Appendix NOI

Noise and Vibration Study

STACK Data Center Project

Noise and Vibration Study

prepared for

City of San José
Planning, Building and Code Enforcement Department
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1 Project Description and Impact Summary

1.1 Introduction

This study analyzes the potential noise and vibration impacts of the STACK Data Center Project (herein referred to as “proposed project” or “project”) in San José, California. Rincon Consultants, Inc. (Rincon) prepared this study for the City of San José for use in support of environmental documentation being prepared for the project pursuant to the California Environmental Quality Act (CEQA). The purpose of this study is to analyze the project’s noise and vibration impacts related to both temporary construction activity and long-term operation of the project.

1.2 Project Summary

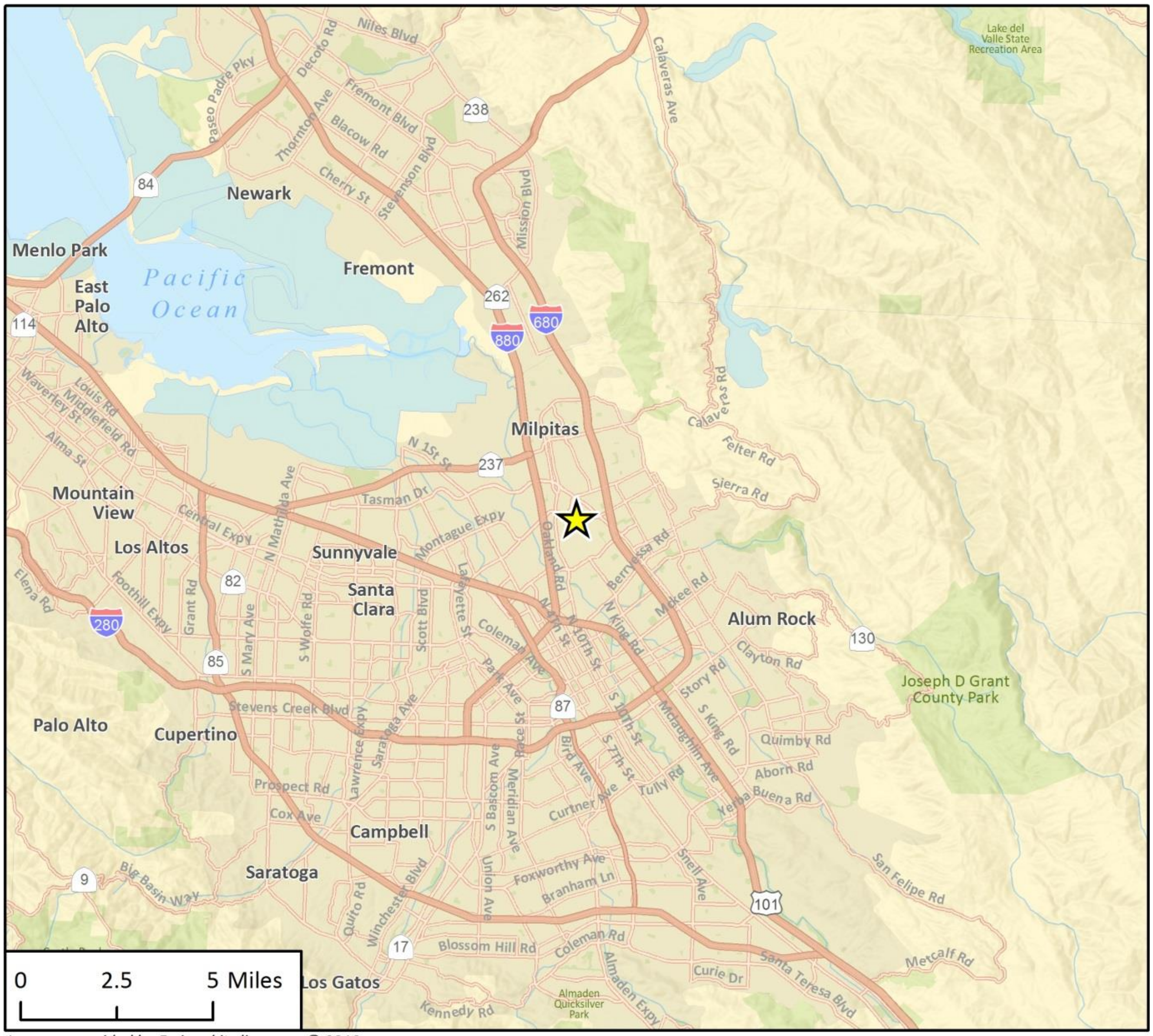
Project Location

The 9.26-acre project site is located at 2001 Fortune Drive in north-east San José. The project site is developed with three industrial buildings, surface parking, and minimal landscaping. Regional access to the site is available from Montague Expressway, Interstate 880 (I-880) and Interstate 680 (I-680). The project site is surrounded by industrial uses in the city of San José to the west, south, and east and residential uses in the city of Milpitas to the north across Trade Zone Boulevard. Figure 1 shows the project site’s regional location, and Figure 2 shows an aerial view of the project site and surrounding area.

Project Description

The project would entail demolition of three existing one-story industrial buildings currently used for offices, storage, and maintenance purposes and construction of a new data center building on the site. The new data center building would measure three stories in height (60.8 feet) and would consist of approximately 239,723 gross square feet, including a 211,334 square foot data center, 20,941 square feet of office space and 7,448 square feet used for lobby, conference rooms, breakrooms, and building maintenance supply storage. The project would include 148 on-site parking spaces. The building and parking area would cover 85 percent of the site. The remaining 15 percent would be landscaped, with a stormwater retention area the southeastern corner of the site. Vehicle access to the project site would be primarily provided on two driveways on Fortune Drive. Emergency vehicle access would be provided on a third driveway on Trade Zone Boulevard. Table 1 contains a project summary, and Figure 3 shows the proposed site plans.

Figure 1 Regional Location



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Project Location

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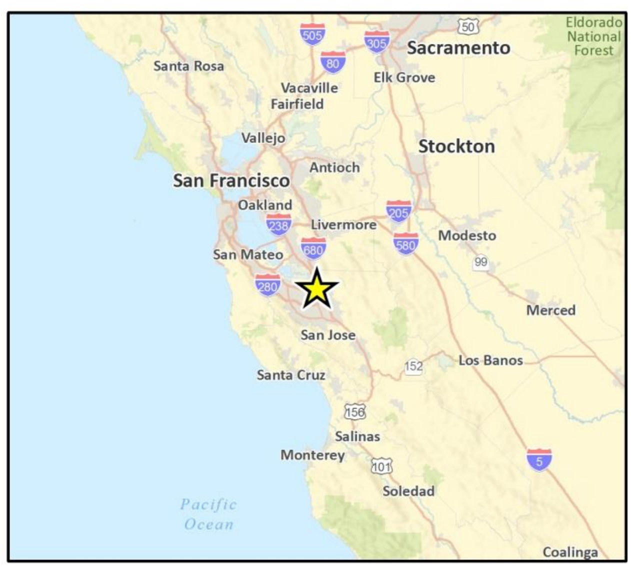

Fig 1 Regional Location

Figure 2 Project Site Location

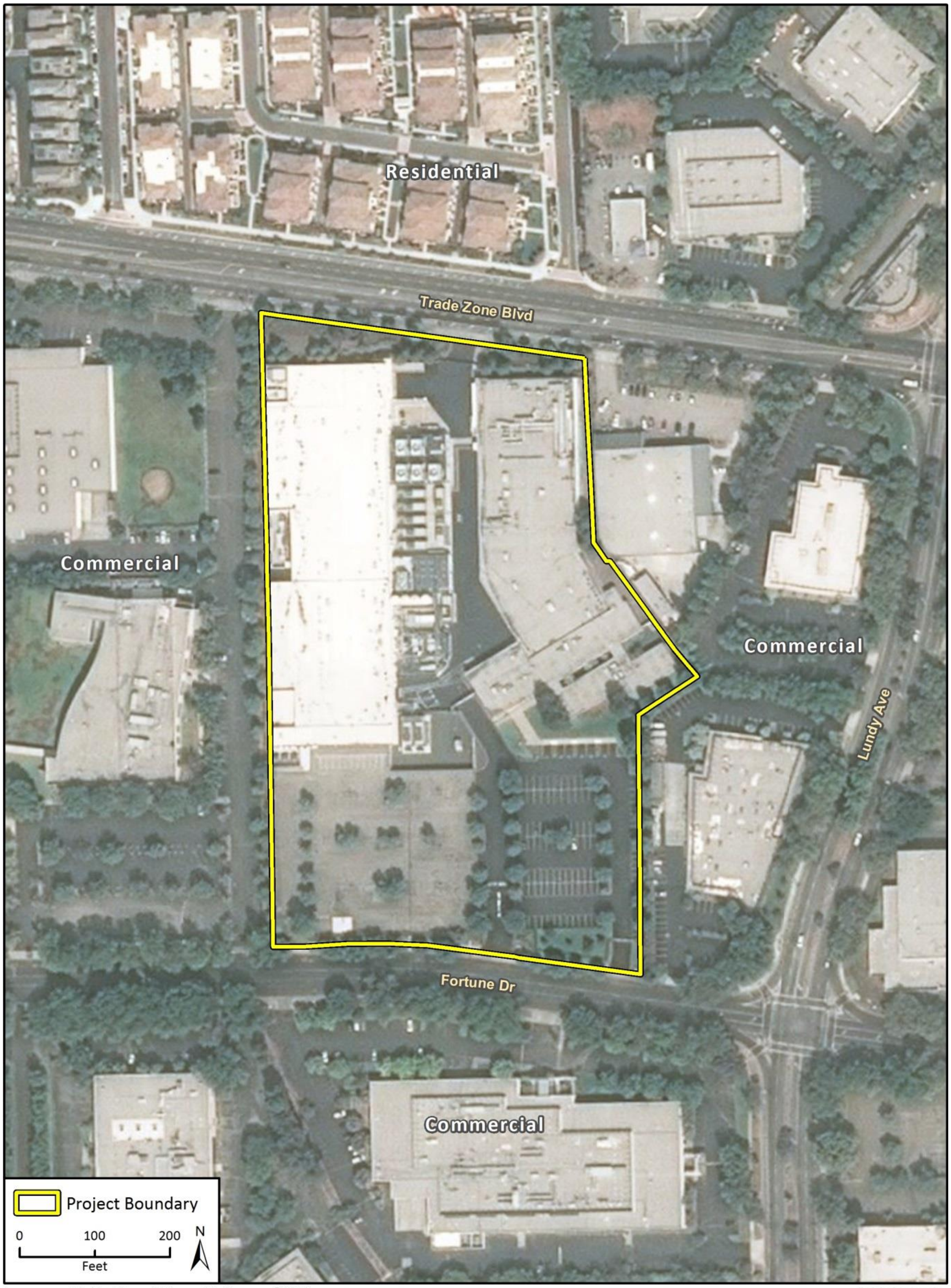

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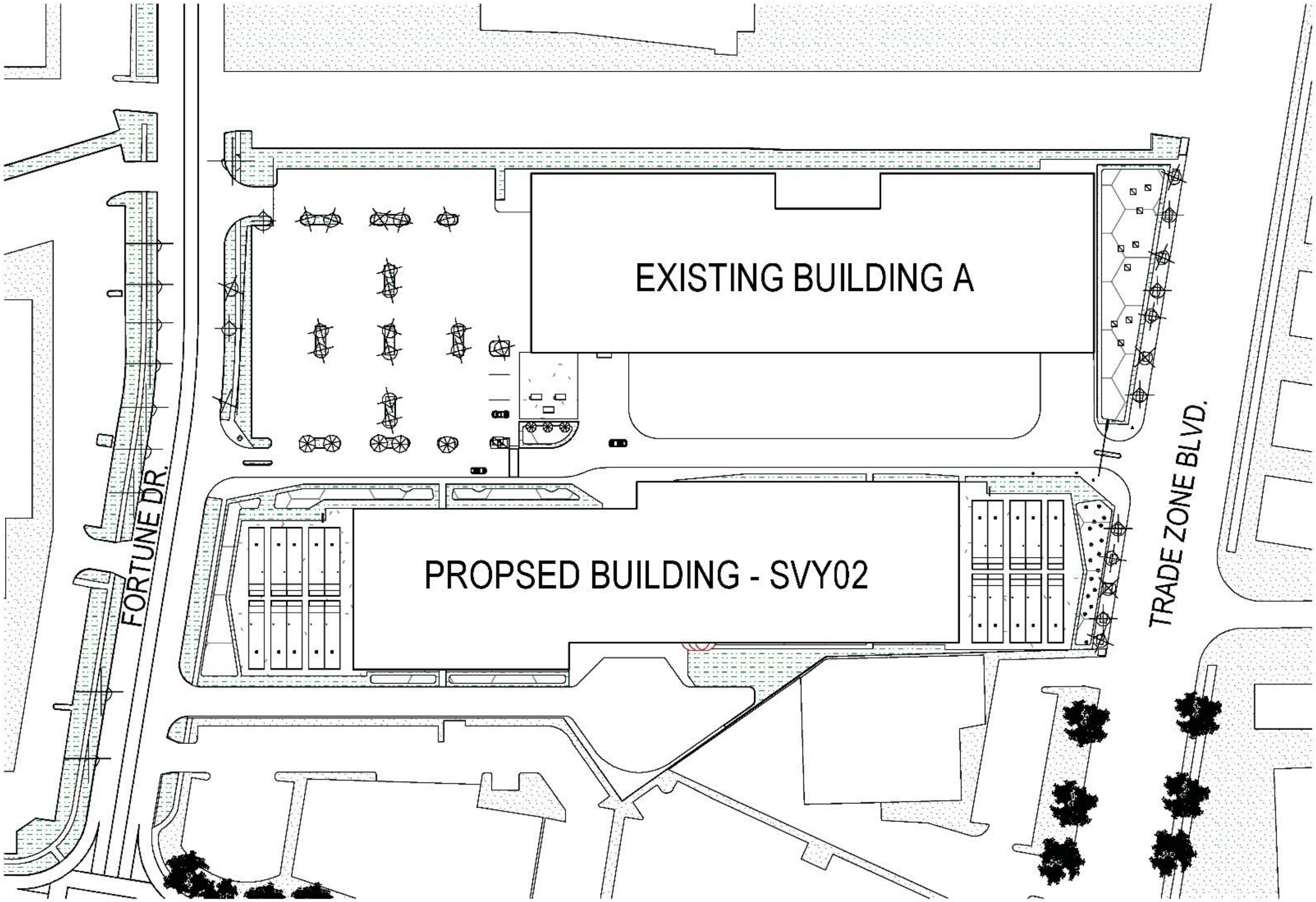
Fig 2 Project Location

Table 1 Project Summary

Project Site Size (square feet)	
Project Site Area	418,176 (9.6 acre)
Building Area (square feet)	
Data Center	211,334
Office	20,941
Other	7,448
Total	239,723
Landscaping (square feet)	
Landscape	62,726 (15% site coverage)
Floor Area Ratio (FAR)	
FAR	0.79
Building Height (feet)	
Data Center Building	60.8
Parking Stalls	
Standard	148
Bicycle	11

Figure 3 Proposed Site Plan



Source: HGA 2019

Mechanical Equipment

Mechanical equipment includes heating, ventilation, and air conditioning (HVAC) equipment which is typically located on the roof of a building or within an interior mechanical room. The project's mechanical equipment would include 9 rooftop HVAC systems and 20 stand-by generators. The generators would be located in acoustical enclosures on the north and south sides of the building. Each of the 20 diesel-powered stand-by generators would have the capacity to produce 3 megawatts (MW) of electric power, or 60 MW in total when all generators are operating at the same time. According to the California Energy Commission (CEC), sites producing more than 50 MW are considered power plants and subject to power plant licensing regulation through the CEC. However, due to standard redundancy practices, 4 generators would remain inactive during power outage events as a back-up in case of failure of the operable generators. Thus, the maximum number of generators in operation at the project site would be 16, producing a maximum of 48 MW of electric power. Therefore, the project would not be subject to power plant licensing through the CEC. Additionally, two new fuel tanks would be installed to provide fuel for the generators. Fuel tanks would be located underneath the generators.

Site Access, Circulation, and Parking

Vehicular access to the project site would be provided from two driveways on Fortune Drive. A third driveway on Trade Zone Boulevard would provide additional emergency vehicle access to the project site. All driveways would be secured with gates. Pedestrian and bicycle access to the project site would be provided on the four driveways. Delivery and trash hauling trucks would access the project site via the eastern driveway on Fortune Drive.

The parking lot would provide 125 parking spaces including five Americans with Disabilities Act (ADA) accessible parking spaces and one van accessible parking space. Additionally, three motorcycle parking spaces and 11 bike parking spaces would be provided in the southwest and northeast corners of the parking lot.

Construction

Project construction is estimated to occur over an 18-month period and would include typical construction phases such as demolition, site preparation and grading, building construction, paving, and architectural coating.

During project construction, equipment anticipated to be used includes backhoes, dozers, pavers, concrete mixers, trucks, air compressors, saws, and hammers. Trucks providing deliveries and hauling to and from the project site would access the site from Fortune Drive. The project would require minimal grading due to previous grading for the existing buildings and parking lots. It is estimated that there would no net import/export of soil at the project site.

2 Background

2.1 Overview of Sound Measurement

Sound is a vibratory disturbance created by a moving or vibrating source, which is capable of being detected by the hearing organs (e.g., the human ear). Noise is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment (California Department of Transportation [Caltrans] 2013a).

Noise levels are commonly measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels so that they are consistent with the human hearing response, which is most sensitive to frequencies around 4,000 Hertz (Hz) and less sensitive to frequencies around and below 100 Hz (Kinsler, et. al. 1999). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used to measure earthquake magnitudes. A doubling of the energy of a noise source, such as a doubling of traffic volume, would increase the noise level by 3 dB; similarly, dividing the energy in half would result in a decrease of 3 dB (Crocker 2007).

Human perception of noise has no simple correlation with sound energy; the perception of sound is not linear in terms of dBA or in terms of sound energy. Two sources do not “sound twice as loud” as one source. It is widely accepted that the average healthy ear can barely perceive an increase (or decrease) of up to 3 dBA in noise levels (i.e., twice [or half] the sound energy); that a change of 5 dBA is readily perceptible (8 times the sound energy); and that an increase (or decrease) of 10 dBA sounds twice (or half) as loud (10.5 times the sound energy) (Crocker 2007).

Sound changes in both level and frequency spectrum as it travels from the source to the receiver. The most obvious change is the decrease in sound level as the distance from the source increases. The manner by which noise reduces with distance depends on factors such as the type of sources (e.g., point or line), the path the sound will travel, site conditions, and obstructions. Noise levels from a point source (e.g., construction, industrial machinery, ventilation units) typically attenuate, or drop off, at a rate of 6 dBA per doubling of distance. Noise from a line source (e.g., roadway, pipeline, railroad) typically attenuates at about 3 dBA per doubling of distance (Caltrans 2013a). The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site, such as a parking lot or smooth body of water, receives no additional ground attenuation, and the changes in noise levels with distance (drop-off rate) result simply from the geometric spreading of the source. An additional ground attenuation value of 1.5 dBA per doubling of distance applies to a soft site (e.g., soft dirt, grass, or scattered bushes and trees) (Caltrans 2013a).

Noise levels may also be reduced by intervening structures; the amount of attenuation provided by this “shielding” depends on the size of the object and the frequencies of the noise levels. Natural terrain features, such as hills and dense woods, and man-made features, such as buildings and walls, can significantly alter noise levels. Generally, any large structure blocking the line of sight will provide at least a 5-dBA reduction in source noise levels at the receiver (Federal Highway Administration 2011). Structures can substantially reduce occupants’ exposure to noise as well. The

FHWA's guidelines indicate that modern building construction generally provides an exterior-to-interior noise level reduction of 20 to 35 dBA with closed windows.

The impact of noise is not a function of sound level alone. The time of day when noise occurs and the duration of the noise are also important. Most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors have been developed. One of the most frequently used noise metrics is the equivalent noise level (L_{eq}); it considers both duration and sound power level. L_{eq} is defined as the single steady A-weighted level equivalent to the same amount of energy as that contained in the actual fluctuating levels over a period of time. Typically, L_{eq} is summed over a one-hour period. L_{max} is the highest root mean squared (RMS) sound pressure level within the sampling period, and L_{min} is the lowest RMS sound pressure level within the measuring period (Crocker 2007). Normal conversational levels are in the 60 to 65 dBA L_{eq} range; ambient noise levels greater than 65 dBA L_{eq} can interrupt conversations (Federal Transit Administration [FTA] 2018).

Noise that occurs at night tends to be more disturbing than that occurring during the day. Community noise is usually measured using Day-Night Average Level (L_{dn}), which is the 24-hour average noise level with a +10 dBA penalty for noise occurring during nighttime hours (10:00 p.m. to 7:00 a.m.).[1] Community noise can also be measured using Community Noise Equivalent Level (CNEL), which is the 24-hour average noise level with a +5 dBA penalty for noise occurring from 7:00 p.m. to 10:00 p.m. and a +10 dBA penalty for noise occurring from 10:00 p.m. to 7:00 a.m. (Caltrans 2013a). Noise levels described by L_{dn} and CNEL usually differ by about 1 dBA. Quiet suburban areas typically have CNEL noise levels in the range of 40 to 50 CNEL, while areas near arterial streets are in the 50 to 60+ CNEL range.

There is no precise way to convert a peak hour L_{eq} to L_{dn} or CNEL. The relationship between the peak hour L_{eq} value and the L_{dn}/CNEL value depends on the distribution of traffic volumes during the day, evening, and night. However, in urban areas near heavy traffic, the peak hour L_{eq} is typically 2 to 4 dBA lower than the daily L_{dn}/CNEL. In less heavily developed areas, such as suburban areas, the peak hour L_{eq} is often roughly equal to the daily L_{dn}/CNEL. For rural areas with little nighttime traffic, the peak hour L_{eq} will often be 3 to 4 dBA greater than the daily L_{dn}/CNEL value (California State Water Resources Control Board 1999).

2.2 Vibration

Groundborne vibration of concern in environmental analysis consists of the oscillatory waves that move from a source through the ground to adjacent structures. The number of cycles per second of oscillation makes up the vibration frequency, described in terms of Hz. The frequency of a vibrating object describes how rapidly it oscillates. The normal frequency range of most groundborne vibration that can be felt by the human body is from a low of less than 1 Hz up to a high of about 200 Hz (Crocker 2007).

While people have varying sensitivities to vibrations at different frequencies, in general they are most sensitive to low-frequency vibration. Vibration in buildings, such as from nearby construction activities, may cause windows, items on shelves, and pictures on walls to rattle. Vibration of building components can also take the form of an audible low-frequency rumbling noise, referred to as groundborne noise (FTA 2018). Although groundborne vibration is sometimes noticeable in outdoor

[1] The L_{dn} can also be expressed as DNL.

environments, it is almost never annoying to people who are outdoors. The primary concern from vibration is that it can be intrusive and annoying to building occupants and vibration-sensitive land uses.

Vibration energy spreads out as it travels through the ground, causing the vibration level to diminish with distance away from the source. High-frequency vibrations diminish much more rapidly than low frequencies, so low frequencies tend to dominate the spectrum at large distances from the source. Discontinuities in the soil strata can also cause diffractions or channeling effects that affect the propagation of vibration over long distances (Caltrans 2013b). When a building is impacted by vibration, a ground-to-foundation coupling loss will usually reduce the overall vibration level. However, under rare circumstances, the ground-to-foundation coupling may actually amplify the vibration level due to structural resonances of the floors and walls.

Vibration amplitudes are usually expressed in peak particle velocity (PPV) or RMS vibration velocity. The PPV and RMS velocity are normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used in monitoring of blasting vibration because it is related to the stresses that are experienced by buildings (Caltrans 2013b).

Although PPV is appropriate for evaluating the potential for building damage, it is not suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude, which is measured as RMS or vibration decibels (VdB). The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as VdB, which serves to compress the range of numbers required to describe vibration (FTA 2018). Therefore, this analysis measures vibration impacts in terms of VdB.

Vibration significance ranges from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, the general threshold where minor damage can occur in fragile buildings (FTA 2018). The general human response to different levels of groundborne vibration velocity levels is described in Table 2.

Table 2 Human Response to Different Levels of Groundborne Vibration

Vibration Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception for many people
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable
85 VdB	Vibration acceptable only if there are an infrequent number of events per day
Source: FTA 2018	

2.3 Sensitive Receivers

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. The San José General Plan Noise Element identifies noise-sensitive land uses as residential, hotels, motels, hospitals, residential care, outdoor sports and recreation, neighborhood parks and playgrounds, schools, libraries, museums, meeting halls, churches, public and quasi public auditoriums, concert halls, and amphitheaters (City of San José 2011). The City of Milpitas General

Plan Noise Element identifies noise-sensitive land uses as residential areas, parks, and schools (City of Milpitas 2015).

2.4 Project Noise Setting

The primary noise sources in the project area are traffic on Trade Zone Boulevard and mechanical equipment at the existing on-site data center and adjacent industrial use. Ambient traffic noise levels are generally highest during the daytime and rush hours unless congestion substantially slows speeds, which tends to reduce ambient noise levels. The predominant noise-sensitive land uses in the vicinity of the project site are residential neighborhoods located across Trade Zone Boulevard to the north.

To characterize existing ambient noise levels, Rincon Consultants, Inc. conducted two long-term 24-hour sound level measurements from July 10 to 12, 2019 and four short-term 15-minute noise measurements on July 12, 2019. Figure 4 shows the noise measurement locations. Table 3 and Table 4 summarize the results of the short- and long-term sound level measurements, respectively.

Table 3 Short-Term Sound Level Monitoring Results

Measurement Number	Measurement Location	Primary Noise Source	Sample Time	dBA L_{eq}
1	20 feet west of east property line, along Fortune Drive	Roadway traffic along Fortune Dr	4:40 pm – 4:55 pm	56
2	Eastern corner of site, near proposed loading dock	Mechanical equipment on site and at adjacent industrial use	5:01 pm – 5:16 pm	53
3	30 feet west of northwest corner of Trade Zone Blvd and Journey Street	Roadway traffic along Trade Zone Blvd	5:28 pm – 5:43 pm	69
4	Trade Zone Blvd, 10 feet west of eastern property line	Roadway traffic along Trade Zone Blvd	5:52 pm – 6:07 pm	69

Source: Field visit using ANSI Type II Integrating sound level meter on July 12, 2019.

Table 4 Long-Term Sound Level Monitoring Results

Measurement Number	Measurement Location	Sample Date	24-Hour L_{eq} (dBA)	L_{dn}
1	Trade Zone Boulevard	July 10 – July 11, 2019	66	71
2	Fortune Drive	July 11 – July 12, 2019	64	66

Source: Field visit using ANSI Type II Integrating sound level meter from July 10 to July 12, 2019.

Figure 4 Noise Measurement Locations

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2.5 Regulatory Setting

City of San José

City of San José Municipal Code

The City of San José regulates noise through the City's Zoning Ordinance contained in San José Municipal Code (SJMC) Chapter 20. SJMC Chapter 20.50.300 establishes noise standards for industrial zoning districts. For industrial uses adjacent to properties used or zoned for residential uses, the maximum noise level at the property line is 55 dBA L_{eq}. For industrial uses adjacent to properties used or zoned for commercial uses, the maximum noise level at the property line is 60 dBA L_{eq}. For industrial uses adjacent to properties used or zoned for industrial or other uses, the maximum noise level at the property line is 70 dBA L_{eq}.

Chapter 20.100.450 limits the hours of construction on sites within 500 feet of a residential land use between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday and does not allow construction at any time on weekends.

Envision San José 2040 General Plan

The City's General Plan establishes interior and exterior noise thresholds for different land uses within the City and vibration thresholds during demolition and construction. The following are applicable policies to the proposed project (City of San José 2011):

Goal EC-1: Community Noise Levels and Land Use Compatibility. Minimize the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies.

Policy EC-1.1 Locate new development in areas where noise levels are appropriate for the proposed uses. Consider federal, state and City noise standards and guidelines as a part of new development review. Applicable standards and guidelines for land uses in San José include:

Interior Noise Levels

The City does not have a standard for interior noise levels in commercial/industrial uses.

Exterior Noise Levels

The City's acceptable exterior noise level objective is 60 dBA DNL or less for residential and most institutional land uses (Table EC-1 [reproduced herein as Table 5]).

Table 5 City of San José Noise and Land Use Compatibility Guidelines

Land Use Category	Noise Exposure Levels (DNL, dBA) Normally Acceptable	Conditionally Acceptable	Unacceptable
1. Residential, Hotels and Motels, Hospitals, and Residential Care	50-60	60-75	> 75
2. Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds	50-65	65-80	> 80
3. Schools, Libraries, Museums, Meeting Halls, Churches	50-60	60-75	> 75
4. Office Buildings, Business Commercial, and Professional Offices	50-70	70-80	> 80
5. Sports Arena, Outdoor Spectator Sports	50-70	70-80	> 80
6. Public and Quasi Public Auditoriums, Concert Halls, Amphitheaters	NA	50-70	> 70

dBA =A-weighted sound pressure level; DNL = Day-Night Average Level

Source: City of San José 2011

Policy EC-1.2 Minimize the noise impacts of new development on land uses sensitive to increased noise levels (Categories 1, 2, 3 and 6) by limiting noise generation and by requiring use of noise attenuation measures such as acoustical enclosures and sound barriers, where feasible. The City considers significant noise impacts to occur if a project would:

- Cause the DNL at noise sensitive receptors to increase by five dBA DNL or more where the noise levels would remain "Normally Acceptable"; or
- Cause the DNL at noise sensitive receptors to increase by three dBA DNL or more where noise levels would equal or exceed the "Normally Acceptable" level.

Policy EC-1.3 Mitigate noise generate of new nonresidential land uses to 55 dBA DNL at the property line when located adjacent to existing or planned noise sensitive residential and public/quasi-public land uses.

Policy EC-1.7 Require construction operations within San José to use best available noise suppression devices and techniques and limit construction hours near residential uses per the City's Municipal Code. The City considers significant construction noise impacts to occur if a project located within 500 feet of residential uses or 200 feet of commercial or office uses would:

- Involve substantial noise generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) continuing for more than 12 months. For such large or complex projects, a construction noise logistics plan that specifies hours of construction, noise and vibration minimization measures, posting or notification of construction schedules, and designation of a noise disturbance coordinator who would respond to neighborhood complaints will be required to be in place prior to the start of construction and implemented during construction to reduce noise impacts on neighboring residents and other uses.

Policy EC-2.3 Require new development to minimize vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, a vibration limit of 0.08 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage to a building. A vibration limit of 0.20 in/sec PPV will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction.

City of Milpitas

City of Milpitas Municipal Code

The City of Milpitas regulates noise and vibration in Chapter 213 of the Milpitas Municipal Code (MMC). MMC Section V-213-3.05 establishes allowed construction hours of 7:00 a.m. to 7:00 p.m. on all weekdays and weekends. No construction is permitted on New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.

Milpitas General Plan

The Milpitas General Plan Noise Element contains the following goals and policies that would be applicable to the proposed project:

Goal 6-G-1. Maintain land use compatibility with noise levels similar to those set by State guidelines.

Goal 6-G-2. Minimize unnecessary, annoying, or injurious noise.

Policy 6-G-1 Use the guidelines in Table 6-1 (Noise and Land Use Compatibility) (reproduced herein as Table 6) as review criteria for development projects.

Policy 6-I-7 Avoid residential DNL exposure increases of more than 3 dB or more than 65 dB at the property line, whichever is more restrictive.

Policy 6-I-11 Minimize noise impacts on neighbors caused by commercial and industrial projects.

Policy 6-I-12 New noise-producing facilities introduced near sensitive land uses which may increase noise levels in excess of “acceptable” levels will be evaluated for impact prior to approval; adequate mitigation at the noise source will be required to protect noise-sensitive land uses.

Policy 6-I-13 Restrict the hours of operation, technique, and equipment used in all public and private construction activities to minimize noise impact. Include noise specifications in requests for bids and equipment information.

Table 6 City of Milpitas Noise and Land Use Compatibility Guidelines

Land Use Category	Noise Exposure Levels (L_{dn} or CNEL, dBA)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential – Low Density, Single Family, Duplex, Mobile Homes	50-60	55-70	70-75	> 75
Residential – Multi-Family	50-65	60-70	70-75	> 75
Transit Lodging – Motels, Hotels	50-65	60-70	70-80	> 80
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-70	60-70	70-80	> 80
Auditoriums, Concert Halls, Amphitheaters	n/a	< 70	n/a	< 65
Sports Arena, Outdoor Spectator Sports	n/a	< 75	> 70	n/a
Playgrounds, Neighborhood Parks	< 70	n/a	67-75	< 72
Golf Courses, Riding Stables, Water Recreation, Cemeteries	> 75	n/a	70-80	> 80
Office Buildings, Business Commercial, and Professional	< 70	67-77	> 75	n/a
Industrial, Manufacturing, Utilities, Agriculture	< 75	70-80	> 75	n/a

L_{dn} = Day-Night Average Level; CNEL = Community Noise Equivalent; dBA =A-weighted sound pressure level; n/a = not applicable

Source: City of Milpitas 2015

3 Impact Analysis

3.1 Methodology

Construction Noise

Construction noise was estimated using the FHWA Roadway Construction Noise Model (RCNM) (2006). RCNM predicts construction noise levels for a variety of construction operations based on empirical data and the application of acoustical propagation formulas. Using RCNM, construction noise levels were estimated at noise-sensitive receivers near the project site. RCNM provides reference noise levels for standard construction equipment, with an attenuation of 6 dBA per doubling of distance for stationary equipment.

For construction noise assessment, construction equipment can be considered to operate in two modes: stationary and mobile. As a rule, stationary equipment operates in a single location for one or more days at a time, with either fixed-power operation (e.g., pumps, generators, and compressors) or variable-power operation (e.g., pile drivers, rock drills, and pavement breakers). Mobile equipment moves around the construction site with power applied in cyclic fashion, such as bulldozers, graders, and loaders (FTA 2018). Noise impacts from stationary equipment are assessed from the center of the equipment, while noise impacts from mobile construction equipment are assessed from the center of the equipment activity area (e.g., construction site).

Variation in power imposes additional complexity in characterizing the noise source level from construction equipment. Power variation is accounted for by describing the noise at a reference distance from the equipment operating at full power and adjusting it based on the duty cycle, or percent of operational time, of the activity to determine the L_{eq} of the operation (FTA 2018).

Each phase of demolition and construction has a specific equipment mix, depending on the work to be accomplished during that phase. Each phase also has its own noise characteristics; some will have higher continuous noise levels than others, and some may have high-impact noise levels. The maximum hourly L_{eq} of each phase is determined by combining the L_{eq} contributions from each piece of equipment used in that phase (FTA 2018). In typical demolition and construction projects, grading activities generate the highest noise levels because grading involves the largest equipment and covers the greatest area.

Project demolition and construction is estimated to occur over 18 months. Construction phases would include demolition, site preparation, grading, building construction, paving, and architectural coating. Construction would not require any blasting or pile driving. The construction equipment list for each phase was generated using the California Emissions Estimator Model version 2016.3.2, which takes into consideration the project's proposed land uses, construction schedule, building and lot area, volume of export, and square footage of demolition (see Appendix A for equipment assumptions). It is assumed that diesel engines would power all construction equipment. For assessment purposes, and to be conservative, the maximum hourly noise level that would occur during of all phases of demolition and construction activities has been used for assessment. Construction noise levels at the nearest sensitive receiver, the residences located across Trade Zone Boulevard, were evaluated at a distance of 80 feet. RCNM calculations are included in Appendix B.

Operational Noise

Noise levels from on-site operations were modeled using SoundPlan, a three-dimensional noise modeling software package that accounts for the shielding and reflective effects associated with intervening buildings and walls. The model accounts for intervening topography to accurately represent noise propagation. The ground was modeled as an acoustically "hard" to account for the existing hard asphalt and concrete surfaces.

The main source of on-site operational noise would be from the HVAC units and occasional operation of the proposed generators. The project potentially includes four 15-ton and one 20-ton HVAC units and up to nine 15-ton air handling units. For assessment purposes, these units were modeled operating at 100 percent power. The anticipated manufacturer of the HVAC and air handling units does not provide sound test data on their units. Thus, HVAC and air handling units were modeled based on similar units. The 15-ton units were modeled as Carrier Model 50TCQ-017 units with a sound power level of 84.1 dBA L_w, and the 20-ton unit was modeled as a Carrier Model 50TCQ-024 with a sound power level of 86.5 dBA L_w. As noted in Section 3, *Project Description*, the project would also include 20 CAT C175-16 generators located within acoustical and weather enclosures. Each of the generators can produce an uncontrolled sound power level of 134.5 dBA L_w. The enclosures would provide a minimum of 77 dBA reduction from the uncontrolled noise level. Thus, with the enclosure, generator noise levels would be reduced to a sound power level of 57.5 dBA L_w. Typically, the generators would only be operated for one hour each week for maintenance and testing. The only scenario in which they would operate for a full hour would be in the case of a power outage. Even in this scenario, the generators would likely only operate at 70 percent of maximum capacity. However, for assessment purposes, the generators were modeled operating at full power for one hour. Operational noise modeling results are included in Appendix C.

Secondary noise sources associated with project operation would include general vehicular movement accessing the site and within parking lots, trash hauling, and general maintenance activities. However, all these activities are also associated with the current building and on-site operations. While some of these activities may be located in slightly different locations, they would be similar in thus, the on-site noise would not result in a change in substantial increase in project area noise level.

Groundborne Vibration

The proposed project does not include substantial vibration sources associated with operation. Thus, construction activities have the greatest potential to generate groundborne vibration affecting nearby receivers, especially during grading and paving of the project site. The greatest vibratory sources during construction would be rollers, bulldozers, and loaded trucks. Neither blasting nor pile driving would be required for construction of the proposed project. Construction vibration estimates are based on vibration levels reported by Caltrans and the FTA (Caltrans 2013b; FTA 2018).

A quantitative assessment of potential vibration impacts from construction activities, such as vibratory compaction, demolition, drilling, or excavation, was conducted using the estimates and equations developed by Caltrans and the FTA (Caltrans 2013b, FTA 2018). Table 7 shows typical vibration levels for various pieces of construction equipment used in the assessment of construction vibration (FTA 2018). These pieces of construction equipment are anticipated to be used during project construction and would generate the highest levels of vibration as compared to construction equipment not included in this analysis.

Table 7 Vibration Levels Measured during Construction Activities

Equipment	PPV at 25 ft. (in/sec)	Approximate L_v at 25 ft. (VdB)
Large Bulldozer	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Vibratory Roller	0.204	94

Source: FTA 2018

3.2 Significance Thresholds

To determine whether a project would have a significant noise impact, Appendix G to the *State CEQA Guidelines* requires consideration of whether a project would result in:

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;
2. Generation of excessive groundborne vibration or groundborne noise levels; or
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, exposure of people residing or working in the project area to excessive noise levels.

Construction Noise

The cities of San José and Milpitas do not currently have any established quantitative noise standards for construction noise. However, Policy EC-1.7 of the City of San José General Plan states that the project would have a significant impact if it would generate substantial noise continuing for more than 12 months within 500 feet of a residence or 200 feet of commercial or office use or does not use best available suppression devices and techniques. As such, this standard is used to evaluate the significance of construction noise impacts.

Operational Noise

Pursuant to City of San José General Plan Policies EC-1.2 and EC-1.3 and SJMC Chapter 20.50.300, the project would have a significant operational impact on ambient noise levels if it would:

- Cause the DNL at noise-sensitive receivers to increase by five L_{dn} or more where the noise levels would remain "Normally Acceptable";
- Cause the DNL at noise-sensitive receivers to increase by three L_{dn} or more where noise levels would equal or exceed the "Normally Acceptable" level;
- Generate noise levels at noise-sensitive receivers that exceed 55 L_{dn};
- Generate noise levels at residential property lines that exceed 55 dBA L_{eq}; or
- Generate noise levels at industrial property lines that exceed 70 dBA L_{eq}.

In addition, pursuant to City of Milpitas General Plan Policy 6-I-7, the project would have a significant operational noise impact if it would cause residential DNL levels to increase by more than

3 dB or generate noise levels greater than 65 L_{dn} at residential property lines, whichever is more restrictive.

Construction Vibration

To minimize the potential for cosmetic damage to buildings, the City of San José has established vibration thresholds of 0.08 in/sec PPV for sensitive historic structures and 0.20 in/sec PPV for buildings of normal conventional construction. The City of Milpitas has not adopted construction vibration standards. Therefore, the City of San José’s standards are utilized to evaluate the significance of the project’s construction vibration impacts.

3.3 Impact Analysis

Threshold 1:	Would the proposed project generate 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]

Impact N-1 CONSTRUCTION OF THE PROPOSED PROJECT WOULD EXPOSE NEARBY SENSITIVE RECEIVERS TO A TEMPORARY INCREASE IN NOISE. CONSTRUCTION ACTIVITIES WOULD RESULT IN A POTENTIALLY SIGNIFICANT IMPACT BECAUSE PROJECT CONSTRUCTION WOULD GENERATE SUBSTANTIAL NOISE CONTINUING FOR MORE THAN 12 MONTHS WITHIN 500 FEET OF A RESIDENCE OR 200 FEET OF COMMERCIAL OR OFFICE USE. THEREFORE, IMPLEMENTATION OF MITIGATION MEASURE N-1 WOULD BE REQUIRED, AND THE PROPOSED PROJECT WOULD HAVE A LESS THAN SIGNIFICANT CONSTRUCTION NOISE IMPACT WITH MITIGATION INCORPORATED.

Project construction would generate temporary noise that would exceed existing ambient noise levels, but such noise would cease upon the completion of construction activity. Noise impacts associated with construction activity are a function of the noise generated by construction equipment, the location and sensitivity of nearby land uses, and the timing and duration of the noise-generating activities.

Table 8 provides estimates of construction noise at the nearest sensitive receiver, the residences located across Trade Zone Boulevard. Noise was modeled based on the project's construction equipment list for each phase and distance to nearby receivers.

Table 8 Estimated Maximum Construction Noise

Construction Phase	Equipment	Estimated Noise at 80 feet (dBA L_{eq})
Phase 1		
Demolition	Concrete saw, excavators (3), dozers (2)	82
Site preparation	Dozers (3), tractors/backhoes/loaders (4)	82
Grading	Tractor/backhoe/loader (3), dozer, grader	83
Phase 2		
Building construction	Crane, forklifts (3), tractors/backhoes/loaders (3), generator set, welder	77
Paving	Paving equipment (2), pavers (2), rollers (2)	82
Architectural coating	Air compressor	70

See Appendix B for RCNM modeling results.

As shown in Table 8, construction noise would reach as high as 83 dBA L_{eq} at a distance of 80 feet during the grading phase, which would exceed the measured ambient noise level of 66 dBA L_{eq} by 17 dBA. Per SJMC Chapter 20.100.450, the hours of construction would be limited to 7:00 a.m. to 7:00 p.m. Monday through Friday because the project site is within 500 feet of a residential land use. These hours of construction would be consistent with MMC Section V-213-3.05.

The Cities of San José and Milpitas do not currently have any established quantitative noise standards for construction noise. However, according to the City of San José's General Plan, the project would have a significant impact if it generates substantial noise continuing for more than 12 months within 500 feet of a residence or 200 feet of commercial or office use or does not use best available suppression devices and techniques. The project would be located approximately 80 feet south of existing residences along Trade Zone Boulevard, and construction activities associated with the project would occur over 18 months. Therefore, construction noise would represent a potentially significant impact and mitigation would be required.

Mitigation Measure

The following mitigation measure would be required to reduce impacts from construction noise to a less than significant level. With implementation of Mitigation Measure N-1, impacts would be less than significant.

Mitigation Measure N-1

Prior to the issuance of any grading permits or demolition, the project applicant shall submit and implement a construction noise control plan that specifies hours of construction, noise minimization measures, posting and notification of construction schedules, equipment to be used, and designation of a noise disturbance coordinator. The noise disturbance coordinator shall respond to neighborhood complaints and shall be in place prior to the start of construction and implemented during construction to reduce noise impacts on neighboring residents and other uses.

- As part of the noise logistic plan and project, construction activities for the proposed project shall include, but is not limited to, the following best management practices: Limit construction activities shall be limited to the hours between 7:00 a.m. and 7:00 p.m., Monday through Friday, unless permission is granted with a development permit or other planning approval. No construction activities are permitted on the weekends at sites within 500 feet of a residence.
- Construct temporary noise barriers, where feasible, to screen mobile and stationary construction equipment. The temporary noise barrier fences would provide noise reduction if the noise barrier interrupts the line-of sight between the noise source and receiver and if the barrier is constructed in a manner that eliminates any cracks or gaps. Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Prohibit unnecessary idling of internal combustion engines.
- Locate stationary noise-generating equipment such as air compressors or portable power generators as far as possible from sensitive receivers. Construct temporary noise barriers to screen stationary noise-generating equipment when located near adjoining sensitive land uses. Temporary noise barriers could reduce construction noise levels by 5 dBA.
- Utilize "quiet" air compressors and other stationary noise sources where technology exists.
- Control noise from construction workers' radios to a point where it is not audible at existing residences bordering the project site.
- A temporary noise control blanket barrier could be erected, if necessary, along building facades facing construction sites. This mitigation would only be necessary if conflicts occurred which were irresolvable by proper scheduling. Noise control blanket barriers can be rented and quickly erected.

- Notify all adjacent business, residences, and other noise-sensitive land uses of the construction schedule, in writing, and provide a written schedule of "noisy" construction activities to the adjacent land uses and nearby residences.
- Designate a "disturbance coordinator" who would be responsible for responding to any complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., bad muffler) and will require that reasonable measures be implemented to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include in it the notice sent to neighbors regarding the construction schedule.

The noise control plan shall be submitted to the Director of Planning, Building, and Code Enforcement or Director's designee for review and approval prior to the issuance of any grading permit.

Significance After Mitigation

Implementation of this mitigation measure would avoid potentially significant construction-related noise impacts to adjacent residential receivers during construction activities. Temporary plywood noise barrier fences would reduce noise by 5 to 10 dBA L_{eq} and exhaust mufflers would reduce noise by 8 dBA L_{eq}. Assuming a conservative reduction of 5 dBA L_{eq} for the fences and noise barriers, the noise reduction mitigation would reduce noise from project construction by at least 13 dBA L_{eq}. Therefore, ambient noise levels 80 feet from the construction site would be reduced to 70 dBA L_{eq} during the loudest construction phase. This would exceed the measured ambient noise level of 66 dBA L_{eq} by 4 dBA L_{eq}. However, increases in ambient noise levels of 3 dBA are imperceptible to the human ear (Crocker 2007). Thus, mitigation of construction noise to a level 4 dBA above the City's threshold would substantially reduce construction noise impacts at the nearest sensitive receivers. Mitigation Measure N-1 would reduce construction noise to the degree feasible; therefore, the proposed project would have a less than significant construction noise impact.

Threshold 1:	Would the proposed project generate 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? [Operation]

Impact N-2 **OPERATION OF THE PROPOSED PROJECT WOULD EXPOSE NEARBY SENSITIVE RECEIVERS TO NOISE TYPICAL OF DATA CENTER USES, INCLUDING NOISE FROM HVAC EQUIPMENT, VEHICULAR MOVEMENT, OTHER MECHANICAL EQUIPMENT, AND INFREQUENT GENERATOR OPERATION. OPERATIONAL NOISE LEVELS WOULD NOT EXCEED THE CITY'S HOURLY NOISE LEVEL STANDARDS OF 55 DBA AT THE NEAREST RESIDENTIAL PROPERTY OR 70 DBA AT THE ADJACENT INDUSTRIAL PROPERTIES. THEREFORE, THE PROPOSED PROJECT WOULD HAVE A LESS THAN SIGNIFICANT OPERATIONAL NOISE IMPACT.**

The proposed project would generate non-mobile operational noise that would be typical of data center uses, including continuous sounds from HVAC equipment and periodic instantaneous sounds such as vehicular movement, other mechanical equipment, and infrequent generator operation. Table 9 summarizes project-generated hourly operational noise levels at the nearest receiver locations. As shown therein, hourly operational noise levels would not exceed the City of San José's industrial use noise standards of 55 dBA L_{eq} at the nearest residential property lines and 70 dBA L_{eq} at the nearest industrial property lines. Table 10 summarizes project-generated 24-hour operational noise levels at residential receivers to the north. As shown therein, project operational noise levels would not exceed the City of San José's 24-hour noise standard of 55 L_{dn} or the City of Milpitas' 24-

hour noise standard of 65 L_{dn}. In addition, the project would result in less than 0.1 L_{dn} change in 24-hour noise levels at residential receivers, which would not exceed the Cities of San José and Milpitas' threshold of 3 L_{dn}. Therefore, operational noise impacts would be less than significant.

Table 9 Modeled Project Hourly Noise Levels

Receiver	Location	Hourly Noise Level (dBA L_{eq})	Hourly Threshold (dBA L_{eq})[1]	Threshold Exceeded?
R-1	2130 Trade Zone Boulevard (east)	39	70	No
R-2	Residential uses (north)	36	50	No
R-3	East of cooling towers	28	70	No
R-4	2091 Fortune Drive (east)	37	70	No
R-5	2090 Fortune Drive (south)	37	70	No
R-6	1849 Fortune Drive (west)	32	70	No
R-7	2400 Ringwood Avenue (west)	32	70	No

[1] Based on SJMC Section 20.50.300.

See Appendix C for operational noise modeling results.

Table 10 Modeled Project 24-Hour Noise Levels

Receiver	Location	Existing 24-Hour Noise Level (L_{dn})[1]	24-Hour Noise Level (L_{dn})[2]	City of Milpitas 24-Hour Threshold (L_{dn})[3]	City of San José 24-Hour Threshold (L_{dn})[4]	Change in 24-Hour Noise Level (L_{dn})	Cities of San José and Milpitas Change in 24-Hour Noise Level Threshold (L_{dn})[5]	Thresholds Exceeded?
R-2	Residential uses north of site	71	39	65	55	< 0.1	3	No

Note: The City of Milpitas 24-hour noise standard only applies to residential land uses, and the City of San José's 24-hour noise standard only applies to sensitive receivers. Therefore, this table only compares modeled 24-hour noise levels at residential uses north of the site to the Cities' 24-hour noise standards.

[1] Based on long-term Noise Measurement 1 (see Table 4).

[2] SoundPlan reports 24-hour noise levels in terms of CNEL. However, noise levels described by L_{dn} and CNEL usually do not differ by more than 1 dB and are used interchangeably in practice.

[3] Based on City of Milpitas General Plan Policy 6-I-7.

[4] Based on San José General Plan Policy EC-1.3.

[5] Based on San José General Plan Policy EC-1.2 and City of Milpitas General Plan Policy 6-1-7. The existing ambient noise level at residential land uses is approximately 71 L_{dn} (based on long-term Noise Measurement 1 [see Table 4]), which falls within the City of San José's "conditionally acceptable" range for residential land uses. Therefore, the threshold of a 3-dBA change in DNL levels is utilized.

See Appendix C for operational noise modeling results.

Threshold 2:	Would the proposed project generate excessive groundborne vibration or groundborne noise levels?

Impact N-3 CONSTRUCTION OF THE PROPOSED PROJECT WOULD EXPOSE NEARBY SENSITIVE RECEIVERS TO A TEMPORARY INCREASE IN VIBRATION. HOWEVER, VIBRATION LEVELS WOULD NOT EXCEED 0.08 IN/SEC PPV AT SENSITIVE HISTORIC STRUCTURES OR 0.20 IN/SEC PPV FOR BUILDINGS OF NORMAL CONVENTIONAL CONSTRUCTION, WHICH ARE THE THRESHOLDS AT WHICH COSMETIC DAMAGE TO BUILDINGS MAY OCCUR TO TYPICAL BUILDINGS. THEREFORE, THE PROPOSED PROJECT WOULD HAVE A LESS THAN SIGNIFICANT VIBRATION IMPACT.

Project construction would result in some vibration that may be felt on properties in the vicinity. In accordance with the SJMC, project construction would be limited to the hours of 7:00 a.m. to 7:00 Monday through Friday and at no time on weekends because it is located within 500 feet of a residence (SJMC Chapter 20.100.450). These timing restrictions on construction activity would avoid vibration during normal sleeping hours. As shown in Table 11, equipment used during project construction would generate vibration of up to 0.20 in/sec PPV at 25 feet, which would not exceed the San José General Plan Policy EC-2.3 thresholds of 0.20 in/sec PPV (approximately 94 VdB at 25 feet distance) for buildings of normal conventional construction. Therefore, construction vibration impacts would be less than significant.

Table 11 Vibration Source Levels for Construction Equipment

	Approximate VdB		Approximate PPV (in/sec)	
Equipment	**25 Feet**	**100 Feet**	**25 Feet**	**100 Feet**
Large Bulldozer	87	69	0.089	0.011
Loaded Trucks	86	68	0.076	0.010
Jackhammer	79	61	0.035	0.004
Vibratory Roller	94	76	0.204	0.026

VdB = vibration decibels

PPV = particle velocity in inches per second

Note: Per San José General Plan Policy EC-2.3, the reference distances of 25 feet was used to determine the significance of vibration levels; The reference distance of 100 feet was used to determine vibration levels at the nearest sensitive receivers (residences on Trade Zone Boulevard).

Source: FTA 2018

Threshold 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 proposed project expose people residing or working in the project area to excessive noise levels?

Impact N-4 THE PROJECT WOULD BE LOCATED OUTSIDE THE AIRPORT INFLUENCE AREA FOR THE SAN JOSÉ INTERNATIONAL AIRPORT. THEREFORE, THE PROJECT WOULD NOT EXPOSE PEOPLE WORKING IN THE PROJECT AREA TO EXCESSIVE NOISE LEVELS. NO IMPACT WOULD OCCUR.

The nearest airport to the project site is the San José International Airport, approximately 3 miles west. The project site is not located within the airport land use plan area (Santa Clara County Airport Land Use Commission 2011). Therefore, the project would not expose people to excessive noise associated with an airstrip. There would be no impact.

4 Conclusions and Recommendations

Because project construction would generate substantial noise continuing for more than 12 months within 500 feet of a residence or 200 feet of commercial or office use, noise generated by project construction would be potentially significant, and implementation of Mitigation Measure N-1 would be required to reduce impacts to a less-than-significant level. All other impacts related to operational noise, vibration, and airport-related noise would be less than significant.

5 References

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Appendix A

Construction Equipment List

STACK Data Center Expansion Project

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	239.72	1000sqft	5.50	162,422.00	0
Parking Lot	148.00	Space	1.33	59,200.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 58

Climate Zone 4 **Operational Year** 2022

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 641.35 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - SJCE intensity factors not available, so used PG&E intensity factors as highly conservative estimate.

Land Use - Per project plans revised 5.1.19, building footprint is 162,422

Construction Phase - Per applicant estimate 18 months construction period

Demolition - Estimated existing 1-story building square footage at 64,037 sf

Grading - Per applicant estimate balanced cut/ fill

Architectural Coating - Per Regulation 8 BAAQMD Architecutral Coatings for nonresidential flat coatings 100 g/L

Vehicle Trips - Hexagon driveway counts September 2019. Trip Generation rate of 1.83

Energy Use - Energy calculated separately.

Water And Wastewater - Applicant provided estimated water demand (Average Annual Usage) 164,369,954 GPY

Stationary Sources - Emergency Generators and Fire Pumps - Per Cat C175-16 Diesel Generator Sets and estimate generators will be run a total of 16 hours per year for maintenance.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	100.00
tblConstructionPhase	NumDays	20.00	176.00
tblEnergyUse	LightingElect	3.08	0.00
tblEnergyUse	LightingElect	0.35	0.00
tblEnergyUse	NT24E	3.70	0.00
tblEnergyUse	NT24NG	6.67	0.00
tblEnergyUse	T24E	1.48	0.00
tblEnergyUse	T24NG	19.71	0.00
tblLandUse	LandUseSquareFeet	239,720.00	162,422.00
tblStationaryGeneratorsPumpsEF	CH4_EF	0.07	0.07
tblStationaryGeneratorsPumpsEF	ROG_EF	2.2480e-003	2.2477e-003
tblStationaryGeneratorsPumpsUse	HorsePowerValue	0.00	187.70
tblStationaryGeneratorsPumpsUse	HoursPerYear	0.00	50.00
tblStationaryGeneratorsPumpsUse	NumberOfEquipment	0.00	18.00
tblVehicleTrips	ST_TR	1.32	1.83
tblVehicleTrips	SU_TR	0.68	1.83
tblVehicleTrips	WD_TR	6.97	1.83
tblWater	IndoorWaterUseRate	55,435,250.00	164,369,954.00

2.0 Emissions Summary

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/28/2020	5	20	
2	Site Preparation	Site Preparation	1/29/2020	2/18/2020	5	10	
3	Grading	Grading	2/19/2020	3/24/2020	5	20	
4	Building Construction	Building Construction	3/25/2020	3/30/2021	5	230	
5	Architectural Coating	Architectural Coating	9/28/2020	5/31/2021	5	176	
6	Paving	Paving	3/31/2021	4/27/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 1.33

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 243,633; Non-Residential Outdoor: 81,211; Striped Parking Area: 3,552 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

Trips and VMT

Appendix B

Roadway Construction Noise Model (RCNM) Results

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/22/2019
Case Description: STACK Data Center Project

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residences on Tradezone	Residential	65.0	65.7	65.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	80.0	0.0
Excavator	No	40		80.7	80.0	0.0
Excavator	No	40		80.7	80.0	0.0
Excavator	No	40		80.7	80.0	0.0
Dozer	No	40		81.7	80.0	0.0
Dozer	No	40		81.7	80.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	85.5	78.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	76.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	76.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	76.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	77.6	73.6	N/A	N/A	N/A	N/A	N/A							

N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Dozer			77.6	73.6	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
		Total	85.5	82.4	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/22/2019
Case Description: STACK Data Center Project

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residences on Tradezone	Residential	65.0	65.7	65.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	80.0	0.0
Dozer	No	40		81.7	80.0	0.0
Dozer	No	40		81.7	80.0	0.0
Dozer	No	40		81.7	80.0	0.0
Backhoe	No	40		77.6	80.0	0.0
Backhoe	No	40		77.6	80.0	0.0
Backhoe	No	40		77.6	80.0	0.0
Grader	No	40	85.0		80.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	77.6	73.6	N/A	N/A	N/A	N/A	N/A							

N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Backhoe			73.5	69.5	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Backhoe			73.5	69.5	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Backhoe			73.5	69.5	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
Grader			80.9	76.9	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			
		Total	80.9	82.3	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A			

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/22/2019
Case Description: STACK Data Center Project

**** Receptor #1 ****

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Residences on Tradezone	Residential	65.0	65.7	65.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	80.0	0.0
Excavator	No	40		80.7	80.0	0.0
Dozer	No	40		81.7	80.0	0.0
Backhoe	No	40		77.6	80.0	0.0
Backhoe	No	40		77.6	80.0	0.0
Backhoe	No	40		77.6	80.0	0.0
Grader	No	40	85.0		80.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	85.5	78.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	76.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	73.5	69.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Backhoe		73.5	69.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		73.5	69.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader		80.9	76.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	85.5	82.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/22/2019
Case Description: STACK Data Center Project

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residences on Tradezone	Residential	65.0	65.7	65.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	80.0	0.0
Man Lift	No	20		74.7	80.0	0.0
Man Lift	No	20		74.7	80.0	0.0
Man Lift	No	20		74.7	80.0	0.0
Backhoe	No	40		77.6	80.0	0.0
Backhoe	No	40		77.6	80.0	0.0
Backhoe	No	40		77.6	80.0	0.0
Generator (<25KVA, VMS signs)	No	50		72.8	80.0	0.0
Welder / Torch	No	40		74.0	80.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Calculated (dBA) Day Evening

Night Day Evening Night

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	76.5	68.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	70.6	63.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	70.6	63.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	70.6	63.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	73.5	69.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	73.5	69.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	73.5	69.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator (<25KVA, VMS signs)	68.7	65.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	69.9	65.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	76.5	76.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/22/2019
Case Description: STACK Data Center Project

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residences on Tradezone	Residential	65.0	65.7	65.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Pavement Scarafier	No	20		89.5	80.0	0.0
Pavement Scarafier	No	20		89.5	80.0	0.0
Paver	No	50		77.2	80.0	0.0
Paver	No	50		77.2	80.0	0.0
Roller	No	20		80.0	80.0	0.0
Roller	No	20		80.0	80.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq

Pavement Scarafier	85.4	78.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pavement Scarafier	85.4	78.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	73.1	70.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	73.1	70.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	75.9	68.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	75.9	68.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.4	82.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/22/2019
Case Description: STACK Data Center Project

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residences on Tradezone	Residential	65.0	65.7	65.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	80.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	73.6	69.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	73.6	69.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix C

Operational Noise Modeling Results

STACK Data Center B
Run info
Operations - SPS

Project description

Project title:	STACK Data Center B
Project No.:	19-07539
Project engineer:	Maddux
Customer:	

Description:

Run description

Calculation type:	Single Point Sound
Title:	Operations - SPS
Group:	
Run file:	RunFile.runx
Result number:	3
Local calculation (ThreadCount=4)	
Calculation start:	10/29/2019 6:56:50 AM
Calculation end:	10/29/2019 6:56:55 AM
Calculation time:	00:03:967 [m:s:ms]
No. of points:	7
No. of calculated points:	7
Kernel version:	SoundPLAN 8.1 (10/24/2019) - 32 bit

Run parameters

Reflection order:	3	
Maximum reflection distance to receiver		200 m
Maximum reflection distance to source		50 m
Search radius	5000 m	
Weighting:	dB(A)	
Allowed tolerance (per individual source):	0.100 dB	
Create ground effect areas from road surfaces:		Yes

Standards:

- Industry: ISO 9613-2: 1996
- Air absorption: ISO 9613-1
- regular ground effect (chapter 7.3.1), for sources without a spectrum automatically alternative ground effect
- Limitation of screening loss:
  - single/multiple 20.0 dB /25.0 dB
- Side diffraction: Outdated method (side paths also around terrain)
- Use Eqn (Abar=Dz-Max(Agr,0)) instead of Eqn (12) (Abar=Dz-Agr) for insertion loss
- Environment:
  - Air pressure 1013.3 mbar
  - rel. humidity 70.0 %
  - Temperature 10.0 °C
  - Meteo. corr. C0(7-22h)[dB]=0.0; C0(22-7h)[dB]=0.0;
  - Ignore Cmet for Lmax industry calculation: No
- Parameter for screening: C2=20.0
- Dissection parameters:
  - Distance to diameter factor 8

Minimal distance	1 m
Max. difference ground effect + diffraction	1.0 dB
Max. number of iterations	4
Attenuation	
Foliage:	ISO 9613-2
Built-up area:	ISO 9613-2
Industrial site:	ISO 9613-2
Assessment:	CNEL (CA)
Reflection of "own" facade is suppressed	

Geometry data

Future.sit	10/29/2019 6:50:10 AM	
- contains:		
AHU.geo	10/29/2019 6:50:10 AM	
Attenuation Area.geo	9/15/2019 2:18:58 PM	
Building.geo	9/15/2019 1:06:22 PM	
Calculation Area.geo	9/15/2019 2:18:58 PM	
Cooling Towers.geo	9/15/2019 1:06:22 PM	
Generator Containers.geo	9/15/2019 1:06:22 PM	
Generator Stacks(Mitigated.geo		10/29/2019 6:50:10 AM
Geo-File1.geo	9/15/2019 2:18:58 PM	
HVAC.geo	9/23/2019 8:23:42 AM	
Mechancial Floor.geo	9/15/2019 1:06:22 PM	
Mechanical Shielding.geo	9/15/2019 12:47:54 PM	
Parapet.geo	9/15/2019 2:08:46 PM	
RDGM0001.dgm	9/15/2019 2:19:26 PM	

STACK Data Center B
Assessed receiver levels
Operations - SPS

Receiver	Usage	Fl	Dir	dB(A)	Lr,lim dB(A)	Lr,lim dB(A)	Lr,lim dB(A)	Ldn dB(A)	
1	GI	G						41.8	
2	GI	G						38.7	
3	GI	G						31.0	
4	GI	G						39.4	
5	GI	G						39.5	
6	GI	G						34.2	
7	GI	G						34.7	

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STACK Data Center B
Octave spectra of the sources in dB(A) - Operations - SPS

Name	Source type	I or A	Li	R'w	L'w	Lw	KI	KT	LwMax	DO-Wall	Day histogram	Emission spectrum	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
		m,m²	dB(A)	dB	dB(A)	dB(A)	dB	dB	dB(A)	dB			dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	
AHU-2	Point				84.0	84.0	0.0	0.0		0	100%/24h	15 Ton - 50TCQ - 017	66.0	67.8	71.8	78.6	78.7	77.7	73.2	64.3	
AHU-3	Point				84.0	84.0	0.0	0.0		0	100%/24h	15 Ton - 50TCQ - 017	66.0	67.8	71.8	78.6	78.7	77.7	73.2	64.3	
AHU-4	Point				84.0	84.0	0.0	0.0		0	100%/24h	15 Ton - 50TCQ - 017	66.0	67.8	71.8	78.6	78.7	77.7	73.2	64.3	
AHU-5	Point				84.0	84.0	0.0	0.0		0	100%/24h	15 Ton - 50TCQ - 017	66.0	67.8	71.8	78.6	78.7	77.7	73.2	64.3	
AHU-6	Point				84.0	84.0	0.0	0.0		0	100%/24h	15 Ton - 50TCQ - 017	66.0	67.8	71.8	78.6	78.7	77.7	73.2	64.3	
AHU-7	Point				84.0	84.0	0.0	0.0		0	100%/24h	15 Ton - 50TCQ - 017	66.0	67.8	71.8	78.6	78.7	77.7	73.2	64.3	
AHU-8	Point				84.0	84.0	0.0	0.0		0	100%/24h	15 Ton - 50TCQ - 017	66.0	67.8	71.8	78.6	78.7	77.7	73.2	64.3	
AHU-9	Point				84.0	84.0	0.0	0.0		0	100%/24h	15 Ton - 50TCQ - 017	66.0	67.8	71.8	78.6	78.7	77.7	73.2	64.3	
AHU 1	Point				84.0	84.0	0.0	0.0		0	100%/24h	15 Ton - 50TCQ - 017	66.0	67.8	71.8	78.6	78.7	77.7	73.2	64.3	
Gen 1	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 2	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 3	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 4	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 5	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 6	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 7	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 8	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 9	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 10	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 11	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	

STACK Data Center B
Octave spectra of the sources in dB(A) - Operations - SPS

Name	Source type	I or A m,m²	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	KI dB	KT dB	LwMax dB(A)	DO-Wall dB	Day histogram	Emission spectrum	63Hz dB(A)	125Hz dB(A)	250Hz dB(A)	500Hz dB(A)	1kHz dB(A)	2kHz dB(A)	4kHz dB(A)	8kHz dB(A)	
Gen 12	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 13	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 14	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 15	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 16	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 17	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 18	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 19	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
Gen 20	Point				81.8	81.8	0.0	0.0		0	Generator Test and Operations	CAT C175-16 - Enclosure		53.9	60.4	68.4	73.6	77.6	75.7	74.0	
RTU-3	Point				86.5	86.5	0.0	0.0		0	100%/24h	20 Ton - 50TCQ - 024	69.4	71.4	75.6	81.0	81.7	79.1	74.2	65.2	
RTU-4	Point				84.0	84.0	0.0	0.0		0	100%/24h	15 Ton - 50TCQ - 017	66.0	67.8	71.8	78.6	78.7	77.7	73.2	64.3	
RTU-5	Point				84.0	84.0	0.0	0.0		0	100%/24h	15 Ton - 50TCQ - 017	66.0	67.8	71.8	78.6	78.7	77.7	73.2	64.3	
RTU -1	Point				84.0	84.0	0.0	0.0		0	100%/24h	15 Ton - 50TCQ - 017	66.0	67.8	71.8	78.6	78.7	77.7	73.2	64.3	
RTU -2	Point				84.0	84.0	0.0	0.0		0	100%/24h	15 Ton - 50TCQ - 017	66.0	67.8	71.8	78.6	78.7	77.7	73.2	64.3	