modeled Noise Levels

Receptor	Existing Leq	Exceed Standard?	With Project Leq	dBA Change	Significant Impact
Site 1	64.9	No	65.0	+0.1	No
Site 2	65.0	No	65.1	+0.1	No
Site 3	64.9	No	65.0	+0.1	No

As shown, noise levels at all receivers modeled are equal to or less than 65 dBA under existing conditions. The proposed project would increase noise levels at the modeled receivers by 0.1 dBA. Project operation would not cause noise levels at receivers modeled or other sensitive properties in the area to increase by 3 dBA or greater or exceed the 65 dBA standard. As shown in Figure 5, the 65 dBA noise contour generally follows the Montezuma Road corridor. **No significant or adverse traffic noise impact would result from the proposed project.**

Exterior Use Noise (HVAC). The HVAC system proposed for use on the site has not been specified and noise levels vary depending on the system size. However, it is assumed that one or more HVAC compressor units will be installed on the roof-top of the proposed building to ventilate the common areas. Individual HVAC units would also be installed in each unit. Noise from rooftop HVAC units would be attenuated by the roof structure, insulation and crawl space; and thus, would not be audible in the top floor units. Thus, the residential units would not be subject to significant HVAC noise. HVAC noise levels can be expected to range from 60 to 70 dBA at 5 feet from the roof top equipment and ventilation openings (Illingsworth & Rodkin, 2011). Assuming HVAC units are installed at the center of the roof top, or an average of 80 feet from the closest receivers to the south, a 70-dBA reference noise level would attenuate to 52 dBA at 40 feet from the source. **HVAC noise would be less than the 65 dBA criteria at the project property line.**

Interior Traffic Noise. California Energy Code Title 24 standards specify construction methods and materials that result in energy efficient structures and up to a 30-dBA reduction in exterior noise levels (assuming windows are closed). This includes operation of mechanical

Figure 4 — Modeled Receivers

- Project Site

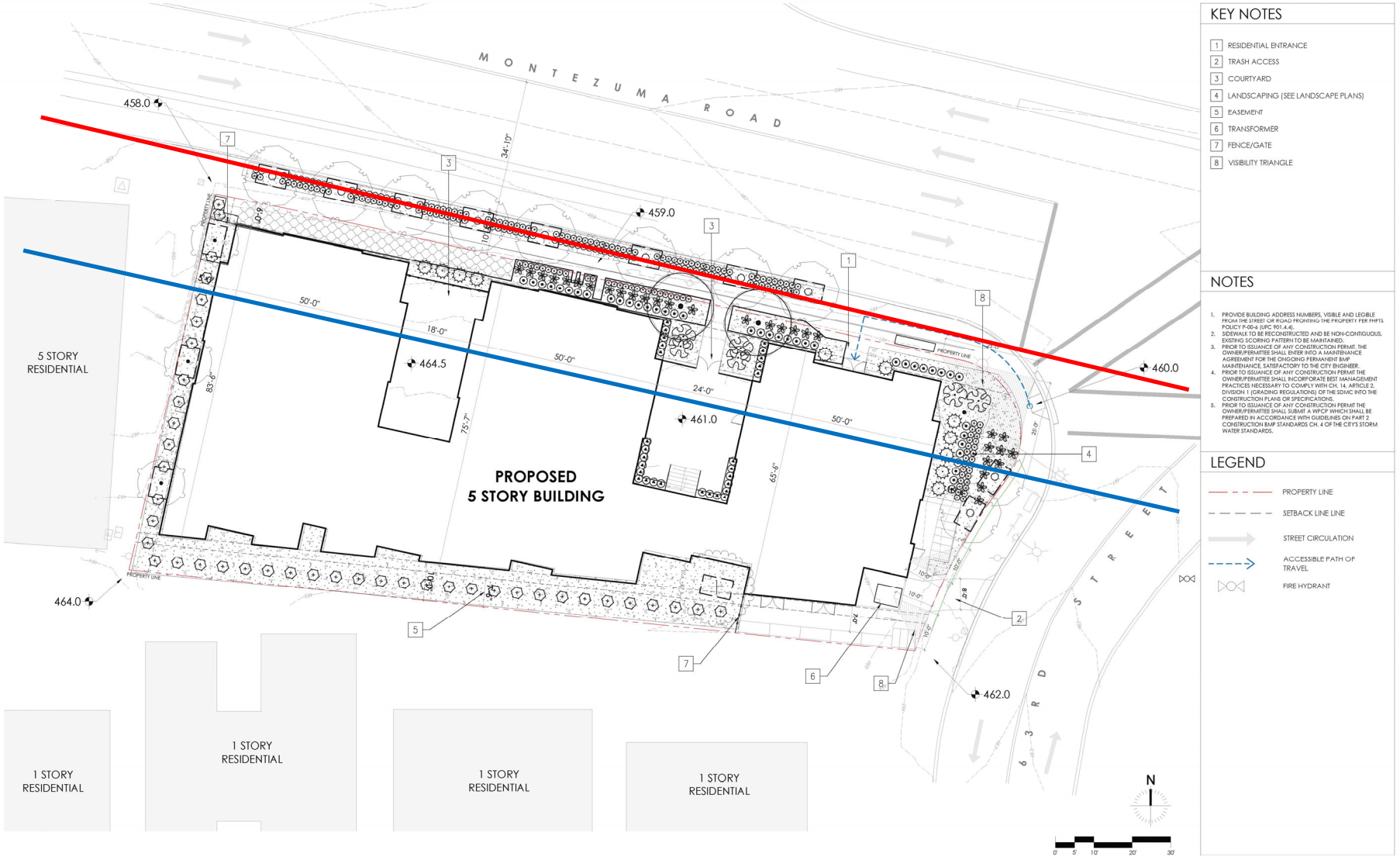

Figure 5— Noise Contours **65 dBA** **60 dBA**

ventilation (e.g. heating and air conditioning), in combination with standard building construction and design features that include dual-glazed windows with a minimum Sound Transmission Class (STC) rating of 26 or higher. When windows are open, the insertion loss drops to about 10 dBA. Assuming windows are closed, interior noise levels at residences along Montezuma Road would be approximately 35 dBA. This would be conditionally compatible with the City of San Diego General Plan Noise Element criteria shown in Table 3 for single- and multifamily uses. In all cases modeled, the existing interior noise levels would not noticeably change with the addition of project traffic.

Airport Land Use Compatibility Plan Compatibility. Gillespie Field is the nearest airport and is located approximately 6.5 miles northeast of the project site. Based on the noise contour maps provided in the Gillespie Field Airport Land Use Compatibility Plan (County of San Diego 2010), the project site is located outside the 60 dBA CNEL contours and is not affected by airport noise. For this reason, the project site is not located in an area that is affected by aircraft noise; and thus, compatibility with an adopted Airport Land Use Compatibility Plan is not required.

CONCLUSION

The location and intensity of construction activities will vary throughout the day and would typically be limited to an 8-hour workday. Further, the size of the site limits the number and type of equipment that can work simultaneously in proximity to adjacent residences. Construction would require the demolition of existing buildings and excavation of a subterranean parking garage. These operations are typically the noisiest as they require use of heavy equipment on-site and trucks to haul away debris. However, the equipment used would likely be limited to what is necessary to perform the specific operation. Thus, over the course of a 12-hour day, the 75-dBA noise standard would not be exceeded. No significant or adverse construction noise impact is anticipated. The existing 65-dBA Leq exterior standard is equaled but not exceeded under existing conditions at the receivers modeled along Montezuma Road in proximity to the project site. Project-related traffic would change noise levels along Montezuma Road by +0.1 dBA which is a negligible increase. Construction of the project consistent with Title 24 requirements would result in a 30-dBA reduction in noise levels between exterior and interior levels. Thus, the interior standard as defined in the San Diego General Plan Noise Element would be met at all residential receivers modeled with operation of the proposed project. Thus, a **less than significant** operational noise impact would occur.

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Appendix A

Monitoring Data Sheet and Modeling Results

FIELD NOISE MEASUREMENT DATA

Project Name: 63 rd / Montezuma Page 1 of
Project #: Day / Date My Name.

Sound Level Meter	Calibrator	Weather Meter
Model # PIAO II	Model #	Model # Serial #
Serial #	Serial #	
Weighting: (A) / C / Flat	Pre-Test: dBA SPL	Terrain: (Hard) / Soft / Mixed
Response: (Slow) / Fast / Impl	Post-Test: dBA SPL	Topo: (Flat) / Hilly (describe)
Windscreen: (Yes) / No		Wind: Steady / Gusty

ID	Time Start	Time Stop	Leq	Lmin	Lmax	L10	L50	L90	Wind Spd/ Dir (mph)	Temp (°F)	RH (%)	Bar Psr (in Hg)	Cloud Cover (%)
1	7:30	7:45	65.6						0	62			100

Roadway Name Montezuma Corr / Ewing St Location(s) / GPS Reading(s):
Speed (post/obs) 45
Number of Lanes 4 - 2 way LT
Width (pave/row) 60
1- or 2- way 2
Grade 0
Bus Stops NO
Stoplights NO
Street Parking NO
Automobiles 165
Medium Trucks 1
Heavy Trucks 0

Ewing
165 | 10 to 63
MID
5 to 0 1

Other Noise Sources: distant (aircraft) / (roadway traffic) / trains / landscaping / rustling leaves / children playing / dogs barking / birds vocalizing

Notes and Sketches on Reverse

Site 1 - Montezuma and 63rd

Start Date	7/10/2019
Start Time	7:28:20 AM
End Time	7:43:19 AM
Duration	00:14:59
Meas Mode	Single
Input Range	Low
Input Type	Mic
SPL Time Weight	Slow
LN% Freq Weight	dBA
Overload	No
UnderRange	No
Sensitivity	18.44mV/Pa

LZeq	71.9
LCeq	71.2
LAeq	65.6
LZSmax	84.5
LCSmax	84.3
LASmax	74.9
LZSmin	61.1
LCSmin	59.5
LASmin	48.4
LZE	101.4
LCE	100.7
LAE	95.1
LZpeak	100.3
LCpeak	100.5
LApeak	95.2
1%	72.9
2%	71.8
5%	70.6
8%	69.7
10%	69.3
25%	67.1
50%	63.7
90%	53.6
95%	51.7
99%	49.5

<Organization?>
<Analysis By?>

24 July 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Montezuma & 63rd
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
Receiver2	2	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
Receiver3	3	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

<Organization?>
<Analysis By?>

2 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Montezuma & 63rd - with Project
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0
Receiver2	2	1	0.0	65.1	66	65.1	10	----	65.1	0.0	8	-8.0
Receiver3	3	1	0.0	65.0	66	65.0	10	----	65.0	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0