Noise Analysis Technical Report
Rancho Springs Medical Center Expansion & Helipad Relocation Project

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A. EXECUTIVE SUMMARY

This Noise Report is intended to provide the City of Murrieta (City) with an evaluation of potential noise impacts associated with the Rancho Springs Medical Center Expansion & Helipad Relocation Project (Project). This Noise Report describes the existing environment in the Project area and estimates future noise levels at surrounding land uses resulting from construction and operation of the Project. The study discusses applicable federal, State, and local noise regulations; monitoring data; applicable noise thresholds; the methodology used to analyze potential noise impacts; and the modeled on-site uses. The finding of the analyses are as follows:

- Construction noise levels would not exceed the single-family and multifamily residential noise standards.
- Exterior noise levels from the proposed flight paths would not result in noticeable changes of above 3 dBA at noise sensitive uses.
- The results determine the proposed emergency medical services (EMS) landing site will comply with all applicable governmental noise standards.

B. PROJECT DESCRIPTION

The RSMC campus is located on a 13.34-acre site in the southern portion of the City, between the Santa Ana Mountains and the San Jacinto Mountains, where the Interstate 215 (I-215) and Interstate 15 (I-15) meet (Project Site), as shown in **Figure 1: Regional and Local Vicinity Map**. The existing uses surrounding the RSMC campus are predominantly commercial and residential. Adjacent uses include scattered residential to the north; vacant land to the south of Murrieta Hot Springs Road; commercial and residential uses to the east of I-215; and commercial and residential uses to the west.

Southwest Healthcare System's RSMC campus proposes plans for the expansion and renovation of the existing facility. The project would construct a two-story, 36,000-square-foot hospital expansion that would connect to the south side of the existing Women's Center and ED building within the RSMC campus. The expansion building would include ancillary support spaces for 14 new beds within a pediatrics department and intensive care center (ICU) on the ground floor, and 16 beds within a Neo-Natal ICU (NICU) department on the second floor.

The northern end of the expansion building would remove the emergency walk-in entry canopy on the ground level of the existing Women's Center and ED building. In order to allow for construction of the expansion building, the existing main access point at the west end of the of the Women's Center and ED building would temporarily be used as an emergency walk-in entry as well. The project would connect to both levels of the Women's Center and ED building in order to provide a seamless connection between the hospital departments.

The project would also remodel the Women's Center and ED building main entry with a new vehicular drop-off zone and canopy, remodel space within the existing pedestrian drop off and outdoor seating area, and remodel the ED waiting room and reception area. The project would also renovate the existing kitchen in the original hospital building and make civil and landscape improvements to reconfigure the southern, western, and eastern surface parking lots. Project construction would require 5,243 cubic yards of cut and 611 cubic yards of fill, requiring a net export of approximately 4,632 cubic yards of soils.

Access to the RSMC campus is currently provided by Medical Center Drive, which is a cul-de-sac that connects to Hancock Avenue. The cul-de-sac branches north to the original hospital entry and east to the current main entry, which then continues to the existing emergency walk-in entry. This access point would be improved to formalize turning movements as drivers approach the terminus of the Medical Center Drive. A secondary access point that provides for ambulance and service vehicle access is located at the northwest corner of the RSMC campus. The project would not make any changes to this access point.

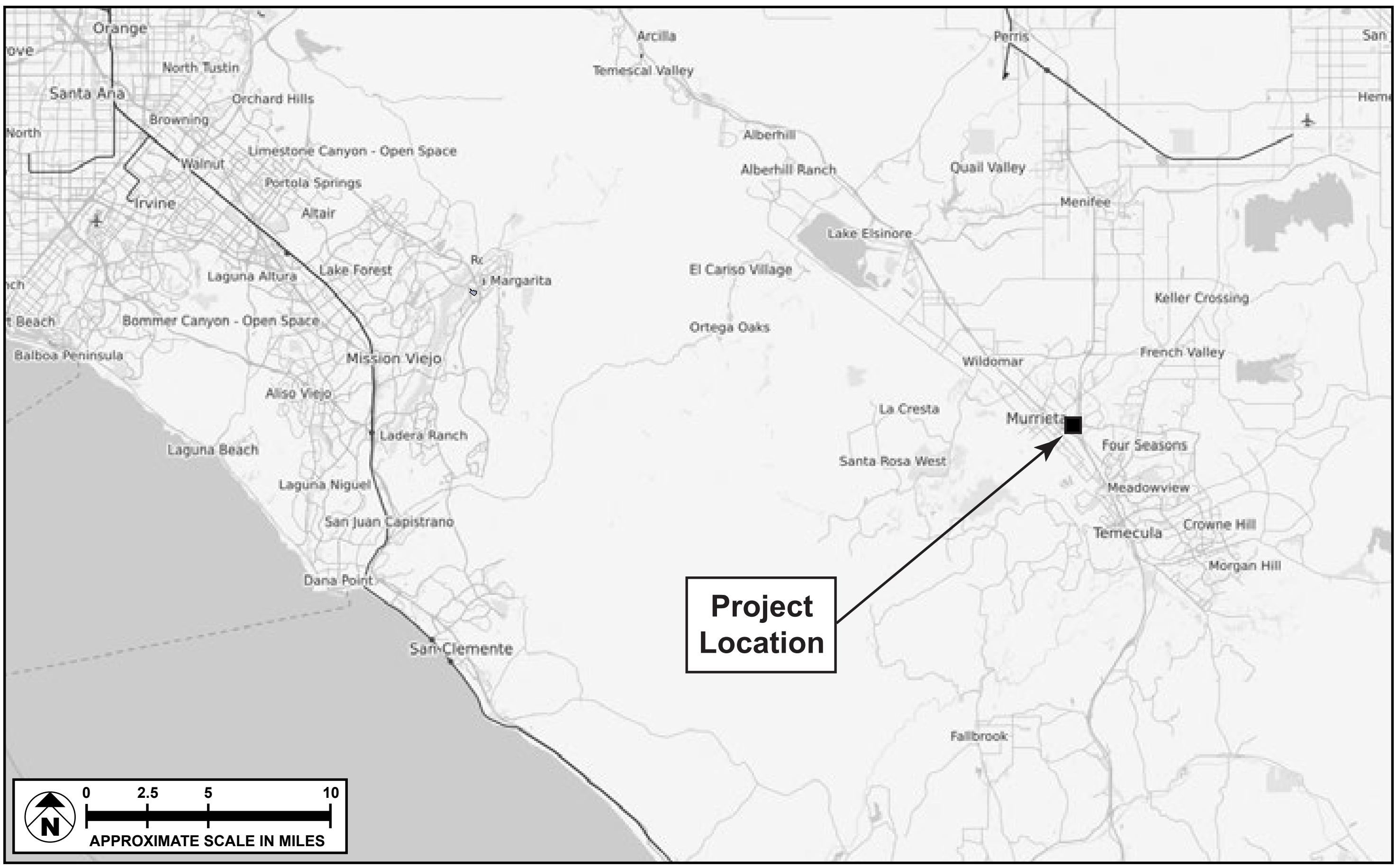
The project would also construct a new helipad platform in the east parking lot closer to the ambulance entry. The existing grass helipad located south of the existing Women's Center and ED building would be removed and converted to a vehicle parking lot once the new helipad platform has been completed and helicopter operations transfer to the new facility. The current EMS operation utilizes an existing helipad landing site south of the Women's Center and adjacent to the west of the southern RSMC surface parking lot. The most common type of helicopters that utilize the landing site include the EC 135 and EC 145 helicopters. The current EMS Landing Site is a special designation under California law allowing the establishment of a helicopter landing facility that is exempt from Caltrans Division of Aeronautics' normal heliport permitting requirements. An EMS landing site designation carries a number of restrictions, as listed in the California Code of Regulations, *Airports and Heliports*, Section 3627(g). The design criteria that are currently met include (1) appropriate lighting for night landings; (2) appropriate fire extinguisher requirements; (3) a minimum 100-foot landing area clear of obstructions and hazards; (4) prevent parking, bicycle and pedestrian traffic; (5) designated appropriate safety area surrounding the Project Site; (6) mount and maintain a lighted (FAA approved) windsock in unobstructed area of the Project Site; (7) and implementation of operational protocols that would ensure security personnel will physically respond to the Project Site to secure the site prior to a landing or take-off. In addition, the current EMS landing site has gone through FAA airspace determination pursuant to the Federal Regulations 14 CFR Part 157,[1] as well as through the City's zoning and CEQA analysis, and the Riverside County Airport Land Use Commission.

1 14 CFR, pt. 157—*Notice of Construction, Alteration, Activation, and Deactiviation of Airports.*

Helicopter flight patterns would be regulated by a Conditional Use Permit (CUP). Pilots would be encouraged to use the specified approach/departure paths (flight paths), as illustrated in **Figure 2: Flight Path**, unless conditions favored alternate approaches or departures. All flights would approach the Project Site from the north and south following the I-215 freeway corridor and would not operate directly over residential uses.

Construction would occur in three (3) phases which include the following:

- Phase 1: Enable and Make Ready
  - This phase will include construction of the new elevated helipad platform in the east parking lot to replace the existing grass helipad; site preparation for construction of the new expansion; relocation of the Emergency Walk-in entry to the western entrance of the Women's Center and ED Building; and demolition of the existing Emergency Walk-in entry canopy and surrounding site areas required for new construction. This phase will also include reconfiguration of underground utilities and improvement of Medical Center Drive. Additionally, construction of the new elevated platform in the east parking lot to replace the existing grass helipad.
- Phase 2: Hospital Expansion and Renovation of Existing Spaces
  - This phase is considered the primary new building construction phase. It includes construction of the new hospital expansion and connections to both levels of the Women's Center and ED building. The south surface parking and south section of the ring road can be finished after the hospital expansion is complete. This phase will also include the remodeling of the Women's Center and ED building, ED waiting room and reception area, and renovation and expansion of the existing kitchen in the main hospital.
- Phase 3: Demolition, Parking, and Landscaping
  - This phase would include reconfiguration of the Women's Center and ED building at the western Main Hospital entrance entry with a new vehicular drop-off zone, canopy, and outdoor seating area, along with the modifications to the west parking lot.



SOURCE: Google Earth - 2020; Meridian Consultants, LLC - 2020

FIGURE 1

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Regional and Local Vicinity Map

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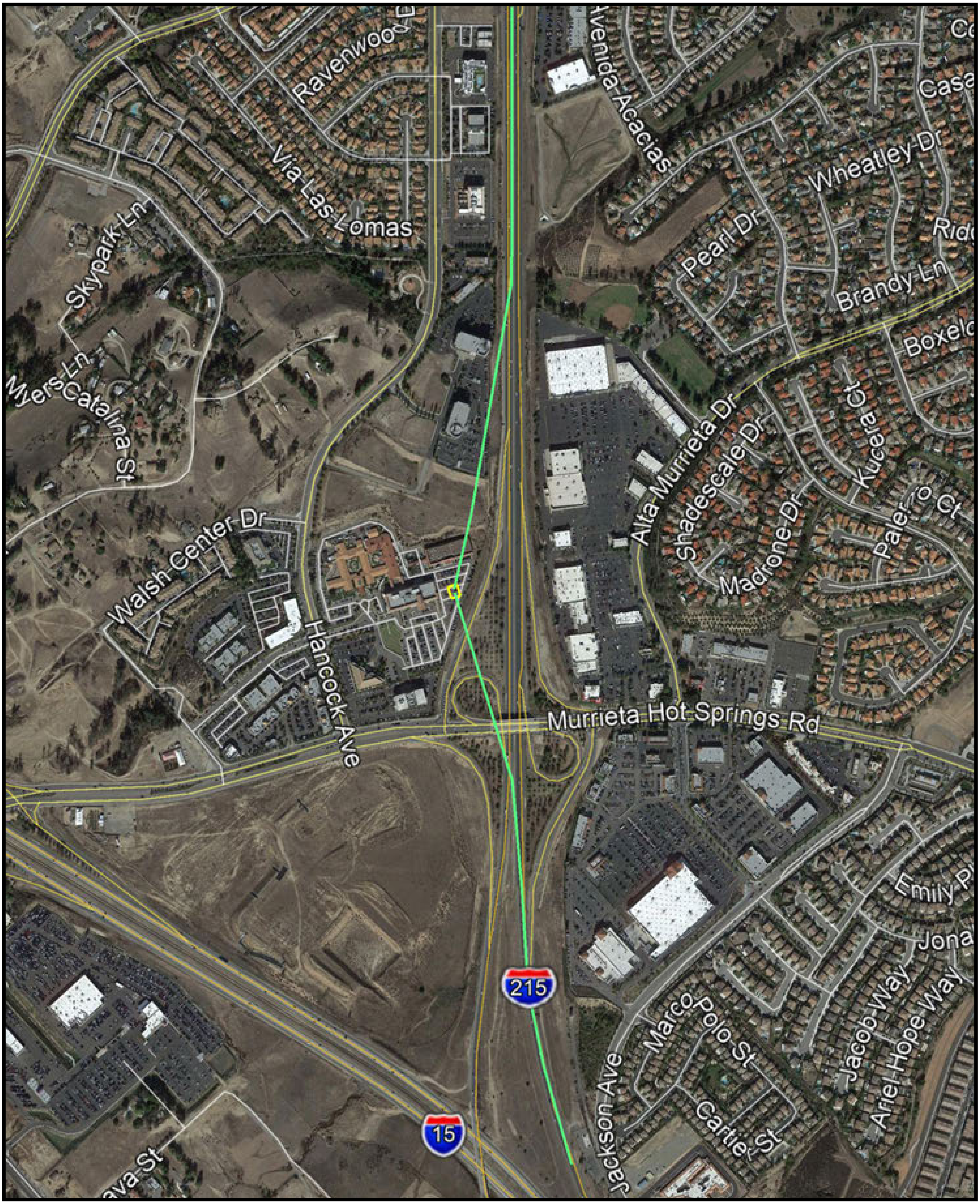

SOURCE: General Plan EIR - 2020

FIGURE **2**

Meridian Consultants

Flight Path

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C. ENVIRONMENTAL SETTING

1. Fundamentals of Sound

Sound is the quickly varying pressure wave travelling through a medium. When sound travels through air, the atmospheric pressure varies periodically. The number of pressure variations per second is called the frequency of sound and is measured in Hertz (Hz), which is defined as cycles per second. “Sound” and “noise” will be used interchangeably throughout this report.

The sounds we hear are composed of various frequencies. A normal human ear is able to hear sounds with frequencies from 20 Hz to 20,000 Hz. The range of 20 Hz to 20,000 Hz is called the audible frequency range. The entire audible frequency range can be divided into 10 or 24 frequency bands, known as octave bands or 1/3 octave bands, respectively. A particular sound or noise can be seen to have different strengths or sound pressure levels (SPLs) in the frequency bands. The higher the frequency, the higher pitched a sound is perceived. For example, the sounds produced by drums have much lower frequencies than those produced by a whistle.

A single SPL is often used to describe a sound. This can be done by adding the contribution from all octave bands or 1/3 octave bands together to yield one single SPL. SPL alone is not a reliable indicator of loudness because the human ear does not respond uniformly to sounds at all frequencies. For example, the human ear is less sensitive to low and high frequencies than it is to the medium frequencies that more closely correspond to human speech. In response to this sensitivity of the human ear to different frequencies, the A-weighted noise level, referenced in units of dB(A), was developed to better correspond with the subjective judgment of sound levels by individuals.

A doubling of sound energy results in a 3 dB(A) increase in sound, which means that a doubling of sound wave energy (e.g., doubling the volume of traffic on a roadway) would result in a barely perceptible change in sound level. In general, changes in a noise level of less than 3 dB(A) are not noticed by the human ear.[2] Changes from 3 to 5 dB(A) may be noticed by some individuals who are extremely sensitive to changes in noise. An increase of greater than 5 dB(A) is readily noticeable, while the human ear perceives a 10 dB(A) increase in sound level to be a doubling of sound volume. To support the assessment of community reaction to noise, scales have been developed that average SPLs over time and quantify the result in terms of a single numerical descriptor. Several scales have been developed that address community noise levels. Leq is the average A-weighted sound level measured over a given time interval. Leq can be measured over any period but is typically measured for 1-minute, 15-minute, 1-hour, or 24-hour periods.

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2 US Department of Transportation, Federal Highway Administration, *Fundamentals and Abatement of Highway Traffic Noise* (Springfield, VA: U.S. Department of Transportation, Federal Highway Administration, September 1980), 81.

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 dB(A), whereas a solid wall or berm reduces noise levels by 5 to 10 dB(A).[3] Vegetative barriers, such as shrubs up to 8 feet in height and 15 feet in width, typically attenuate noise levels 1 dB(A) and can attenuate noise levels from 1 to 3 dB(A), depending on the type and amount of vegetation.[4]

Decibel readings are weighted to reflect sensitivities to different frequencies. As discussed above, the A weighting is intended to reflect human sensitivity to higher frequencies, while the C weighting incorporates low frequencies. Examples of various sound levels in different environments is illustrated in **Figure 3: Sound Levels and Human Response**.

The sound level averages, Leq, were measured as A-weighted, slow-time-weighted (1-minute period) sound-level variables, commonly used for measuring environmental sounds. The maximum 1-minute recorded measurement is commonly referred to as Lmax. The minimum 1-minute recorded measurement is commonly referred to as Lmin. The day-night level (Ldn) is the 24-hour average sound level that recognizes the increased sensitivity to nighttime noise by adding 10 dB to noise occurring between 10:00 PM and 7:00 AM. The Community Noise Equivalent Level (CNEL) is similar to the Ldn except that CNEL also adds 5 dB to noise occurring between 7:00 PM and 10:00 PM. Sound levels presented in this report represent an average Leq, the Lmax, and the Lmin expressed in terms of dB(A).

Table 1: Noise Descriptors identifies various noise descriptors developed to measure sound levels over different periods of time.

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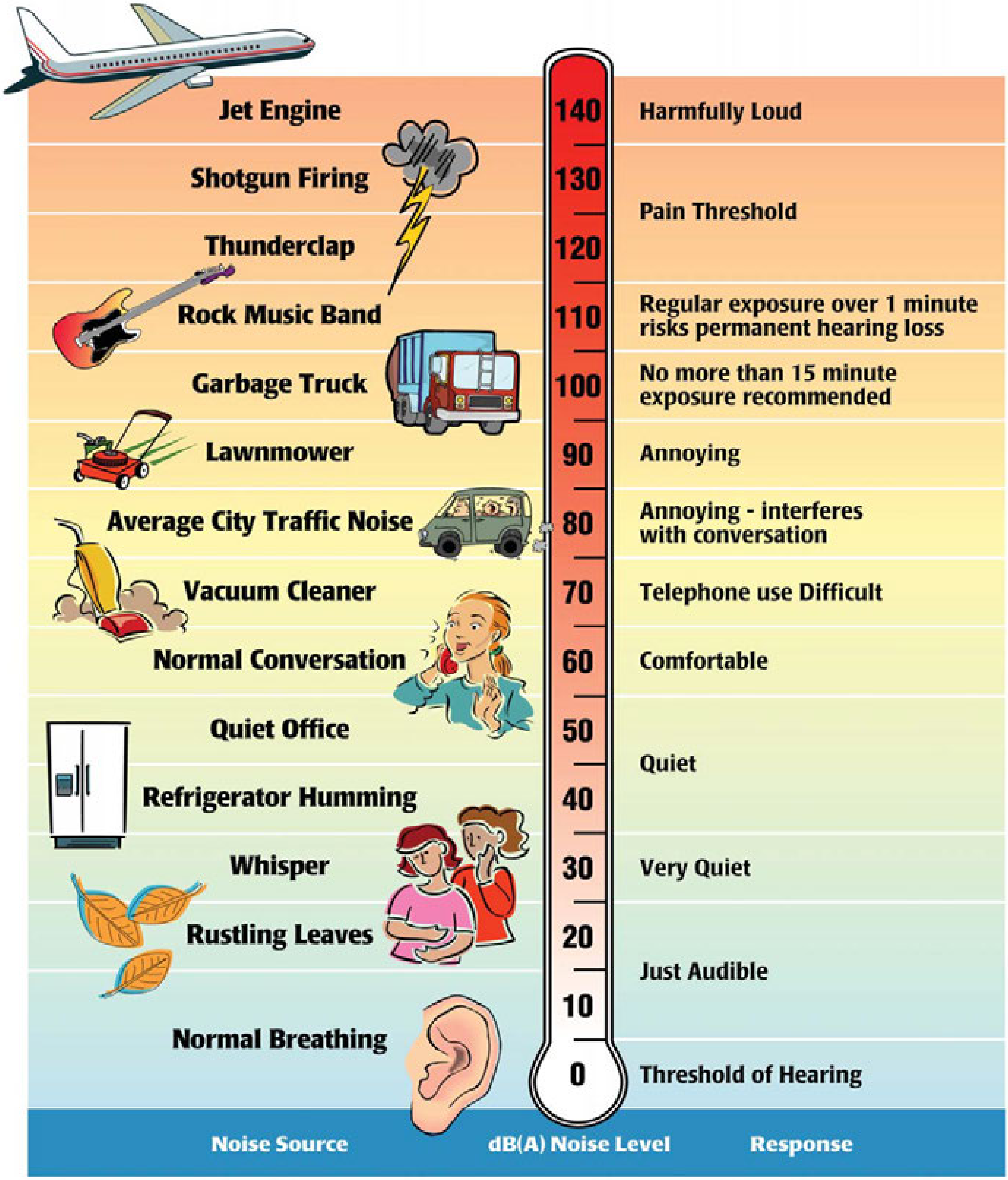
3 State of California Department of Transportation (Caltrans), *Technical Noise Supplement,* 1998, pp. 33-40, 123-131.
4 Caltrans, *Traffic Noise Attenuation as a Function of Ground and Vegetation (Final Report),* 1995, pp. 65.

Table 1
Noise Descriptors

Term	Definition
Decibel (dB)	The unit for measuring the volume of sound equal to 10 times the logarithm (base 10) of the ratio of the pressure of a measure sound to a reference pressure.
A-Weighted Decibel [dB(A)]	A sound measurement scale that adjusts the pressure of individual frequencies according to human sensitivities. The scale accounts for the fact that the region of highest sensitivity for the human ear is between 2,000 and 4,000 cycles per second (hertz).
Hertz (Hz)	The frequency of the pressure vibration which is measured in cycles per second.
Kilohertz (kHz)	One thousand cycles per second.
Equivalent Sound Level (Leq)	The sound level containing the same total energy as a time varying signal over a given time period. The Leq is the value that expresses the time averaged total energy of a fluctuating sound level. Leq can be measured over any time period, but is typically measured for 1-minute, 15-minute, 1-hour, or 24-hour periods.
Community Noise Equivalent Level (CNEL)	A rating of community noise exposure to all sources of sound that differentiates between daytime, evening, and nighttime noise exposure. These adjustments add 5 dB(A) for the evening, 7:00 PM to 10:00 PM, and add 10 dB(A) for the night, 10:00 PM to 7:00 AM. The 5- and-10 decibel penalties are applied to account for increased noise sensitivity during the evening and nighttime hours. The logarithmic effect of adding these penalties to the 1-hour Leq measurements typically results in a CNEL measurement that is within approximately 3 dB(A) of the peak-hour Leq.[a]
Daytime (Lday)	Lday is the average noise exposure during the hourly periods from 7:00 AM to 10:00 PM.
Nighttime (Lnight)	Lnight is the average noise exposure during the hourly periods from 10:00 PM to 7:00 AM.
Day-Night Level (Ldn)	24-hour average sound level, with a penalty of 10 dB added for noise during the nighttime hours of 10:00 PM to 7:00 AM.
Sound Pressure Level (SPL)	The sound pressure is the force of sound on a surface area perpendicular to the direction of the sound. The SPL is expressed in dB.
Ambient Noise	The level of noise that is all encompassing within a given environment, being usually a composite of sounds from many and varied sources near to and far from the observer. No specific source is identified in the ambient environment.

[a] *California Department of Transportation, Technical Noise Supplement: A Technical Supplement to the Traffic Noise Analysis Protocol (Sacramento: November 2009), pp. N51–N54.*



Source: Melville C. Branch and R. Dale Beland, Outdoor Noise in the Metropolitan Environment, 1970.
Environmental Protection Agency, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004), March 1974.

SOURCE: General Plan EIR - 2020

FIGURE **3**

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Sound Levels and Human Response

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2. Existing Conditions

a. Ambient Noise Levels

The City General Plan Noise Element identifies that dominant noise in the City is due to mobile sources, particularly freeway traffic (vehicles and trucks) and traffic on heavily traveled surface streets.[5] The existing ambient noise environment throughout the City was determined by conducting noise measurements by sensitive receptors that would potentially be impacted by the proposed Project. According to the City, land uses that are sensitive to intrusive noise include residential uses (particularly those in the vicinity of I-15 and I-215 Freeways), schools, hospitals, churches, and parks.

In September 2016, noise monitoring was conducted over 24-hour intervals at four locations with a Larson Davis 831 Sound Level Meter. The ambient noise environment results are provided in **Table 2: Noise Measurements in Project Vicinity**, and their locations are shown on **Figure 4: Noise Monitoring Locations**. These measured noise levels represent day-to-day noise from sources near the Project Site, including traffic along local streets and I-215, consistent with the existing roadway noise contours identified in the Noise Element.[6] As shown, average ambient CNEL noise levels ranged from 60.4 dB(A) at Site 2 to 72.8 dB(A) at Site 4. In addition, ambient noise measurements (15-minute) were taken within the Project Site, specifically within the current EMS landing site. Ambient noise levels at the Project Site were 55.0 dB(A).

Table 2
Noise Measurements in Project Vicinity (2016)

Measurement Site	Locations	Leq Daytime	Leq Nighttime	CNEL
		(dB[A])		
Site 1	Along Jackson Avenue, East of highway 215 southeast of the Project Site	69.2	64.3	72.2
Site 2	Along Walsh Center Drive, northwest of the Project Site	59.1	51.1	60.4
Site 3	Along Rockcrest Drive, East of highway 215, east of the Project Site	62.7	56.1	64.8
Site 4	Along Hancock Avenue, West of highway 215, north of the Project Site	71.6	63.5	72.8
	Project Site	—	—	55.0*

*Source: Refer to **Appendix A.1** for monitoring data sheets.*
Site 1: Measurements were taken from 1:00 PM on September 27, 2016, to 1:00 PM on September 28, 2016.
Site 2: Measurements were taken from 1:00 PM on September 27, 2016, to 1:00 PM on September 28, 2016.
Site 3: Measurements were taken from 2:00 PM on September 27, 2016, to 2:00 PM on September 28, 2016.
Site 4: Measurements were taken on from 1:00 PM on September 27, 2016, to 1:00 PM on September 28, 2016.
* *Project Site measurements were taken on September 28, 2016, from 12:11 PM to 12:26 PM. Noise measurement represents 15-minute Leq.*

5 City of Murrieta, *General Plan 2035,* "Noise Element" (adopted July 19, 2011), p. 11-11.
6 City of Murrieta, *General Plan 2035,* "Noise Element" (adopted July 19, 2011), Exhibit 11-3.

Additional short-term (10-minute) measurements were taken at the same locations on July 30, 2020 between two time intervals identified by the City: 7:00 AM to 10:00 PM and 10:00 PM to 7:00 AM. As shown in **Table 3: Noise Measurements in Project Vicinity (2020)**, daytime ambient noise measurements ranged from a low of 55.2 dBA at Site 2 to a high of 69.2 dBA at Site 1. Additionally, nighttime ambient noise measurements ranged from a low of 41.6 dBA at Site 3 to a high of 56.4 dBA at Site 1.

Table 3
Noise Measurements in Project Vicinity (2020)

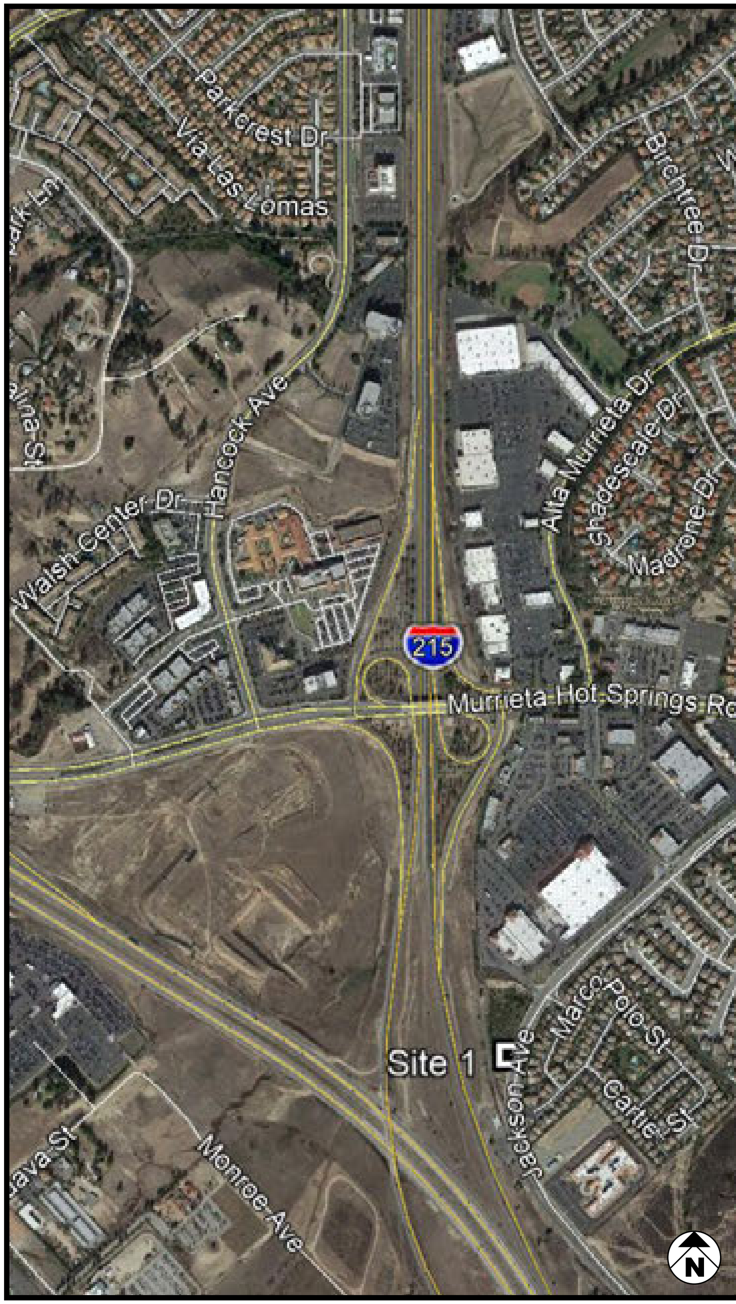
Measurement Site	Locations	Time Period	Leq (10-minute)	Lmax	Lmin
			(dB[A])		
Site 1	Along Jackson Avenue, East of highway 215 southeast of the Project Site	Daytime	69.2	78.2	62.7
		Nighttime	56.4	73.3	53.2
Site 2	Along Walsh Center Drive, northwest of the Project Site	Daytime	55.2	69.4	45.8
		Nighttime	46.1	67.5	44.8
Site 3	Along Rockcrest Drive, East of highway 215, east of the Project Site	Daytime	57.6	72.5	45.8
		Nighttime	41.6	64.8	39.8
Site 4	Along Hancock Avenue, West of highway 215, north of the Project Site	Daytime	67.3	80.7	51.3
		Nighttime	48.4	71.4	47.3

Source: Refer to ***Appendix A.2*** *for monitoring data sheets.*
Site 1: Daytime measurements were taken between 5:41 PM – 5:51 PM on July 30, 2020. Nighttime measurements were taken between 10:02 PM – 10:12 PM on July 30, 2020.
Site 2: Daytime measurements were taken between 5:59 PM – 6:09 PM on July 30, 2020. Nighttime measurements were taken between 10:32 PM – 10:42 PM on July 30, 2020.
Site 3: Daytime measurements were taken between 6:18 PM – 7:28 PM on July 30, 2020. Nighttime measurements were taken between 10:16 PM – 10:26 PM on July 30, 2020.
Site 4: Daytime measurements were taken between 6:35 PM – 6:45 PM on July 30, 2020. Nighttime measurements were taken between 10:45 PM – 10:55 PM on July 30, 2020.

b. Roadway Noise Levels

In addition to the ambient noise measurements near the Project Site, the existing traffic noise on local roadways in the surrounding areas was calculated to quantify the 24-hour CNEL noise levels using information provided in the transportation impact analysis prepared by LLG dated July 16, 2020. The transportation impact analysis analyzed four segments within the Project vicinity. Traffic noise levels were calculated using the Federal Highway Administration Traffic Noise Model (FHWA TNM).

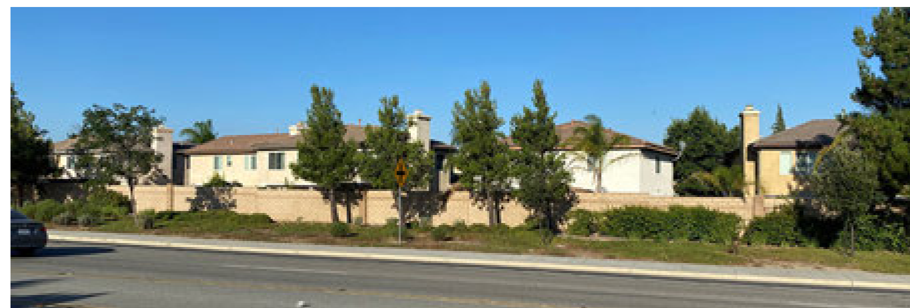
Table 4: Existing Roadway Noise Levels provides the calculated CNEL for the analyzed local roadway segments based on existing traffic volumes. Daytime levels attributed to roadway traffic range from a low of 48.5 dBA along Walsh Center Drive west of Hancock Avenue, to a high of 73.3 dBA along Murrieta Hot Springs Road east of Hancock Avenue.

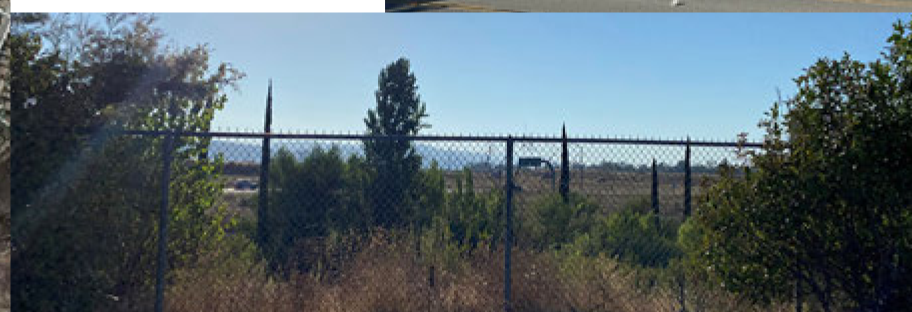


South

North

East





West

SOURCE: Google Earth - 2020

FIGURE **4a**

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Noise Monitoring Location (Site 1)

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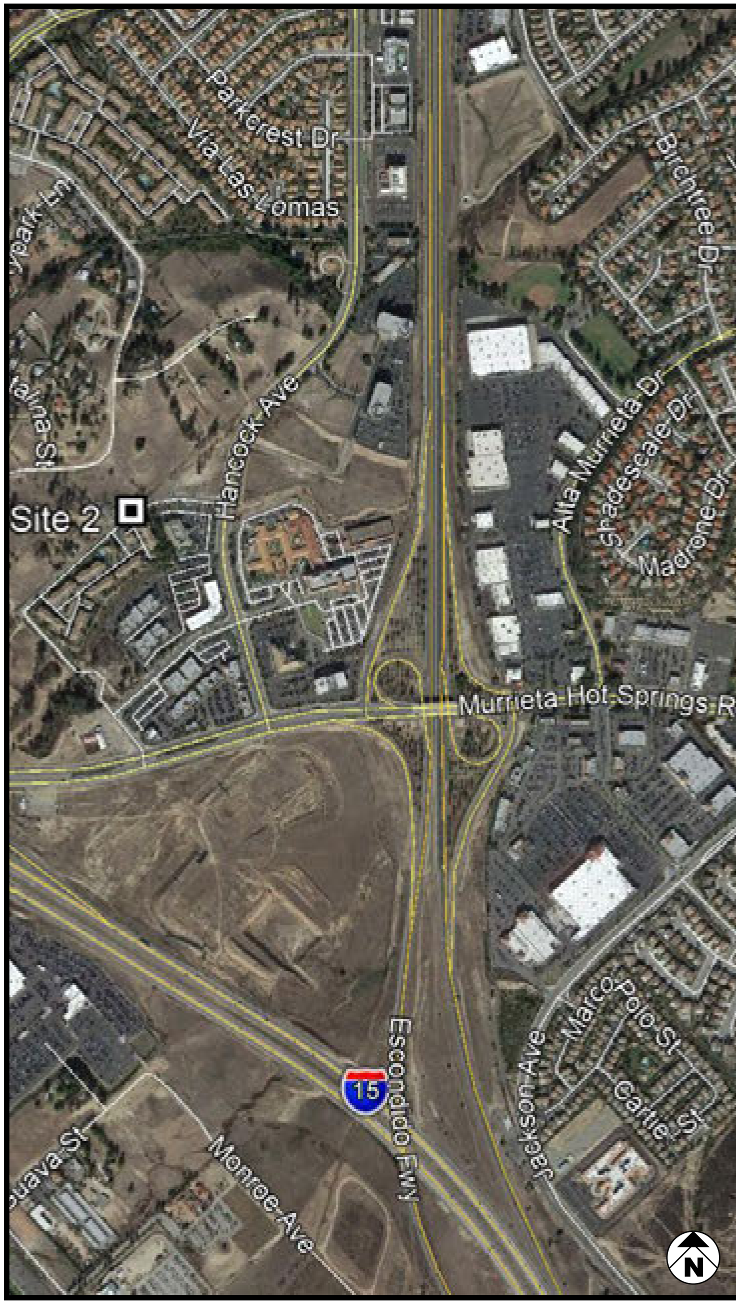

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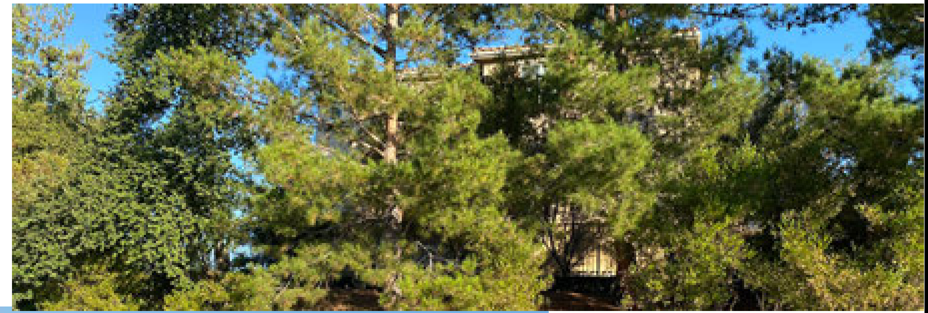
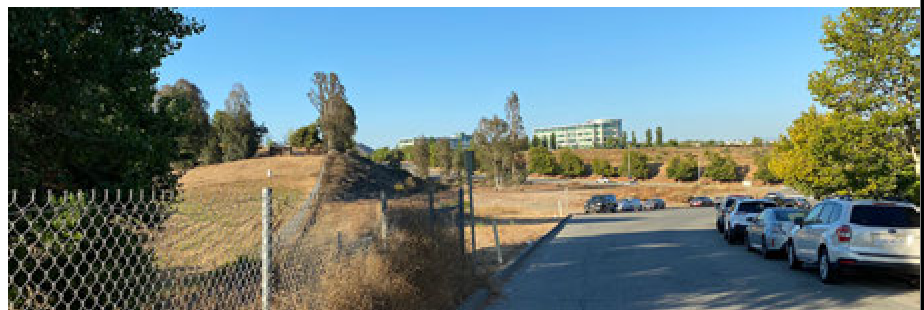
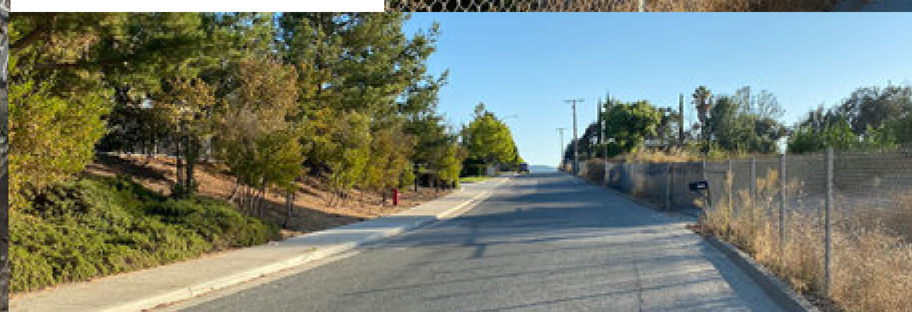


North

East



West



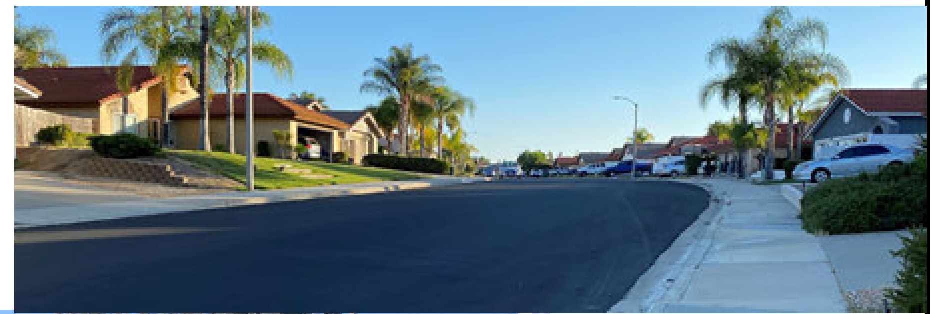
SOURCE: Google Earth - 2020

FIGURE **4b**

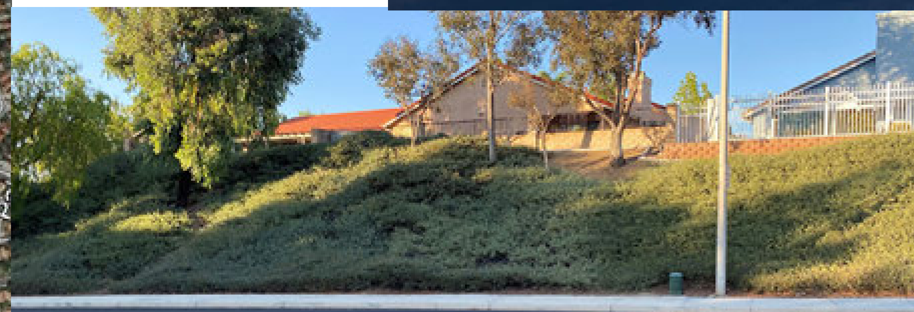
Meridian Consultants

Noise Monitoring Location (Site 2)

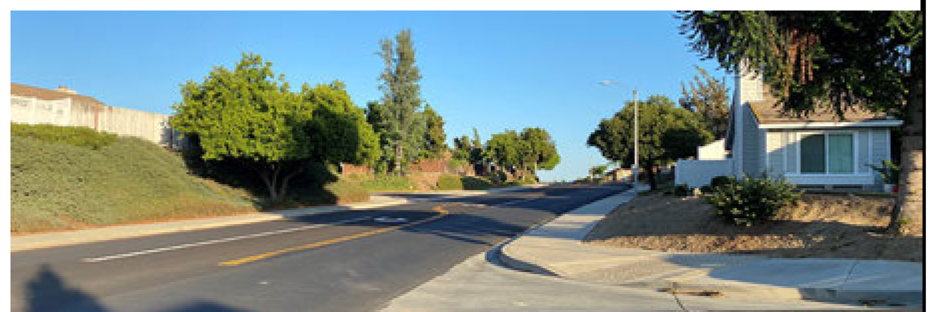
284-001-20



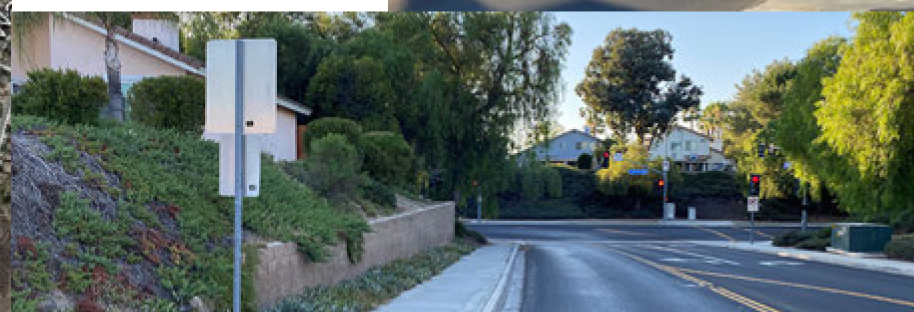
South



North



East



West

SOURCE: Google Earth - 2020

FIGURE **4c**

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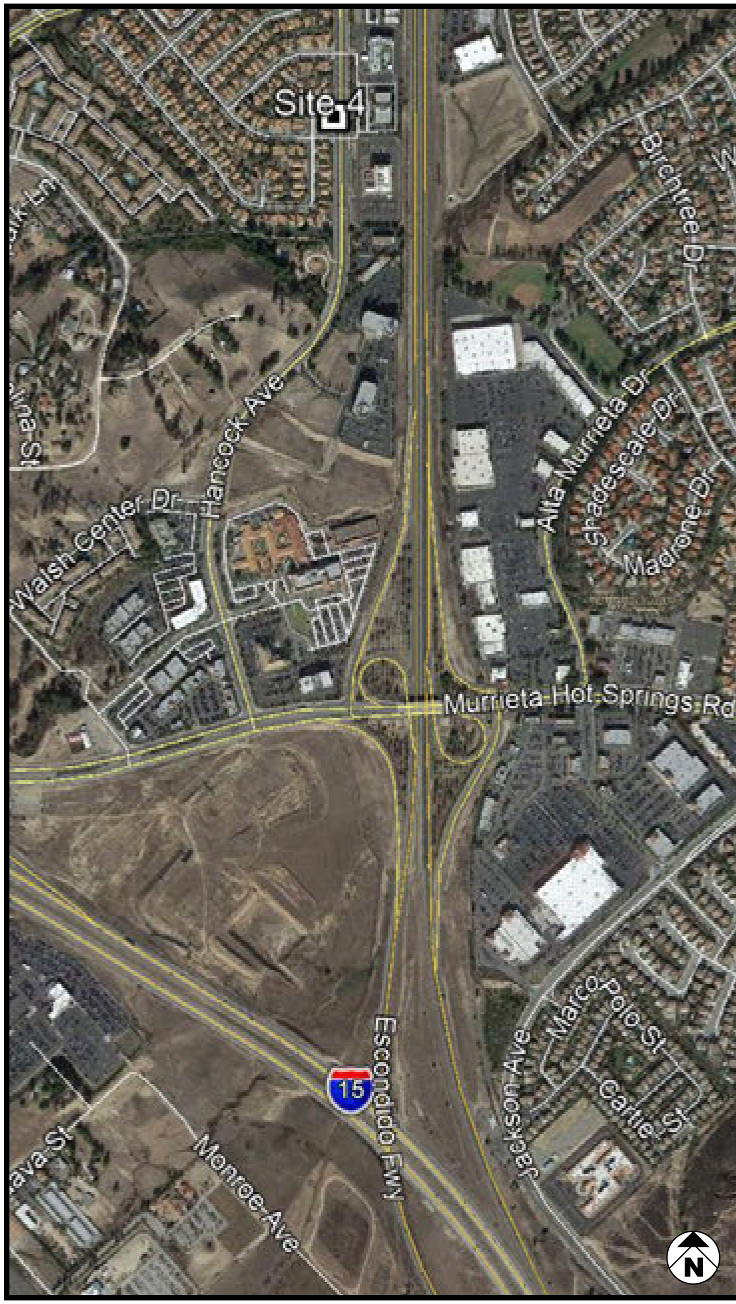
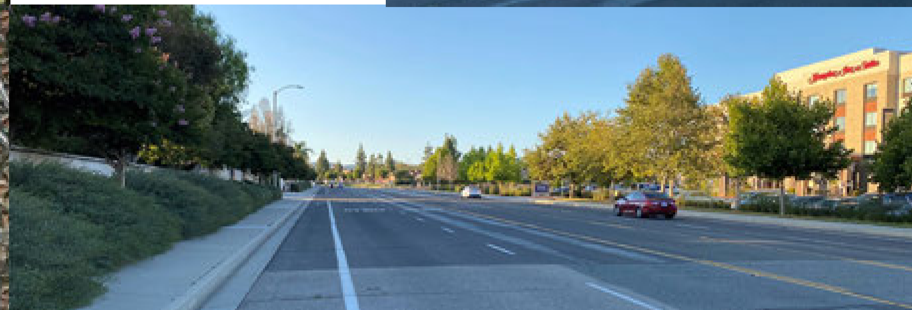
Noise Monitoring Location (Site 3)



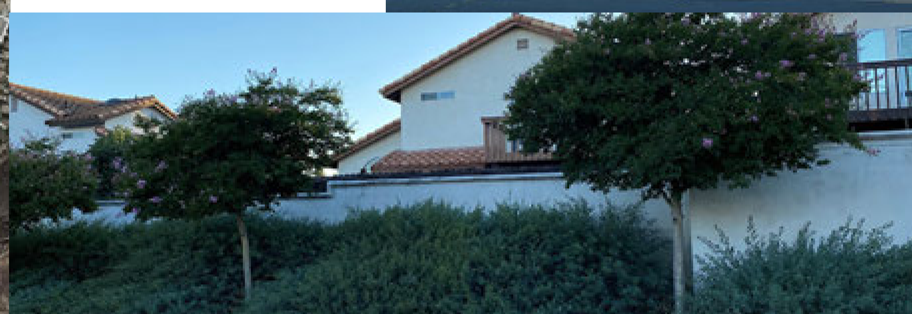
South

North



East

West



SOURCE: Google Earth - 2020

FIGURE **4d**

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Noise Monitoring Location (Site 4)

Table 4
Existing Roadway Noise Levels

Roadway Segment	Adjacent Land Use	Existing Roadway Noise Level		Existing Noise Exposure Compatibility Category
		Daytime	Nighttime	
Hancock Avenue				
Murrieta Hot Springs Road to Medical Center Drive	Hospital	68.4	60.9	Normally Acceptable/Conditionally Acceptable
Medical Center Drive to Walsh Center Drive	Hospital	67.0	59.5	Normally Acceptable/Conditionally Acceptable
Murrieta Hot Springs Road				
East of Hancock Avenue	Hospital	73.3	65.8	Normally Unacceptable
West of Hancock Avenue	Hospital	73.1	65.5	Normally Unacceptable
Medical Center Drive				
East of Hancock Avenue	Hospital	56.7	49.2	Normally Acceptable
West of Hancock Avenue	Hospital	56.1	48.6	Normally Acceptable
Walsh Center Drive				
West of Hancock Avenue	Residential	48.5	40.9	Normally Acceptable

*Source: Refer to **Appendix B** for SoundPLAN Output TNM Worksheet*

In terms of the City's land use noise compatibility categories based on roadway traffic only, most locations are classified as normally acceptable, with others classified as conditionally acceptable and normally unacceptable. Specifically, the noise exposure compatibility categories based on roadway traffic only are summarized as follows:

- Normally Acceptable: Locations where residential uses are dominant along Walsh Center Drive and where hospital uses are dominant along Hancock Avenue and Medical Center Drive.
- Conditionally Acceptable: Locations where hospital uses are dominant along Hancock Avenue and Medical Center Drive.
- Normally Unacceptable: Locations where freeway uses are dominant along Murrieta Hot Springs Road. Additionally, as identified in the City's Noise Element, seven segments along Murrieta Hot Springs Road experience traffic noise levels in excess of 70 CNEL. Roadway segments within the Project vicinity include the area between I-15 and I-215 Freeways.
- Clearly Unacceptable: None.

D. REGULATORY SETTING

1. Federal Regulations

a. US Environmental Protection Agency

The Federal Noise Control Act of 1972 establishes programs and guidelines to identify and address the effects of noise on public health and welfare and the environment.[7] The US Environmental Protection Agency (USEPA) administrators determined in 1981 that subjective issues such as noise would be better addressed at more local levels of government. Consequently, in 1982, responsibilities for regulating noise-control policies were transferred to State and local governments. However, noise-control guidelines and regulations contained in the rulings of the USEPA in prior years remain in place, enforced by designated federal agencies where relevant.

2. State Regulations

a. State of California Building Code

California's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2, California Building Code. These noise standards are applied to new construction in California to ensure interior noise compatibility from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are located near major transportation noise sources, and where such noise sources create an exterior noise level of 60 dB(A) CNEL or higher. Acoustical studies that accompany building plans must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new residential buildings, schools, and hospitals, the acceptable interior noise limit for new construction is 45 dB(A) CNEL.

b. California Noise Insulation Standards

The California Noise Insulation Standards[8] require that interior noise levels from exterior sources be 45 dB(A) or less in any habitable room of a multiresidential-use facility (e.g., hotels, motels, dormitories, long-term care facilities, and apartment houses, except detached single-family dwellings) with doors and windows closed. Measurements are based on CNEL or Ldn, whichever is consistent with the noise element of the local general plan. Where exterior noise levels exceed 60 dB(A) CNEL, an acoustical analysis for new development may be required to show that the proposed construction will reduce interior noise levels to 45 dB(A) CNEL. If the interior 45 dB(A) CNEL limit can be achieved only with the windows closed, the residence must include mechanical ventilation that meets applicable Uniform Building Code requirements.

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7 Noise Control Act of 1972, sec. 2 (1972).

8 California Code of Regulation, tit. 24, sec. 3501 et seq.

c. *California Department of Health Services*

The State of California Department of Health Services, Environmental Health Division, has published recommended guidelines for noise and land use compatibility, referred to as the *State Land Use Compatibility Guidelines for Noise* (State Noise Guidelines). The State Noise Guidelines, illustrated in **Figure 5: Land Use Compatibility to Noise**, indicate that commercial and industrial land uses generally should be located in areas where outdoor ambient noise levels do not exceed 70 to 75 dB(A) CNEL. According to the State Noise Guidelines, an exterior noise level of 65 dB(A) CNEL is considered “normally acceptable” for office buildings, business commercial, and professional uses involving normal, conventional construction without any special noise insulation requirements. Exterior noise levels up to 80 dB(A) CNEL are typically considered “normally acceptable” for industrial and manufacturing utility uses without any special noise insulation requirements. Between these values and 80 dB(A) CNEL, exterior noise levels are typically considered “conditionally acceptable,” and commercial and industrial construction should only occur after a detailed analysis of the noise reduction requirements and needed noise attenuation features have been included in the project design. Exterior noise attenuation features include but are not limited to requiring setbacks to place structures outside the conditionally acceptable noise contour, orienting structures so no windows open to the noise source, and/or installing noise barriers such as berms and/or solid walls.

3. Local Regulations

a. *City of Murrieta General Plan Noise Element*

The City has adopted the State Noise Guidelines and defines sensitive noise receptors by land uses, which include schools, playgrounds, athletic facilities, hospitals, rest homes, rehabilitation centers, and long-term care and mental care facilities, as well as day care centers, single-family dwellings, mobile home parks, churches, and libraries. Current land uses located within the City that are sensitive to intrusive noise include residential uses, schools, hospitals, churches, and parks.

The Noise Element contains goals and policies to maintain noise levels that are compatible with various types of land uses, as well as prevent high noise levels in sensitive areas. The applicable goals to this Project include:

Goal N-1: Noise sensitive land uses are properly and effectively protected from excessive noise generators.

Goal N-2: A comprehensive and effective land use planning and development review process that ensures noise impacts are adequately addressed.

Goal N-4: Reduced noise levels from construction activities.

b. City of Murrieta Municipal Code Noise Ordinance

The City's regulations with respect to noise are included in Chapter 16.30 of the Development Code, also known as the Noise Ordinance. Construction-related and operational noise restrictions are discussed below.

i. Construction

Section 16.30.130 of the City's Noise Ordinance regulates construction noise, prohibiting noise generated by construction activities between the hours of 7:00 PM and 7:00 AM and on Sundays and holidays. Construction activities shall not be conducted in a manner that the maximum noise levels at the affected structures will not exceed those listed in **Table 5: City Construction Noise Standards**.

Table 5
City of Murrieta Construction Noise Standards

	Single-Family Residential	Multi-Family Residential	Commercial
Mobile Equipment			
Daily, except Sundays and holidays, 7:00 AM to 8:00 PM	75 dBA	80 dBA	85 dBA
Daily, except Sundays and holidays, 8:00 PM to 7:00 AM	60 dBA	64 dBA	70 dBA
Stationary Equipment			
Daily, except Sundays and holidays, 7:00 AM to 8:00 PM	60 dBA	65 dBA	70 dBA
Daily, except Sundays and holidays, 8:00 PM to 7:00 AM	50 dBA	55 dBA	60 dBA

Source: City, City Development Code Section 16.30.130.

ii. Operation

The City Noise Ordinance "Noise Ordinance" governs operational noise generated between two properties and does not regulate noise from transportation sources, such as traffic, aircraft, and railways.[9] For purposes of this analysis, noise levels were compared to the City's Exterior Noise Standards to determine if increase in noise levels would be considered significant.

9 City of Murrieta, *General Plan 2035,* "Noise Element" (adopted July 19, 2011), p. 11-6.

The City Noise Ordinance (Ordinance; Section 16.30.090(A)—Exterior Noise Standards, and Section 16.30.100—Interior Noise Standards), establishes exterior and interior noise standards based on "noise zones," as shown in **Table 6: City Exterior and Interior Noise Standards**.

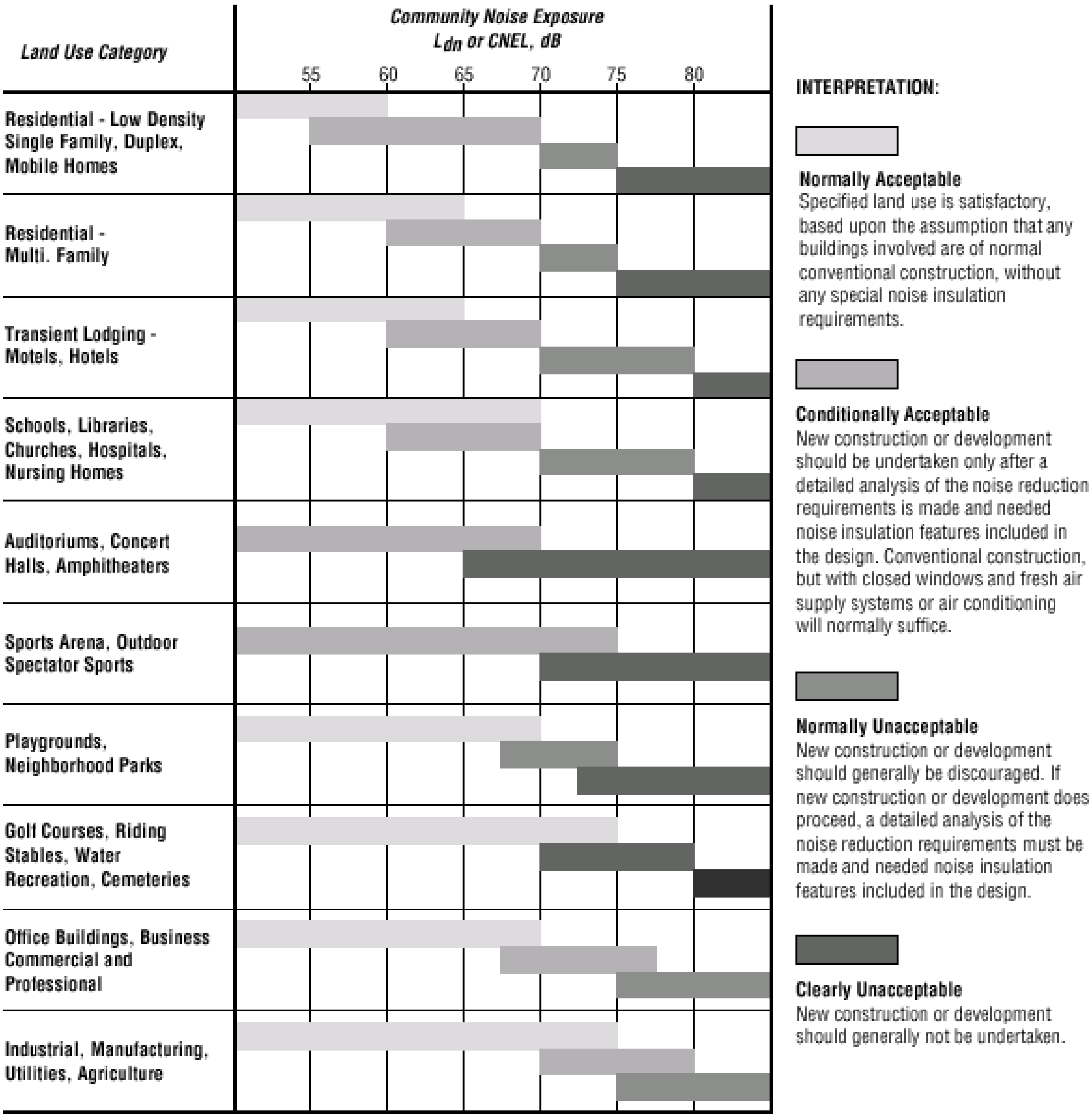
Table 6
City of Murrieta Exterior and Interior Noise Standards

Noise Zone	Designated Land Use (Receptor Property)	Time Interval	Allowed Noise Level
Exterior Noise Limits			
I	Noise-sensitive area	Anytime	45 dB(A)
II	Residential properties	10:00 PM to 7:00 AM	45 dB(A)
		7:00 AM to 10:00 PM	50 dB(A)
III	Commercial properties	10:00 PM to 7:00 AM	55 dB(A)
		7:00 AM to 10:00 PM	60 dB(A)
IV	Industrial properties	Anytime	70 dB(A)
Interior Noise Limits			
All	Multifamily Residential	10:00 PM to 7:00 AM	40 dB(A)
		7:00 AM to 10:00 PM	45 dB(A)

Source: City, City Development Code Section 16.30.090.

Section 16.30.090(B), Noise Standards, further states that no person shall operate, or cause to be operated, any source of sound at any location within the City or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by a person that causes the noise level, when measured on any other property to exceed the following exterior noise standards:

1. Standard No. 1 shall be the exterior noise level which shall not be exceeded for a cumulative period of more than thirty (30) minutes in any hour. Standard No. 1 may be the applicable noise level from **Table 6** above.
2. Standard No. 2 shall be the exterior noise level which shall not be exceeded for a cumulative period of more than fifteen (15) minutes in any hour. Standard No. 2 shall be the applicable noise level from **Table 6** above plus 5 dB.
3. Standard No. 3 shall be the exterior noise level which shall not be exceeded for a cumulative period of more than five minutes in any hour. Standard No. 3 shall be the applicable noise level from **Table 6** above plus 10 dB.
4. Standard No. 4 shall be the exterior noise level which shall not be exceeded for a cumulative period of more than one minute in any hour. Standard No. 4 shall be the applicable noise level from **Table 6** above plus 15 dB.
5. Standard No. 5 shall be the exterior noise level which shall not be exceeded in any period of time. Standard No. 5 shall be the applicable noise level from **Table 6** above plus 20 dB.



SOURCE: opr.ca.gov/docs/OPR_Appendix_D_final.pdf

FIGURE **5**

Meridian Consultants

Land Use Compatibility to Noise

Additionally, Section 16.30.100 sets forth interior noise level limits for multifamily residential properties, as stated in **Table 6** above. Section 16.30.100 states no person shall operate or cause to be operated within a residential unit any source of sound, or allow the creation of any noise, that causes the noise level when measured inside a neighboring receiving residential unit to exceed the following standards:

1. Standard No. 1: The applicable interior noise level for cumulative period of more than five minutes in any hour;
2. Standard No. 2: The applicable interior noise level plus five dB for a cumulative period of more than one minute in any hour; or
3. Standard No. 3: The applicable interior noise level plus ten dB for any period of time.

E. METHODOLOGY

1. Ambient Noise Measurements

To establish baseline noise conditions, existing ambient noise levels, as described above, were monitored at the four representative locations within the vicinity of the Project Site. These monitored noise levels serve as the baseline for the analysis of proposed Project impacts. The baseline noise-monitoring was conducted on both September 27, 2016 and July 30, 2020, using a Larson Davis 831 Type 1 Sound Level Meter, compliant with Section 16.30.070 of the City's Municipal Code.

2. Construction Noise

a. On-Site Construction Activities

Construction activities typically generate noise from the operation of equipment required for construction of various facilities. Noise impacts from on-site construction and staging of construction trucks were evaluated by determining the noise levels generated by different types of construction activity, calculating the construction-related noise level at nearby noise-sensitive receptor locations, and comparing these construction-related noise levels to existing ambient noise levels (i.e., noise levels without project-related construction noise). The actual noise level would vary, depending upon the equipment type, model, the type of work activity being performed, and the condition of the equipment.

In order to calculate a construction CNEL, hourly activity or utilization factors (i.e., the percentage of normal construction activity that would occur, or construction equipment that would be active, during each hour of the day) are estimated based on the temporal characteristics of other previous and current construction projects. The hourly activity factors express the percentage of time that construction activities would emit average noise levels. Typical noise levels for each type of construction equipment were obtained from the FHWA Roadway Construction Noise Model. Calculated noise levels associated with construction at noise-sensitive receptor locations were then compared to estimated existing noise levels and the construction noise significance thresholds identified below.

b. Construction Traffic Noise

The analysis of construction traffic noise impacts focuses on off-site areas by: (1) identifying major roadways that may be used for construction worker commute routes or truck haul routes; (2) generally identifying the nature and location of noise-sensitive receptors along those routes; and (3) evaluating the traffic characteristics along those routes, specifically as related to existing traffic volumes. Construction traffic volume and road parameter data would be input into the FHWA TNM model to calculate average noise levels for these trips. Construction trucks staging and hauling route noise impacts would be evaluated by determining the noise levels generated by different types of construction activity, calculating the construction-related noise levels and comparing against existing ambient noise levels (i.e., noise levels without construction noise) and exterior standards.

c. Construction Equipment Vibration

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. While ground vibrations from construction activities do not often reach the levels that can damage structures, fragile buildings must receive special consideration.

Impacts due to construction activities were evaluated by identifying vibration sources (i.e., construction equipment), measuring the distance between vibration sources and surrounding structure locations, and making a significance determination.

For quantitative construction vibration assessments related to building damage and human annoyance, vibration source levels for construction equipment is taken from the FTA *Transit Noise and Vibration Impact Assessment Manual.* Building damage would be assessed for each piece of equipment individually and assessed in terms of peak particle velocity. Ground-borne vibration related to human annoyance is assessed in terms of rms velocity levels.

The vibration source levels for various types of equipment are based on data provided by the FTA.

3. Operational Noise

a. Roadway Noise

Traffic noise levels were modeled using the FHWA TNM. The FHWA TNM calculates noise associated with a specific line source and the results characterize noise generated by motor vehicle travel along a specific roadway segment. The traffic noise impact analysis is based on the 24-hour CNEL noise descriptor and incorporates traffic volumes, vehicle mix, posted speed limits, roadway geometry, and site conditions. Noise levels were evaluated with respect to the following traffic scenarios:

- Existing (2020) Conditions;
- Future (2023) without proposed Project Conditions; and
- Future (2023) plus proposed Project Conditions.

Noise impacts due to off-site motor vehicle travel were analyzed by comparing the projected increase in traffic noise levels from without Project conditions to plus proposed Project to the applicable significance criteria. Future plus Project conditions include traffic volumes from future ambient growth, related projects, and the proposed Project.

b. Helicopter Noise

To understand the expected noise levels produced by helicopters that would be operated on the Project Site, on-ground helicopter sound measurements of the most common helicopters that would be operated by the Project were conducted on the Project Site on September 28, 2016. On-ground measurements were measured from four different locations around the Airbus Helicopter (H135; formerly the Eurocopter EC135) with the engine(s) running at maximum revolutions per minute (rpm) with the rotors engaged. The measurements were conducted 75 feet behind the tail rotor, to the west, north, and east side of the helicopter. Measurements were collected over 30 seconds at each location. The maximum Leq values of A-weighted sound levels recorded during the ground run from the different locations around the helicopter are provided in **Table 7: H135 Helicopter Noise Levels**.

Table 7
H135 Helicopter Noise Levels

Location	Distance (feet)	Maximum (dB[A])
Behind tail rotor	75	92.5
West	75	86.0
North	75	82.6
East	75	89.5

Noise-level calculations at the location of noise-sensitive land uses in the Project vicinity were assessed using the SoundPLAN noise model. The SoundPLAN model depicts noise contours at varying distances and accounts for various inputs to analyze topography, vegetation, propagation from buildings, and existing- and proposed-noise sources and barriers. The SoundPLAN model takes into account the varying slant distances between the helicopter and the receiver. The software uses various inputs to analyze the topography, vegetation, vehicle traffic, existing- and proposed-noise sources, and existing- and proposed-barriers to depict noise contours at varying distances. The software utilizes algorithms (based on the inverse square law) to calculate noise level projections. Accuracy has been validated in published studies to be +/- 2.7 dBA with an 85 percent confidence level. The software allows the user to input specific noise sources, spectral content, sound barriers, building placement, topography, and sensitive receptor locations. Helicopter flight profiles were modeled based on the flight paths shown in **Figure 2** above and were programmed into the SoundPLAN noise modeling system.

4. Vibration

The majority of the Project's operational-related vibration sources, such as mechanical and electrical equipment, would incorporate vibration attenuation mounts, as required by the particular equipment specifications. Therefore, operation of the Project would not increase the existing vibration levels in the immediate vicinity of the Project and, as such, vibration impacts associated with the Project would be minimal. Therefore, the ground borne vibration analysis is limited to Project-related construction activities.

THRESHOLDS OF SIGNIFICANCE

In order to assist in determining whether a project would have a significant effect on the environment, the City finds a project may be deemed to have a significant noise impact, if it would result in the:

Threshold 5.7-1: **Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?**

Construction Noise

Section 16.30.130 of the City's Development Code exempts construction noise from its provisions so long as construction activities are limited between the hours of 7:00 AM and 7:00 PM, except on Sundays and holidays. Construction occurring outside of these time periods would be subject to the City's allowable noise levels, which are shown in **Table 3** and discussed above. Additionally, to result in a significant impact from construction noise sources, the Project would have to generate construction noise exceeding the standards identified in **Table 5** above. Additionally, for purposes of this analysis, a construction noise impact would occur if noise levels measured at the property line of affected uses increase to or within the "normally unacceptable" or "clearly unacceptable" land use compatibility category as identified in the City's General Plan Noise Element. Normally acceptable levels for residential uses range from 50 to 60 dBA CNEL and conditionally acceptable between 55 to 70 dBA CNEL.

Operational Noise

To result in a significant impact from operational roadway noise, the proposed Project would have to cause the ambient noise level measured at the property line of affected uses to increase by 3 dBA in CNEL to or within the "normally unacceptable" or "clearly unacceptable" category, or any 5 dBA CNEL or greater noise increase.

The Noise Ordinance does not regulate noise from transportation sources, such as aircraft. However, for purposes of this analysis, noise levels were compared to the City's Noise Standards to determine if increase in noise levels would be considered significant. In addition, the Federal Interagency Committee on Noise (FICON) recommendations were used to determine whether or not increases in operational noise would be considered significant. **Table 8: Significance of Change in Operational Noise Exposure**, shows the significance thresholds for increases in operational noise levels caused by the Project or by cumulative development. If residential development or other sensitive receptors would be exposed to operational noise increases exceeding these criteria, impacts would be considered significant.

Table 8
Significance of Change in Operational Noise Exposure

Ambient Noise Level with Project (Ldn or CNEL)	Significant Impact
< 60 dB	+ 5.0 dB or more
60–65 dB	+ 3.0 dB or more
> 65 dB	+ 1.5 dB or more

Threshold 5.7-2: Generation of excessive groundborne vibration or groundborne noise levels?

The City currently does not have a significance threshold to assess vibration impacts. However, the FTA guidelines set forth in FTA's *Transit Noise and Vibration Assessment guidance document,*[10] are used to evaluate potential impacts related to construction vibration. According to FTA guidelines, impacts relative

10 FTA, *Transit Noise and Vibration Impact Manual*, September 2018, accessed September 2020, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.

to ground-borne vibration associated with potential building damage would be considered significant if any of the following future events were to occur:

- Project construction activities cause ground-borne vibration levels to exceed 0.5 PPV at the nearest off-site reinforced-concrete, steel, or timber building.
- Project construction activities cause ground-borne vibration levels to exceed 0.3 PPV at the nearest off-site engineered concrete and masonry building.
- Project construction activities cause ground-borne vibration levels to exceed 0.2 PPV at the nearest off-site nonengineered timber and masonry building.
- Project construction activities cause ground-borne vibration levels to exceed 0.12 PPV at buildings extremely susceptible to vibration damage, such as historic buildings.

Based on FTA guidance, construction vibration impacts associated with human annoyance would be significant if the following were to occur (applicable to frequent events; 70 or more vibration events per day):

- Project construction activities cause ground-borne vibration levels to exceed 72 VdB at off-site sensitive uses (i.e., residential and hotel uses).

Additionally, the City's Development Code Section 16.30.130(K) prohibits the operation of any device that creates vibration above the City's established perception threshold of 0.01 in/sec over the range of one to 100 hertz.

Threshold 5.7-3: **For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project are to excessive noise levels?**

The Project Site is not located within the vicinity of a private airstrip. The nearest airport is the French Valley Airport, which is located approximately three miles to the northeast; the Project Site is outside the Airport Influence Area Boundary for French Valley Airport.[11] Therefore, the Project Site is not located within an airport land use plan or within two miles of a public airport. No impact related to the exposure of people residing or working in the area to excessive noise levels would occur.

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11 Riverside County Airport Land Use Commission, *Compatibility Plan*, accessed September 2020, http://www.rcaluc.org/Plans/New-Compatibility-Plan

F. IMPACT ANALYSIS

1. Construction

Noise from Project construction activities would be affected by the amount of construction equipment, the location of this equipment, the timing and duration of construction activities, and the relative distance to noise-sensitive receptors. Construction activities that would occur during the construction phases would generate both steady-state and episodic noise that would be heard both on and off the Project Site. Each phase involves the use of different types of construction equipment and, therefore, has its own distinct noise characteristics. The Project would be constructed using typical construction techniques; no blasting or impact pile driving would be required.

a. On-Site Construction Noise

Individual pieces of construction equipment that would be used during construction produce maximum noise levels of 73 dBA to 85 dBA at a reference distance of 50 feet from the noise source, as shown in **Table 9: Typical Maximum Noise Levels for Project Construction Equipment**.

Table 9
Typical Maximum Noise Levels for Project Construction Equipment

Equipment Description	Typical Duty Cycle (%)	Spec Lmax (dBA)[a]	Actual Lmax (dBA)[a]
Air Compressor	40	80.0	77.7
Backhoe	40	80.0	77.6
Crane	16	85.0	80.6
Dozer	40	85.0	81.7
Forklift	40	85.0	N/A
Generator	50	82.0	80.6
Grader	40	85.0	N/A
Loader	40	80.0	79.1
Paver	50	85.0	77.2
Roller	20	85.0	80.0
Tractor	40	84.0	N/A
Trenchers	50	82.0	80.4
Welder	40	73.0	74.0

Source: FHWA Roadway Construction Noise Model (RCNM) version 1.1
Note: N/A = not available.
[a] Lmax sound levels are measured 50 feet from the source of the equipment.

These construction equipment reference noise levels are based on measured noise data compiled by the FHWA and would occur when equipment is operating under full power conditions. However, equipment used on construction sites typically operate at less than full power. The acoustical usage factor is the percentage of time that each type of construction equipment is anticipated to be in full power operation during a typical construction day. These values are estimates and will vary based on the actual construction process and schedule.

Construction equipment operates at its noisiest levels for certain percentages of time during operation. It is important to note, equipment would operate at different percentages over the course of an hour.[12] During a construction day, the highest noise levels would be generated when multiple pieces of construction equipment are operated concurrently.

To characterize construction-period noise levels, the average (hourly Leq) noise level associated with each construction stage was calculated based on the quantity, type, and usage factors for each type of equipment that would be used during each construction stage. These noise levels are typically associated with multiple pieces of equipment operating simultaneously.

The estimated construction noise levels were calculated for a scenario in which a reasonable number of construction equipment was assumed to be operating simultaneously, given the physical size of the Project Site and logistical limitations, and with the noise equipment located at the construction area nearest to the affected receptors to present a conservative impact analysis. This is considered a worst-case evaluation because construction of the Project would typically use fewer pieces of equipment simultaneously at any given time and, as such, would likely generate lower noise levels than reported herein.

Separate forecasts of construction noise levels from on-site construction at each of the noise monitoring sites within the immediate vicinity were completed. The forecast noise levels at the nearest residential uses (Site 1 through 4) and the adjacent hospital use to the south (Site 5) to the Project Site from construction activity are shown in **Table 10: Construction Maximum Noise Estimates**. Average noise levels for each construction phase would range between 39 dBA to 69 dBA at the identified receptors. The loudest anticipated phase is grading, where the residential uses (Site 2) could be exposed to noise levels of up to an average of 60 dBA and the adjacent hospital to the south (Site 5) could be exposed to noise levels of 69 dBA. Consequently, noise levels at the adjacent residential uses would remain within normally acceptable levels of 50 to 60 dBA CNEL and conditionally acceptable levels of 55 to 70 dBA CNEL for residential uses and within the normally acceptable levels of 50 70 dBA CNEL and conditionally acceptable levels of 60 to 70 dBA CNEL for hospital uses. As such, construction noise impacts would not be considered significant.

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12 Federal Highway Administration, Traffic *Noise Model (2006).*

Table 10
Construction Maximum Noise Estimates

Construction Activity	Sound Level at Various Receptor Distances from Construction Activities, dBA									
	Site 1		Site 2		Site 3		Site 4		Site 5	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Utilities – Storm Drains	46	43	54	51	52	49	48	45	68	65
NICU Renovation	43	41	52	49	50	47	45	43	66	63
Helipad Construction	49	50	58	59	56	57	52	52	62	62
Kitchen Service Renovation	43	41	52	49	50	47	45	43	66	63
Grading – Expansion	50	51	59	60	57	58	53	53	68	69
Building Construction	50	51	59	59	57	57	53	53	68	69
Canopy - New	50	51	59	59	57	57	53	53	68	69
Paving - Parking	49	48	58	57	56	55	52	51	69	68
Architectural Coating	43	39	52	48	50	46	45	41	66	62

Source: RCNM Version 1.1
*Refer to **Appendix C.1** through **C.9** for construction noise worksheets.*

b. Off-Site Construction Noise

Construction of the Project would require haul and vendor truck trips to and from the site to export soil and delivery supplies to the site. Trucks traveling to and from the Project Site would be required to travel along a haul route approved by the City. At the maximum, 20 worker trips per day and 18 vendor trips per day would occur during the building construction and canopy phase. Additionally, 579 total hauling trips (53 hauling trips per day) would occur during grading – expansion phase.

Noise associated with construction trips were estimated using the Caltrans FHWA Traffic Noise Model based on the maximum number of worker and hauling trips in a day. 38 trips per day (20 worker and 18 vendor) would generate roadway noise levels of approximately 38.6 dBA CNEL measured at a distance of 75 feet. The 53 hauling trips per day would generate roadway noise levels ranging from 49.6 dBA to 54.5 dBA at a distance of 75 feet, depending on the use of medium or heavy duty trucks. As shown in **Table 3** above, daytime ambient noise measurements ranged from a low of 55.2 dBA at Site 2 to a high of 69.2 dBA at Site 1. Off-site construction noise levels would be below the existing ambient noise environment. As such, off-site construction noise impacts would not be considered significant.

2. Construction Vibration

a. On-Site Construction Vibration

Table 11: On-Site Construction Vibration Impacts–Building Damage and Table 12: On-Site Construction Vibration Impacts–Human Annoyance presents the construction vibration impacts associated with on-site construction in terms of building damage and human annoyance, respectively. As shown in Table 11, the forecasted vibration levels due to on-site construction activities would not exceed the building damage significance threshold of 0.12 PPV ips for all sites surrounding the Project area during construction. Due to the distance of the Project-identified sensitive receptors, changes in elevations, and intervening structures, such as buildings and walls, on-site construction vibration would not result in a significant vibration impact with regard to building damage. Impacts related to building damage from on-site construction vibration would not be considered significant.

As shown in **Table 12**, the forecasted vibration levels due to on-site construction activities would range from a low of -4 VdB to a high of 67 VdB and would not exceed human annoyance significance threshold of 72 VdB. Due to the distance of the Project-identified sensitive receptors, changes in elevations, and intervening structures, such as buildings and walls, on-site construction vibration would not result in a significant vibration impact with regard to human annoyance. Impacts related to human annoyance from on-site construction vibration would be less than significant.

Table 11
On-Site Construction Vibration Impacts – Building Damage

Nearest Off-Site Building Structures	Estimated Vibration Velocity Levels at the Nearest Off-Site Structures from the Project Construction Equipment						Significance Threshold (PPV ips)	Exceeds Threshold?
	Vibratory Roller	Large Bulldozer	Caisson Drilling	Loaded Trucks	Jack-hammer	Small bulldozer		
FTA Reference Vibration Levels at 25 feet								
	0.210	*0.089*	*0.089*	*0.076*	*0.035*	*0.003*	—	
Site 1	0.000	0.000	0.000	0.000	0.000	0.000	0.12	**No**
Site 2	0.001	0.000	0.000	0.000	0.000	0.000	0.12	**No**
Site 3	0.000	0.000	0.000	0.000	0.000	0.000	0.12	**No**
Site 4	0.000	0.000	0.000	0.000	0.000	0.000	0.12	**No**
Site 5	0.002	0.001	0.001	0.001	0.000	0.000	0.12	**No**

Source: US Department of Transportation, Federal Transportation Authority, Transit Noise and Vibration Impact Assessment.
Note: Refer to ***Appendix D*** *for construction vibration worksheets.*

Table 12
On-Site Construction Vibration Impacts – Human Annoyance

Nearest Off-Site Building Structures	Estimated Vibration Velocity Levels at the Nearest Off-Site Structures from the Project Construction Equipment						Significance Threshold (VdB)	Exceeds Threshold?
	Vibratory Roller	Large Bulldozer	Caisson Drilling	Loaded Trucks	Jack-hammer	Small bulldozer		
FTA Reference Vibration Levels at 25 feet								
	94	*87*	*87*	*86*	*79*	*58*	—	
Site 1	33	26	26	25	18	-4	72	**No**
Site 2	46	39	39	38	31	9	72	**No**
Site 3	43	36	36	35	28	7	72	**No**
Site 4	37	29	29	28	21	0	72	**No**
Site 5	67	60	60	58	52	30	72	**No**

Source: US Department of Transportation, Federal Transportation Authority, Transit Noise and Vibration Impact Assessment.
Note: Refer to ***Appendix D*** *for construction vibration worksheets.*

b. Off-Site Construction Vibration

In addition to on-site construction activities, construction delivery/haul trucks would generate ground-borne vibration as they travel along the Projects anticipated off-site truck travel routes. Based on the FTA data, the vibration generated by a typical loaded truck would be approximately 0.0076 PPV at a distance of 25 feet from the truck.[13] This forecasted vibration level would be well below the most stringent building damage criteria of 0.12 PPV. The nearest vibration sensitive uses (e.g., residential) are located to the west of the RSMC campus along Walsh Center Drive. These are located more than 25 feet from the truck travel pathway which would occur along Murrieta Hot Springs Road to the I-215 Freeway. Therefore, vibration impacts with respect to building damage and human annoyance from off-site construction truck travel on public roadways would not be considered significant.

3. Operation

a. Roadway Noise

As mentioned previously, to estimate noise level increase and impacts due to the Project, noise level increases were calculated from the traffic volumes obtained in the transportation impact analysis prepared by LLG dated July 16, 2020. **Table 13: Future (Year 2023) plus Project** illustrates the change in noise levels from traffic volumes and from traffic generated by the Project. The difference in traffic noise between Future (Year 2023) conditions and Future (Year 2023) plus Project conditions represents the increase in

13 FTA, *Transit Noise and Vibration Impact Assessment Manual,* September 2018, accessed May 2020, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

noise attributable to Project-related traffic. As shown in **Table 13**, the maximum noise level increase during the daytime and nighttime period along analyzed roadways would be 0.4 dB along Medical Center Drive east of Hancock Avenue. Consequently, Project-related traffic would not cause noise levels along the analyzed roadways to increase by more than 3.0 dBA. Thus, the Proposed Project would not result in a permanent increase in noise levels above ambient levels in the vicinity of the Project Site in excess of the City's Noise Element and Noise Ordinance. Vehicular related noise impacts would not be considered significant.

Table 13
Future (Year 2023) plus Project

Roadway Segment	Time Period	Future (Year 2023) Without Project	Future (Year 2023) With Project	Difference	Significant Impact?
Hancock Avenue					
Murrieta Hot Springs Road to Medical Center Drive	Daytime	69.5	69.6	+0.1	**No**
	Nighttime	62.0	62.1	+0.1	**No**
Medical Center Drive to Walsh Center Drive	Daytime	69.1	69.1	0.0	**No**
	Nighttime	61.6	61.6	0.0	**No**
Murrieta Hot Springs Road					
East of Hancock Avenue	Daytime	73.7	73.7	0.0	**No**
	Nighttime	66.1	66.2	+0.1	**No**
West of Hancock Avenue	Daytime	73.4	73.4	0.0	**No**
	Nighttime	65.8	65.8	0.0	**No**
Medical Center Drive					
East of Hancock Avenue	Daytime	56.7	57.1	+0.4	**No**
	Nighttime	49.2	49.6	+0.4	**No**
West of Hancock Avenue	Daytime	56.4	56.4	0.0	**No**
	Nighttime	48.9	48.9	0.0	**No**
Walsh Center Drive					
West of Hancock Avenue	Daytime	54.2	54.2	0.0	**No**
	Nighttime	46.6	46.6	0.0	**No**

Source: Refer to ***Appendix B.1*** *for roadway noise worksheets*

b. Helicopter Noise

For the helicopter approach, once a ground speed of 0 is reached, the helicopter begins vertical descent to the landing pad, which takes approximately 15 seconds. Once on the helipad surface, the helicopter undergoes a 30-second ground idle. Following the idle period, the helicopter is shut down. Overall, the entire duration of the helicopter approach takes under 2 minutes.

For the helicopter departure, start-up and flight checks are performed during the ground-idle phase, which typically lasts up to 3 minutes. Following the flight checks and start-up, the rotor blades begin turning at full power, hover is initiated, and the aircraft ascends vertically above the pad, which lasts approximately 15 seconds. Once desired altitude is reached, the helicopter accelerates horizontally and departs the Project Site. Overall, the main noise-producing portion of the departure to altitude and cruising speed from initial start-up takes under 1 minute, with surrounding land uses exposed to maximum sound levels for less than 15 seconds during this period.

Based on previous data provided regarding flight operations, a maximum of two (2) flights have taken place from RSMC between the daytime hours of 7:00 AM to 10:00 PM on any given day and a maximum of one (1) flight has taken place between the nighttime hours of 10:00 PM to 7:00 AM on any given day. Therefore, to simulate worst-case scenario helicopter approach/departure impacts, it was assumed four (4) events (2 approach and 2 departure) would take place during the daytime period and two (2) events (1 approach and 1 departure) would take place during the nighttime period on the same day.

Helicopters are designated with maximum takeoff weight (MTOW) classes. The EC-35 has a MTOW of approximately 2,800 kilograms (6,173 pounds) and the EC-145 has a MTOW of approximately 3,585 kilograms (7,904 pounds).

i. Helicopter Approach/Departure (North)

As shown in **Table 14: Exterior Noise Levels – Flight Path to the North**, the EC 135 helicopter would result in a maximum increase of 0.1 dBA during the nighttime period (10:00 PM to 7:00 AM). The results of the predictive modeling process during the daytime and nighttime period for the EC 135 helicopter are shown graphically in **Figure 6: EC 135 Flight Path to the North Contour Map (Daytime)** and **Figure 7: EC 135 Flight Path to the North Contour Map (Nighttime)**.

Additionally, the EC 145 helicopter would result in a maximum increase of 0.2 dBA during the nighttime period (10:00 PM to 7:00 AM). The results of the predictive modeling process during the daytime and nighttime period for the EC 145 helicopter are shown graphically in **Figure 8: EC 145 Flight Path to the North Contour Map (Daytime)** and **Figure 9: EC 145 Flight Path to the North Contour Map (Nighttime)**.

No increases would result during the daytime period for both the EC 135 and EC 145 helicopters flight path to the north. Residential development or other sensitive receptors would not be exposed to operational noise increases exceeding the criteria identified in **Table 4** above. As such, impacts would not be considered significant.

Table 14
Exterior Noise Levels – Flight Path to the North

ID	Time Period	Ambient Noise Levels (dBA)	Modeled Noise Levels (dBA)	Ambient plus Modeled Noise Levels (dBA)	Increase Above Ambient (dBA)	Significant Impact?
EC 135						
Site 1	Daytime	69.2	19.0	69.2	0.0	**No**
	Nighttime	56.4	15.2	56.4	0.0	**No**
Site 2	Daytime	55.2	25.0	55.2	0.0	**No**
	Nighttime	46.1	21.2	46.1	0.0	**No**
Site 3	Daytime	57.6	28.8	57.6	0.0	**No**
	Nighttime	41.6	25.0	41.7	+0.1	**No**
Site 4	Daytime	67.3	30.1	67.3	0.0	**No**
	Nighttime	48.4	26.3	48.4	0.0	**No**
Site 5	Daytime	55.0	29.7	55.0	0.0	**No**
	Nighttime	55.0	25.9	55.0	0.0	**No**
EC 145						
Site 1	Daytime	69.2	21.6	69.2	0.0	**No**
	Nighttime	56.4	17.8	56.4	0.0	**No**
Site 2	Daytime	55.2	27.6	55.2	0.0	**No**
	Nighttime	46.1	23.8	46.1	0.0	**No**
Site 3	Daytime	57.6	31.4	57.6	0.0	**No**
	Nighttime	41.6	27.6	41.8	+0.2	**No**
Site 4	Daytime	67.3	32.7	67.3	0.0	**No**
	Nighttime	48.4	28.9	48.4	0.0	**No**
Site 5	Daytime	55.0	34.0	55.0	0.0	**No**
	Nighttime	55.0	30.2	55.0	0.0	**No**

Note: Source: SoundPLAN version 8.2
Refer to ***Appendix B.2*** *for SoundPLAN Output Sheets.*

ii. Helicopter Approach/Departure (South)

As shown in **Table 15: Exterior Noise Levels –Flight Path to the South**, the EC 135 helicopter would result in a maximum increase of 0.1 dBA during the nighttime period (10:00 PM to 7:00 AM).

Table 15
Exterior Noise Levels – Flight Path to the South

ID	Time Period	Ambient Noise Levels	Modeled Noise Levels	Ambient plus Modeled Noise Levels	Increase Above Ambient	Significant Impact?
		dBA				
EC 135						
Site 1	Daytime	69.2	29.8	69.2	0.0	**No**
	Nighttime	56.4	26.0	56.4	0.0	**No**
Site 2	Daytime	55.2	25.7	55.2	0.0	**No**
	Nighttime	46.1	21.9	46.1	0.0	**No**
Site 3	Daytime	57.6	27.7	57.6	0.0	**No**
	Nighttime	41.6	23.9	41.7	+0.1	**No**
Site 4	Daytime	67.3	20.7	67.3	0.0	**No**
	Nighttime	48.4	16.9	48.4	0.0	**No**
Site 5	Daytime	55.0	32.3	55.0	0.0	**No**
	Nighttime	55.0	28.5	55.0	0.0	**No**
EC 145						
Site 1	Daytime	69.2	32.4	69.2	0.0	**No**
	Nighttime	56.4	28.6	56.4	0.0	**No**
Site 2	Daytime	55.2	28.3	55.2	0.0	**No**
	Nighttime	46.1	24.5	46.1	0.0	**No**
Site 3	Daytime	57.6	30.3	57.6	0.0	**No**
	Nighttime	41.6	26.5	41.7	+0.1	**No**
Site 4	Daytime	67.3	23.3	67.3	0.0	**No**
	Nighttime	48.4	19.5	48.4	0.0	**No**
Site 5	Daytime	55.0	36.6	55.1	+0.1	**No**
	Nighttime	55.0	32.8	55.0	0.0	**No**

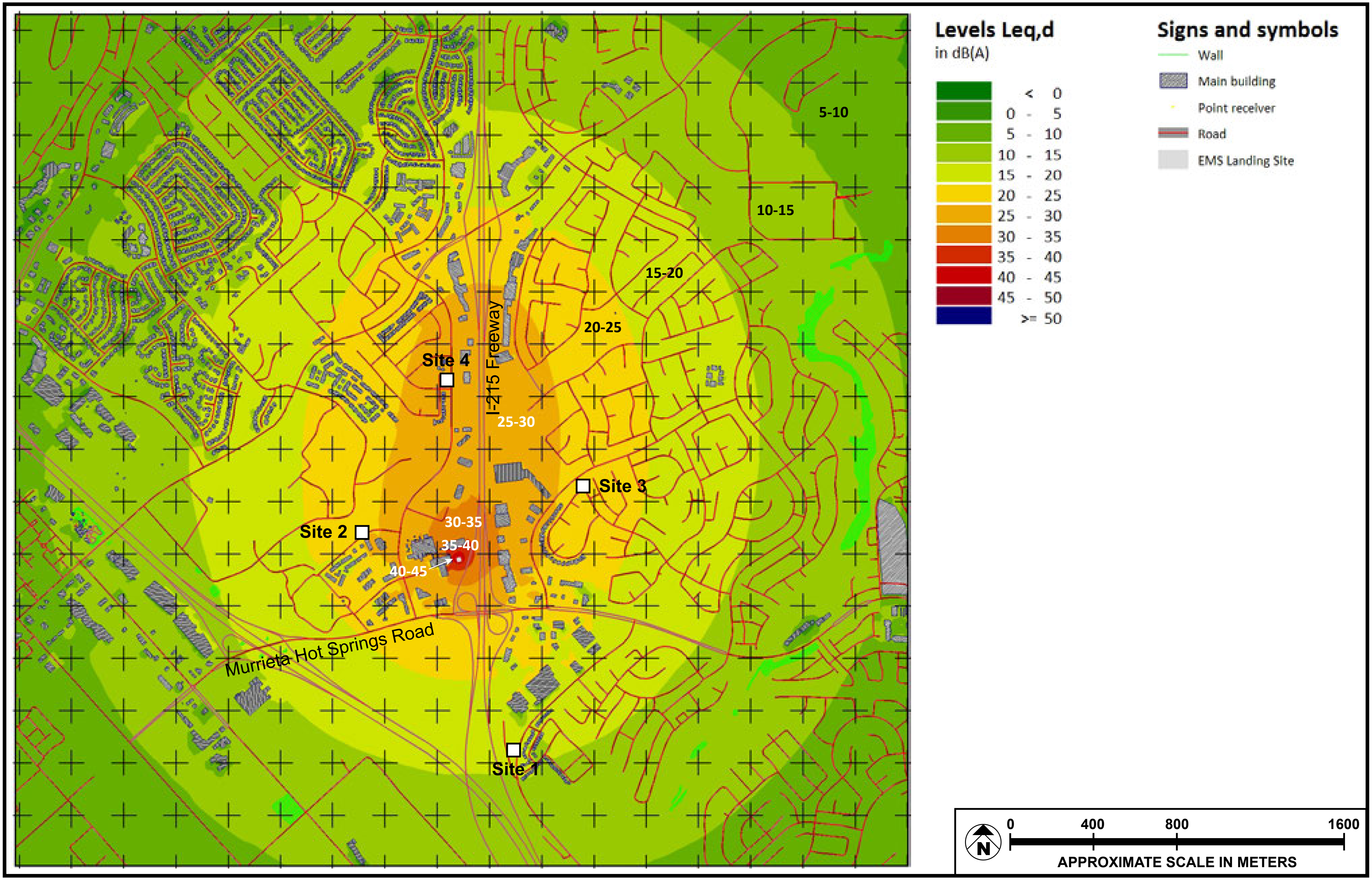
Note: Source: SoundPLAN version 8.2
*Refer to **Appendix B.2** for SoundPLAN Output Sheets.*

The results of the predictive modeling process during the daytime and nighttime period for the EC 135 helicopter are shown graphically in **Figure 10: EC 135 Flight Path to the South Contour Map (Daytime)** and **Figure 11: EC 135 Flight Path to the South Contour Map (Nighttime)**.

Additionally, the EC 145 helicopter would result in a maximum increase of 0.1 dBA during the nighttime period (10:00 PM to 7:00 AM). The results of the predictive modeling process during the daytime and nighttime period for the EC 145 helicopter are shown graphically in **Figure 12: EC 145 Flight Path to the North Contour Map (Daytime)** and **Figure 13: EC 145 Flight Path to the North Contour Map (Nighttime)**.

No increases would result during the daytime period for both the EC 135 and EC 145 helicopters flight path to the south. Residential development or other sensitive receptors would not be exposed to operational noise increases exceeding the criteria identified in **Table 4** above. As such, impacts would not be considered significant.

The hospital would be required to comply with California's noise insulation standards which are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2, California Building Code. These noise standards are applied to new construction in California for the purpose of interior noise compatibility from exterior noise sources. As mentioned previously, the regulations specify buildings shall be designed to limit interior noise in habitable rooms to acceptable noise levels. For hospitals, the acceptable interior noise limit for new construction is 45 dBA CNEL. With the existing EMS Landing Site located with a direct line of sight to the south entrance of Women's Center, current interior noise levels do not exceed the interior noise limit of 45 dBA CNEL. As the EMS Landing Site would be relocated to the east portion of the Women's Center and adjacent to the I-215 Freeway to the east, interior noise levels would be further reduced as the landing site would not be located within a direct line of sight. As such, interior noise levels would remain within acceptable limits.



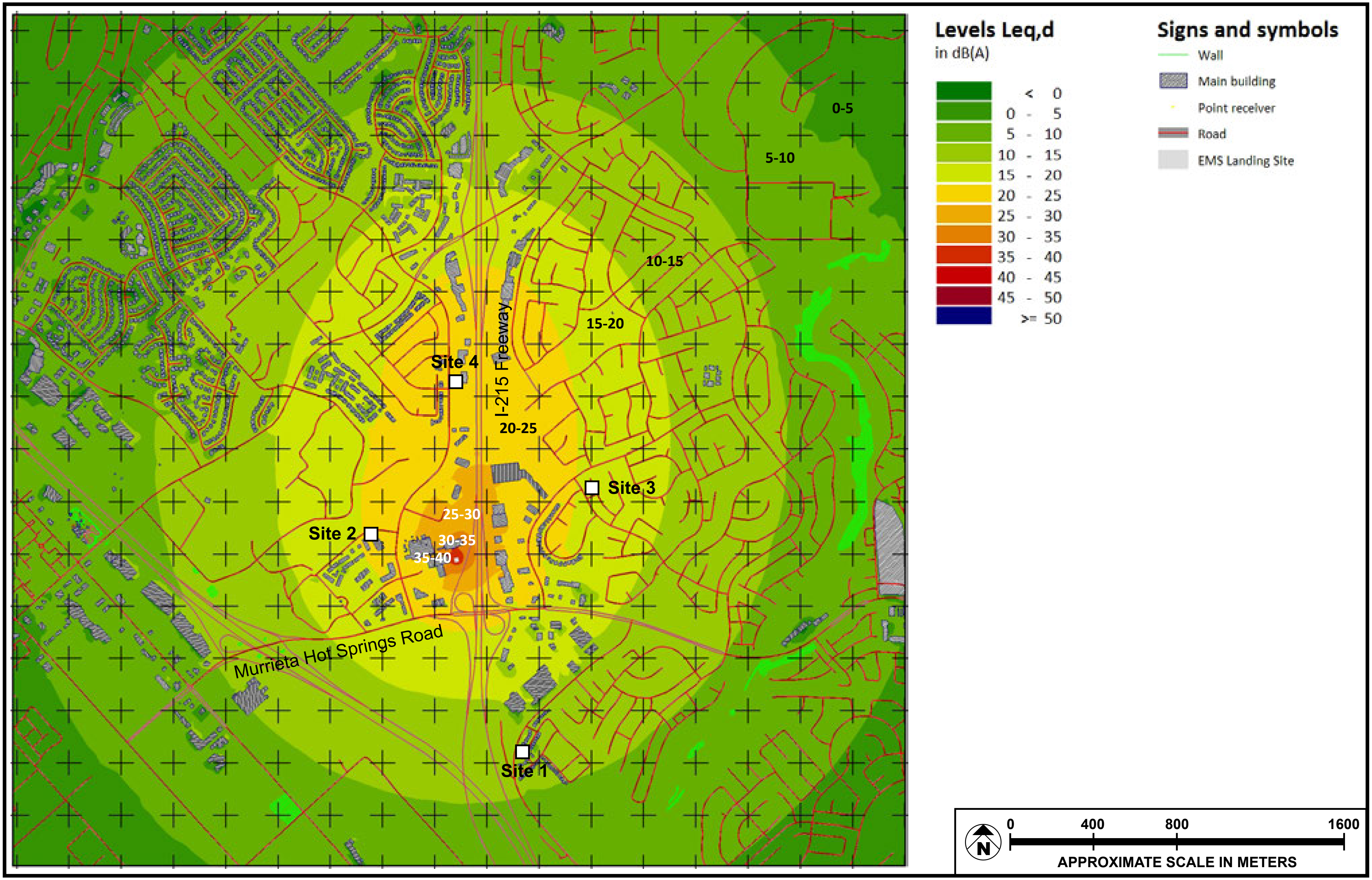
SOURCE: Google Earth - 2020

FIGURE **6**

Meridian Consultants

EC 135 Flight Path to the North Contour Map (Daytime)

291-001-20



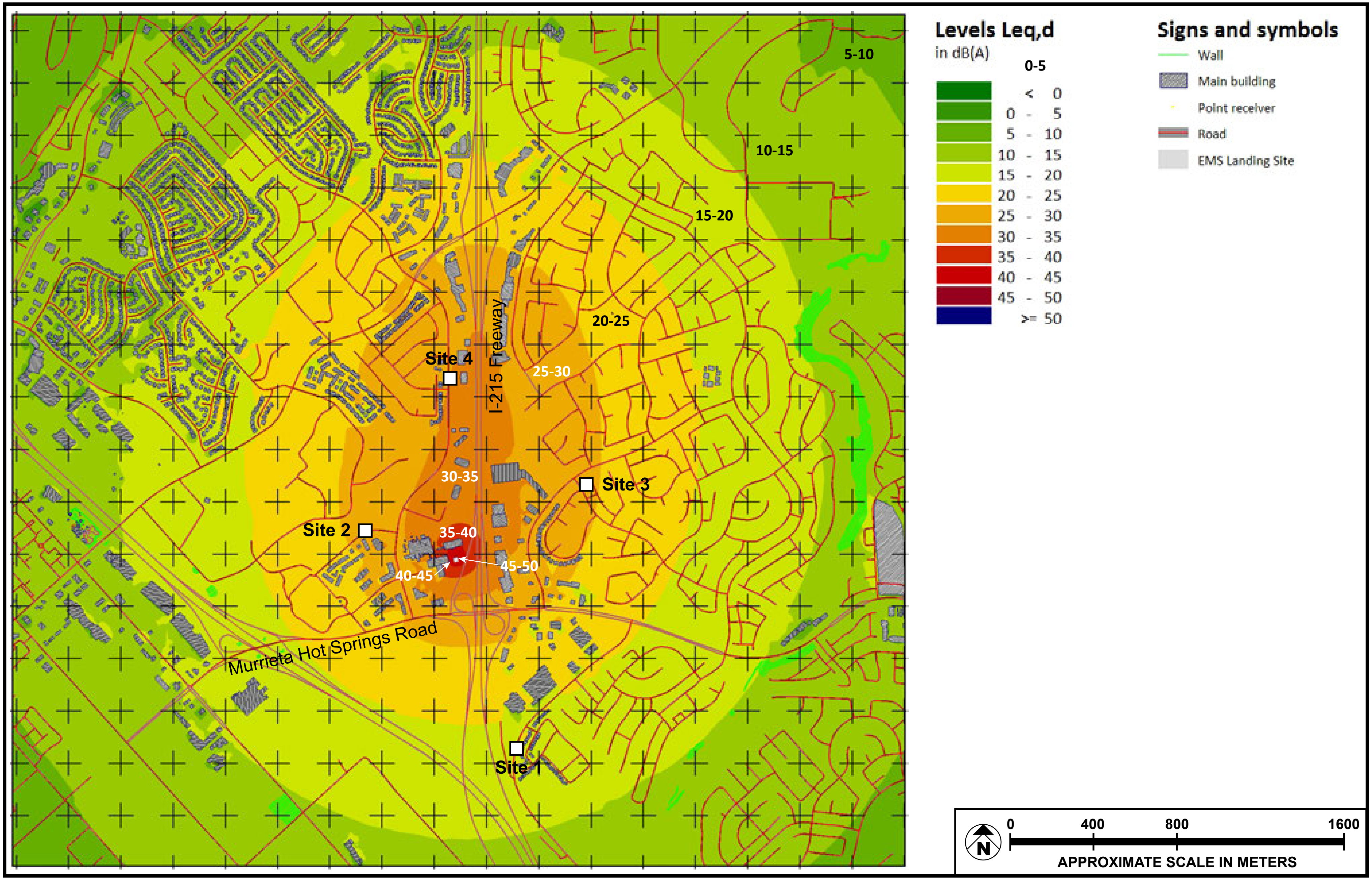
SOURCE: Google Earth - 2020

FIGURE 7

Meridian Consultants

EC 135 Flight Path to the North Contour Map (Nighttime)

291-001-20



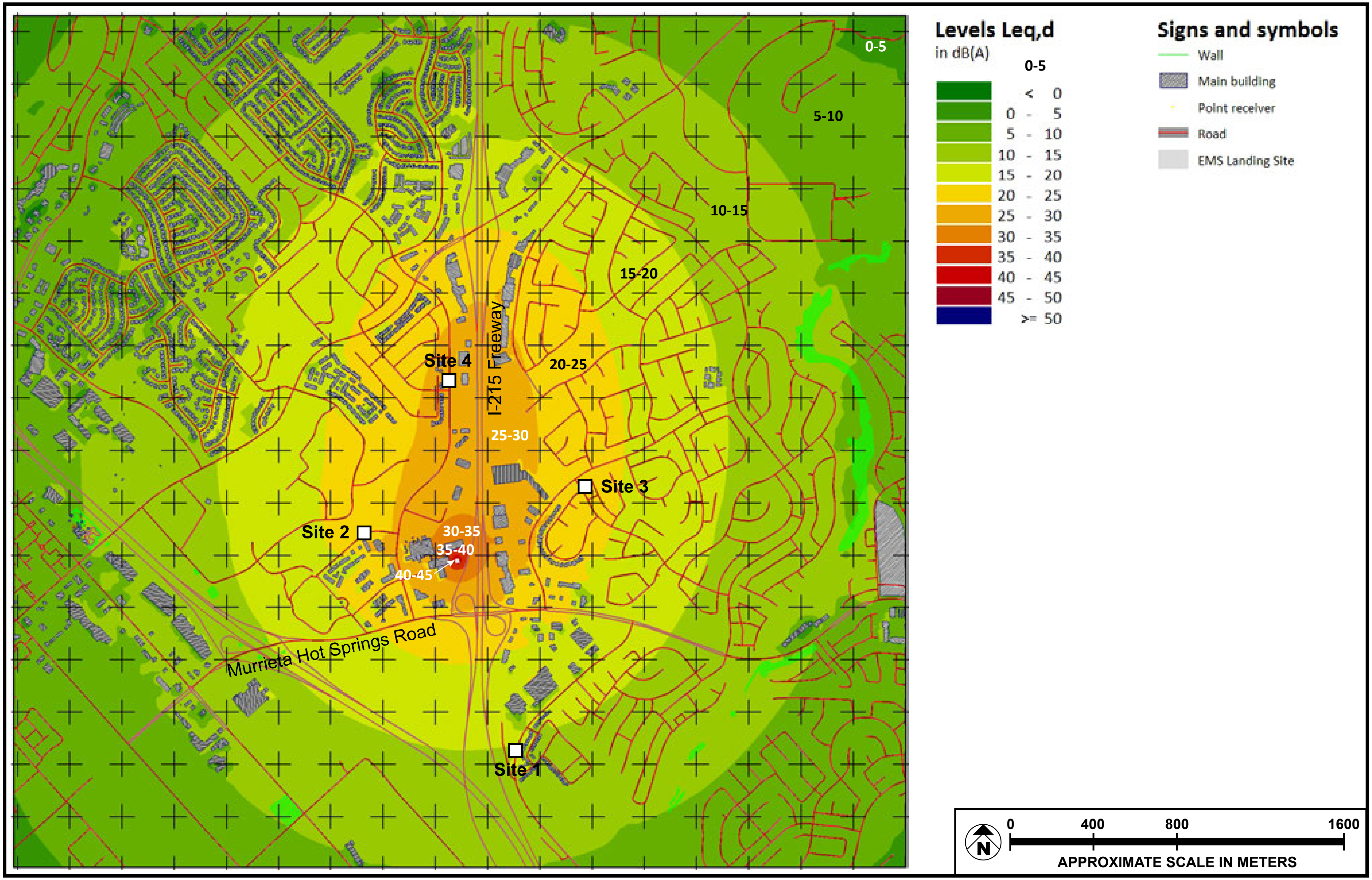
SOURCE: Google Earth - 2020

FIGURE **8**

Meridian Consultants

EC 145 Flight Path to the North Contour Map (Daytime)

291-001-20

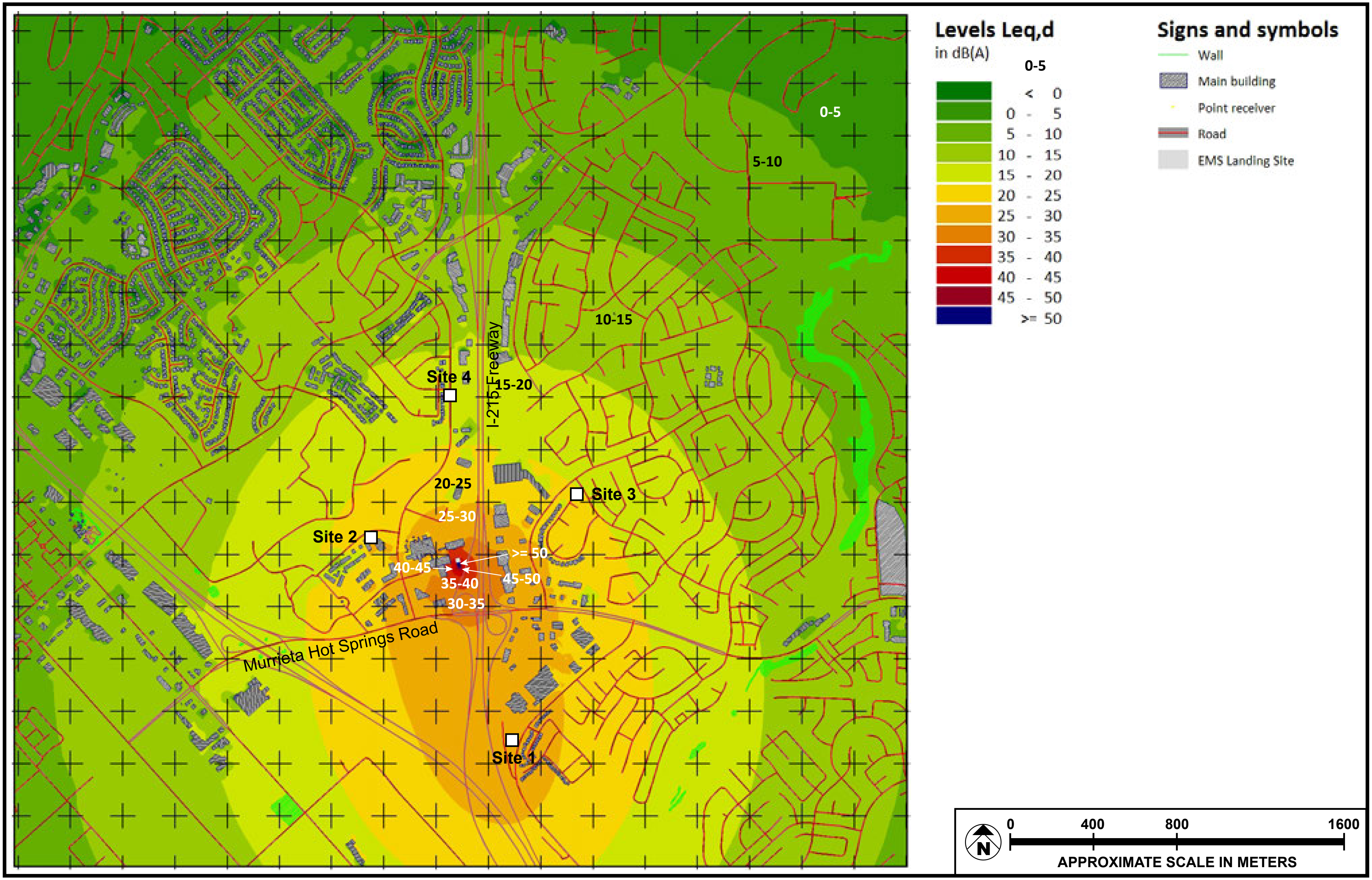


SOURCE: Google Earth - 2020

FIGURE **9**

Meridian Consultants

EC 145 Flight Path to the North Contour Map (Nighttime)



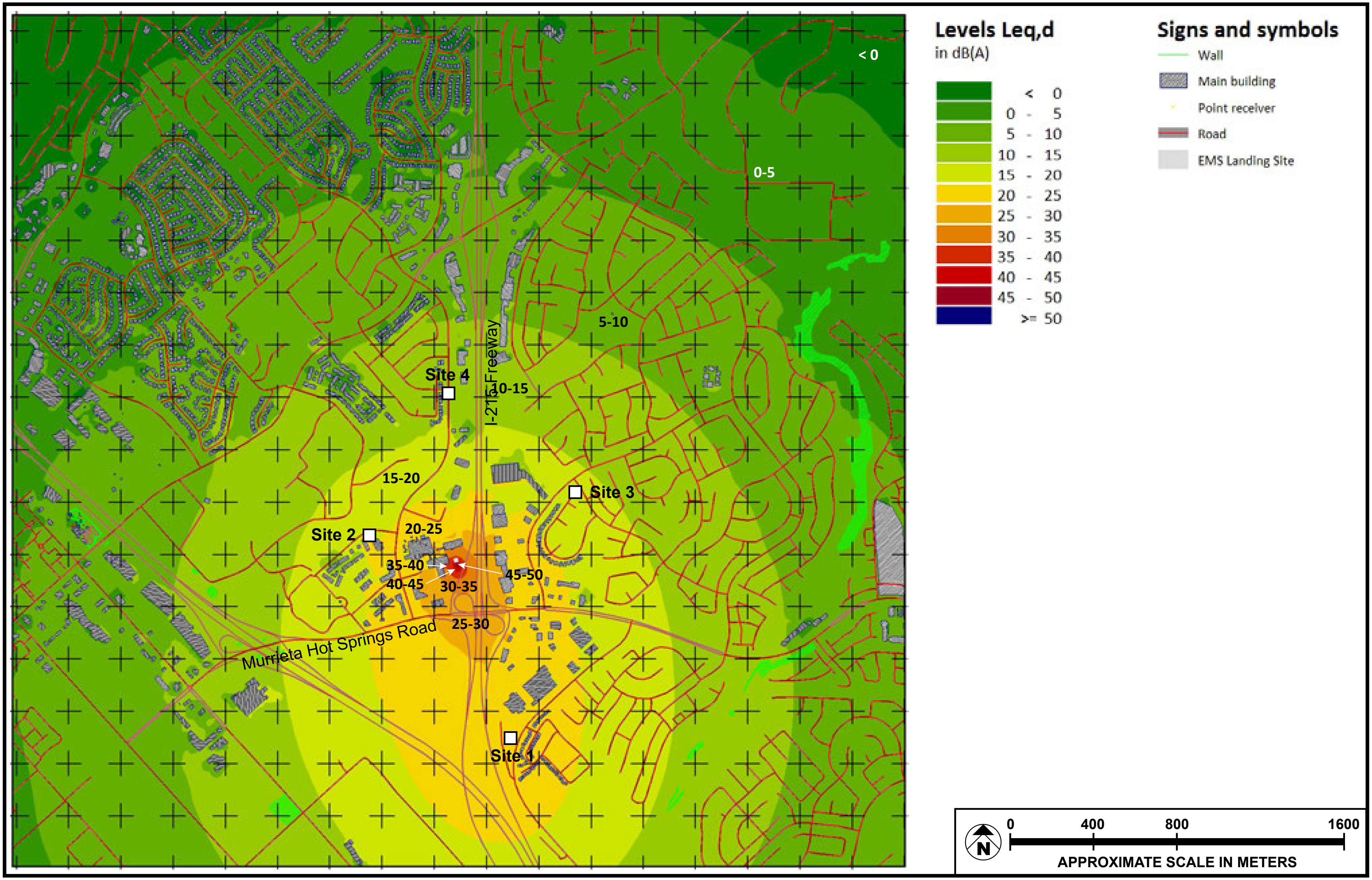
SOURCE: Google Earth - 2020

FIGURE **10**

Meridian Consultants

EC 135 Flight Path to the South Contour Map (Daytime)

291-001-20



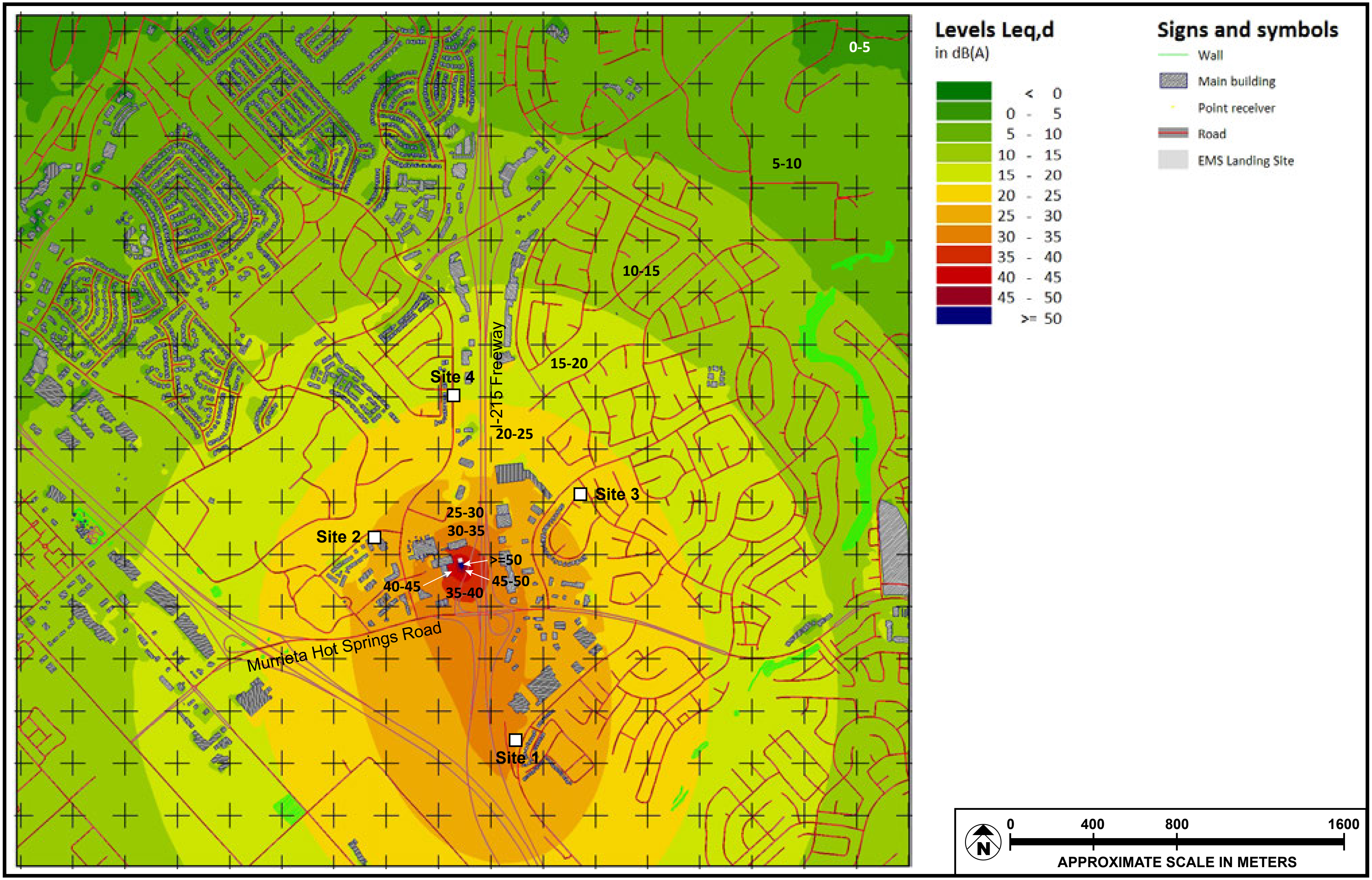
SOURCE: Google Earth - 2020

FIGURE **11**

Meridian Consultants

EC 135 Flight Path to the South Contour Map (Nighttime)

291-001-20



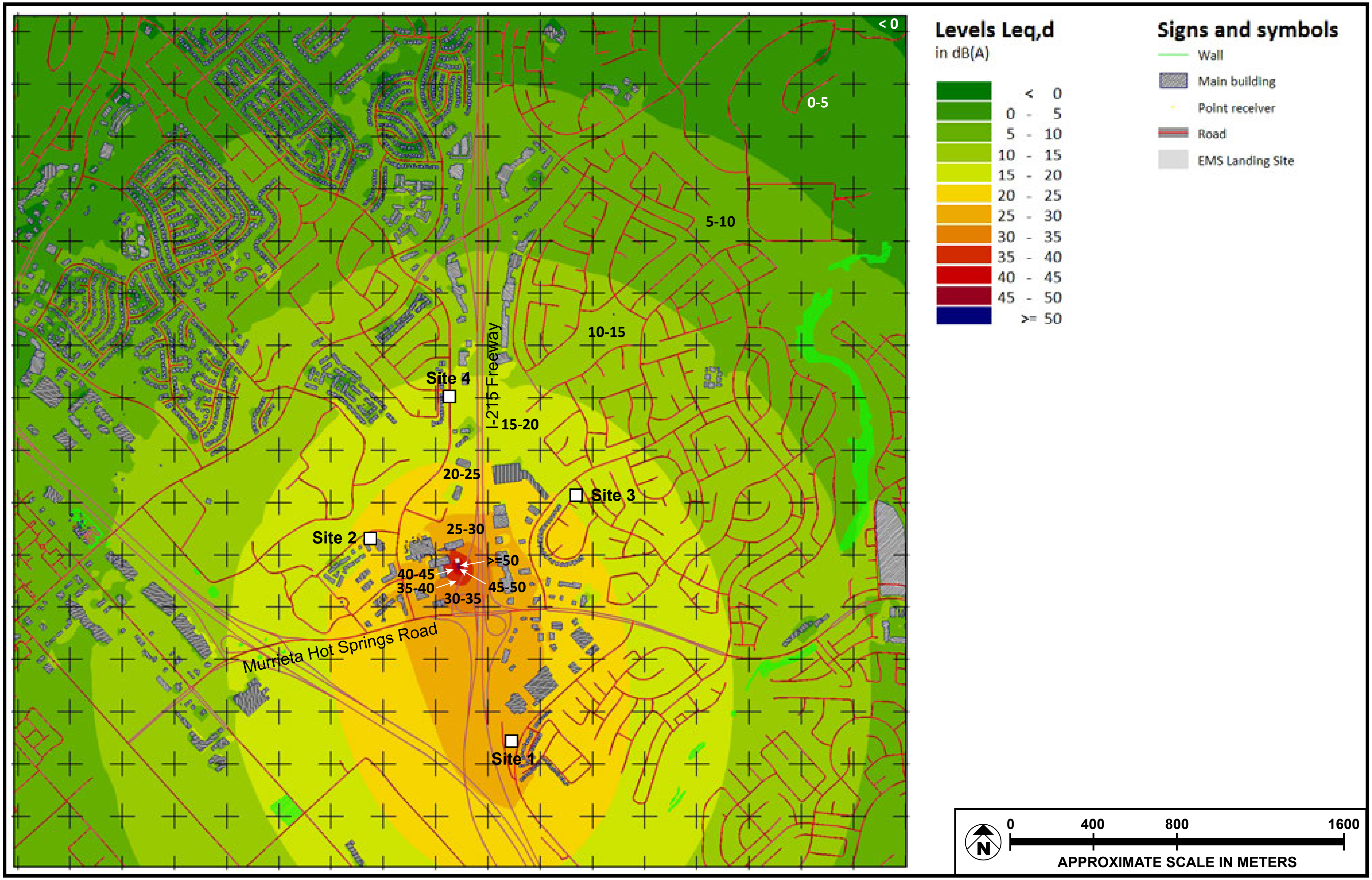
SOURCE: Google Earth - 2020

FIGURE **12**

Meridian Consultants

EC 145 Flight Path to the South Contour Map (Daytime)

291-001-20



SOURCE: Google Earth - 2020

FIGURE **13**

Meridian Consultants

EC 145 Flight Path to the South Contour Map (Nighttime)

291-001-20

4. General Plan Consistency

The Project would be consistent with the policies identified in the City's Noise Element, as identified in **Table 16: General Plan Noise Element Applicable Policies**.

Table 16
General Plan Noise Element Applicable Policies

Policies		Consistency
N-1.1	**Comply with the Land Use Compatibility for Community Noise Environments**	**Consistent.** As indicated in **Table 14** and **Table 15**, the helicopter approach and departure from the north and south would not result in an increase in ambient noise measurements at any of the nearby sensitive receptors and thus would be below the FICON-recommended 3.0 dB threshold for ambient noise of 60–65 dB CNEL, and the 1.5 dB threshold for ambient noise greater than 65 dB CNEL. The Project would not exceed the land use compatibility criteria.
N-1.2	**Protect schools, hospitals, libraries, churches, convalescent homes, and other noise sensitive uses from excessive noise levels by incorporating site planning and project design techniques to minimize noise impacts. The use of noise barriers shall be considered after all practical design-related noise measures have been integrated into the project. In cases where sound walls are necessary, they should help create an attractive setting with features such as setbacks, changes in alignment, detail and texture, murals, pedestrian access (if appropriate), and landscaping**	**Consistent.** The Project would not generate noise levels in excess of City standards. Overall, the noise generated by the helicopter approach/departure from the north/south would be similar to that for existing conditions. Noise from flights would occur for a relatively short period of time and would be infrequent; therefore, noise levels would not exceed the City's Noise Ordinance thresholds at any period of time.
N-2.2	**Integrate noise considerations into land use planning decisions to prevent new noise/land use conflicts**	**Consistent.** Flight paths would be approved by the City through the CUP. Pilots would be committed to use only the prescribed flight paths from the northeast and southeast to prevent new noise/land use conflicts.
N-2.3	**Consider the compatibility of proposed land uses with the noise environment when preparing, revising, or reviewing development proposals**	**Consistent.** The continued use of the EMS Landing Site was analyzed and summarized in this noise report The proposed Project would not conflict with surrounding land uses and land uses along the proposed flight paths. Pilots would be committed to use only the prescribed flight paths from the northeast and southeast to prevent exceedance of City standards.
N-2.4	**Encourage proper site planning and architecture to reduce noise impacts**	**Consistent.** The continued use of the EMS Landing Site was analyzed and summarized in this noise report. The proposed Project would not conflict with surrounding land uses and land uses along the proposed flight paths. Pilots would be committed to use only the prescribed flight paths from the northeast and southeast to prevent exceedance of City standards.

G. CONCLUSIONS

As shown in **Table 10**, average noise levels for each construction phase would range between 39 dBA to 69 dBA at the identified receptors. Consequently, noise levels at the adjacent residential uses would remain within normally acceptable levels of 50 to 60 dBA CNEL and conditionally acceptable levels of 55 to 70 dBA CNEL and within the normally acceptable levels of 50 70 dBA CNEL and conditionally acceptable levels of 60 to 70 dBA CNEL for the adjacent hospital uses to the south. Construction noise impacts would not be considered significant.

As shown in **Table 11** and **Table 12**, the forecasted vibration levels due to on-site construction activities would not exceed the building damage significance threshold of 0.12 PPV ips and human annoyance significance threshold of 72 VdB for all sites surrounding the Project area during construction.

As shown in **Table 13**, Project-related traffic would not cause noise levels along the analyzed roadways to increase by more than 3.0 dBA. Vehicular related noise impacts would not be considered significant.

As shown in **Table 14** and **Table 15**, residential development or other sensitive receptors would not be exposed to operational noise increases exceeding the criteria identified in Table 4 above. Helicopter noise impacts would not be considered significant.

APPENDIX A

Noise Measurements

APPENDIX A.1

Long-Term (CNEL) Noise Measurements (2016)

Rancho Springs Medical Center
Ldn/CNEL Conversion of Monitored Leq's
Existing Conditions

Monitoring Location: Site 1
Primary Noise Source:

Time(s): September 27 1:00 PM through September 28 1:00 PM

Monitoring Period			Monitored Leq	Logarithmic Equivalent	Evening/Night Adjustments 10 dB	Evening/Night Adjustments 5 dB
Midnight		0 / 24	59.8	954993	9549926	3019952
am	1:00	100	57.0	501187	5011872	1584893
	2:00	200	56.6	457088	4570882	1445440
	3:00	300	59.7	933254	9332543	2951209
	4:00	400	62.3	1698244	16982437	5370318
	5:00	500	67.2	5248075	52480746	16595869
	6:00	600	70.5	11220185	112201845	35481339
	7:00	700	70.3	10715193	107151931	33884416
	8:00	800	70.3	10715193	107151931	33884416
	9:00	900	68.1	6456542	64565423	20417379
	10:00	1000	67.6	5754399	57543994	18197009
	11:00	1100	68.9	7762471	77624712	24547089
	12:00	1200	69.1	8128305	81283052	25703958
pm	1:00	1300	69.3	8511380	85113804	26915348
	2:00	1400	69.3	8511380	85113804	26915348
	3:00	1500	70.2	10471285	104712855	33113112
	4:00	1600	71.2	13182567	131825674	41686938
	5:00	1700	71.3	13489629	134896288	42657952
	6:00	1800	69.3	8511380	85113804	26915348
	7:00	1900	67.5	5623413	56234133	17782794
	8:00	2000	65.8	3801894	38018940	12022644
	9:00	2100	66.0	3981072	39810717	12589254
	10:00	2200	63.5	2238721	22387211	7079458
pm	11:00	2300	60.7	1174898	11748976	3715352

Leq Morning Peak Hour 7:00-10:00 a.m.
70 dBA

Leq Evening Peak Hour 4:00-8:00 p.m.
70 dBA

Leq Nighttime 10:00 pm-7:00 a.m. (not adjusted)
64.3 dBA

Leq Daytime 7:00 am-10:00 p.m.
69.2 dBA

Leq 24-Hour
68 dBA

Ldn: 10 dB adjustment between 10:00 p.m. & 7:00 a.m.
72 dBA

CNEL: 5 dB adjustment between 7:00p.m. & 10:00 p.m., & 10 dB adjustment between 10:00 p.m. & 7:00 a.m.
72.2 dBA

Difference between CNEL and Ldn
CNEL - Ldn = 0.32768471

Note to modelers: Only input data under "Monitored Leq" (Column D).

Monitoring Location: Site 2
Primary Noise Source:

Time(s): September 27 1:00 PM through September 28 1:00 PM

Monitoring Period			Monitored Leq	Logarithmic Equivalent	Evening/Night Adjustments 10 dB	5 dB
Midnight		0 / 24	47.3	53703	537032	169824
am	1:00	100	48.7	74131	741310	234423
	2:00	200	47.8	60256	602560	190546
	3:00	300	48.7	74131	741310	234423
	4:00	400	51.9	154882	1548817	489779
	5:00	500	53.1	204174	2041738	645654
	6:00	600	53.8	239883	2398833	758578
	7:00	700	62.1	1621810	16218101	5128614
	8:00	800	57.9	616595	6165950	1949845
	9:00	900	56.0	398107	3981072	1258925
	10:00	1000	57.1	512861	5128614	1621810
	11:00	1100	57.6	575440	5754399	1819701
	12:00	1200	58.5	707946	7079458	2238721
pm	1:00	1300	59.0	794328	7943282	2511886
	2:00	1400	59.4	870964	8709636	2754229
	3:00	1500	59.0	794328	7943282	2511886
	4:00	1600	64.2	2630268	26302680	8317638
	5:00	1700	59.3	851138	8511380	2691535
	6:00	1800	57.5	562341	5623413	1778279
	7:00	1900	56.8	478630	4786301	1513561
	8:00	2000	55.9	389045	3890451	1230269
	9:00	2100	56.0	398107	3981072	1258925
	10:00	2200	52.4	173780	1737801	549541
pm	11:00	2300	50.6	114815	1148154	363078

Leq Morning Peak Hour 7:00-10:00 a.m.
59 dBA

Leq Evening Peak Hour 4:00-8:00 p.m.
61 dBA

Leq Nighttime 10:00 pm-7:00 a.m. (not adjusted)
51.1 dBA

Leq Daytime 7:00 am-10:00 p.m.
59.1 dBA

Leq 24-Hour
57 dBA

Ldn: 10 dB adjustment between 10:00 p.m. & 7:00 a.m.
60 dBA

CNEL: 5 dB adjustment between 7:00p.m. & 10:00 p.m., & 10 dB adjustment between 10:00 p.m. & 7:00 a.m.
60.4 dBA

Difference between CNEL and Ldn
CNEL - Ldn = 0.474644

Note to modelers: Only input data under "Monitored Leq" (Column D).

Monitoring Location: Site 3
Primary Noise Source:

Time(s): September 27 2:00 PM through September 27 2:00 PM

Monitoring Period			Monitored Leq	Logarithmic Equivalent	Evening/Night Adjustments 10 dB	5 dB
Midnight		0 / 24	43.6	22909	229087	72444
am	1:00	100	47.0	50119	501187	158489
	2:00	200	42.3	16982	169824	53703
	3:00	300	50.5	112202	1122018	354813
	4:00	400	55.3	338844	3388442	1071519
	5:00	500	57.8	602560	6025596	1905461
	6:00	600	60.7	1174898	11748976	3715352
	7:00	700	66.9	4897788	48977882	15488166
	8:00	800	62.7	1862087	18620871	5888437
	9:00	900	60.4	1096478	10964782	3467369
	10:00	1000	60.2	1047129	10471285	3311311
	11:00	1100	63.7	2344229	23442288	7413102
	12:00	1200	61.3	1348963	13489629	4265795
pm	1:00	1300	61.9	1548817	15488166	4897788
	2:00	1400	61.6	1445440	14454398	4570882
	3:00	1500	63.0	1995262	19952623	6309573
	4:00	1600	63.1	2041738	20417379	6456542
	5:00	1700	65.6	3630781	36307805	11481536
	6:00	1800	62.5	1778279	17782794	5623413
	7:00	1900	61.4	1380384	13803843	4365158
	8:00	2000	61.2	1318257	13182567	4168694
	9:00	2100	56.7	467735	4677351	1479108
	10:00	2200	55.5	354813	3548134	1122018
pm	11:00	2300	60.1	1023293	10232930	3235937

Leq Morning Peak Hour 7:00-10:00 a.m.
64 dBA

Leq Evening Peak Hour 4:00-8:00 p.m.
63 dBA

Leq Nighttime 10:00 pm-7:00 a.m. (not adjusted)
56.1 dBA

Leq Daytime 7:00 am-10:00 p.m.
62.7 dBA

Leq 24-Hour
61 dBA

Ldn: 10 dB adjustment between 10:00 p.m. & 7:00 a.m.
64 dBA

CNEL: 5 dB adjustment between 7:00p.m. & 10:00 p.m., & 10 dB adjustment between 10:00 p.m. & 7:00 a.m.
64.8 dBA

Difference between CNEL and Ldn
CNEL - Ldn = 0.433851

Note to modelers: Only input data under "Monitored Leq" (Column D).

Monitoring Location: Site 4
Primary Noise Source:

Time(s): September 27 1:00 PM - September 28 1:00 PM

Monitoring Period			Monitored Leq	Logarithmic Equivalent	Evening/Night Adjustments 10 dB	5 dB
Midnight		0 / 24	58.2	660693	6606934	2089296
am	1:00	100	57.8	602560	6025596	1905461
	2:00	200	56.3	426580	4265795	1348963
	3:00	300	58.9	776247	7762471	2454709
	4:00	400	62.3	1698244	16982437	5370318
	5:00	500	66.8	4786301	47863009	15135612
	6:00	600	68.7	7413102	74131024	23442288
	7:00	700	72.6	18197009	181970086	57543994
	8:00	800	72.6	18197009	181970086	57543994
	9:00	900	71.2	13182567	131825674	41686938
	10:00	1000	71.3	13489629	134896288	42657952
	11:00	1100	72.5	17782794	177827941	56234133
	12:00	1200	72.9	19498446	194984460	61659500
pm	1:00	1300	71.7	14791084	147910839	46773514
	2:00	1400	73.1	20417379	204173794	64565423
	3:00	1500	72.0	15848932	158489319	50118723
	4:00	1600	71.9	15488166	154881662	48977882
	5:00	1700	73.1	20417379	204173794	64565423
	6:00	1800	70.5	11220185	112201845	35481339
	7:00	1900	69.3	8511380	85113804	26915348
	8:00	2000	68.5	7079458	70794578	22387211
	9:00	2100	66.4	4365158	43651583	13803843
	10:00	2200	63.4	2187762	21877616	6918310
pm	11:00	2300	61.6	1445440	14454398	4570882

Leq Morning Peak Hour 7:00-10:00 a.m.
72 dBA

Leq Evening Peak Hour 4:00-8:00 p.m.
71 dBA

Leq Nighttime 10:00 pm-7:00 a.m. (not adjusted)
63.5 dBA

Leq Daytime 7:00 am-10:00 p.m.
71.6 dBA

Leq 24-Hour
70 dBA

Ldn: 10 dB adjustment between 10:00 p.m. & 7:00 a.m.
72 dBA

CNEL: 5 dB adjustment between 7:00p.m. & 10:00 p.m., & 10 dB adjustment between 10:00 p.m. & 7:00 a.m.
72.8 dBA

Difference between CNEL and Ldn
CNEL - Ldn = 0.4262204

Note to modelers: Only input data under "Monitored Leq" (Column D).

APPENDIX A.2

Short-term (15-minute) Noise Measurements (2020)

Monitoring Location: Site 1
Monitoring Date: 7/30/2020

Monitoring Period

Time	LAeq	LASmax	LASmin
17:41:23	70.3	76.4	63.1
17:42:23	68.9	73.6	63.4
17:43:23	70.4	75.9	64.0
17:44:23	70.2	75.5	64.8
17:45:23	70.4	78.2	63.1
17:46:23	69.2	73.9	64.5
17:47:23	67.3	76.0	62.7
17:48:23	68.1	76.3	62.7
17:49:23	68.8	76.0	63.0
17:50:23	68.6	73.5	63.0
17:51:23	66.9	70.6	64.5
		78.2	62.7

10-minute LAeq **69.2**

Monitoring Period

Time	LAeq	LASmax	LASmin
22:02:04	59.3	64.9	54.6
22:03:04	58.3	61.9	55.7
22:04:04	61.1	68.5	55.7
22:05:04	57.4	60.6	53.2
22:06:04	65.9	73.3	57.9
22:07:04	62.5	71.6	54.6
22:08:04	60.2	71.3	55.7
22:09:04	61.8	65.9	58.1
22:10:04	62.6	69.4	56.6
22:11:04	62.7	71.4	57.1
22:12:04	58.7	60.0	58.5
		73.3	53.2

10-minute LAeq **56.4**

Monitoring Location: Site 2
Monitoring Date: 7/30/2020

Monitoring Period

Time	LAeq	LASmax	LASmin
17:59:52	47.9	51.0	46.7
18:00:52	55.6	67.6	47.3
18:01:52	57.7	68.5	47.1
18:02:52	56.7	69.4	47.8
18:03:52	55.3	67.0	47.3
18:04:52	55.6	66.0	46.2
18:05:52	50.1	53.0	47.8
18:06:52	57.0	69.3	45.8
18:07:52	49.4	52.2	46.8
18:08:52	55.9	66.2	46.0
18:09:52	56.0	61.6	56.3
		69.4	45.8

15-minute LAeq **55.2**

Monitoring Period

Time	LAeq	LASmax	LASmin
22:32:20	48.3	51.3	46.1
22:33:20	47.7	58.4	45.7
22:34:20	46.6	48.1	45.6
22:35:20	45.9	47.4	44.8
22:36:20	48.9	57.8	44.9
22:37:20	46.3	48.5	45.2
22:38:20	48.7	53.9	46.5
22:39:20	48.4	55.4	45.9
22:40:20	55.7	67.5	47.0
22:41:20	49.1	53.0	47.4
22:42:20	48.4	50.9	47.3
		67.5	44.8

10-minute LAeq **46.1**

Monitoring Location: Site 3
Monitoring Date: 7/30/2020

Monitoring Period

Time	LAeq	LASmax	LASmin
18:18:35	56.3	66.8	46.4
18:19:35	54.8	62.6	45.8
18:20:35	63.2	72.5	47.4
18:21:35	50.2	57.9	46.5
18:22:35	57.4	66.7	46.6
18:23:35	58.5	69.9	48.8
18:24:35	60.9	70.5	48.8
18:25:35	53.2	61.0	48.5
18:26:35	56.5	65.9	48.8
18:27:35	54.2	59.0	49.0
18:28:35	49.4	51.4	48.4
		72.5	45.8

15-minute LAeq **57.6**

Monitoring Period

Time	LAeq	LASmax	LASmin
22:16:41	44.1	48.9	41.4
22:17:41	52.8	64.8	41.5
22:18:41	50.6	61.0	40.4
22:19:41	46.7	55.1	40.9
22:20:41	44.2	54.5	39.8
22:21:41	48.4	59.9	39.8
22:22:41	48.1	57.7	40.4
22:23:41	51.3	59.8	40.6
22:24:41	48.6	58.6	40.7
22:25:41	46.1	58.0	41.1
22:26:41	53.1	56.1	46.2
		64.8	39.8

10-minute LAeq **41.6**

Monitoring Location: Site 4
Monitoring Date: 7/30/2020

Monitoring Period

Time	LAeq	LASmax	LASmin
18:35:47	68.6	80.7	52.3
18:36:47	66.9	73.3	54.7
18:37:47	68.8	77.2	53.4
18:38:47	69.1	76.3	56.6
18:39:47	67.5	77.4	51.3
18:40:47	63.8	72.6	52.5
18:41:47	68.7	76.0	53.4
18:42:47	66.1	75.5	53.0
18:43:47	65.6	72.9	53.7
18:44:47	69.1	77.3	53.3
18:45:47	55.9	58.3	55.3
		80.7	51.3

15-minute LAeq **67.3**

Monitoring Period

Time	LAeq	LASmax	LASmin
22:45:51	53.1	68.2	47.5
22:46:51	60.9	69.9	48.2
22:47:51	57.3	66.8	47.7
22:48:51	59.4	68.7	48.3
22:49:51	54.6	63.1	47.9
22:50:51	58.5	70.4	47.3
22:51:51	61.5	71.4	47.6
22:52:51	62.7	70.0	50.4
22:53:51	60.2	70.3	48.8
22:54:51	59.5	68.7	49.9
22:55:51	48.6	49.9	47.6
		71.4	47.3

10-minute LAeq **48.4**

APPENDIX B

SoundPLAN Output

APPENDIX B.1

Roadway Noise Worksheets

Street Segment	Scenario	Daytime ADT	HT	MT	Nighttime ADT	HT	MT	Speed (km/h)
Hancock Avenue (Medical Center Drive to Walsh Center Drive)	Existing	775.2	14.3	5.6	137.2	2.5	1.0	72.4
Hancock Avenue (Murrieta Hot Springs Rd to Medical Center Drive)	Existing	877.1	16.2	6.3	155.2	2.9	1.1	72.4
Medical Center Drive (East of Hancock Avenue)	Existing	267.9	4.9	1.9	47.4	0.9	0.3	40.2
Medical Center Drive (West of Hancock Avenue)	Existing	236.5	4.4	1.7	41.9	0.8	0.3	40.2
Murrieta Hot Springs Road (East of Hancock Avenue)	Existing	2692.3	49.7	19.3	476.5	8.8	3.4	72.4
Murrieta Hot Springs Road (West of Hancock Avenue)	Existing	2538.0	46.9	18.2	449.2	8.3	3.2	72.4
Walsh Center Drive (West of Hancock Avenu)	Existing	40.4	0.7	0.3	7.2	0.1	0.1	40.2

Street Segment	Scenario	Daytime ADT	HT	MT	Nighttime ADT	HT	MT	Speed (km/h)
Hancock Avenue (Medical Center Drive to Walsh Center Drive)	Future 2023 Without Project	1013.8	18.7	7.3	179.4	3.3	1.3	72.4
Hancock Avenue (Murrieta Hot Springs Rd to Medical Center Drive)	Future 2023 Without Project	1109.8	20.5	8.0	196.4	3.6	1.4	72.4
Medical Center Drive (East of Hancock Avenue)	Future 2023 Without Project	267.9	4.9	1.9	47.4	0.9	0.3	40.2
Medical Center Drive (West of Hancock Avenue)	Future 2023 Without Project	251.2	4.6	1.8	44.5	0.8	0.3	40.2
Murrieta Hot Springs Road (East of Hancock Avenue)	Future 2023 Without Project	2905.0	53.6	20.9	514.2	9.5	3.7	72.4
Murrieta Hot Springs Road (West of Hancock Avenue)	Future 2023 Without Project	2711.4	50.1	19.5	479.9	8.9	3.4	72.4
Walsh Center Drive (West of Hancock Avenu)	Future 2023 Without Project	149.7	2.8	1.1	26.5	0.5	0.2	40.2

Street Segment	Scenario	Daytime ADT	HT	MT	Nighttime ADT	HT	MT	Speed (km/h)
Hancock Avenue (Medical Center Drive to Walsh Center Drive)	Future 2023 With Project	1015.1	18.7	7.3	179.7	3.3	1.3	72.4
Hancock Avenue (Murrieta Hot Springs Rd to Medical Center Drive)	Future 2023 With Project	1135.5	21.0	8.2	201.0	3.7	1.4	72.4
Medical Center Drive (East of Hancock Avenue)	Future 2023 With Project	295.0	5.4	2.1	52.2	1.0	0.4	40.2
Medical Center Drive (West of Hancock Avenue)	Future 2023 With Project	251.2	4.6	1.8	44.5	0.8	0.3	40.2
Murrieta Hot Springs Road (East of Hancock Avenue)	Future 2023 With Project	2922.7	54.0	21.0	517.3	9.5	3.7	72.4
Murrieta Hot Springs Road (West of Hancock Avenue)	Future 2023 With Project	2719.5	50.2	19.5	481.3	8.9	3.5	72.4
Walsh Center Drive (West of Hancock Avenu)	Future 2023 With Project	149.7	2.8	1.1	26.5	0.5	0.2	40.2

APPENDIX B.2

Helicopter Noise Worksheets

EC 135 To the North

Receiver	Fl	Ldn/dB(A)	Leq,d/dB(A	Leq,n/dB(A	H/dB(A)	Time slice	63Hz dB(A	125Hz dB(	250Hz dB(	500Hz dB(	1kHz dB(A	2kHz dB(A	4kHz dB(A	8kHz dB(A)
Site 1	G	22.4	19	15.2	27.7	Ldn	3.3	2.3	13.7	20.1	16.1	4.1	-29.5	-119.2
						Leq,d	-0.1	-1.1	10.3	16.7	12.7	0.7	-32.9	
						Leq,n	-3.9	-4.9	6.5	12.9	8.9	-3.1	-36.7	
						H	8.7	7.6	19	25.4	21.5	9.4	-24.1	-113.8
Site 2	G	28.4	25	21.2	33.8	Ldn	8.1	7.6	18.8	25.7	23	14.8	-5.7	-51.5
						Leq,d	4.7	4.2	15.4	22.3	19.6	11.4	-9.1	-54.9
						Leq,n	0.9	0.4	11.6	18.5	15.8	7.6	-12.9	-58.8
						H	13.4	13	24.1	31.1	28.3	20.2	-0.4	-46.2
Site 3	G	32.2	28.8	25	37.5	Ldn	11.4	11.2	22.3	29.4	26.8	19.1	0.6	-37.7
						Leq,d	8	7.8	18.9	26	23.4	15.7	-2.8	-41.1
						Leq,n	4.2	4	15.1	22.2	19.6	11.9	-6.6	-44.9
						H	16.7	16.5	27.7	34.8	32.2	24.5	5.9	-32.3
Site 4	G	33.5	30.1	26.3	38.9	Ldn	12.7	12.7	23.7	30.8	28.2	20.7	2.4	-34.9
						Leq,d	9.3	9.3	20.3	27.4	24.8	17.3	-1	-38.3
						Leq,n	5.5	5.5	16.5	23.6	21	13.5	-4.8	-42.1
						H	18	18.1	29	36.2	33.6	26	7.8	-29.6
Site 5	G	33.1	29.7	25.9	38.5	Ldn	12	12.1	23.1	30.3	27.9	20.9	5.8	-18.8
						Leq,d	8.6	8.7	19.7	26.9	24.5	17.5	2.4	-22.2
						Leq,n	4.8	4.9	15.9	23.1	20.7	13.7	-1.4	-26
						H	17.4	17.4	28.5	35.7	33.2	26.3	11.2	-13.4

EC 135 To the South

Receiver	Fl	Ldn/dB(A)	Leq,d/dB(A	Leq,n/dB(A	H/dB(A)	Time slice	63Hz dB(A	125Hz dB(	250Hz dB(	500Hz dB(	1kHz dB(A	2kHz dB(A	4kHz dB(A	8kHz dB(A)
Site 1	G	33.2	29.8	26	38.6	Ldn	12.4	12.5	23.4	30.5	27.9	20.5	2.9	-32.8
						Leq,d	9	9.1	20	27.1	24.5	17.1	-0.5	-36.2
						Leq,n	5.2	5.3	16.2	23.3	20.7	13.3	-4.3	-40
						H	17.7	17.8	28.7	35.8	33.3	25.8	8.3	-27.4
Site 2	G	29.1	25.7	21.9	34.4	Ldn	8.8	8.3	19.6	26.5	23.5	14.9	-6.5	-53.5
						Leq,d	5.4	4.9	16.2	23.1	20.1	11.5	-9.9	-56.9
						Leq,n	1.6	1.1	12.4	19.3	16.3	7.7	-13.7	-60.7
						H	14.2	13.6	24.9	31.8	28.9	20.2	-1.2	-48.1
Site 3	G	31.1	27.7	23.9	36.4	Ldn	10.5	10.1	21.4	28.4	25.7	18	-1	-40.6
						Leq,d	7.1	6.8	18	25	22.3	14.6	-4.4	-44
						Leq,n	3.3	2.9	14.2	21.2	18.5	10.8	-8.2	-47.8
						H	15.9	15.5	26.7	33.7	31	23.4	4.3	-35.3
Site 4	G	24.1	20.7	16.9	29.5	Ldn	4.8	3.7	15.2	21.7	18.1	7.3	-21.8	-95.3
						Leq,d	1.4	0.3	11.8	18.3	14.7	3.9	-25.2	-98.7
						Leq,n	-2.4	-3.5	8	14.5	10.9	0.1	-29	-102.5
						H	10.2	9.1	20.6	27.1	23.5	12.6	-16.5	-90
Site 5	G	37.4	34	30.2	42.7	Ldn	15.8	16.3	27.1	34.4	32.3	26	12.8	-6.7
						Leq,d	12.4	12.9	23.7	31	28.9	22.6	9.4	-10.1
						Leq,n	8.6	9.1	19.9	27.2	25.1	18.8	5.6	-13.9
						H	21.2	21.7	32.5	39.8	37.6	31.4	18.2	-1.3

EC 145 To the North

Receiver	Fl	Ldn/dB(A)	Leq,d/dB(A	Leq,n/dB(A	H/dB(A)	Time slice	63Hz dB(A	125Hz dB(	250Hz dB(	500Hz dB(	1kHz dB(A	2kHz dB(A	4kHz dB(A	8kHz dB(A)
Site 1	G	25	21.6	17.8	30.3	Ldn	5.9	4.9	16.3	22.7	18.7	6.7	-26.9	-116.6
						Leq,d	2.5	1.5	12.9	19.3	15.3	3.3	-30.3	-120
						Leq,n	-1.3	-2.3	9.1	15.5	11.5	-0.5	-34.1	
						H	11.3	10.2	21.6	28	24.1	12	-21.5	-111.2
Site 2	G	31	27.6	23.8	36.4	Ldn	10.7	10.2	21.4	28.3	25.6	17.4	-3.1	-48.9
						Leq,d	7.3	6.8	18	24.9	22.2	14	-6.5	-52.3
						Leq,n	3.5	3	14.2	21.1	18.4	10.2	-10.3	-56.2
						H	16	15.6	26.7	33.7	30.9	22.8	2.2	-43.6
Site 3	G	34.8	31.4	27.6	40.1	Ldn	14	13.8	24.9	32	29.4	21.7	3.2	-35.1
						Leq,d	10.6	10.4	21.5	28.6	26	18.3	-0.2	-38.5
						Leq,n	6.8	6.6	17.7	24.8	22.2	14.5	-4	-42.3
						H	19.3	19.1	30.3	37.4	34.8	27.1	8.5	-29.7
Site 4	G	36.1	32.7	28.9	41.5	Ldn	15.3	15.3	26.3	33.4	30.8	23.3	5	-32.3
						Leq,d	11.9	11.9	22.9	30	27.4	19.9	1.6	-35.7
						Leq,n	8.1	8.1	19.1	26.2	23.6	16.1	-2.2	-39.5
						H	20.6	20.7	31.6	38.8	36.2	28.6	10.4	-27
Site 5	G	35.7	32.3	28.5	41.1	Ldn	14.6	14.7	25.7	32.9	30.5	23.5	8.4	-16.2
						Leq,d	11.2	11.3	22.3	29.5	27.1	20.1	5	-19.6
						Leq,n	7.4	7.5	18.5	25.7	23.3	16.3	1.2	-23.4
						H	20	20	31.1	38.3	35.8	28.9	13.8	-10.8

EC 145 To the South

Receiver	Fl	Ldn/dB(A)	Leq,d/dB(A	Leq,n/dB(A	H/dB(A)	Time slice	63Hz dB(A	125Hz dB(	250Hz dB(	500Hz dB(	1kHz dB(A	2kHz dB(A	4kHz dB(A	8kHz dB(A)
Site 1	G	35.8	32.4	28.6	41.2	Ldn	15	15.1	26	33.1	30.5	23.1	5.5	-30.2
						Leq,d	11.6	11.7	22.6	29.7	27.1	19.7	2.1	-33.6
						Leq,n	7.8	7.9	18.8	25.9	23.3	15.9	-1.7	-37.4
						H	20.3	20.4	31.3	38.4	35.9	28.4	10.9	-24.8
Site 2	G	31.7	28.3	24.5	37	Ldn	11.4	10.9	22.2	29.1	26.1	17.5	-3.9	-50.9
						Leq,d	8	7.5	18.8	25.7	22.7	14.1	-7.3	-54.3
						Leq,n	4.2	3.7	15	21.9	18.9	10.3	-11.1	-58.1
						H	16.8	16.2	27.5	34.4	31.5	22.8	1.4	-45.5
Site 3	G	33.7	30.3	26.5	39	Ldn	13.1	12.7	24	31	28.3	20.6	1.6	-38
						Leq,d	9.7	9.4	20.6	27.6	24.9	17.2	-1.8	-41.4
						Leq,n	5.9	5.5	16.8	23.8	21.1	13.4	-5.6	-45.2
						H	18.5	18.1	29.3	36.3	33.6	26	6.9	-32.7
Site 4	G	26.7	23.3	19.5	32.1	Ldn	7.4	6.3	17.8	24.3	20.7	9.9	-19.2	-92.7
						Leq,d	4	2.9	14.4	20.9	17.3	6.5	-22.6	-96.1
						Leq,n	0.2	-0.9	10.6	17.1	13.5	2.7	-26.4	-99.9
						H	12.8	11.7	23.2	29.7	26.1	15.2	-13.9	-87.4
Site 5	G	40	36.6	32.8	45.3	Ldn	18.4	18.9	29.7	37	34.9	28.6	15.4	-4.1
						Leq,d	15	15.5	26.3	33.6	31.5	25.2	12	-7.5
						Leq,n	11.2	11.7	22.5	29.8	27.7	21.4	8.2	-11.3
						H	23.8	24.3	35.1	42.4	40.2	34	20.8	1.3

APPENDIX C

Construction Noise Worksheets

APPENDIX C.1

Utilities – Storm Drains

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 1/21/2021
Case Descr Utilities - Storm Drains

---- Receptor #1 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
Site 1	Residential	69.2	56.4	56.4

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Slurry Trenching Machi	No	50		80.4	2700	0

Calculated (dBA)

Equipment		*Lmax	Leq
Slurry Trenching Machi		45.7	42.7
	Total	45.7	42.7

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
Site 2	Residential	55	46.1	46.1

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Slurry Trenching Machi	No	50		80.4	1000	0

Calculated (dBA)

Equipment		*Lmax	Leq
Slurry Trenching Machi		54.3	51.3
	Total	54.3	51.3

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
Site 3	Residential	57.6	41.6	41.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Slurry Trenching Machi	No	50		80.4	1250	0

	Calculated (dBA)	
Equipment	*Lmax	Leq
Slurry Trenching Machi	52.4	49.4
Total	52.4	49.4

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
Site 4	Residential	67.3	48.4	48.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Slurry Trenching Machi	No	50		80.4	2100	0

	Calculated (dBA)	
Equipment	*Lmax	Leq
Slurry Trenching Machi	47.9	44.9
Total	47.9	44.9

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 5	Commercial	70	70	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Slurry Trenching Machi	No	50		80.4	200	0

Calculated (dBA)

Equipment	*Lmax	Leq
Slurry Trenching Machi	68.3	65.3
Total	68.3	65.3

*Calculated Lmax is the Loudest value.

APPENDIX C.2

NICU Renovation

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 1/21/2021
Case Descr NICU Renovation

---- Receptor #1 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 1	Residential	69.2	56.4	56.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	2700	0
Welder / Torch	No	40		74	2700	0

	Calculated (dBA)	
Equipment	*Lmax	Leq
Compressor (air)	43	39
Welder / Torch	39.4	35.4
Total	43	40.6

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Site 2	Residential	55	46.1	46.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	1000	0
Welder / Torch	No	40		74	1000	0

	Calculated (dBA)	
Equipment	*Lmax	Leq
Compressor (air)	51.6	47.7
Welder / Torch	48	44
Total	51.6	49.2

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 3	Residential	57.6	41.6	41.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	1250	0
Welder / Torch	No	40		74	1250	0

Calculated (dBA)

Equipment	*Lmax	Leq
Compressor (air)	49.7	45.7
Welder / Torch	46	42.1
Total	49.7	47.3

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 4	Residential	67.3	48.4	48.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	2100	0
Welder / Torch	No	40		74	2100	0

Calculated (dBA)

Equipment	*Lmax	Leq
Compressor (air)	45.2	41.2
Welder / Torch	41.5	37.6
Total	45.2	42.8

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 5	Commercial	70	70	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	200	0
Welder / Torch	No	40		74	200	0

Calculated (dBA)

Equipment	*Lmax	Leq
Compressor (air)	65.6	61.6
Welder / Torch	62	58
Total	65.6	63.2

*Calculated Lmax is the Loudest value.

APPENDIX C.3

Helipad Construction

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 1/21/2021
Case Descr Helipad Construction

---- Receptor #1 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
Site 1	Residential	69.2	56.4	56.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	2700	0
Concrete Mixer Truck	No	40		78.8	2700	0
Concrete Mixer Truck	No	40		78.8	2700	0
Concrete Mixer Truck	No	40		78.8	2700	0
Paver	No	50		77.2	2700	0
Roller	No	20		80	2700	0
Roller	No	20		80	2700	0
Tractor	No	40	84		2700	0

	Calculated (dBA)	
Equipment	*Lmax	Leq
Concrete Mixer Truck	44.2	40.2
Concrete Mixer Truck	44.2	40.2
Concrete Mixer Truck	44.2	40.2
Concrete Mixer Truck	44.2	40.2
Paver	42.6	39.6
Roller	45.4	38.4
Roller	45.4	38.4
Tractor	49.4	45.4
Total	49.4	49.9

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 2	Residential	55	46.1	46.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	1000	0
Concrete Mixer Truck	No	40		78.8	1000	0
Concrete Mixer Truck	No	40		78.8	1000	0
Concrete Mixer Truck	No	40		78.8	1000	0
Paver	No	50		77.2	1000	0
Roller	No	20		80	1000	0
Roller	No	20		80	1000	0
Tractor	No	40	84		1000	0

Calculated (dBA)

Equipment	*Lmax	Leq
Concrete Mixer Truck	52.8	48.8
Concrete Mixer Truck	52.8	48.8
Concrete Mixer Truck	52.8	48.8
Concrete Mixer Truck	52.8	48.8
Paver	51.2	48.2
Roller	54	47
Roller	54	47
Tractor	58	54
Total	58	58.6

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Descriptior	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 3	Residential	57.6	41.6	41.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	1250	0
Concrete Mixer Truck	No	40		78.8	1250	0
Concrete Mixer Truck	No	40		78.8	1250	0
Concrete Mixer Truck	No	40		78.8	1250	0
Paver	No	50		77.2	1250	0
Roller	No	20		80	1250	0
Roller	No	20		80	1250	0
Tractor	No	40	84		1250	0

Calculated (dBA)

Equipment	*Lmax	Leq
Concrete Mixer Truck	50.8	46.9
Concrete Mixer Truck	50.8	46.9
Concrete Mixer Truck	50.8	46.9
Concrete Mixer Truck	50.8	46.9
Paver	49.3	46.3
Roller	52	45.1
Roller	52	45.1
Tractor	56	52.1
Total	56	56.6

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 4	Residential	67.3	48.4	48.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	2100	0
Concrete Mixer Truck	No	40		78.8	2100	0
Concrete Mixer Truck	No	40		78.8	2100	0
Concrete Mixer Truck	No	40		78.8	2100	0
Paver	No	50		77.2	2100	0
Roller	No	20		80	2100	0
Roller	No	20		80	2100	0
Tractor	No	40	84		2100	0

Calculated (dBA)

Equipment	*Lmax	Leq
Concrete Mixer Truck	46.3	42.4
Concrete Mixer Truck	46.3	42.4
Concrete Mixer Truck	46.3	42.4
Concrete Mixer Truck	46.3	42.4
Paver	44.8	41.7
Roller	47.5	40.5
Roller	47.5	40.5
Tractor	51.5	47.6
Total	51.5	52.1

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 5	Commercial	70	70	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	650	0
Concrete Mixer Truck	No	40		78.8	650	0
Concrete Mixer Truck	No	40		78.8	650	0
Concrete Mixer Truck	No	40		78.8	650	0
Paver	No	50		77.2	650	0
Roller	No	20		80	650	0
Roller	No	20		80	650	0
Tractor	No	40	84		650	0

Calculated (dBA)

Equipment	*Lmax	Leq
Concrete Mixer Truck	56.5	52.5
Concrete Mixer Truck	56.5	52.5
Concrete Mixer Truck	56.5	52.5
Concrete Mixer Truck	56.5	52.5
Paver	54.9	51.9
Roller	57.7	50.7
Roller	57.7	50.7
Tractor	61.7	57.7
Total	61.7	62.3

*Calculated Lmax is the Loudest value.

APPENDIX C.4

Kitchen Service Renovation

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/21/2021
Case Descript Kitchen Service Renovation

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 1	Residential	69.2	56.4	56.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	2700	0
Welder / Torch	No	40		74	2700	0

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor (air)		43	39
Welder / Torch		39.4	35.4
	Total	43	40.6

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 2	Residential	55	46.1	46.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	1000	0
Welder / Torch	No	40		74	1000	0

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor (air)		51.6	47.7
Welder / Torch		48	44
	Total	51.6	49.2

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 3	Residential	57.6	41.6	41.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	1250	0
Welder / Torch	No	40		74	1250	0

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor (air)		49.7	45.7
Welder / Torch		46	42.1
	Total	49.7	47.3

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 4	Residential	67.3	48.4	48.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	2100	0
Welder / Torch	No	40		74	2100	0

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor (air)		45.2	41.2
Welder / Torch		41.5	37.6
	Total	45.2	42.8

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 5	Commercial	70	70	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	200	0
Welder / Torch	No	40		74	200	0

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor (air)		65.6	61.6
Welder / Torch		62	58
	Total	65.6	63.2

*Calculated Lmax is the Loudest value.

APPENDIX C.5

Grading – Expansion

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/21/2021
Case Descriptioi Grading - Expansion

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 1	Residential	69.2	56.4	56.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		2700	0
Dozer	No	40		81.7	2700	0
Tractor	No	40	84		2700	0
Tractor	No	40	84		2700	0

Calculated (dBA)

Equipment		*Lmax	Leq
Grader		50.4	46.4
Dozer		47	43
Tractor		49.4	45.4
Tractor		49.4	45.4
	Total	50.4	51.2

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 2	Residential	55	46.1	46.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		1000	0
Dozer	No	40		81.7	1000	0
Tractor	No	40	84		1000	0
Tractor	No	40	84		1000	0

Calculated (dBA)

Equipment		*Lmax	Leq
Grader		59	55
Dozer		55.6	51.7
Tractor		58	54
Tractor		58	54
	Total	59	59.8

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site 3	Residential	57.6	41.6	41.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		1250	0
Dozer	No	40		81.7	1250	0
Tractor	No	40	84		1250	0
Tractor	No	40	84		1250	0

		Calculated (dBA)	
Equipment		*Lmax	Leq
Grader		57	53.1
Dozer		53.7	49.7
Tractor		56	52.1
Tractor		56	52.1
	Total	57	57.9

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site 4	Residential	67.3	48.4	48.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		2100	0
Dozer	No	40		81.7	2100	0
Tractor	No	40	84		2100	0
Tractor	No	40	84		2100	0

		Calculated (dBA)	
Equipment		*Lmax	Leq
Grader		52.5	48.6
Dozer		49.2	45.2
Tractor		51.5	47.6
Tractor		51.5	47.6
	Total	52.5	53.4

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 5	Commercial	70	70	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		350	0
Dozer	No	40		81.7	350	0
Tractor	No	40	84		350	0
Tractor	No	40	84		350	0

Calculated (dBA)

Equipment		*Lmax	Leq
Grader		68.1	64.1
Dozer		64.8	60.8
Tractor		67.1	63.1
Tractor		67.1	63.1
	Total	68.1	69

*Calculated Lmax is the Loudest value.

APPENDIX C.6

Building Construction

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/21/2021
Case Description: Building Construction

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site 1	Residential	69.2	56.4	56.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	2700	0
Generator	No	50		80.6	2700	0
Tractor	No	40	84		2700	0
Welder / Torch	No	40		74	2700	0
Welder / Torch	No	40		74	2700	0
Welder / Torch	No	40		74	2700	0
Forklift	No	40	85		2700	0

		Calculated (dBA)	
Equipment		*Lmax	Leq
Crane		45.9	37.9
Generator		46	43
Tractor		49.4	45.4
Welder / Torch		39.4	35.4
Welder / Torch		39.4	35.4
Welder / Torch		39.4	35.4
Forklift		50.4	46.4
	Total	50.4	50.6

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 2	Residential	55	46.1	46.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	1000	0
Generator	No	50		80.6	1000	0
Tractor	No	40	84		1000	0
Welder / Torch	No	40		74	1000	0
Welder / Torch	No	40		74	1000	0
Welder / Torch	No	40		74	1000	0
Forklift	No	40	85		1000	0

Calculated (dBA)

Equipment		*Lmax	Leq
Crane		54.5	46.6
Generator		54.6	51.6
Tractor		58	54
Welder / Torch		48	44
Welder / Torch		48	44
Welder / Torch		48	44
Forklift		59	55
	Total	59	59.2

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 3	Residential	57.6	41.6	41.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	1250	0
Generator	No	50		80.6	1250	0
Tractor	No	40	84		1250	0
Welder / Torch	No	40		74	1250	0
Welder / Torch	No	40		74	1250	0
Welder / Torch	No	40		74	1250	0
Forklift	No	40	85		1250	0

Calculated (dBA)

Equipment		*Lmax	Leq
Crane		52.6	44.6
Generator		52.7	49.7
Tractor		56	52.1
Welder / Torch		46	42.1
Welder / Torch		46	42.1
Welder / Torch		46	42.1
Forklift		57	53.1
	Total	57	57.3

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 4	Residential	67.3	48.4	48.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	2100	0
Generator	No	50		80.6	2100	0
Tractor	No	40	84		2100	0
Welder / Torch	No	40		74	2100	0
Welder / Torch	No	40		74	2100	0
Welder / Torch	No	40		74	2100	0
Forklift	No	40	85		2100	0

Calculated (dBA)

Equipment		*Lmax	Leq
Crane		48.1	40.1
Generator		48.2	45.2
Tractor		51.5	47.6
Welder / Torch		41.5	37.6
Welder / Torch		41.5	37.6
Welder / Torch		41.5	37.6
Forklift		52.5	48.6
	Total	52.5	52.8

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 5	Commercial	70	70	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	340	0
Generator	No	50		80.6	340	0
Tractor	No	40	84		340	0
Welder / Torch	No	40		74	340	0
Welder / Torch	No	40		74	340	0
Welder / Torch	No	40		74	340	0
Forklift	No	40	85		340	0

Calculated (dBA)

Equipment		*Lmax	Leq
Crane		63.9	55.9
Generator		64	61
Tractor		67.3	63.4
Welder / Torch		57.3	53.4
Welder / Torch		57.3	53.4
Welder / Torch		57.3	53.4
Forklift		68.3	64.4
	Total	68.3	68.6

*Calculated Lmax is the Loudest value.

APPENDIX C.7

Canopy

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/21/2021
Case Descripti Building Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 1	Residential	69.2	56.4	56.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	2700	0
Generator	No	50		80.6	2700	0
Tractor	No	40	84		2700	0
Welder / Torch	No	40		74	2700	0
Welder / Torch	No	40		74	2700	0
Welder / Torch	No	40		74	2700	0
Forklift	No	40		0	2700	0

Calculated (dBA)

Equipment	*Lmax	Leq
Crane	45.9	37.9
Generator	46	43
Tractor	49.4	45.4
Welder / Torch	39.4	35.4
Welder / Torch	39.4	35.4
Welder / Torch	39.4	35.4
Forklift	-34.6	-38.6
Total	49.4	48.5

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 2	Residential	55	46.1	46.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	1000	0
Generator	No	50		80.6	1000	0
Tractor	No	40	84		1000	0
Welder / Torch	No	40		74	1000	0
Welder / Torch	No	40		74	1000	0
Welder / Torch	No	40		74	1000	0
Forklift	No	40		0	1000	0

Calculated (dBA)

Equipment	*Lmax	Leq
Crane	54.5	46.6
Generator	54.6	51.6
Tractor	58	54
Welder / Torch	48	44
Welder / Torch	48	44
Welder / Torch	48	44
Forklift	-26	-30
Total	58	57.1

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 3	Residential	57.6	41.6	41.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	1250	0
Generator	No	50		80.6	1250	0
Tractor	No	40	84		1250	0
Welder / Torch	No	40		74	1250	0
Welder / Torch	No	40		74	1250	0
Welder / Torch	No	40		74	1250	0
Forklift	No	40		0	1250	0

Calculated (dBA)

Equipment	*Lmax	Leq
Crane	52.6	44.6
Generator	52.7	49.7
Tractor	56	52.1
Welder / Torch	46	42.1
Welder / Torch	46	42.1
Welder / Torch	46	42.1
Forklift	-28	-31.9
Total	56	55.2

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 4	Residential	67.3	48.4	48.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	2100	0
Generator	No	50		80.6	2100	0
Tractor	No	40	84		2100	0
Welder / Torch	No	40		74	2100	0
Welder / Torch	No	40		74	2100	0
Welder / Torch	No	40		74	2100	0
Forklift	No	40		0	2100	0

Calculated (dBA)

Equipment	*Lmax	Leq
Crane	48.1	40.1
Generator	48.2	45.2
Tractor	51.5	47.6
Welder / Torch	41.5	37.6
Welder / Torch	41.5	37.6
Welder / Torch	41.5	37.6
Forklift	-32.5	-36.4
Total	51.5	50.7

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 5	Commercial	70	70	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	340	0
Generator	No	50		80.6	340	0
Tractor	No	40	84		340	0
Welder / Torch	No	40		74	340	0
Welder / Torch	No	40		74	340	0
Welder / Torch	No	40		74	340	0
Forklift	No	40	85		340	0

Calculated (dBA)

Equipment		*Lmax	Leq
Crane		63.9	55.9
Generator		64	61
Tractor		67.3	63.4
Welder / Torch		57.3	53.4
Welder / Torch		57.3	53.4
Welder / Torch		57.3	53.4
Forklift		68.3	64.4
	Total	68.3	68.6

*Calculated Lmax is the Loudest value.

APPENDIX C.8

Paving – Parking

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/21/2021
Case Descripti‹ Paving - Parking

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site 1	Residential	69.2	56.4	56.4

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Concrete Mixer Truck	No	40		78.8	2700	0
Paver	No	50		77.2	2700	0
Paver	No	50		77.2	2700	0
Roller	No	20		80	2700	0
Tractor	No	40	84		2700	0

	Calculated (dBA)	
Equipment	*Lmax	Leq
Concrete Mixer Truck	44.2	40.2
Paver	42.6	39.6
Paver	42.6	39.6
Roller	45.4	38.4
Tractor	49.4	45.4
Total	49.4	48.4

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 2	Residential	55	46.1	46.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	1000	0
Paver	No	50		77.2	1000	0
Paver	No	50		77.2	1000	0
Roller	No	20		80	1000	0
Tractor	No	40	84		1000	0

Calculated (dBA)

Equipment	*Lmax	Leq
Concrete Mixer Truck	52.8	48.8
Paver	51.2	48.2
Paver	51.2	48.2
Roller	54	47
Tractor	58	54
Total	58	57.1

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 3	Residential	57.6	41.6	41.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	1250	0
Paver	No	50		77.2	1250	0
Paver	No	50		77.2	1250	0
Roller	No	20		80	1250	0
Tractor	No	40	84		1250	0

Calculated (dBA)

Equipment	*Lmax	Leq
Concrete Mixer Truck	50.8	46.9
Paver	49.3	46.3
Paver	49.3	46.3
Roller	52	45.1
Tractor	56	52.1
Total	56	55.1

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 4	Residential	67.3	48.4	48.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	2100	0
Paver	No	50		77.2	2100	0
Paver	No	50		77.2	2100	0
Roller	No	20		80	2100	0
Tractor	No	40	84		2100	0

Calculated (dBA)

Equipment	*Lmax	Leq
Concrete Mixer Truck	46.3	42.4
Paver	44.8	41.7
Paver	44.8	41.7
Roller	47.5	40.5
Tractor	51.5	47.6
Total	51.5	50.6

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 5	Commercial	70	70	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	275	0
Paver	No	50		77.2	275	0
Paver	No	50		77.2	275	0
Roller	No	20		80	275	0
Tractor	No	40	84		275	0

Calculated (dBA)

Equipment	*Lmax	Leq
Concrete Mixer Truck	64	60
Paver	62.4	59.4
Paver	62.4	59.4
Roller	65.2	58.2
Tractor	69.2	65.2
Total	69.2	68.3

*Calculated Lmax is the Loudest value.

APPENDIX C.9

Architectural Coating

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 1/21/2021
Case Descriptic Architectural Coating

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 1	Residential	69.2	56.4	56.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	2700	0

	Calculated (dBA)	
Equipment	*Lmax	Leq
Compressor (air)	43	39
Total	43	39

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 2	Residential	55	46.1	46.1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	1000	0

	Calculated (dBA)	
Equipment	*Lmax	Leq
Compressor (air)	51.6	47.7
Total	51.6	47.7

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 3	Residential	57.6	41.6	41.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	1250	0

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor (air)		49.7	45.7
	Total	49.7	45.7

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 4	Residential	67.3	48.4	48.4

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	2100	0

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor (air)		45.2	41.2
	Total	45.2	41.2

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site 5	Commercial	70	70	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	200	0

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor (air)		65.6	61.6
	Total	65.6	61.6

*Calculated Lmax is the Loudest value.

APPENDIX D

Construction Vibration Worksheets

Rancho Springs Medical Center Expansion
Construction Vibration Model
(2700 feet)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	2700	0.000	0.000	26
Jackhammer		1	0.035	2700	0.000	0.000	18
Large bulldozer		1	0.089	2700	0.000	0.000	26
Loaded trucks		1	0.076	2700	0.000	0.000	25
Pile Drive (impact)		1	0.644	2700	0.001	0.000	43
Vibratory Roller		1	0.210	2700	0.000	0.000	33
Small bulldozer		1	0.003	2700	0.000	0.000	-4

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment**

Rancho Springs Medical Center Expansion
Construction Vibration Model
(1000 feet)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	1000	0.000	0.000	39
Jackhammer		1	0.035	1000	0.000	0.000	31
Large bulldozer		1	0.089	1000	0.000	0.000	39
Loaded trucks		1	0.076	1000	0.000	0.000	38
Pile Drive (impact)		1	0.644	1000	0.003	0.001	56
Vibratory Roller		1	0.210	1000	0.001	0.000	46
Small bulldozer		1	0.003	1000	0.000	0.000	9

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment**

Rancho Springs Medical Center Expansion
Construction Vibration Model
(1250 feet)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	1250	0.000	0.000	36
Jackhammer		1	0.035	1250	0.000	0.000	28
Large bulldozer		1	0.089	1250	0.000	0.000	36
Loaded trucks		1	0.076	1250	0.000	0.000	35
Pile Drive (impact)		1	0.644	1250	0.002	0.000	53
Vibratory Roller		1	0.210	1250	0.001	0.000	43
Small bulldozer		1	0.003	1250	0.000	0.000	7

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment**

Rancho Springs Medical Center Expansion
Construction Vibration Model
(2100 feet)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	2100	0.000	0.000	29
Jackhammer		1	0.035	2100	0.000	0.000	21
Large bulldozer		1	0.089	2100	0.000	0.000	29
Loaded trucks		1	0.076	2100	0.000	0.000	28
Pile Drive (impact)		1	0.644	2100	0.001	0.000	46
Vibratory Roller		1	0.210	2100	0.000	0.000	37
Small bulldozer		1	0.003	2100	0.000	0.000	0

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment**

Rancho Springs Medical Center Expansion
Construction Vibration Model
(200 feet)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	200	0.004	0.001	60
Jackhammer		1	0.035	200	0.002	0.000	52
Large bulldozer		1	0.089	200	0.004	0.001	60
Loaded trucks		1	0.076	200	0.003	0.001	58
Pile Drive (impact)		1	0.644	200	0.028	0.007	77
Vibratory Roller		1	0.210	200	0.009	0.002	67
Small bulldozer		1	0.003	200	0.000	0.000	30

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment**