CoreSite – Santa Clara Data Center SV9

Noise and Vibration Study

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1.1 Introduction

This study analyzes the potential noise and vibration impacts of the proposed CoreSite – Santa Clara Data Center SV9 Project (herein referred to as "proposed project" or "project") in Santa Clara, California. Rincon Consultants, Inc. (Rincon) prepared this study for the City of Santa Clara 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 approximately four-acre project site is in the City of Santa Clara, in the Silicon Valley region of the larger San Francisco Bay Area. The project site is in central Santa Clara, south of US Highway 101 (US-101) and west of the San Tomas Expressway. Figure 1 shows the project site's regional location. Land use designations surrounding the project site consist of Light Industrial and Planned Industrial to the west, south, and east; Low Intensity Office/Research and Development to the north, and High Intensity Office/Research and Development farther to the west.

Surrounding development consists mainly of one- to five-story buildings with large surface parking lots. Nearby uses include data centers, research and development buildings, biotech companies and other digital technology-oriented uses. Buildings are generally set back from the street by landscaped areas, fencing and surface parking. Street-side trees occur intermittently throughout the area, often breaking up views of existing buildings from the street.

The project site is bound by Central Expressway to the south, Stender Way to the west, adjacent buildings to the north, and San Tomas Aquino Creek to the east. CoreSite's SV3, SV4, SV5, SV6, SV7, and SV8 data centers are immediately west of the project site along Stender Way and Coronado Drive. Corporate offices for ON Semiconductor (Semiconductor supplier) are immediately to the north while San Tomas Aquino Creek and bike trail is to the east. There are various offices for Allegion, Crystal Instruments, AccuImage and Sentek Dynamics further to the east across the creek on Owen Street. Figure 2 shows an aerial view of the project location and immediate surroundings.

Site Conditions

The project site is developed with a single-story light industrial building and parking lot. The building is currently in use by several tenants leasing space. The existing building is set back from the roadway and parcel lines on all sides, and is surrounded on the west, north, and eastern sides with surface parking. The southern side of the building is set back from Central Expressway with landscaping, trees and a paved pedestrian walkway. The topography of the project site is relatively flat, with slight mounding around landscaping.

Figure 1 Regional Location

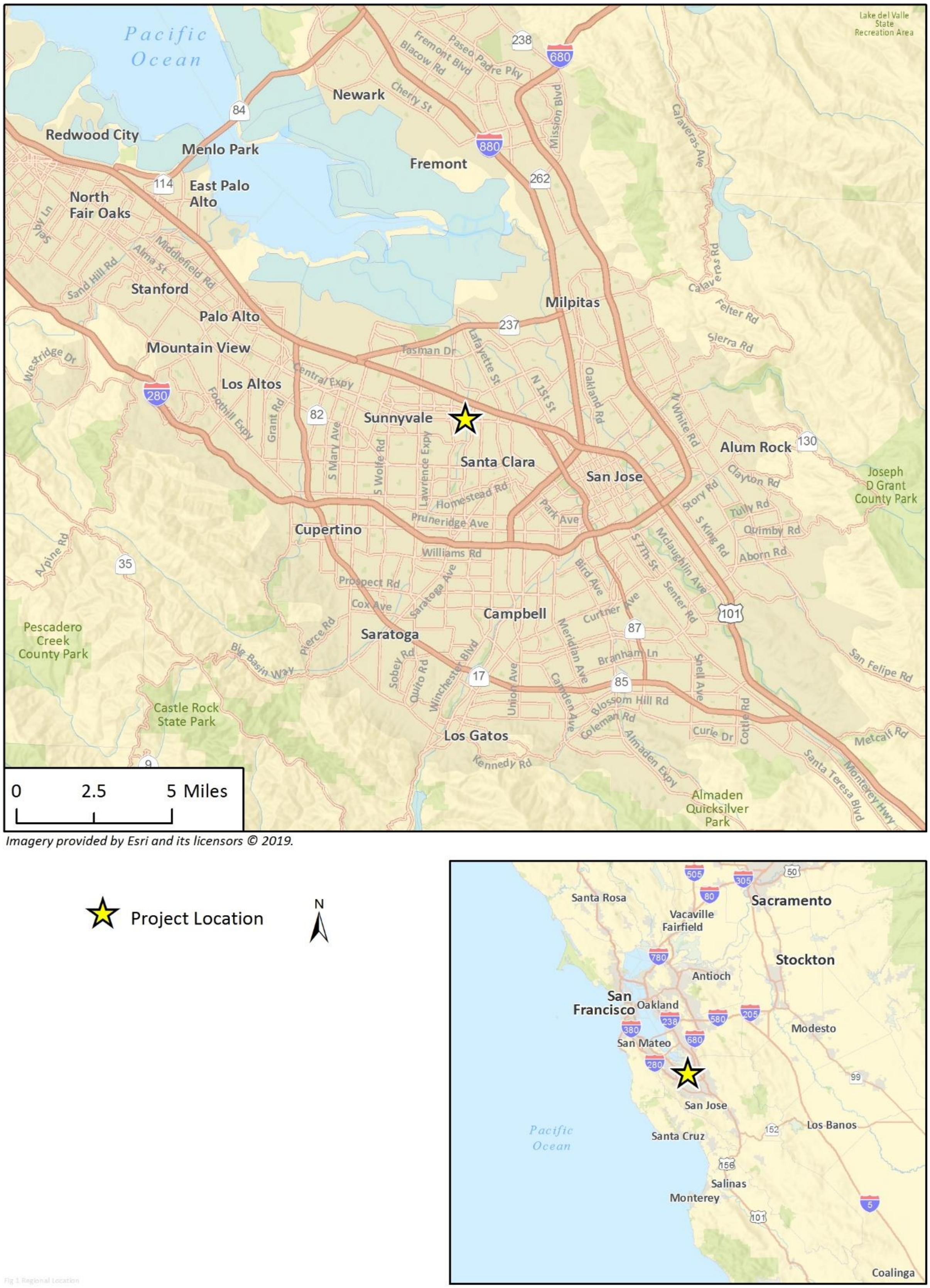

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Figure 2 Project Site Location

Imagery provided by Microsoft Bing and its licensors © 2019.

There are two curb cuts which allow vehicles to enter the site from Stender Way. Primary pedestrian access is also from Stender Way. The site includes utility connections (water, sewer, and electrical) and a Silicon Valley Power (SVP) utility easement that runs along the southern and western edge of the site. Additionally, there is an easement for electrical systems in favor of the City of Santa Clara encompassing the existing transformer and conduit.

Project Description

As part of the project, the existing single-story building would be demolished, and the associated parking lot would be removed. A four-story, 246,660 square-foot data center (SV9) would replace the existing uses on the site. The SV9 data center would be approximately 85 feet in height and would house computer servers and supporting equipment for private clients. Clients would either use the project as a place to relocate their existing servers or to store new servers and expand their server capacity. Sixteen standby, backup diesel generators (backup generators) would be added to the site to provide backup power to the SV9 data center in the event of power failure.

At full buildout, the SV9 data center would have 48-megawatt (MW) connection to SVP service. The 48 MW service requirement for the SV9 data center would be met by the improvements made to SVP's nearby systems. A substation with capacity to fully serve the data center would be constructed.[1] For the purposes of this analysis, it is assumed that the SV9 data center would operate using 48-MW from opening day. This approach ensures that the maximum greenhouse gas emissions are captured.

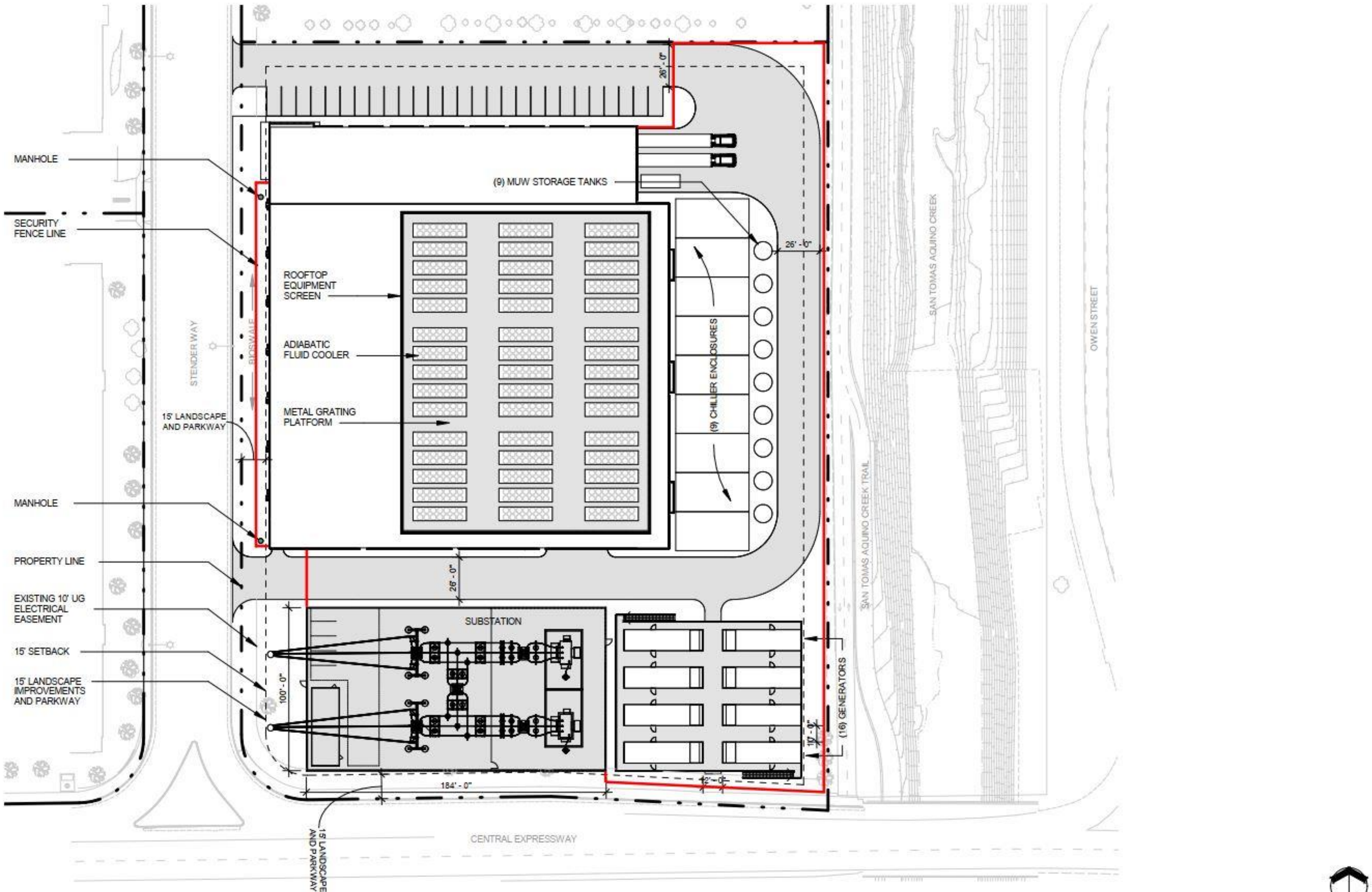
Site improvements would include the SV9 data center building, a covered loading dock, exterior lighting, gated driveway access, parking lot, and perimeter landscaping (see Figure 3).

Building Design

The SV9 data center would be steel frame construction and would have an exterior aluminum composite panel system with materials chosen to match the texture and finish of adjacent CoreSite data centers. Elevations are shown in Figure 4 and Figure 5 and renderings of the SV9 data center are shown in Figure 6. Exterior glazing would break up the façade with large, continuous sections of glazing spanning from the base to the roofline. Rooftop equipment and the rooftop staircase access and elevator would be screened from view from the surrounding area by a louvered screenwall system 10 feet in height. The screenwall would be set back from the roof edge. Backup generators for the SV9 data center would be housed at grade in weather enclosures, adjacent to both the SV9 build and new substation (see Figure 3).

[1] Precise information on required off-site improvements to SVP facilities to support the SV9 data center is not known at this time

Figure 3 Proposed Site Plan



Source: Corgan 2019

Figure 4 Proposed West and East Elevations

Source: Corgan 2019

Figure 5 Proposed South and North Elevations

Source: Corgan 2019

Figure 6 Project Rendering

Source: Corgan 2019

Major Equipment

Table 1 provides a list of the major equipment that would be located on site as part of the project.

Table 1 Major Equipment

Equipment	Quantity	Location
3500-kilowatt (KW) backup generators	16 (N+2 configuration)	SV9 yard, adjacent to the data center
Modular Chiller Plant Enclosures	9 (N+1 configuration)	SV9 yard, adjacent to the data center
Adiabatic Fluid Coolers	45	Roof

Source: CoreSite, 2019

Parking and Site Access

The project site currently has a total of 250 parking spaces, including eight accessible spaces consistent with Americans with Disabilities Act (ADA) requirements all of which would be removed as part of the project. Based on the anticipated parking demand for this project, a total of 99 spaces are required, 27 of which would be provided on site. The remaining 72 would be land banked. “Land banking” refers to land reserved for other uses (such as landscaping or outdoor seating) in lieu of parking spaces. The data center parking lot would be constructed along the northern side of the building.

As shown in Figure 2 and described above, two primary site access points would remain from Stender Way, although driveway access would be gated at the southern access point. The design and dimensions of the driveways would be updated to meet the City’s current design requirements as provided in the City’s Standard Details. The two driveways along Stender Way would also provide access for service vehicles and fire trucks. Existing pedestrian access to the site from Stender Way would available at the north site access point only.

Landscaping and Trees

The project would include landscaping consistent with the surrounding buildings to comply with the City’s design requirements. Construction of the SV9 data center and parking lot would require removal of 39 non-protected trees. There are seven trees (Blue atlas cedar, Raywood ash, Green ash) located on neighboring properties that would remain in place. Two neighboring trees (olive and avocado) would directly conflict with the parking lot and would require removal.

As shown in Figure 3, perimeter landscaping surrounding the existing building would be removed and partially replaced. New landscaping is proposed at the ends of the parking bays and replacement landscaping would be installed along the southern and western property boundary. An SVP duct bank currently exists along the south and west side of the property. Coordination with SVP would be necessary to meet SVP standards for access to duct banks. No additional landscaping is proposed.

Project Operation

Backup Energy Supply

A data center relies upon a constant supply of power to allow servers to operate continuously: 24 hours per day, seven days per week. To ensure continuous energy supply, the project would utilize sixteen 3.5-MW backup generators. The generators are designed to start up quickly in the event of a power failure. All generators would be installed in the equipment yard of the SV9 data center building.

Emissions from combustion engines for stationary uses, including diesel generators, are regulated by the U.S. Environmental Protection Agency (EPA). Engine emission standards have been categorized into a tiering system that designates maximum pollutant emissions. All new generators would have EPA Tier II engines and would be outfitted with diesel particulate filters. The generator engines would be fueled using ultra-low sulfur diesel fuel with a maximum sulfur content of 15 parts per million (ppm). All generator engines would be equipped with California Air Resources Board (CARB) Level 3 verified diesel particulate filters (DPFs) with a minimum control efficiency of 85 percent removal of particulate matter.

The generators would have maintenance testing performed throughout the year to ensure performance when needed during a power failure. All generators would be operated strictly in accordance with permitted hours as determined by the Bay Area Air Quality Management District (BAAQMD).

Generators would be installed in a double-stacked configuration. Each double-stack would be provided with a 13,000-gallon sub-base fuel storage tank. The top generator would have a 160-gallon diesel fuel tank installed next to the generator. The sub-base fuel storage tanks with be provisioned with fuel ports to allow refilling from the paved loop road surrounding the data center.

Additionally, the project would include uninterruptable power supplies (UPS) with direct-current (DC) batteries for backup power. Batteries would provide enough energy to cover the critical load of 35-MW in the event of a power failure. UPS and batteries would be located on each of the four floors, adjacent to the computer room the system serves.

Battery technology for commercial UPS systems is lead-acid type. The batteries are placed in cabinets and installed next to the associated UPS module in a temperature-controlled room for optimum efficiency and battery life. The quantity of batteries is dictated by the length of time the standby optional, backup generators need to start and reach full operating power. This is typically less than 1 minute; however, a safety factor is added which results in an average of five to six minutes of battery power available.

Cooling

Servers convert electrical energy into heat as they operate and need to be kept cool. Therefore, cooling systems are a critical component of data center operation. Cooling systems would be installed to remove heat, ensuring servers operate safely and effectively. The project would include nine modular chiller plants located in the chiller yard adjacent to the SV9 data center. Adiabatic fluid coolers would be installed on the roof of the data center. Each 1,575-ton chiller would be supported by five adiabatic fluid coolers, for a total of 45 adiabatic fluid chillers. The adiabatic fluid coolers require minimal make-up water and would collectively use approximately 18 acre-feet annually, or 5,865,325 gallons. It is anticipated that the make-up water serving the adiabatic fluid coolers will have a single potable source. To supplement, two 15,000-gallon aboveground water storage tanks would be installed on site to provide 24-hours of make-up water in the event of temporary loss of water service. Aboveground water tanks would be installed adjacent to the modular chiller plants.

The make-up water would be chemically treated on-site before use to meet specifications for water quality. Biocides and scale and corrosion inhibitors would be injected into the stream to limit biological growth. Water treatment chemicals would be stored in a pumphouse, located adjacent to the modular chiller plant to treat incoming potable water.

Employees

It is anticipated that up to eight employees would typically be working in the building during the daytime, and up to five employees per shift would work in the building in the evening and overnight for a total of up to 18 employees every 24 hours. As needed, technical support personnel would also be present on the site.

Vehicle Trips

Truck trips would occur during project operation to deliver and remove equipment as needed. Passenger vehicle trips to the site would be minimal, consisting of employees traveling to the site for work and occasional client visits.

Energy Usage

Major sources of energy demand for project operations would be client servers and the cooling system. The facility would use a maximum of 48-MW for a maximum load of 1,152,000 kilowatt-hours (kWh) daily. Overall, the daily power usage would vary depending on how many servers are up and running and how intensely the SV9 data center's clients are running their servers. The building would require very little lighting. Lighting would be used only to support small areas such as a security area, lobby, and office/conference room.

Construction

Construction of the facility would commence in October 2020 and be completed in November 2021. Conventional construction equipment would be used, such as excavators, backhoes, and both light-duty trucks and heavy-duty dump trucks. Truck trips are expected to reach the project site via US-101, San Tomas Expressway, Scott Boulevard, and Central Expressway in addition to Coronado Drive and Stender Way. Truck trips for off-haul of excavated materials are expected to travel along these same routes and arterials to dispose of construction demolition debris.

Permits and Approvals

The project applicant is seeking approval from the City's Architectural Committee. The approval is anticipated after the Architectural Committee considers the application at a publicly noticed meeting.

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.).[2] 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 environments, it is almost never annoying to people who are outdoors. The primary concern from

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

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). The ppv is defined as the maximum instantaneous positive or negative peak of a vibration signal (Caltrans 2013b). Caltrans developed a guidance manual for specifically assessing vibration impacts associated with construction and also compiled vibration research and recommended limits for vibration based on the source. Table 2 summarizes the vibration limits recommended by the American Association of State Highway and Transportation Officials for structural damage to buildings.

Table 2 Maximum Vibration Levels for Preventing Damage

Type of Situation	In./sec. ppv
Historic sites or other critical locations	0.1
Residential buildings, plastered walls	0.2–0.3
Residential buildings in good repair with gypsum board walls	0.4–0.5
Engineered structures, without plaster	1.0–1.5
Source: Caltrans 2013b	

In addition to the potential for building damage, the human body to responds to vibration signals. However, unlike buildings, which are rigid, it takes some time for the human body to respond to vibration. In a sense, a building responds to the instantaneous movement while the human body responds to average vibration amplitude, which similar to noise levels, is measured as RMS. The averaging of the particle generally results in the RMS conservatively being equivalent to 71 percent of the ppv. Thus, human annoyance usually results in a more restrictive vibration limit than structural damage limits.

Numerous studies have been conducted to characterize the human response to vibration. Vibration significance in humans ranges from approximately 0.0013 in./sec. ppv (0.0003 in. sec. RMS), which is the typical background vibration-velocity level, to 4 in./sec. ppv (0.1 in./sec. RMS), 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 3 and Table 4.

For purposes of assessing vibrations impacts to humans, vibrations would potentially be significant if vibration levels exceeded distinctly perceptible levels in occupied off-site structures, i.e. in excess of 0.035 in./sec. ppv from project operation or in excess of 0.24 in./sec. ppv from project related construction. Regardless of whether a structure is occupied, a vibration level in excess 1.5 in./sec. ppv at any structure could result in adverse impacts.

Table 3 Human Response to Steady State Vibration

Human Response	In./sec. ppv
Very disturbing	3.6 (at 2 Hz)–0.4 (at 20 Hz)
Disturbing	0.7 (at 2 Hz)–0.17 (at 20 Hz)
Strongly perceptible	0.10
Distinctly perceptible	0.035
Slightly perceptible	0.012
Source: Caltrans 2013b	

Table 4 Human Response to Transient Vibration

Human Response	In./sec. ppv
Severe	2.0
Strongly perceptible	0.9
Distinctly perceptible	0.24
Barely perceptible	0.035
Source: Caltrans 2013b	

2.3 Sensitive Receivers

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. The Santa Clara General Plan Noise Element identifies noise-sensitive land uses as residences, hospitals, schools, libraries and rest homes (City of Santa Clara 2010).) The nearest receivers, residences, are approximately 1,400 feet northwest of the project parcel.

2.4 Project Noise Setting

The primary noise sources in the project area are traffic on Central Expressway and mechanical equipment at the existing data center across the street and adjacent industrial uses. 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 Scott Boulevard to the north.

To characterize existing ambient noise levels, Rincon conducted two short-term 15-minute noise measurements on November 13, 2019 (see Appendix A). Figure 7 shows the noise measurement locations. Table 5 summarizes the results of the short-term sound level measurements, respectively.

Figure 7 Noise Measurement Locations

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Table 5 Short-Term Sound Level Monitoring Results

Measurement Number	Measurement Location	Primary Noise Source	Sample Time	dBA L_{eq}
1	Northwest corner of the project site	Generator across Stender Way	4:03-4:18 p.m.	63.4
2	Southeast corner of the project site	Traffic on Central Expressway	4:33-4:48 p.m.	76.0

See Appendix A for noise monitoring data.

Source: Field visit using ANSI Type II Integrating sound level meter on November 13, 2019.

2.5 Regulatory Setting

City of Santa Clara Municipal Code

The City's noise ordinance is codified in Chapter 9.10, *Regulation of Noise and Vibration,* of the Santa Clara Municipal Code (SCMC). The noise ordinance requires protection from unnecessary, excessive, and unreasonable noise or vibration from fixed sources in the community. Applicable provisions of the City's noise ordinance are discussed below.

SCMC Section 9.10.40 limits exterior noise levels at residences to 55 dBA during daytime hours of 7:00 a.m. to 10:00 p.m. and 50 dBA during nighttime hours of 10:00 p.m. to 7:00 a.m.; noise levels at commercial uses to 65 dBA during daytime hours and 60 dBA during nighttime hours; noise levels at light industrial uses to 70 dBA at any time and noise levels to 75 dBA at heavy industrial uses at any time. Section 9.10.060(c), states that, if the measured ambient noise level differs from those levels set forth in SCMC Section 9.10.040, the allowable noise standard should be "adjusted in five dBA increments in each category as appropriate to encompass or reflect said ambient noise level".

Section 9.10.230 of the SCMC states that construction activities are not permitted within 300 feet of residentially zoned property except within the hours of 7:00 a.m. and 6:00 p.m. on weekdays and 9:00 a.m. and 6:00 p.m. on Saturdays.

SCCM Section 9.10.050 provides vibration standards and states that, "it shall be unlawful for any person to operate or cause, permit, or allow the operation of, any fixed source of vibration of disturbing, excessive, or offensive vibration on property owned, leased, occupied, or otherwise controlled by such person, such that the vibration originating from such source is above the vibration perception threshold of an individual at the closest property line point to the vibration source on the real property affected by the vibration."

Section 9.10.070(a) exempts "emergency generators and pumps or other equipment necessary to provide services during an emergency."

City of Santa Clara General Plan

The City of Santa Clara General Plan contains goals and policies that are designed to control noise within the city. In addition, the General Plan identifies noise and land use compatibility standards for various land uses. Table 6 includes acceptable noise levels for various land uses. Industrial land uses are considered compatible in noise environments of 73 DNL/CNEL or less. The guidelines state that where the exterior noise levels are greater than 73 DNL/CNEL and less than 83 DNL/CNEL, the design of the project should include measures to reduce noise to acceptable levels.

Table 6 Noise and Land Use Compatibility Standards

Land Use	Compatible (DNL/CNEL)	Require Design Standard (DNL/CNEL)[1]	Incompatible (DNL/CNEL)[2]
Residential	<57	58-73	>73
Educational	<57	58-73	>73
Recreational	<67	68-77	>77
Commercial	<67	68-77	>77
Industrial	<73	73-83	>83
Open Space	<85	N/A	N/A

[1] Requires design standard and insulation to reduce noise levels

[2] Avoid land use except when entirely indoors and an interior level of 45 DNL can be maintained

N/A = no applicable noise standard

Source: City of Santa Clara 2010 Table 5.10-2

The City of Santa Clara General Plan also establishes the following goals and policies that would apply to the project:

Goal 5.10.6-G1. Noise sources restricted to minimize impacts in the community.

Goal 5.10.6-G2. Sensitive uses protected from noise intrusion.

Goal 5.10.6-G3. Land use, development and design approval that take noise levels into consideration.

Policy 5.10.6-P1. Review all land use development proposal for consistency with the General Plan compatibility standards and acceptable noise exposure levels defined on Table 5.10-1.

Policy 5.10.6-P2. Incorporate noise attenuation measures for all projects that have noise exposure levels greater than General Plan "normally acceptable" levels, as defined on Table 5.10-1.

Policy 5.10.6-P3. New development should include noise control techniques to reduce noise to acceptable levels, including site layout (setbacks, separation and shielding), building treatments (mechanical ventilation system, sound-rated windows, solid core doors and baffling) and structural measures (earthen berms and sound walls).

Policy 5.10.6-P4. Encourage the control of noise at the source through site design, building design, landscaping, hours of operation and other techniques.

Policy 5.10.6-P6. Discourage noise sensitive uses, such as residences, hospitals, schools, libraries, and rest homes, from areas with high noise levels, and discourage high noise generating uses from areas adjacent to sensitive uses.

Policy 5.10.6-P7. Implement measures to reduce interior noise levels and restrict outdoor activities in areas subject to aircraft noise in order to make Office/Research and Development uses compatible with the Norman Y. Mineta International Airport land use restrictions.

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.

Construction equipment with a diesel engine typically generates maximum noise levels from 80 to 90 dB(A) L_{eq} at a distance of 50 feet (Federal Highway Administration [FHWA] 2006). Table 7 summarizes typical construction equipment noise levels.

Table 7 Typical Construction Equipment Noise Levels

Equipment	Noise Level at 50 Feet [dB(A) L_{eq}]
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Crane	81
Dozer	85
Excavator	81
Grader	85
Jack Hammer	88
Loader	85
Paver	89
Pump	76
Roller	74
Scraper	89
Truck	88

Source: FHWA 2006

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).

Each phase of 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 construction projects, grading activities generate the highest noise levels because grading involves the largest equipment and covers the greatest area. Typical heavy construction equipment during project grading could include dozers, excavators, loaders, and dump trucks.

Construction phases would include demolition, site preparation, grading, paving, and utility installation, followed by building construction. Construction would not require blasting or pile driving. 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 construction activities has been used for assessment. In addition, construction equipment would not be in constant use during the 8-hour operating day.

A potential construction scenario includes a loader, excavator, and a dump truck working to grade the site. Therefore, a loader, excavator, and dump truck were analyzed together for construction noise impacts due to their likelihood of being used in conjunction at the same time and therefore a conservative scenario for the greatest noise generation during construction. At a distance of 50 feet, a loader, excavator, and dump truck would generate a noise level of approximately 80 dBA L_{eq} (RCNM calculations are included in Appendix B). Due to the dynamic nature of construction, maximum hourly noise levels were calculated from the center of the site. Construction noise levels were assessed at 1,400 feet (the approximate distance from the nearest residences), 250 feet (the approximately distance to the nearest industrial property), 2,000 feet (the approximately distance to the nearest commercial property).

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.

Operational Noise

Noise generated by future operation of the project was modeled using SoundPLAN, version 8.0. The SoundPLAN program (SoundPLAN GmbH, 2019) uses noise propagation following the International Organization for Standardization method *ISO 9613-2 – Acoustics, Attenuation of Sound during Propagation Outdoors*. The model calculates noise levels at selected receiver locations using input parameter estimates such as total noise generated by each noise source; distances between sources, barriers, and receivers; and shielding provided by intervening terrain, barriers, and structures. Topography, roadways, and receivers were input into the model using three-dimensional coordinates.

The main source of on-site operational noise would be from electrical equipment (i.e., generators and the substation transformers), ventilation units, and the cooling systems. Secondary sources would be people on site, trash collection, and traffic generated by the project. The project potentially includes 12- to 18-ton HVAC units and up to nine ground-mounted chillers with 45 associated roof mounted Adiabatic Fluid Coolers. For assessment purposes, these units were modeled operating at 100 percent power. The anticipated noise levels are based on the manufacturer specifications provided in Appendix C. The locations of all modeled noise sources and receiver locations are shown in Figure 8.

As noted in Section 3, *Project Description*, the project would also include 16 generators located within weather enclosures. Each of the generators can produce an uncontrolled sound power level of 132.2 dBA L_w from the exhaust and 130.3 dBA L_w from the engine casing. It is assumed the enclosures would be similar to standard industrial frame and provide a minimum of 35 dBA reduction from the uncontrolled noise level from the casing. No exhaust silencers have been identified and the generators are assumed to operate without sound control. Anticipated generator noise levels are provided in Appendix D.

Typically, 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 which would be an emergency situation and the operation of the generators would be exempt. Although, 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 100 percent power for a full hour. Initial modeling included the simultaneous testing of eight generators for one hour, then reduced scenarios removing generators until the noise levels complied with the City's noise ordinance limits for surrounding properties. Operational noise modeling results are included in Appendix E.

Figure 8 Modeled Source and Receiver Locations

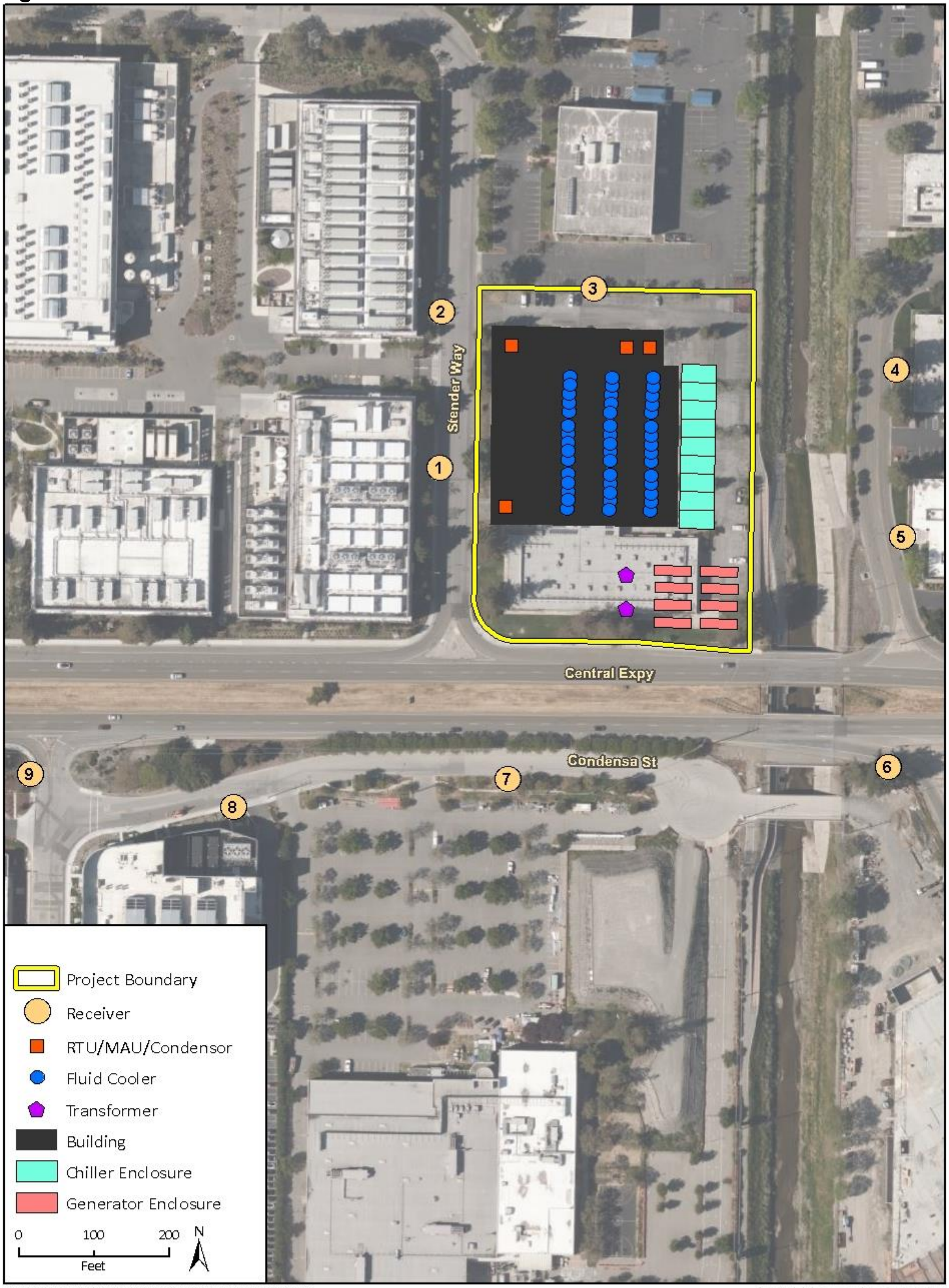

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Fig 8 Modeled Source and Receiver Locations

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, these activities are 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 to existing conditions. Therefore, the on-site noise would not result in a change in substantial increase in project area noise level.

Operational Traffic Noise

Off-site traffic noise impacts due to the project are based on the change in existing and existing plus project traffic volumes. Based on the Institute of Traffic Engineers *Trip Generation Manual*, a data center land use would generate 0.99 trips per 1,000 square feet (ITE 2017). This would result in 244 average daily trips which is assumed to include ancillary trips associated with technical support personnel and equipment deliveries as most industrial uses include deliveries and other non-employee trips.

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.

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 8 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 8 Vibration Levels of Various Construction Equipment

Equipment	PPV at 25 ft. (in/sec)
Large Bulldozer	0.089
Loaded trucks	0.076
Jackhammer	0.035
Vibratory Roller	0.204

Source: FTA 2018

3.2 Significance Thresholds

To determine whether a project would have a significant noise impact, Appendix G to the *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

To control noise impacts associated with the construction of the proposed project, the City of Santa Clara has established limits to the hours of construction. Section 9.10.230 of the SCMC states that construction activities are not permitted within 300 feet of residentially zoned property except within the hours of 7:00 a.m. and 6:00 p.m. on weekdays and 9:00 a.m. and 6:00 p.m. on Saturdays. However, neither the General Plan nor Municipal Code establish quantifiable construction noise levels limits.

To evaluate whether the project will generate a substantial periodic increase in short-term noise levels at off-site sensitive receiver locations, this analysis uses a construction-related noise level threshold based on the FTA's *Transit Noise and Vibration Assessment Manual* recommended noise level criteria for determining construction noise impacts as outlined in Table 9.

Table 9 Construction Noise Criteria

Land Use	dBA Leq 8-hour	
	Day	Night
Residential	80	70
Commercial	85	85
Industrial	90	90

Source: FTA 2018

Operational Noise

Pursuant to City of Santa Carla General Plan and SCMC Chapter 9.10, the project would have a significant operational impact on ambient noise levels if it would:

- Generate noise levels at residential property lines that exceed 55 dBA L_{eq};
- Generate noise levels at commercial property lines that exceed 60 dBA L_{eq}; or
- Generate noise levels at industrial property lines that exceed 70 dBA L_{eq}.

Construction Vibration

SCMC Section 9.10.050 states that there would be a significant vibration impact if vibration is perceptible at the closest property line from the vibration source. This would occur if the project would subject adjacent land uses to construction-related ground-borne vibration that exceeds the distinctly perceptible vibration annoyance potential criteria for human receivers of 0.24 in./sec. ppv.

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]

Construction noise levels vary for individual pieces of equipment, as equipment may come in different sizes and with different engines. Construction equipment noise levels also vary as a function of the activity level, or duty cycle. In a typical construction project, the loudest short-term noise levels are those of earth-moving equipment under full load, which are on the order of 85 dBA L_{eq} at a distance of 50 feet from the center of the activity. Peak noise events may occur during pavement breaking or demolition, and when there may be a combination of noise from several pieces of equipment, including the noise of backup alarms. Noise levels of other activities, such as building construction operations and paving, would be less. For periods longer than one hour, average noise levels would be lower.

The City municipal code restricts construction activities to specific times if the project is within 300 feet of residentially zoned properties. The nearest residential receivers are approximately 1,400 feet northwest of the project parcel. Therefore, these restrictions would not apply to the project.

Over the course of a typical construction day, construction equipment would be located as close as 250 feet to the nearest industrial property, 1,400 to the nearest residential property, and 2,000 feet to the nearest commercial property. At a distance of 250 feet, a loader, excavator, and dump truck would generate a noise level of approximately 66 dBA L_{eq} (8-hour). Therefore, construction noise levels would not exceed 80 dBA L_{eq} at any residential land use, 85 dBA L_{eq} at any commercial property, or 90 dBA L_{eq} at any industrial property (see Appendix B for RCNM results). Other construction activities, such as demolition and building construction, would be anticipated to use equipment of intensity similar to less than the simultaneous use of a loader, excavator, and dump truck. Impacts would be less than significant.

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]

Off-Site Traffic Noise

The project would generate approximately 244 trips per weekday while the existing 54,000 square foot light industrial use at the project site is estimated to generate approximately 268 trips per weekday based on 4.96 trips per 1,000 square feet (ITE 2017). Thus, the project would result in a net decrease in trips on local roadways as compared to existing land use. Because the project would reduce overall vehicle trips as compared to existing conditions the project would not result in an off-site traffic noise impact.

On-Site Operational Noise

The proposed project would generate non-mobile operational noise that would be typical of data center uses. The project's on-site operations were modeled based on the information provided in Section 3.1 and sources modeled are shown in Figure 8. Table 10 summarizes project-generated hourly operational noise levels at the nearest properties for two scenarios. The first scenario is based on all eight generators operating at full power for one hour during testing and maintenance. The second scenario is based on six generators operating at full power for one hour during testing and maintenance. Other scenarios assessed and included in Appendix E evaluated the operation of a combination of six generators, four generators, and one generator. Figure 9 shows the ground level noise contours generated by the operation of eight generators. Figure 10 shows the operation of six generators. As shown in Table 10, hourly operational noise levels of eight generators would exceed the City's noise standards of 70 dBA L_{eq} at the nearest industrial properties and 60 dBA L_{eq} at the nearest commercial properties. Therefore, operational noise impacts would exceed City standards without the incorporation of noise abatement measures.

Table 10 Modeled Project Hourly Noise Levels

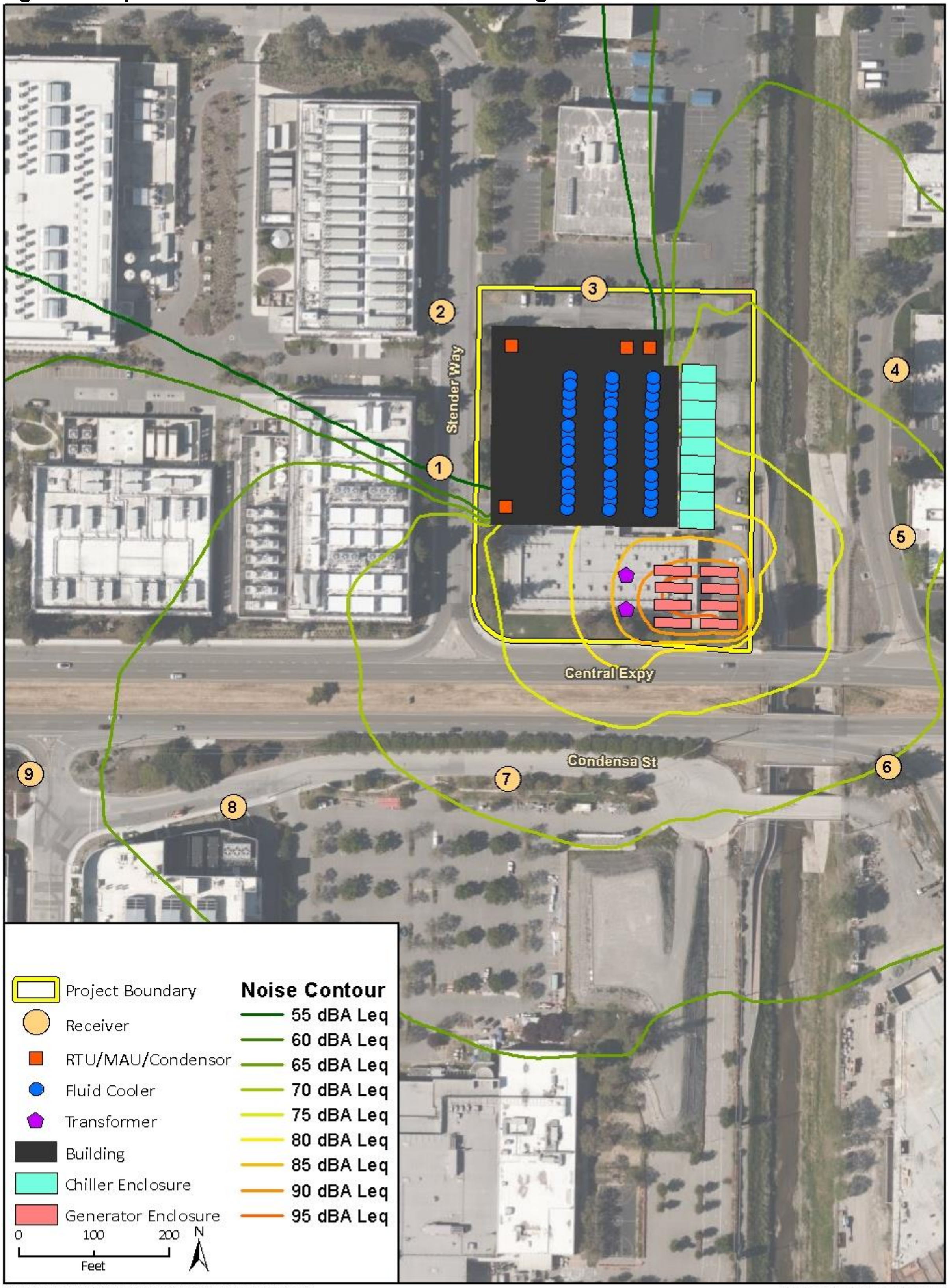
Receiver	Location	Hourly Noise Level (dBA L_{eq}) 8-Generators	Hourly Threshold (dBA L_{eq})[1]	Threshold Exceeded?
R-1	2950 Stender Way	54	70	No
R-2	2972 Stender Way	50	70	No
R-3	2975 Stender Way	52	70	No
R-4	2360 Owen Street	69	70	No
R-5	2380 Owen Street	**72**	70	Yes
R-6	2800 San Tomas	70	70[2]	No
R-7	2400 Condensa Street	**71**	70[2]	Yes
R-8	2500 Condensa Street	67	70	No
R-9	2880 Northwestern Parkway	61	70	No

[1] Based on SJMC Section 20.50.300.

2 Based on ambient noise level measurement location 2, the ambient noise level at these properties is 70 dBA L_{eq} during daytime hours.

See Appendix E for operational noise modeling results.

Figure 9 Operational Noise Level Contours with Eight Generators



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Noise Abatement

To determine the cause for the noise level exceedances identified in Table 10, noise modeling results were assessed for the dominant noise sources affecting each of the receivers. Based on the review, the generators were identified as the dominant source from the project at each of receiver location. Therefore, several scenarios involving the testing and maintenance of different numbers of generators were evaluated for the project site. Based on the modeling results if testing and maintenance were limited to six generators noise levels would be at or below City standards.

Mitigation Measures

The proposed project would exceed City noise standards at surrounding properties without mitigation. Mitigation Measure N-1 requires a limitation on the number of generators that could be tested simultaneously and the hours testing and maintenance would occur to reduce noise levels to comply with City standards.

Mitigation Measure N-1

The project applicant shall ensure that no more than six generators are operated simultaneously during scheduled maintenance, and testing and these activities would only occur during the daytime between the hours of 7:00 a.m. and 10:00 p.m.

Significance After Mitigation

As shown in Table 11, with the incorporation of the identified limitations, hourly operational noise levels would not exceed the City's daytime or nighttime noise standards. Therefore, operational noise impacts would be less than significant with incorporation of the recommended mitigation measure.

Table 11 Modeled Project Hourly Noise Levels – Six Generators

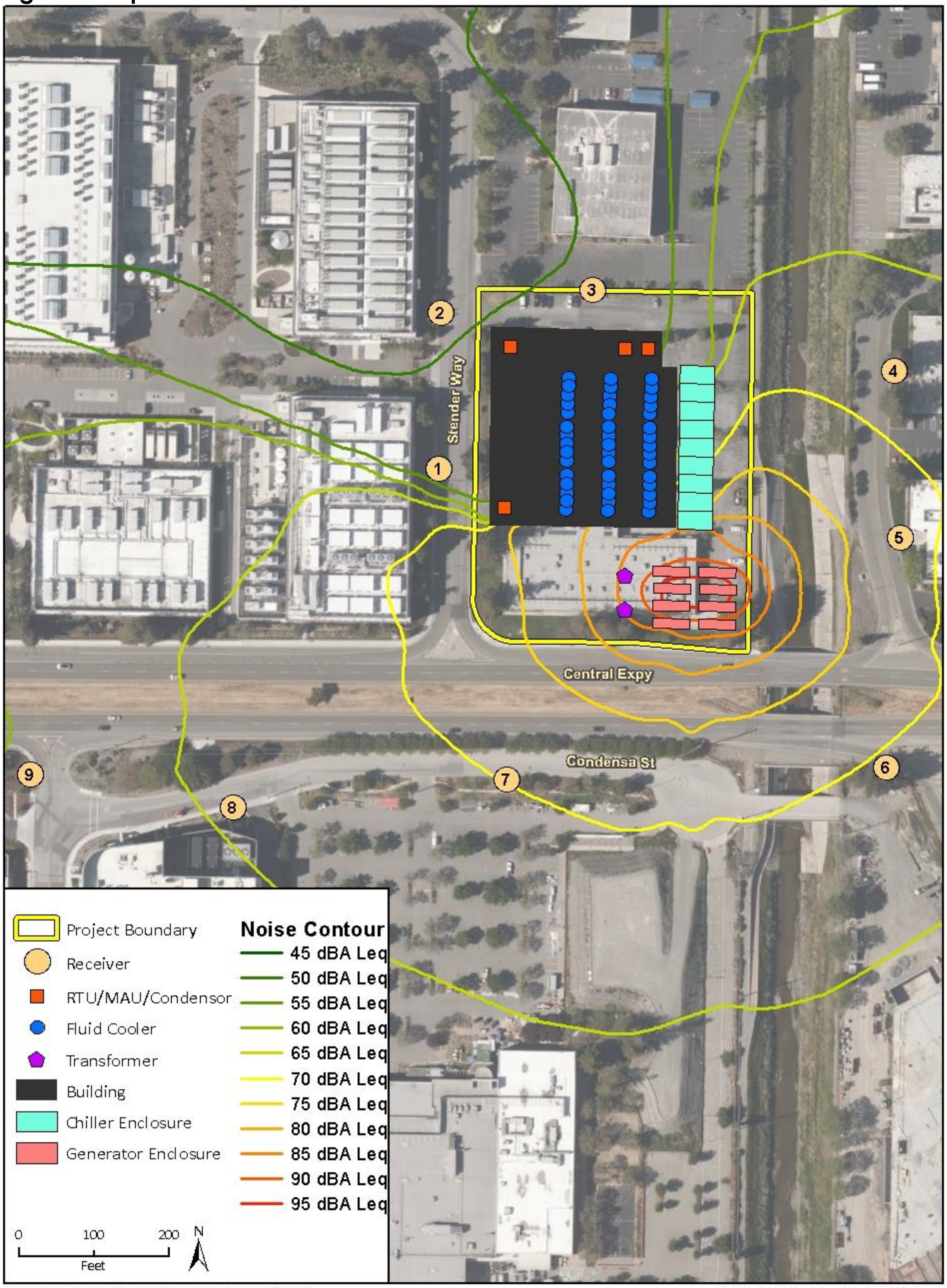
Receiver	Location	Hourly Noise Level (dBA L_{eq})	Hourly Threshold (dBA L_{eq})[1]	Threshold Exceeded?
R-1	2950 Stender Way	53	70	No
R-2	2972 Stender Way	49	70	No
R-3	2975 Stender Way	51	70	No
R-4	2360 Owen Street	68	70	No
R-5	2380 Owen Street	72	70	No
R-6	2800 San Tomas	69	70[2]	No
R-7	2400 Condensa Street	70	70[2]	No
R-8	2500 Condensa Street	65	70	No
R-9	2880 Northwestern Parkway	59	70	No

[1] Based on SJMC Section 20.50.300.

2 Based on ambient noise level measurement location 2, the ambient noise level at these properties is 70 dBA L_{eq} during daytime hours.

See Appendix E for operational noise modeling results.

Figure 10 Operational Noise Level Contours 6-Generators



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

Construction activities have the potential to result in varying degrees of temporary ground vibration, depending on the specific construction equipment used and operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. The effects of ground vibration may be imperceptible at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, and damage to nearby structures at the highest levels. Project construction would result in vibration levels that would be felt in the immediate vicinity of construction activities and may be felt at nearby properties.

The ground vibration levels associated with various types of construction equipment are summarized in Table 8. No pile driving would occur during construction of the project, nor would blasting be required. The project would pave a large parking area which would involve the use of a vibratory roller. Based on information in Table 8, the vibratory roller would represent the greatest vibration source. At the nearest structures, which are as close as 75 feet from the project parcel, vibration levels are anticipated to be approximately 0.063 ppv in./sec as shown in Table 12. Receptors R-1 and R-2, as shown on Figure 8, are also data centers and do not contain vibration sensitive uses, such as laboratory equipment. However, as with the proposed project, the data centers have employees that may be affected by substantial vibrations. While some vibrations may be perceived, the 0.063 ppv in./sec. is less than the 0.24 ppv in./sec. recommended standard for human annoyance from transient sources and less than the threshold of 1.5 in./sec. ppv. There would be no significant vibrations-related impacts.

Table 12 Vibration Source Levels for Construction Equipment

Equipment	Approximate Vibration Level (in./sec .PPV)	Threshold (in./sec. PPV)	Threshold Exceeded?
R-1 and R-2	0.063	0.24	No
R-3	0.058	0.24	No

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?

The nearest airport to the project site is the San José International Airport, approximately 1.5 miles to the east. The project site is not located within the airport land use plan (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

The project would generate both temporary construction-related noise and long-term noise associated with operation of the project. Construction noise not would exceed the SCMC noise standards at the nearby land uses, and impacts from construction noise would be less than significant.

The project is anticipated to generate less traffic than existing uses at the project site. There would not be an increase in traffic noise along local roadways and off-site traffic noise impacts would be less than significant.

Operational activities on the project site would potentially generate noise levels up to 90 dBA L_{eq} at adjacent properties. The noise from the operation of cooling equipment and emergency backup electrical equipment would potentially exceed the City's property line noise limits at adjacent properties. Therefore, Mitigation Measure N-1 would be required to limit the simultaneous testing and maintenance of generators. With incorporation of the identified limitation, operational activities on the project site would be reduced to a maximum of 70 dBA L_{eq} at adjacent properties and the proposed project would comply with the City property line noise limits.

The project would generate groundborne vibration during construction. Groundborne vibration would not exceed the applicable vibration threshold at the nearest structures and vibration levels would not be perceptible. Construction-related vibration impacts would be less than significant.

The project site is outside the noise contours for the San Jose Airport and is not within an airport land use plan. Therefore, no substantial noise exposure would occur to construction workers, employees, or users of the project from aircraft noise.

5 References

California Department of Transportation (Caltrans). 2013a. Technical Noise Supplement to the Traffic Noise Analysis Protocol. (CT-HWANP-RT-13-069.25.2) September. http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf (accessed November 2019).

_____. 2013b Transportation and Construction Vibration Guidance Manual (CT-HWANP-RT-13-069.25.3). September. http://www.dot.ca.gov/hq/env/noise/pub/TCVGM_Sep13_FINAL.pdf (accessed November 2019).

Crocker, Malcolm J. Crocker (Editor). 2007. Handbook of Noise and Vibration Control Book, ISBN: 978-0-471-39599-7, Wiley-VCH, October.

Federal Highway Administration (FHWA). 2011. Highway Traffic Noise: Analysis and Abatement Guidance (FHWA-HEP-10-025). https://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/revguidance.pdf (accessed November 2019).

Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. 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 (accessed November 2019).

Institute of Traffic Engineers (ITE). 2017, Trip Generation Manual 10th Edition, Volume 2, Industrial Land Uses 100–199. September 2017.

Kinsler, Lawrence E. and R. Frey, Austin and B. Coppens, Alan and V. Sanders, James. 1999. Fundamentals of Acoustics, 4th Edition. ISBN 0-471-84789-5. Wiley-VCH, December 1999.

Santa Clara, City of. 2010. Celebrating Our Past, Present and Future, City of Santa Clara 2010-2035 General Plan. Santa Clara, CA. November 16, 2010. https://www.santaclaraca.gov/government/departments/community-development/planning-division/general-plan (accessed November 2019).

Santa Clara County Airport Land Use Commission. 2011. Comprehensive Land Use Plan Santa Clara County: Noman Y. Mineta San José International Airport. San José, CA. https://www.sccgov.org/sites/dpd/DocsForms/Documents/ALUC_SJC_CLUP.pdf (accessed November 2019).

Appendix A

Noise Measurement Data

- Time Weight : FAST
- Level Range : 40-100
- Max dB : 72.1 - 2019/11/13 16:1
- Level Range : 40-100
- SEL : 92.9
- Leq : 63.4
-

No.s	Date	Time	(dB)
1	2019/11/13	16:03:12	64.1
2	2019/11/13	16:03:13	65.5
3	2019/11/13	16:03:14	64.7
4	2019/11/13	16:03:15	64.6
5	2019/11/13	16:03:16	65.3
6	2019/11/13	16:03:17	66.8
7	2019/11/13	16:03:18	67.8
8	2019/11/13	16:03:19	68.6
9	2019/11/13	16:03:20	69.7
10	2019/11/13	16:03:21	66.5
11	2019/11/13	16:03:22	64.7
12	2019/11/13	16:03:23	65.4
13	2019/11/13	16:03:24	64.1
14	2019/11/13	16:03:25	63.4
15	2019/11/13	16:03:26	63.5
16	2019/11/13	16:03:27	63.2
17	2019/11/13	16:03:28	64.1
18	2019/11/13	16:03:29	63.2
19	2019/11/13	16:03:30	63.3
20	2019/11/13	16:03:31	63.1
21	2019/11/13	16:03:32	62.8
22	2019/11/13	16:03:33	62.9
23	2019/11/13	16:03:34	63.7
24	2019/11/13	16:03:35	63.2
25	2019/11/13	16:03:36	62.8
26	2019/11/13	16:03:37	63.4
27	2019/11/13	16:03:38	63.3
28	2019/11/13	16:03:39	62.6
29	2019/11/13	16:03:40	62.6
30	2019/11/13	16:03:41	62.9
31	2019/11/13	16:03:42	62.1
32	2019/11/13	16:03:43	62.8
33	2019/11/13	16:03:44	62.3
34	2019/11/13	16:03:45	61.9
35	2019/11/13	16:03:46	62.6
36	2019/11/13	16:03:47	62.6
37	2019/11/13	16:03:48	62.7
38	2019/11/13	16:03:49	62.7
39	2019/11/13	16:03:50	62.7
40	2019/11/13	16:03:51	62.7
41	2019/11/13	16:03:52	62.9
42	2019/11/13	16:03:53	62.5
43	2019/11/13	16:03:54	62.3
44	2019/11/13	16:03:55	62.7
45	2019/11/13	16:03:56	62.8

46	2019/11/13	16:03:57	63.1
47	2019/11/13	16:03:58	65.5
48	2019/11/13	16:03:59	68.5
49	2019/11/13	16:16:00	69.0
50	2019/11/13	16:16:01	67.4
51	2019/11/13	16:16:02	63.4
52	2019/11/13	16:16:03	63.6
53	2019/11/13	16:16:04	62.9
54	2019/11/13	16:16:05	63.1
55	2019/11/13	16:16:06	63.5
56	2019/11/13	16:16:07	62.0
57	2019/11/13	16:16:08	62.8
58	2019/11/13	16:16:09	62.5
59	2019/11/13	16:16:10	62.7
60	2019/11/13	16:16:11	62.6
61	2019/11/13	16:16:12	62.6
62	2019/11/13	16:16:13	63.0
63	2019/11/13	16:16:14	62.3
64	2019/11/13	16:16:15	62.4
65	2019/11/13	16:16:16	62.2
66	2019/11/13	16:16:17	61.9
67	2019/11/13	16:16:18	62.3
68	2019/11/13	16:16:19	62.8
69	2019/11/13	16:16:20	62.4
70	2019/11/13	16:16:21	62.7
71	2019/11/13	16:16:22	61.8
72	2019/11/13	16:16:23	62.9
73	2019/11/13	16:16:24	62.0
74	2019/11/13	16:16:25	62.8
75	2019/11/13	16:16:26	62.3
76	2019/11/13	16:16:27	62.2
77	2019/11/13	16:16:28	62.3
78	2019/11/13	16:16:29	61.7
79	2019/11/13	16:16:30	62.1
80	2019/11/13	16:16:31	62.7
81	2019/11/13	16:16:32	62.4
82	2019/11/13	16:16:33	62.8
83	2019/11/13	16:16:34	62.4
84	2019/11/13	16:16:35	62.6
85	2019/11/13	16:16:36	62.5
86	2019/11/13	16:16:37	62.8
87	2019/11/13	16:16:38	62.6
88	2019/11/13	16:16:39	62.4
89	2019/11/13	16:16:40	63.0
90	2019/11/13	16:16:41	62.8
91	2019/11/13	16:16:42	62.7
92	2019/11/13	16:16:43	62.4
93	2019/11/13	16:16:44	62.1
94	2019/11/13	16:16:45	62.1
95	2019/11/13	16:16:46	62.6
96	2019/11/13	16:16:47	62.8
97	2019/11/13	16:16:48	62.4
98	2019/11/13	16:16:49	62.1

99	2019/11/13	16:16:50	62.9
100	2019/11/13	16:16:51	62.7
101	2019/11/13	16:16:52	63.0
102	2019/11/13	16:16:53	62.7
103	2019/11/13	16:16:54	62.7
104	2019/11/13	16:16:55	62.9
105	2019/11/13	16:16:56	63.2
106	2019/11/13	16:16:57	62.6
107	2019/11/13	16:16:58	62.6
108	2019/11/13	16:16:59	62.9
109	2019/11/13	16:05:00	62.8
110	2019/11/13	16:05:01	62.6
111	2019/11/13	16:05:02	62.7
112	2019/11/13	16:05:03	62.8
113	2019/11/13	16:05:04	62.5
114	2019/11/13	16:05:05	62.7
115	2019/11/13	16:05:06	62.3
116	2019/11/13	16:05:07	62.4
117	2019/11/13	16:05:08	62.8
118	2019/11/13	16:05:09	62.8
119	2019/11/13	16:05:10	62.7
120	2019/11/13	16:05:11	62.7
121	2019/11/13	16:05:12	62.6
122	2019/11/13	16:05:13	62.6
123	2019/11/13	16:05:14	63.4
124	2019/11/13	16:05:15	62.5
125	2019/11/13	16:05:16	62.7
126	2019/11/13	16:05:17	62.8
127	2019/11/13	16:05:18	62.4
128	2019/11/13	16:05:19	63.4
129	2019/11/13	16:05:20	62.7
130	2019/11/13	16:05:21	63.3
131	2019/11/13	16:05:22	62.5
132	2019/11/13	16:05:23	62.9
133	2019/11/13	16:05:24	63.1
134	2019/11/13	16:05:25	62.6
135	2019/11/13	16:05:26	62.7
136	2019/11/13	16:05:27	62.9
137	2019/11/13	16:05:28	63.0
138	2019/11/13	16:05:29	62.8
139	2019/11/13	16:05:30	62.6
140	2019/11/13	16:05:31	62.5
141	2019/11/13	16:05:32	63.2
142	2019/11/13	16:05:33	62.6
143	2019/11/13	16:05:34	62.8
144	2019/11/13	16:05:35	62.5
145	2019/11/13	16:05:36	62.8
146	2019/11/13	16:05:37	62.5
147	2019/11/13	16:05:38	62.3
148	2019/11/13	16:05:39	62.9
149	2019/11/13	16:05:40	63.1
150	2019/11/13	16:05:41	62.7
151	2019/11/13	16:05:42	62.9

152	2019/11/13	16:05:43	62.6
153	2019/11/13	16:05:44	63.2
212	2019/11/13	16:06:43	62.8
213	2019/11/13	16:06:44	62.8
214	2019/11/13	16:06:45	63.6
215	2019/11/13	16:06:46	63.1
216	2019/11/13	16:06:47	63.1
217	2019/11/13	16:06:48	63.5
218	2019/11/13	16:06:49	63.1
219	2019/11/13	16:06:50	62.7
220	2019/11/13	16:06:51	63.3
221	2019/11/13	16:06:52	63.6
222	2019/11/13	16:06:53	63.3
223	2019/11/13	16:06:54	63.2
224	2019/11/13	16:06:55	62.7
225	2019/11/13	16:06:56	62.7
226	2019/11/13	16:06:57	63.3
227	2019/11/13	16:06:58	63.4
228	2019/11/13	16:06:59	62.7
229	2019/11/13	16:07:00	63.0
230	2019/11/13	16:07:01	62.5
231	2019/11/13	16:07:02	63.0
232	2019/11/13	16:07:03	63.2
233	2019/11/13	16:07:04	62.7
234	2019/11/13	16:07:05	63.3
235	2019/11/13	16:07:06	63.1
236	2019/11/13	16:07:07	62.9
237	2019/11/13	16:07:08	62.3
238	2019/11/13	16:07:09	63.0
239	2019/11/13	16:07:10	62.4
240	2019/11/13	16:07:11	62.4
241	2019/11/13	16:07:12	62.6
242	2019/11/13	16:07:13	63.3
243	2019/11/13	16:07:14	62.9
244	2019/11/13	16:07:15	63.3
245	2019/11/13	16:07:16	63.2
246	2019/11/13	16:07:17	63.6
247	2019/11/13	16:07:18	62.7
248	2019/11/13	16:07:19	63.1
249	2019/11/13	16:07:20	63.5
250	2019/11/13	16:07:21	62.8
251	2019/11/13	16:07:22	62.4
310	2019/11/13	16:08:21	63.4
311	2019/11/13	16:08:22	63.4
312	2019/11/13	16:08:23	63.3
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314	2019/11/13	16:08:25	62.9
315	2019/11/13	16:08:26	63.3
316	2019/11/13	16:08:27	63.4
317	2019/11/13	16:08:28	63.2
318	2019/11/13	16:08:29	64.0
319	2019/11/13	16:08:30	65.5
320	2019/11/13	16:08:31	66.4

321	2019/11/13	16:08:32	65.6
322	2019/11/13	16:08:33	65.7
323	2019/11/13	16:08:34	65.3
324	2019/11/13	16:08:35	64.3
325	2019/11/13	16:08:36	64.3
326	2019/11/13	16:08:37	64.2
327	2019/11/13	16:08:38	64.5
328	2019/11/13	16:08:39	64.4
329	2019/11/13	16:08:40	64.4
330	2019/11/13	16:08:41	64.2
331	2019/11/13	16:08:42	64.2
332	2019/11/13	16:08:43	63.8
333	2019/11/13	16:08:44	64.0
334	2019/11/13	16:08:45	64.1
335	2019/11/13	16:08:46	64.1
336	2019/11/13	16:08:47	63.7
337	2019/11/13	16:08:48	63.7
338	2019/11/13	16:08:49	63.9
339	2019/11/13	16:08:50	63.9
340	2019/11/13	16:08:51	63.9
341	2019/11/13	16:08:52	63.7
342	2019/11/13	16:08:53	63.4
343	2019/11/13	16:08:54	64.0
344	2019/11/13	16:08:55	63.3
345	2019/11/13	16:08:56	64.6
346	2019/11/13	16:08:57	63.2
347	2019/11/13	16:08:58	63.3
348	2019/11/13	16:08:59	63.7
349	2019/11/13	16:09:00	64.2
408	2019/11/13	16:09:59	63.0
409	2019/11/13	16:10:00	62.7
410	2019/11/13	16:10:01	62.8
411	2019/11/13	16:10:02	62.8
412	2019/11/13	16:10:03	63.5
413	2019/11/13	16:10:04	63.1
414	2019/11/13	16:10:05	63.2
415	2019/11/13	16:10:06	63.2
416	2019/11/13	16:10:07	63.7
417	2019/11/13	16:10:08	63.7
418	2019/11/13	16:10:09	64.0
419	2019/11/13	16:10:10	63.6
420	2019/11/13	16:10:11	63.6
421	2019/11/13	16:10:12	63.1
422	2019/11/13	16:10:13	63.0
423	2019/11/13	16:10:14	63.8
424	2019/11/13	16:10:15	62.8
425	2019/11/13	16:10:16	63.9
426	2019/11/13	16:10:17	63.3
427	2019/11/13	16:10:18	64.0
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429	2019/11/13	16:10:20	63.0
430	2019/11/13	16:10:21	63.5
431	2019/11/13	16:10:22	63.3

432	2019/11/13	16:10:23	64.3
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436	2019/11/13	16:10:27	63.5
437	2019/11/13	16:10:28	63.5
438	2019/11/13	16:10:29	63.4
439	2019/11/13	16:10:30	66.5
440	2019/11/13	16:10:31	63.1
441	2019/11/13	16:10:32	63.7
442	2019/11/13	16:10:33	62.9
443	2019/11/13	16:10:34	62.9
444	2019/11/13	16:10:35	63.2
445	2019/11/13	16:10:36	63.0
446	2019/11/13	16:10:37	63.1
447	2019/11/13	16:10:38	63.5
506	2019/11/13	16:11:37	63.1
507	2019/11/13	16:11:38	64.3
508	2019/11/13	16:11:39	64.0
509	2019/11/13	16:11:40	65.4
510	2019/11/13	16:11:41	68.0
511	2019/11/13	16:11:42	66.9
512	2019/11/13	16:11:43	69.0
513	2019/11/13	16:11:44	69.0
514	2019/11/13	16:11:45	67.7
515	2019/11/13	16:11:46	65.7
516	2019/11/13	16:11:47	64.2
517	2019/11/13	16:11:48	62.8
518	2019/11/13	16:11:49	63.6
519	2019/11/13	16:11:50	63.2
520	2019/11/13	16:11:51	62.8
521	2019/11/13	16:11:52	63.9
522	2019/11/13	16:11:53	64.3
523	2019/11/13	16:11:54	64.2
524	2019/11/13	16:11:55	64.0
525	2019/11/13	16:11:56	63.7
526	2019/11/13	16:11:57	64.2
527	2019/11/13	16:11:58	63.0
528	2019/11/13	16:11:59	63.1
529	2019/11/13	16:12:00	63.8
530	2019/11/13	16:12:01	63.2
531	2019/11/13	16:12:02	63.3
532	2019/11/13	16:12:03	63.2
533	2019/11/13	16:12:04	62.8
534	2019/11/13	16:12:05	62.9
535	2019/11/13	16:12:06	62.6
536	2019/11/13	16:12:07	63.0
537	2019/11/13	16:12:08	62.8
538	2019/11/13	16:12:09	63.5
539	2019/11/13	16:12:10	63.2
540	2019/11/13	16:12:11	63.1
541	2019/11/13	16:12:12	63.0
542	2019/11/13	16:12:13	63.2

543	2019/11/13	16:12:14	63.7
544	2019/11/13	16:12:15	63.0
545	2019/11/13	16:12:16	62.9
604	2019/11/13	16:13:15	63.3
605	2019/11/13	16:13:16	62.9
606	2019/11/13	16:13:17	62.8
607	2019/11/13	16:13:18	62.9
608	2019/11/13	16:13:19	63.2
609	2019/11/13	16:13:20	62.7
610	2019/11/13	16:13:21	62.4
611	2019/11/13	16:13:22	62.6
612	2019/11/13	16:13:23	63.4
613	2019/11/13	16:13:24	63.4
614	2019/11/13	16:13:25	63.2
615	2019/11/13	16:13:26	63.1
616	2019/11/13	16:13:27	62.9
617	2019/11/13	16:13:28	62.9
618	2019/11/13	16:13:29	63.0
619	2019/11/13	16:13:30	63.0
620	2019/11/13	16:13:31	63.4
621	2019/11/13	16:13:32	63.1
622	2019/11/13	16:13:33	63.3
623	2019/11/13	16:13:34	62.9
624	2019/11/13	16:13:35	62.6
625	2019/11/13	16:13:36	63.7
626	2019/11/13	16:13:37	63.1
627	2019/11/13	16:13:38	63.8
628	2019/11/13	16:13:39	63.0
629	2019/11/13	16:13:40	63.4
630	2019/11/13	16:13:41	63.1
631	2019/11/13	16:13:42	63.3
632	2019/11/13	16:13:43	63.5
633	2019/11/13	16:13:44	63.5
634	2019/11/13	16:13:45	63.5
635	2019/11/13	16:13:46	63.7
636	2019/11/13	16:13:47	63.9
637	2019/11/13	16:13:48	63.0
638	2019/11/13	16:13:49	63.2
639	2019/11/13	16:13:50	63.2
640	2019/11/13	16:13:51	62.8
641	2019/11/13	16:13:52	62.8
642	2019/11/13	16:13:53	63.1
643	2019/11/13	16:13:54	62.8
702	2019/11/13	16:14:53	63.7
703	2019/11/13	16:14:54	63.6
704	2019/11/13	16:14:55	63.8
705	2019/11/13	16:14:56	63.3
706	2019/11/13	16:14:57	63.3
707	2019/11/13	16:14:58	63.3
708	2019/11/13	16:14:59	63.8
709	2019/11/13	16:15:00	63.8
710	2019/11/13	16:15:01	63.1
711	2019/11/13	16:15:02	63.4

712	2019/11/13	16:15:03	63.0
713	2019/11/13	16:15:04	63.4
714	2019/11/13	16:15:05	63.1
715	2019/11/13	16:15:06	63.5
716	2019/11/13	16:15:07	63.5
717	2019/11/13	16:15:08	63.4
718	2019/11/13	16:15:09	64.8
719	2019/11/13	16:15:10	63.9
720	2019/11/13	16:15:11	66.2
721	2019/11/13	16:15:12	64.8
722	2019/11/13	16:15:13	65.6
723	2019/11/13	16:15:14	67.0
724	2019/11/13	16:15:15	65.8
725	2019/11/13	16:15:16	64.7
726	2019/11/13	16:15:17	66.1
727	2019/11/13	16:15:18	69.2
728	2019/11/13	16:15:19	68.1
729	2019/11/13	16:15:20	66.1
730	2019/11/13	16:15:21	67.3
731	2019/11/13	16:15:22	67.9
732	2019/11/13	16:15:23	65.6
733	2019/11/13	16:15:24	68.2
734	2019/11/13	16:15:25	67.8
735	2019/11/13	16:15:26	65.1
736	2019/11/13	16:15:27	65.7
737	2019/11/13	16:15:28	64.9
738	2019/11/13	16:15:29	64.9
739	2019/11/13	16:15:30	65.3
740	2019/11/13	16:15:31	65.7
741	2019/11/13	16:15:32	66.7
800	2019/11/13	16:16:31	62.1
801	2019/11/13	16:16:32	62.6
802	2019/11/13	16:16:33	62.1
803	2019/11/13	16:16:34	62.7
804	2019/11/13	16:16:35	62.4
805	2019/11/13	16:16:36	62.8
806	2019/11/13	16:16:37	62.4
807	2019/11/13	16:16:38	62.8
808	2019/11/13	16:16:39	63.3
809	2019/11/13	16:16:40	62.5
810	2019/11/13	16:16:41	63.3
811	2019/11/13	16:16:42	63.3
812	2019/11/13	16:16:43	63.8
813	2019/11/13	16:16:44	63.3
814	2019/11/13	16:16:45	63.0
815	2019/11/13	16:16:46	63.2
816	2019/11/13	16:16:47	62.6
817	2019/11/13	16:16:48	62.5
818	2019/11/13	16:16:49	62.9
819	2019/11/13	16:16:50	63.2
820	2019/11/13	16:16:51	63.3
821	2019/11/13	16:16:52	63.6
822	2019/11/13	16:16:53	62.7

823	2019/11/13	16:16:54	63.3
824	2019/11/13	16:16:55	63.1
825	2019/11/13	16:16:56	63.2
826	2019/11/13	16:16:57	62.7
827	2019/11/13	16:16:58	63.2
828	2019/11/13	16:16:59	63.3
829	2019/11/13	16:17:00	63.2
830	2019/11/13	16:17:01	63.0
831	2019/11/13	16:17:02	62.5
832	2019/11/13	16:17:03	62.6
833	2019/11/13	16:17:04	63.0
834	2019/11/13	16:17:05	62.5
835	2019/11/13	16:17:06	62.6
836	2019/11/13	16:17:07	64.0
837	2019/11/13	16:17:08	63.4
838	2019/11/13	16:17:09	63.0
839	2019/11/13	16:17:10	62.8
898	2019/11/13	16:18:09	62.0
899	2019/11/13	16:18:10	62.4
900	2019/11/13	16:18:11	62.1

L7:43

Noise Measurement 2

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 89.7 - 2019/11/12 16:4
- Level Range : 40-100
- SEL : 105.5
- Leq : 76.0
-

No.s	Date	Time	(dB)
368	2019/11/12	00:09:56	51.1
369	2019/11/12	00:09:57	52.5
370	2019/11/12	00:09:58	50.9
371	2019/11/12	00:09:59	51.6
372	2019/11/12	00:10:00	49.2
373	2019/11/12	00:10:01	49.4
374	2019/11/12	00:10:02	50.3
375	2019/11/12	00:10:03	51.9
376	2019/11/12	00:10:04	51.0
377	2019/11/12	00:10:05	50.2
378	2019/11/12	00:10:06	51.2
379	2019/11/12	00:10:07	49.1
380	2019/11/12	00:10:08	49.4
381	2019/11/12	00:10:09	50.4
382	2019/11/12	00:10:10	49.5
383	2019/11/12	00:10:11	49.3
384	2019/11/12	00:10:12	51.1
385	2019/11/12	00:10:13	49.4
386	2019/11/12	00:10:14	49.3
387	2019/11/12	00:10:15	49.5
388	2019/11/12	00:10:16	50.2
389	2019/11/12	00:10:17	50.3
390	2019/11/12	00:10:18	50.4
391	2019/11/12	00:10:19	50.4
392	2019/11/12	00:10:20	51.5
393	2019/11/12	00:10:21	52.6
394	2019/11/12	00:10:22	51.3
395	2019/11/12	00:10:23	50.1
396	2019/11/12	00:10:24	48.8
397	2019/11/12	00:10:25	49.6
398	2019/11/12	00:10:26	50.0
399	2019/11/12	00:10:27	50.4
400	2019/11/12	00:10:28	49.6
401	2019/11/12	00:10:29	48.2
402	2019/11/12	00:10:30	48.4
403	2019/11/12	00:10:31	48.3
404	2019/11/12	00:10:32	48.7
405	2019/11/12	00:10:33	47.8
406	2019/11/12	00:10:34	47.8
407	2019/11/12	00:10:35	47.4
408	2019/11/12	00:10:36	47.8
409	2019/11/12	00:10:37	47.5
410	2019/11/12	00:10:38	47.2
411	2019/11/12	00:10:39	47.0
412	2019/11/12	00:10:40	47.5

413	2019/11/12	00:10:41	48.2
414	2019/11/12	00:10:42	48.0
415	2019/11/12	00:10:43	47.4
416	2019/11/12	00:10:44	47.0
417	2019/11/12	00:10:45	47.2
418	2019/11/12	00:10:46	47.2
419	2019/11/12	00:10:47	47.5
420	2019/11/12	00:10:48	47.5
421	2019/11/12	00:10:49	47.9
422	2019/11/12	00:10:50	48.4
481	2019/11/12	00:11:49	47.7
482	2019/11/12	00:11:50	47.2
483	2019/11/12	00:11:51	47.2
484	2019/11/12	00:11:52	46.8
485	2019/11/12	00:11:53	47.8
486	2019/11/12	00:11:54	51.7
487	2019/11/12	00:11:55	47.9
488	2019/11/12	00:11:56	48.0
489	2019/11/12	00:11:57	49.3
490	2019/11/12	00:11:58	49.2
491	2019/11/12	00:11:59	49.1
492	2019/11/12	00:12:00	48.3
493	2019/11/12	00:12:01	48.2
494	2019/11/12	00:12:02	47.5
495	2019/11/12	00:12:03	47.3
496	2019/11/12	00:12:04	54.1
497	2019/11/12	00:12:05	47.5
498	2019/11/12	00:12:06	47.0
499	2019/11/12	00:12:07	47.0
500	2019/11/12	00:12:08	47.7
501	2019/11/12	00:12:09	47.6
502	2019/11/12	00:12:10	47.0
503	2019/11/12	00:12:11	47.6
504	2019/11/12	00:12:12	48.7
505	2019/11/12	00:12:13	49.7
506	2019/11/12	00:12:14	49.0
507	2019/11/12	00:12:15	49.6
508	2019/11/12	00:12:16	50.0
509	2019/11/12	00:12:17	50.8
510	2019/11/12	00:12:18	49.3
511	2019/11/12	00:12:19	49.7
512	2019/11/12	00:12:20	49.3
513	2019/11/12	00:12:21	49.8
514	2019/11/12	00:12:22	49.0
515	2019/11/12	00:12:23	49.5
516	2019/11/12	00:12:24	49.0
517	2019/11/12	00:12:25	48.6
518	2019/11/12	00:12:26	49.1
519	2019/11/12	00:12:27	49.0
520	2019/11/12	00:12:28	49.0
579	2019/11/12	00:13:27	47.8
580	2019/11/12	00:13:28	46.8
581	2019/11/12	00:13:29	46.8

582	2019/11/12	00:13:30	47.1
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587	2019/11/12	00:13:35	47.4
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589	2019/11/12	00:13:37	48.3
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591	2019/11/12	00:13:39	48.7
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784	2019/11/12	00:16:52	50.7
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880	2019/11/12	00:18:28	49.6
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9	2019/11/12	16:32:48	75.6
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76	2019/11/12	16:33:55	75.4
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688	2019/11/12	16:44:07	79.9
689	2019/11/12	16:44:08	80.2
690	2019/11/12	16:44:09	77.7
691	2019/11/12	16:44:10	74.8
692	2019/11/12	16:44:11	74.7
693	2019/11/12	16:44:12	76.7
694	2019/11/12	16:44:13	79.9
695	2019/11/12	16:44:14	79.8
696	2019/11/12	16:44:15	77.7
697	2019/11/12	16:44:16	73.6
698	2019/11/12	16:44:17	72.8
757	2019/11/12	16:45:16	81.1
758	2019/11/12	16:45:17	81.1
759	2019/11/12	16:45:18	78.7
760	2019/11/12	16:45:19	75.9
761	2019/11/12	16:45:20	74.4
762	2019/11/12	16:45:21	75.3
763	2019/11/12	16:45:22	76.6
764	2019/11/12	16:45:23	79.5
765	2019/11/12	16:45:24	79.2
766	2019/11/12	16:45:25	79.4
767	2019/11/12	16:45:26	80.2
768	2019/11/12	16:45:27	80.4
769	2019/11/12	16:45:28	78.1
770	2019/11/12	16:45:29	74.7
771	2019/11/12	16:45:30	74.4
772	2019/11/12	16:45:31	73.7
773	2019/11/12	16:45:32	79.1
774	2019/11/12	16:45:33	74.5
775	2019/11/12	16:45:34	74.8
776	2019/11/12	16:45:35	71.0
777	2019/11/12	16:45:36	70.0
778	2019/11/12	16:45:37	68.9
779	2019/11/12	16:45:38	68.1
780	2019/11/12	16:45:39	67.3
781	2019/11/12	16:45:40	67.7
782	2019/11/12	16:45:41	66.1
783	2019/11/12	16:45:42	66.5
784	2019/11/12	16:45:43	66.3
785	2019/11/12	16:45:44	65.9
786	2019/11/12	16:45:45	66.8
787	2019/11/12	16:45:46	70.4
788	2019/11/12	16:45:47	75.8
789	2019/11/12	16:45:48	76.3
790	2019/11/12	16:45:49	75.0
791	2019/11/12	16:45:50	72.6
792	2019/11/12	16:45:51	70.7
793	2019/11/12	16:45:52	68.8
794	2019/11/12	16:45:53	70.1
795	2019/11/12	16:45:54	67.2
796	2019/11/12	16:45:55	65.5

855	2019/11/12	16:46:54	75.9
856	2019/11/12	16:46:55	81.7
857	2019/11/12	16:46:56	89.6
858	2019/11/12	16:46:57	83.3
859	2019/11/12	16:46:58	77.5
860	2019/11/12	16:46:59	76.1
861	2019/11/12	16:47:00	78.1
862	2019/11/12	16:47:01	79.4
863	2019/11/12	16:47:02	79.7
864	2019/11/12	16:47:03	81.1
865	2019/11/12	16:47:04	82.2
866	2019/11/12	16:47:05	81.3
867	2019/11/12	16:47:06	79.0
868	2019/11/12	16:47:07	77.8
869	2019/11/12	16:47:08	78.2
870	2019/11/12	16:47:09	77.2
871	2019/11/12	16:47:10	74.9
872	2019/11/12	16:47:11	73.2
873	2019/11/12	16:47:12	73.7
874	2019/11/12	16:47:13	75.9
875	2019/11/12	16:47:14	78.6
876	2019/11/12	16:47:15	78.7
877	2019/11/12	16:47:16	77.0
878	2019/11/12	16:47:17	77.7
879	2019/11/12	16:47:18	79.4
880	2019/11/12	16:47:19	77.1
881	2019/11/12	16:47:20	76.1
882	2019/11/12	16:47:21	75.8
883	2019/11/12	16:47:22	76.4
884	2019/11/12	16:47:23	75.4
885	2019/11/12	16:47:24	75.1
886	2019/11/12	16:47:25	78.2
887	2019/11/12	16:47:26	79.3
888	2019/11/12	16:47:27	78.4
889	2019/11/12	16:47:28	75.3
890	2019/11/12	16:47:29	74.6
891	2019/11/12	16:47:30	74.6
892	2019/11/12	16:47:31	77.6
893	2019/11/12	16:47:32	77.1
894	2019/11/12	16:47:33	76.3
895	2019/11/12	16:47:34	75.1
896	2019/11/12	16:47:35	76.5
897	2019/11/12	16:47:36	76.1
898	2019/11/12	16:47:37	77.6
899	2019/11/12	16:47:38	78.0
900	2019/11/12	16:47:39	80.1

Noise Measurement 2

46:56

Appendix B

Roadway Construction Noise Model Data

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 12/9/2019
Case Descr CoreSite Data Center Grading

---- Receptor #1 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
Reference	Residential	65	55	50

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Excavator	No	40		80.7	50	0
Dump Truck	No	40		76.5	50	0
Front End Loader	No	40		79.1	50	0

			Results				
	Calculated (dBA)			Noise Limits (dBA)			
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A
Dump Truck	76.5	72.5	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A
Total	80.7	79.9	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
Nearest Re	Residential	65	55	50

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Excavator	No	40		80.7	1400	0
Dump Truck	No	40		76.5	1400	0
Front End Loader	No	40		79.1	1400	0

			Results				
	Calculated (dBA)			Noise Limits (dBA)			
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Excavator	51.8	47.8	N/A	N/A	N/A	N/A	N/A
Dump Truck	47.5	43.5	N/A	N/A	N/A	N/A	N/A

Front End Loader	50.2	46.2	N/A	N/A	N/A	N/A	N/A
Total	51.8	50.9	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Inc	Industrial	65	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	250	0
Dump Truck	No	40		76.5	250	0
Front End Loader	No	40		79.1	250	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Excavator	66.7	62.8	N/A	N/A	N/A	N/A	N/A
Dump Truck	62.5	58.5	N/A	N/A	N/A	N/A	N/A
Front End Loader	65.1	61.2	N/A	N/A	N/A	N/A	N/A
Total	66.7	65.9	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Co	Commercial	65	55	50

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	2000	0
Dump Truck	No	40		76.5	2000	0
Front End Loader	No	40		79.1	2000	0

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Excavator	48.7	44.7	N/A	N/A	N/A	N/A	N/A
Dump Truck	44.4	40.4	N/A	N/A	N/A	N/A	N/A
Front End Loader	47.1	43.1	N/A	N/A	N/A	N/A	N/A

Total	48.7	47.8	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Appendix C

Cooing Equipment Specification Sheets

hydroBLU

Project Name:	CoreSite SV9 - Adiabatic Fluid Cooler Option
Location:	Santa Clara, CA
Selection ID:	90530
Date:	08/19/2019

GÜNTNER

hydroBLU Adiabatic Fluid Cooler

GFD 090.1A2x7/6AA-E240L/02P.M

Quantity: 5

Design Working Fluid Flow/Capacity:	4531.0 GPM / 21946 MBH	**Working Fluid:**	25% Propylene Glycol
Rated Capacity vs. Design:	102.7 %	**Entering Fluid Temperature:**	110.0 °F
Air Flow per Unit:	209157 CFM	**Leaving Fluid Temperature:**	100.0 °F
Air Inlet Dry Bulb Temperature:	105.0 °F	**Fluid Pres. Drop at Design Flow:**	10.75 psig
Air Inlet Wet Bulb Temperature:	76.0 °F	**Elevation:**	72 ft
Precooled Air Temperature	82.9 °F	**Dry Switch Point**	82.9 °F

Detailed Unitary Data

Fans:	14, suitable for 480V/3Ph/60Hz	**Sound Pressure @ 3ft:**	74 dB(A)
Total Fan Power in/out:	33.6 kW / 41.5 HP, nominal	**Sound Pressure @ 30ft:**	63 dB(A)
FLA:	51.8 A	**Sound Power Level:**	96 dB(A)
MCA:	52.7 A		
MOCP:	60.0 A		
Angular Fan Velocity:	1050 RPM		

Casing:	Galv. Powder coated	**Interior Coil Volume:**	22.9 ft³
Coil:	Copper	**Max Operating Pressure:**	232 psia
		Number of Support Anchors:	8
		Fin Material:	Aluminum
		Fin Spacing:	12.7 FPI

Dimensions

Height:	9.3	ft
Width:	8.5	ft
Length, nominal:	32.3	ft
Length, incl. water manifold:	32.6	ft

Weights

Shipping:	13981	lbs
Operating:	16325	lbs

Headers and Connections (Diameters)

Refrigerant		
Inlet Connections:	4 x 4.125	in
Outlet Connections:	4 x 4.125	in
Headers:		
Inlet:	4.125	in
Outlet:	4.125	in
Water:		
Inlet Connections	1.25	in
Outlet Connections	2	in

Reference Information

GFDA 090.1D/2x7-M(2)1C/2P.M

Water Side

Water Inlet Pressure Range:

25.00 – 60.00 psig

Evap. Rate @ Design:

8.9 GPM

Design Water Flow:

11.8 GPM

Water Equiv. Cycle of Conc.: 4.0

Important Remarks / Explanatory Notes

Terms of Delivery:

Payment Cond:

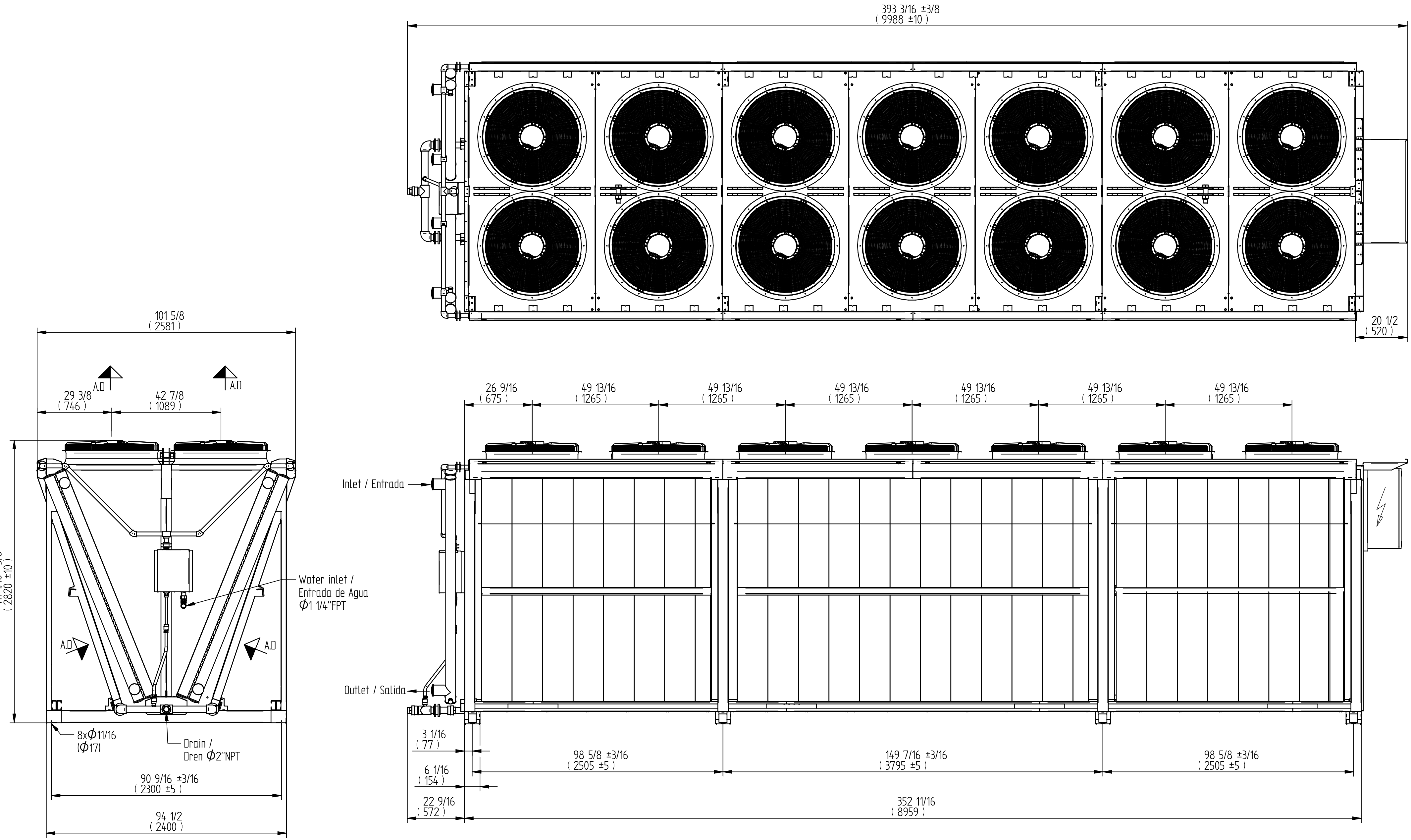
Delivery Time:

Validity: 10/18/2019

Our general terms of sales and delivery apply.

Güntner is not liable for unit and system damage due to lack of freeze protection for coils installed in freezing climates protection note acc. to DIN ISO 16016

measures without specification of tolerances:
welding / brazing: DIN EN ISO 13920, tolerance class D
general tolerances: DIN ISO 2768-1, tolerance class component parts m / assembly v , lenght >4m DIN 7168, tolerance class component parts m / assembly sg.
general tolerances: DIN ISO 2768-2, tolerance class component parts K / assembly L, lenght >3m EN 10162, tolerance straightness and flatness 0,002xl (lenght)



NOTES:
Preliminary drawing. Do not use for construction.
Coil inlet and outlet details and quantities often vary from the sample shown above

Guentner U.S. Ref.#:	Dimensions in inches (mm)	scale	1:25 sheet 1/1 size DIN A2
		material	
		weight [kg]	
		notice	14-fan hydroBLU Adiabatic
		type	GFDA 090.1../2x7..
		name	Cooler / Condenser
		Baan-No.	
revision	date name	drawing number	300-0000645181 index
Güntner U.S. LLC. 110 W. Hillcrest Blvd. Suite 105 Schaumburg, IL 60195 USA Tel. + 1 847 781 0900 www.guentnerus.com	date / name	customer	
	drawn: 17.03.2017 jvalero	project/ quantity	
	certified 18.05.2017 jdelgado	order/ position	

Magnitude®Water Cooled Centrifugal Chiller

DAIKIN

Job Information	Technical Data Sheet
Job Name	CoreSite - SV9
Date	8/19/2019
Submitted By	Steve Blau
Software Version	14.70
Unit Tag	WME-1575 w Adiabatic Fluid Cooler
Country of Origin	USA

Unit Overview

Model Number	Net Capacity ton	NPLV.IP kW/ton	Voltage	Starter Type	ASHRAE 90.1	LEED EA Credit 4
WME106DD	1575	0.1818	460 V / 60 Hz / 3 Ph	VFD	'10, '13 & '16	Qualifies

Unit

Model Number:	WME106DDC99/E4216-JB2C-2/C4216-VE2C-2/R134-AAAAPAC-U	Vintage:	C
Approval:	AHRI and ETL / cETL		
Vessel Code:	ASME		

Unit Shipping Weight	Unit Operating Weight	Overall Unit Length	Overall Unit Width	Overall Unit Height
33986 lb	40595 lb	230.0 in	97.9 in	112.7 in
Compressor Quantity	**Capacity Control**	**Refrigerant Type**	**Refrigerant Weight**	**Altitude**
2	VFD / Inlet Guide Vanes	R134a	2488 lb	0 to 3,280 ft

Evaporator

Entering Fluid Temperature	Leaving Fluid Temperature	Fluid Type	Actual Fluid Flow	Minimum Fluid Flow
80.00 °F	60.00 °F	Water	1896 gpm	645.0 gpm

Length	Diameter	Number of Passes	Tube		Fouling Factor
			Material	Wall Thickness	
16 ft	42 in	2	Copper	0.025 in	0.000100 °F.ft².h/Btu

Condenser

Entering Fluid Temperature	Leaving Fluid Temperature	Fluid Type	Glycol Concentration	Fluid Flow
100.00 °F	110.00 °F	Propylene Glycol	25 %	4531 gpm

Length	Diameter	Number of Passes	Tube		Fouling Factor
			Material	Wall Thickness	
16 ft	42 in	2	Copper	0.025 in	0.000250 °F.ft².h/Btu

Unit Performance (AHRI 550/590)

Design Points Rated with AHRI Condenser Relief

Net Capacity ton	Input kW	Cooling Efficiency kW/ton	NPLV.IP kW/ton	Part Load Cooling Efficiency			Evaporator Fluid		Condenser Fluid	
				75% kW/ton	50% kW/ton	25% kW/ton	Pressure Drop ft H_2O	Entering Temperature °F	Pressure Drop ft H_2O	Leaving Temperature °F
1575	822.2	0.5221	0.1818	0.3330	0.1345	0.1370	29.1	80.00	18.2	110.00

Unit Performance (AHRI 550/590)

Performance Points Rated with AHRI Condenser Relief

Point #	% of Design Load	Net Capacity ton	Input kW	Cooling Efficiency kW/ton	Evaporator Fluid				Condenser Fluid			
					Flow gpm	Temperature Entering °F	Temperature Leaving °F	Pressure Drop ft H_2O	Flow gpm	Temperature Entering °F	Temperature Leaving °F	Pressure Drop ft H_2O
1	100.0	1575	822.2	0.5221	1896	80.00	60.00	29.1	4531	100.00	110.00	18.2
2	90.0	1417	634.6	0.4477	1896	78.00	60.00	29.1	4531	93.00	101.78	18.0
3	80.0	1260	470.5	0.3734	1896	76.00	60.00	29.1	4531	86.00	93.64	17.7
4	70.0	1103	321.0	0.2911	1896	74.00	60.00	29.1	4531	79.00	85.56	17.3
5	60.0	945.0	195.7	0.2071	1896	72.00	60.00	29.2	4531	72.00	77.51	16.7
6	50.0	787.5	105.9	0.1345	1896	70.00	60.00	29.2	4531	65.00	69.51	16.1
7	40.0	630.0	73.08	0.1160	1896	68.00	60.00	29.2	4531	65.00	68.59	16.0
8	30.0	472.5	49.72	0.1052	1896	66.00	60.00	29.2	4531	65.00	67.68	16.0
9	20.0	315.0	35.35	0.1122	1896	64.00	60.00	29.2	4531	65.00	66.79	15.9
10	10.0	157.5	17.58	0.1116	1896	62.00	60.00	29.2	4531	65.00	65.89	15.9

Service Data

Service Points Rated with AHRI Condenser Relief

Point #	Superheat Δ °F	Subcooling Δ °F	Evaporator Fluid			Condenser Fluid		
			Temperature °F	Pressure psig	Velocity ft/s	Temperature °F	Pressure psig	Velocity ft/s
1	1.0	8.1	59.2	56.4	6.6	112.2	151.7	6.1
2	1.0	7.8	59.2	56.5	6.6	103.7	132.2	6.1
3	1.0	7.3	59.3	56.5	6.6	95.4	114.7	6.1
4	1.0	6.7	59.3	56.6	6.6	87.1	98.9	6.1
5	1.0	6.0	59.4	56.6	6.6	78.8	84.8	6.1
6	1.0	5.2	59.4	56.7	6.6	70.6	72.1	6.1
7	1.0	4.3	59.5	56.7	6.6	69.5	70.4	6.1
8	1.0	3.2	59.5	56.8	6.6	68.4	68.7	6.1
9	1.0	2.2	59.6	56.8	6.6	67.2	67.2	6.1
10	1.0	1.1	59.6	56.9	6.6	66.1	65.6	6.1

Performance Matrix

Standard Performance Rated with AHRI Condenser Relief

Capacity ton	% of Design Load	Evaporator		Condenser												
		Flow gpm	Fluid Leaving Temperature °F	Flow gpm	Fluid Entering Temperature °F										
					100.00	95.00	90.00	85.00	80.00	75.00	70.00	65.00	60.00	55.00	50.00
					Cooling Efficiency kW/ton										
1,575.0	100.0	1,895.68	60.00	4,531.35	0.5221	0.4681	0.4295	0.3933	0.3578	0.3259	0.2975	0.2761	0.2594	0.2435	0.2356
1,417.5	90.0	-	60.00	4,531.35	0.5073	0.4643	0.4227	0.3823	0.3447	0.3086	0.2737	0.2437	0.2266	0.2307	RES
1,260.0	80.0	-	60.00	4,531.35	0.5014	0.4548	0.4090	0.3648	0.3229	0.2806	0.2437	0.2137	0.1988	0.2205	RES
1,102.5	70.0	-	60.00	4,531.35	0.4962	0.4438	0.3936	0.3457	0.3001	0.2544	0.2159	0.1849	0.1753	0.3012	0.3125
945.0	60.0	-	60.00	4,531.35	0.4941	0.4348	0.3808	0.3294	0.2806	0.2326	0.1909	0.1581	0.1540	0.3216	RES

Physical

Evaporator

Inlet Location	Header Type	Header Material	Tube Sheet Material	Design Pressure (Waterside)
Left	Dished, Grooved	Carbon Steel	Carbon Steel	150 psig

Condenser

Inlet Location	Header Type	Header Material	Tube Sheet Material	Design Pressure (Waterside)
Left	Dished, Grooved	Carbon Steel	Carbon Steel	150 psig

Electrical

Voltage	Power Connection	Circuit (Compr)	RLA	MCA	MOCP	LRA	Power Factor	Lug Size
460 V / 60 Hz / 3 Ph	Single Point	1	1130 A	1278 A	1843 A	622 A	0.93	2000A / (6) 2 AWG - 600 MCM
		2				622 A		

Above RLA, MCA & MOCP values are per chiller; LRA values are per compressor

Drive

Type	Model	Location	Harmonic Distortion	Enclosure Type	Motor Protection
VFD	Integral	Unit Mounted	Standard	NEMA 1	Standard

Circuit Breaker	Short Circuit Current Rating	Approval
65 KAIC	65 KAIC	ETL, ETLc

Sound (with insulation)

Sound Pressure											
63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	Overall	75% Load	50% Load	25% Load
40.0	57.0	66.0	72.0	71.0	71.0	82.0	69.0	**84.5**	79.6	78.6	75.6

Sound Pressure (dB) measured in accordance with ANSI/AHRI Standard 575-2008 ('A' weighted)

Options

Basic Unit	
Packaging:	Bagging only
Hinge Type:	Hinges on Both Ends
Insulation	
Thermal:	0.75" on Evaporator Shell, Suction Piping, Compressor Inlet, Motor Barrel & High Humidity
Head:	Evaporator Return & Connection Heads
Control	
Communication Protocol:	BACnet IP/Ethernet
RapidRestore®:	Included
Drive	
Ground Fault Protection:	Included

Warranty

Unit Startup:	Domestic by Daikin Factory Service (Std.)
Standard Warranty:	Domestic, First Year Standard Warranty (Parts & Labor)
Delayed Warranty Start:	None (Startup 12-18 months after ship date)

AHRI Certification

Certified in accordance with the AHRI Water-Cooled Water Chilling and Heat Pump Water-Heating Packages Certification Program, which is based on AHRI Standard 550/590 (I-P) and AHRI Standard 551/591 (SI). Unit containing freeze protection fluids in the condenser or in the evaporator with a leaving chilled fluid temperature above 32°F [0°C] is certified when rated per the Standard with water. Certified units may be found in the AHRI Directory at www.ahridirectory.org.

Environmental Product Declaration

Magnitude® chillers have Type III Environmental Product Declaration (EPD) verification in accordance with ISO 14025 to help obtain LEED certification. EPD document can be downloaded here: http://tinyurl.com/DaikinMagnitudeEPD or by scanning the QR Code.

Notes

1. Above RLA, MCA & MOCP values are per chiller; LRA values are per compressor and are for input amps.
2. Performance kW & kW/ton values are total values unless noted otherwise.
3. Minimum flow is based upon standard condenser water relief and not increased lift due to constant condenser water temperature.
4. Motor overload settings determined by motor amps. Refer to unit nameplate for proper settings.
5. The USGBC bases its LEED EA credit 4 calculations for Enhanced Refrigerant Management on the default values for a water cooled centrifugal chiller with a 25-year life, 10% end of life loss and 2% annual leak rate. The gross ARI cooling capacity for the unit is at least 10 tons, and the refrigerant charge is 10 lbs.
6. The LEED result above considers the chiller only. When applying this information for credit or prerequisite compliance the entire building must be considered.
7. Use only copper supply wires with ampacity based on 75°C conductor rating. Connections to terminals must be made with copper lugs and copper wire.
8. For orientation purposes, left and right hand vessel connection locations are determined by facing the OITS panel (Operator Interface Touch Screen). The unit front is the long dimension side with the OITS panel and rear is the opposite side long dimension.

Appendix D

Cummings 3500 D6e Generator Specifications

Specification sheet

Diesel Generator set QSK95 series engine

2500 kW-3500 kW 60 Hz

EPA Tier 2 emissions regulated

Description

Cummins® commercial generator sets are fully integrated power generation systems providing optimum performance, fuel economy, reliability and versatility for stationary Standby, Prime and Continuous power applications.

Features

Cummins heavy-duty engine - Rugged 4-cycle, industrial diesel delivers reliable power, low emissions and fast response to load changes.

Alternator - Several alternator sizes offer selectable motor starting capability with low reactance windings, low waveform distortion with non-linear loads and fault clearing short-circuit capability.

Control system - The PowerCommand® digital control is standard equipment and provides total genset system integration including automatic remote starting/stopping, precise frequency and voltage regulation, alarm and status message display, AmpSentry™ protective relay, output metering and auto-shutdown.

Cooling system - Standard and enhanced integral set-mounted radiator systems, designed and tested for rated ambient temperatures, simplifies facility design requirements for rejected heat. Also optional remote cooled configuration for non-factory supplied cooling systems.

Warranty and service - Backed by a comprehensive warranty and worldwide distributor network.

NFPA - The generator set accepts full rated load in a single step in accordance with NFPA 110 for Level 1 systems.

	Standby rating	Prime rating	Continuous rating	Emissions compliance	Data sheets
Model	**60 Hz kW (kVA)**	**60 Hz kW (kVA)**	**60 Hz kW (kVA)**	**EPA**	**60 Hz**
C3000 D6e	3000 (3750)	2750 (3438)	2500 (3125)	EPA Tier 2	NAD-5942-EN
C3250 D6e	3250 (4063)	3000 (3750)	2500 (3125)	EPA Tier 2	NAD-3527-EN
C3500 D6e	3500 (4375)	3000 (3750)	2750 (3438)	EPA Tier 2	NAD-5917-EN

Note: All ratings include radiator fan losses.

Generator set specifications

Governor regulation class	ISO 8528 Part 1 Class G3
Voltage regulation, no load to full load	± 0.5%
Random voltage variation	± 0.5%
Frequency regulation	Isochronous
Random frequency variation	± 0.25%
Radio Frequency (RF) emission compliance	47 CFR FCC PART 15 Subpart B (Class A for industrial)

Engine specifications

Bore	190 mm (7.48 in)
Stroke	210 mm (8.27 in)
Displacement	95.3 litres (5815 in^3)
Configuration	Cast iron, V 16 cylinder
Battery capacity	6 x 1400 amps minimum at ambient temperature of -18 °C (0 °F)
Battery charging alternator	145 amps
Starting voltage	24 volt, negative ground
Fuel system	Cummins modular common rail system
Fuel filter	On engine triple element, 5 micron primary filtration with water separators, 3 micron/2 micron (filter in filter design) secondary filtration.
Fuel transfer pump	Electronic variable speed priming and lift pump
Breather	Cummins impactor breather system
Air cleaner type	Unhoused dry replaceable element
Lube oil filter type(s)	Spin-on combination full flow filter and bypass filters
Standard cooling system	High ambient cooling system (ship loose)

Alternator specifications

Design	Brushless, 4 pole, drip proof, revolving field
Stator	Optimal
Rotor	Two bearing, flexible coupling
Insulation system	Class H on low and medium voltage, Class F on high voltage
Standard temperature rise	125 ºC Standby/105 ºC Prime
Exciter type	Optimal
Phase rotation	A (U), B (V), C (W)
Alternator cooling	Direct drive centrifugal blower fan
AC waveform Total Harmonic Distortion (THDV)	< 5% no load to full linear load, < 3% for any single harmonic
Telephone Influence Factor (TIF)	< 50 per NEMA MG1-22.43
Telephone Harmonic Factor (THF)	< 3
Anti-condensation heater	1400 watt

Available voltages

60 Hz Line – Neutral/Line – Line

- 220/380
- 240/416
- 255/440
- 7200/12470
- 277/480
- 347/600
- 2400/4160
- 7620/13200
- 7970/13800

Note: Consult factory for other voltages.

Generator set options and accessories

Engine

- 480 V thermostatically controlled coolant heater for ambient above 4.5 °C (40 °F)
- Heavy duty air cleaner
- Redundant fuel filter
- Air starter
- Redundant electric starting
- Eliminator oil filter system
- Lube oil make up
- Coalescing breather filter

Alternator

- 80 °C rise
- 105 °C rise
- 125 °C rise
- 150 °C rise
- Differential current transformers

Cooling system

- Enhanced high ambient cooling system (ship loose)
- Remote cooled configuration

Generator set options and accessories (continued)

Control panel

- Multiple language support
- Ground fault indication
- Remote annunciator panel
- Paralleling and shutdown alarm relay package
- Floor mounted pedestal installed control panel

Generator set

- Battery
- Battery charger
- LV and MV entrance box
- Spring isolators
- Factory witness tests
- IBC, OSHPD, IEEE seismic certification

Warranty

- 3, 5, or 10 years for Standby including parts (labor and travel optional)
- 2 or 3 years for Prime including parts, labor and travel

Note: Some options may not be available on all models - consult factory for availability.

PowerCommand 3.3 – control system

An integrated microprocessor based generator set control system providing voltage regulation, engine protection, alternator protection, operator interface and isochronous governing. Refer to document S-1570 for more detailed information on the control.

AmpSentry – Includes integral AmpSentry protection, which provides a full range of alternator protection functions that are matched to the alternator provided.

Power management – Control function provides battery monitoring and testing features and smart starting control system.

Advanced control methodology – Three phase sensing, full wave rectified voltage regulation, with a PWM output for stable operation with all load types.

Communications interface – Control comes standard with PCCNet and Modbus interface.

Regulation compliant – Prototype tested: UL, CSA and CE compliant.

Service - InPower™ PC-based service tool available for detailed diagnostics, setup, data logging and fault simulation.

Easily upgradeable – PowerCommand controls are designed with common control interfaces.

Reliable design – The control system is designed for reliable operation in harsh environment.

Multi-language support

Operator panel features

Operator/display functions

- Displays paralleling breaker status
- Provides direct control of the paralleling breaker
- 320 x 240 pixels graphic LED backlight LCD
- Auto, manual, start, stop, fault reset and lamp test/panel lamp switches
- Alpha-numeric display with pushbuttons
- LED lamps indicating genset running, remote start, not in auto, common shutdown, common warning, manual run mode, auto mode and stop

Paralleling control functions

- First Start Sensor™ system selects first genset to close to bus
- Phase lock loop synchronizer with voltage matching
- Sync check relay
- Isochronous kW and kVar load sharing
- Load govern control for utility paralleling
- Extended paralleling (base load/peak shave) mode
- Digital power transfer control, for use with a breaker pair to provide open transition, closed transition, ramping closed transition, peaking and base load functions.

Other control features

- 150 watt anti-condensation heater
- DC distribution panel
- AC auxiliary distribution panel

Alternator data

- Line-to-Neutral and Line-to-Line AC volts
- 3-phase AC current
- Frequency
- kW, kVar, power factor kVA (three phase and total)
- Winding temperature
- Bearing temperature

Engine data

- DC voltage
- Engine speed
- Lube oil pressure and temperature
- Coolant temperature
- Comprehensive FAE data (where applicable)

Other data

- Genset model data
- Start attempts, starts, running hours, kW hours
- Load profile (operating hours at % load in 5% increments)
- Fault history
- Data logging and fault simulation (requires InPower)
- Air cleaner restriction indication
- Exhaust temperature in each cylinder

Standard control functions

Digital governing

- Integrated digital electronic isochronous governor
- Temperature dynamic governing

Standard control functions (continued)

Digital voltage regulation

- Integrated digital electronic voltage regulator
- 3-phase, 4-wire Line-to-Line sensing
- Configurable torque matching

AmpSentry AC protection

- AmpSentry protective relay
- Over current and short circuit shutdown
- Over current warning
- Single and three phase fault regulation
- Over and under voltage shutdown
- Over and under frequency shutdown
- Overload warning with alarm contact
- Reverse power and reverse Var shutdown
- Field overload shutdown

Engine protection

- Battery voltage monitoring, protection and testing
- Overspeed shutdown
- Low oil pressure warning and shutdown
- High coolant temperature warning and shutdown
- Low coolant level warning or shutdown
- Low coolant temperature warning
- Fail to start (overcrank) shutdown
- Fail to crank shutdown
- Cranking lockout
- Sensor failure indication
- Low fuel level warning or shutdown
- Fuel-in-rupture-basin warning or shutdown
- Full authority electronic engine protection

Control functions

- Time delay start and cool down
- Real time clock for fault and event time stamping
- Exerciser clock and time of day start/stop
- Data logging
- Cycle cranking
- Load shed
- Configurable inputs and outputs (20)
- Remote emergency stop

Ratings definitions

Emergency Standby Power (ESP):

Applicable for supplying power to varying electrical loads for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Limited-Time Running Power (LTP):

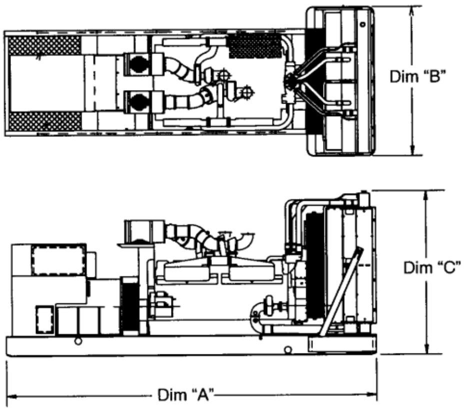
Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.

Prime Power (PRP):

Applicable for supplying power to varying electrical loads for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Base Load (Continuous) Power (COP):

Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) in accordance with ISO 8528, ISO 3046, AS 2789, DIN 6271 and BS 5514.



This outline drawing is for reference only. See PowerSuite library for specific model outline drawing number.

Do not use for installation design

Model	Dim "A"* mm (in.)	Dim "B"* mm (in.)	Dim "C"* mm (in.)	Set weight* dry kg (lbs)	Set weight* wet kg (lbs)
C3000 D6e	7902 (311)	3028 (119)	3663 (144)	29526 (65092)	31194 (68771)
C3250 D6e	7902 (311)	3028 (119)	3663 (144)	29526 (65092)	31194 (68771)
C3500 D6e	7902 (311)	3028 (119)	3663 (144)	29526 (65092)	31194 (68771)

* Weights and dimensions represent a set with standard features and alternator frame P80X.
See outline drawing for weights and dimensions of other configurations.

Codes and standards

Codes or standards compliance may not be available with all model configurations – consult factory for availability.

ISO 9001	This generator set is designed in facilities certified to ISO 9001 and manufactured in facilities certified to ISO 9001 or ISO 9002.	UL	The generator set is available listed to UL 2200, Stationary Engine Generator Assemblies for all 60 Hz low voltage models. The PowerCommand control is Listed to UL 508 - Category NITW7 for U.S. and Canadian usage.
PTS	The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Cummins products bearing the PTS symbol meet the prototype test requirements of NFPA 110 for Level 1 systems.	**U.S. EPA**	Engine certified to Stationary Emergency U.S. EPA New Source Performance Standards, 40 CFR 60 subpart IIII Tier 2 exhaust emission levels. U.S. applications must be applied per this EPA regulation.
CSA	All models are CSA certified to product class 4215-01.		

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is open.

For more information contact your local Cummins distributor or visit power.cummins.com

Our energy working for you.™

NAS-5849-EN (09/17)

Appendix E

Operational Noise Modeling Results

Santa Clara Data Center
Assessed receiver levels
Operation-SPS

Receiver	Usage	Fl	Dir	dB(A)	Lr,lim dB(A)	Lr,lim dB(A)	Lr,lim dB(A)	Ldn dB(A)	
1	SCR	G						71.9	
2	SCR	G						68.4	
3	SCR	G						70.1	
4	SCR	G						91.4	
5	SCR	G						96.2	
6	SCR	G						93.5	
7	SCR	G						94.4	
8	SCR	G						89.7	
9	SCR	G						81.5	

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Santa Clara Data Center
Assessed receiver levels
Operation Mit-SPS

Receiver	Usage	Fl	Dir	dB(A)	Lr,lim dB(A)	Lr,lim dB(A)	Lr,lim dB(A)	Ldn dB(A)	
1	SCR	G						53.2	
2	SCR	G						50.9	
3	SCR	G						53.2	
4	SCR	G						69.5	
5	SCR	G						74.0	
6	SCR	G						71.3	
7	SCR	G						72.2	
8	SCR	G						67.4	
9	SCR	G						59.9	

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