NOISE ASSESSMENT

Chino Valley Fire Station 68
City of Chino Hills, CA

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GLOSSARY OF COMMON TERMS

Sound Pressure Level (SPL): a ratio of one sound pressure to a reference pressure (L_{ref}) of 20 µPa. Because of the dynamic range of the human ear, the ratio is calculated logarithmically by 20 log (L/L_{ref}).

A-weighted Sound Pressure Level (dBA): Some frequencies of noise are more noticeable than others. To compensate for this fact, different sound frequencies are weighted more.

Minimum Sound Level (L_{min}): Minimum SPL or the lowest SPL measured over the time interval using the A-weighted network and slow time weighting.

Maximum Sound Level (L_{max}): Maximum SPL or the highest SPL measured over the time interval the A-weighted network and slow time weighting.

Equivalent sound level (L_{eq}): the true equivalent sound level measured over the run time. Leq is the A-weighted steady sound level that contains the same total acoustical energy as the actual fluctuating sound level.

Day Night Sound Level (Ldn): Representing the Day/Night sound level, this measurement is a 24 –hour average sound level where 10 dB is added to all the readings that occur between 10 pm and 7 am. This is primarily used in community noise regulations where there is a 10 dB "Penalty" for nighttime noise. Typically, Ldn's are measured using A weighting.

Community Noise Exposure Level (CNEL): The accumulated exposure to sound measured in a 24-hour sampling interval and artificially boosted during certain hours. For CNEL, samples taken between 7 pm and 10 pm are boosted by 5 dB; samples taken between 10 pm and 7 am are boosted by 10 dB.

Octave Band: An octave band is defined as a frequency band whose upper band-edge frequency is twice the lower band frequency.

Third-Octave Band: A third-octave band is defined as a frequency band whose upper band-edge frequency is 1.26 times the lower band frequency.

Response Time (F,S,I): The response time is a standardized exponential time weighting of the input signal according to fast (F), slow (S) or impulse (I) time response relationships. Time response can be described with a time constant. The time constants for fast, slow and impulse responses are 1.0 seconds, 0.125 seconds and 0.35 milliseconds, respectively.

EXECUTIVE SUMMARY

This noise study has been completed to determine the noise impacts for the proposed Chino Valley Fire Station 68 project. The Chino Valley Fire District is proposing to construct a new fire station (Fire Station No. 68) and the Essential Resource Facility (ERF), a separate building for offices, apparatus bays, and emergency supply storage (Proposed Project or Project) on a vacant 3.74-acre site south of the intersection of Pipeline Avenue and Soquel Canyon Road in Chino Hills, CA.

Construction Noise

Project construction noise levels are considered exempt if activities occur within the hours specified in the City of Chino Hills Municipal Code, Section 8.08.020 of 7:00 a.m. and 7:00 p.m. on weekdays, and between 8:00 a.m. and 6:00 p.m. on Saturdays, excluding federal holidays. At the time of this analysis, no Project construction activity is planned outside of the specified hours, therefore, no impacts are anticipated.

Nonetheless, in addition to complying with the City's noise standards regarding construction working hours and noise levels, construction noise should be minimized through the implementation of best management practices (BMPs) that may include, but are not limited to, the following:

- Proper maintenance and tuning of all construction equipment engines to minimize noise emissions.
- Proper maintenance and functioning of the mufflers on all internal combustion and equipment engine.
- Locate fixed and/or stationary equipment as far as possible from noise-sensitive receptors.
- Appoint a public liaison for Project construction that would be responsible for addressing public concerns about construction activities, including excessive noise. As needed, the liaison would determine the cause of concern (e.g., starting too early, bad muffler) and implement measures to address the concern. These BMPs would further reduce construction noise levels.

No blasting or rock crushing is anticipated during the grading operations. Therefore, no impulsive noise sources are expected and the Project will comply with Section 16.48.030 of the City Noise Ordinance.

Offsite Transportation Noise

The project will not create a direct impact of more than 3 dBA CNEL on any roadway segment and no cumulative noise increase of 3 dBA CNEL or more were found. Therefore, the proposed project's direct and cumulative contributions to off-site roadway noise increases will not cause any significant impacts to any existing or future noise sensitive land uses.

Operational Noise

The noise levels from the proposed Project operations would be considered less than significant at the residential property lines to the east and west and are in compliance with the City of Chino Hills Municipal Code Section 16.48.020.

The City of Chino Hills Municipal Code also specifically exempts noise generated by warning devices necessary for the protection of public safety (e.g., police, fire, and ambulance sirens). Therefore, these Project's operational noise levels are exempt from the property line noise thresholds of Section 16.48.020.

1.0 PROJECT INTRODUCTION

1.1 Purpose of this Study

The purpose of this Noise study is to determine noise impacts, if any, from the project (i.e., construction, operations) onto surrounding uses. Should impacts be determined, the intent of this study would be to recommend suitable mitigation measures to reduce impacts to below a level of significance.

1.2 Project Location

The proposed Chino Valley Fire Station 68 is located on a vacant 3.74-acre site south of the intersection of Pipeline Avenue and Soquel Canyon Road in Chino Hills, CA. A general project vicinity map is shown in Figure 1-A.

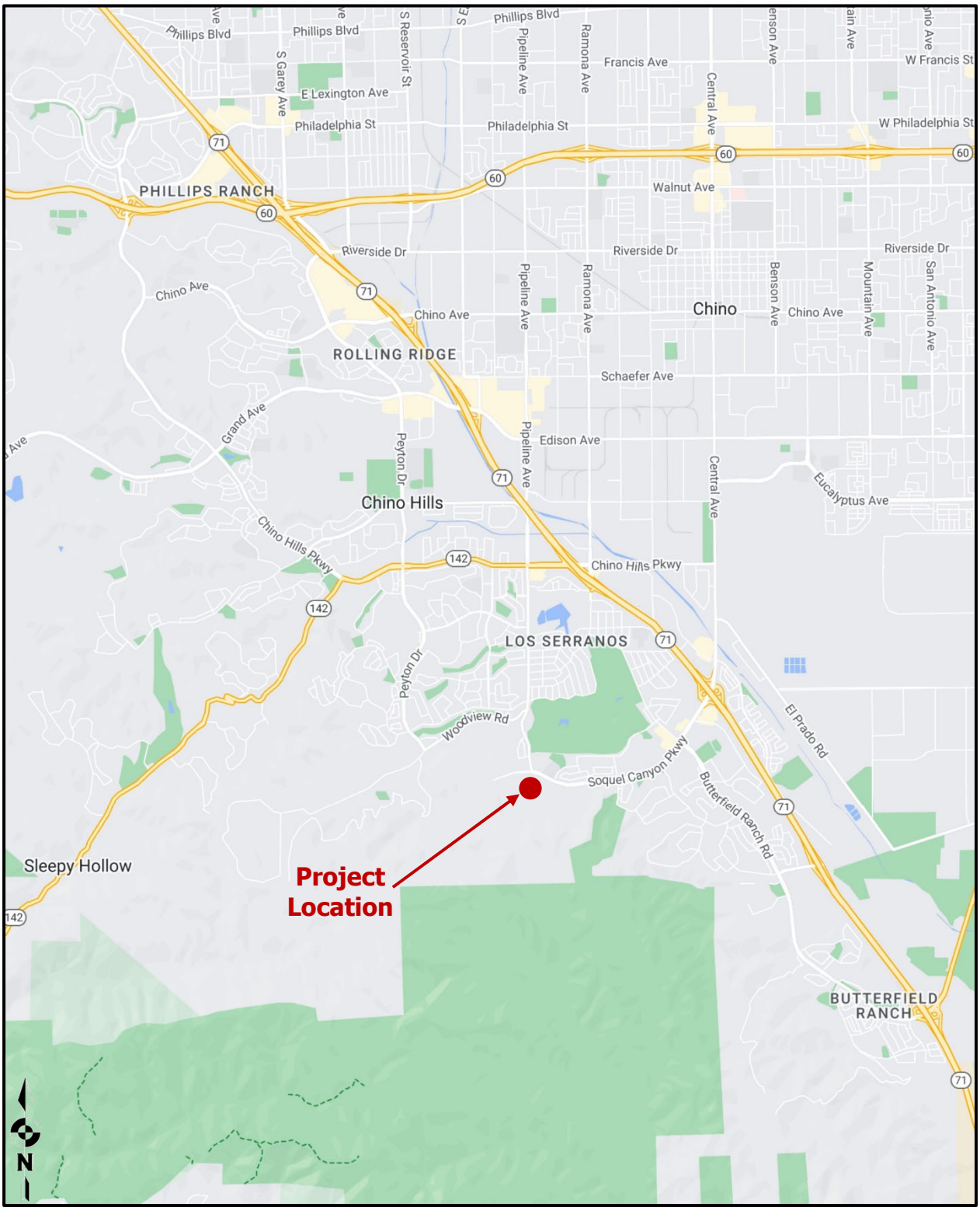
1.3 Project Description and Purpose

The Chino Valley Fire District (CVFD) identified a significant need to build a fire station in the Soquel Canyon area of Chino Hills through a Standards of Cover Assessment and Master Plan update conducted in 2018. To support this requirement, The CVFD is proposing to construct a new 11,813 square-foot fire station, 6,332 square-foot emergency resource facility (ERF), and a 6-bay 600 square-foot apparatus room on a 3.74 acre project site. Site improvements proposed include approximately 56,115-square-feet of hardscape including visitor and secured parking areas, 88,600 square-feet of landscaping, security fencing, concrete masonry site walls, hose tower, an emergency generator, an above ground fuel dispensing tank, and carports with PV arrays. The Project is expected to commence in early 2024 and be completed in early 2025. The project would require 14,307 Cubic Yards (CY) of export during the grading operations.

Following the construction of the Project, operations of the new Fire Station and ERF will be added to the three existing Chino Hills fire stations, under the Chino Valley Fire District in order to maintain the appropriate levels of response times to calls for service within its service area.

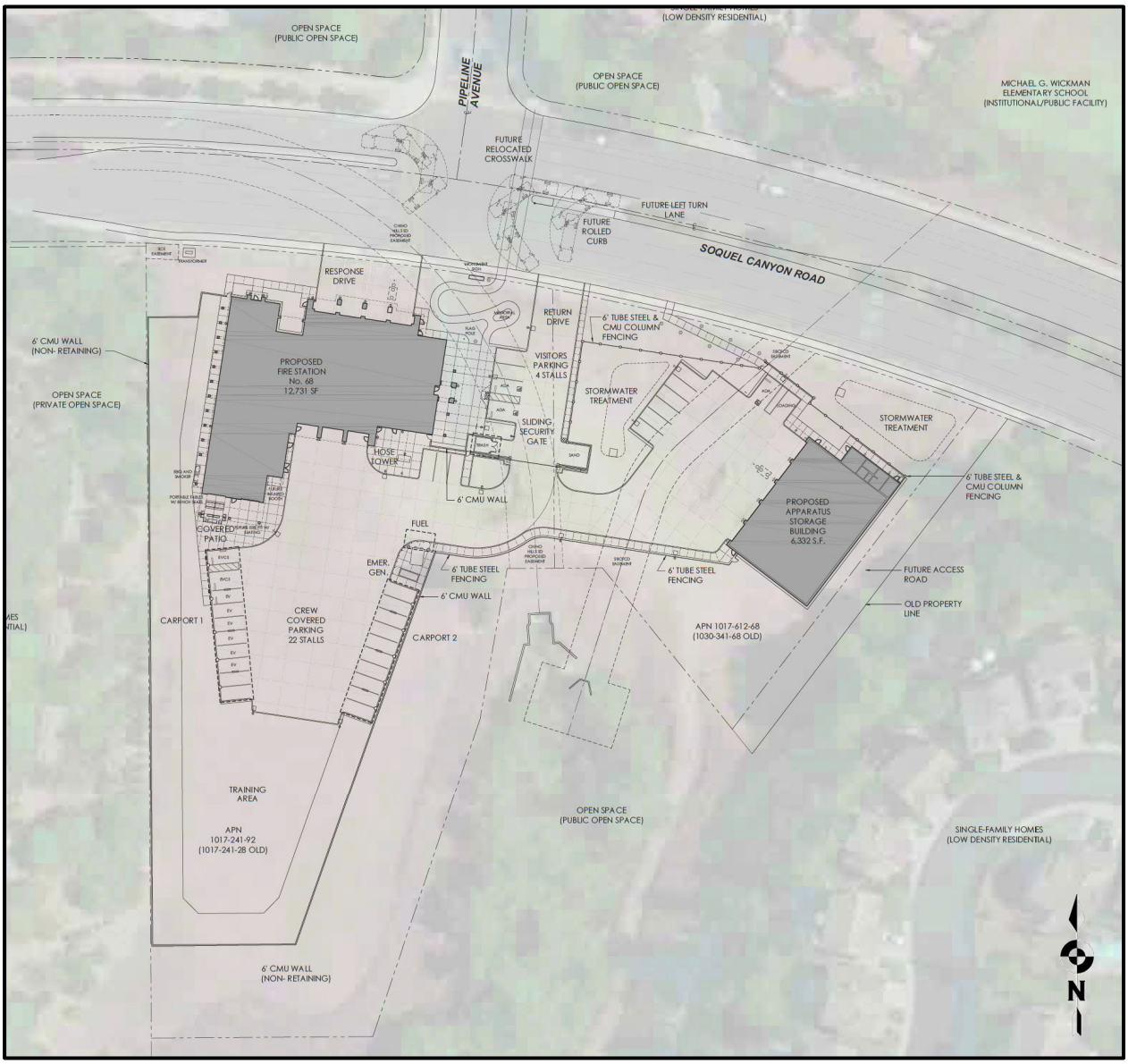
The Fire Department anticipate eight calls daily at the opening and forecasts as many as 12 calls per day at the peak. The site expects to operate with as little as one ladder truck or an engine company, an ambulance as well as a Battalion Chief unit. The project site plan is shown in Figure 1-B.

Figure 1-A: Project Vicinity Map



Source: (Google, 2023)

Figure 1-B: Proposed Site Layout



Source: (PBK, 2023)

2.0 FUNDAMENTALS

2.1 Acoustical Fundamentals

Noise is defined as unwanted or annoying sound which interferes with or disrupts normal activities. Exposure to high noise levels has been demonstrated to cause hearing loss. The individual human response to environmental noise is based on the sensitivity of that individual, the type of noise that occurs and when the noise occurs. Sound is measured on a logarithmic scale consisting of sound pressure levels known as a decibel (dB). The sounds heard by humans typically do not consist of a single frequency but of a broadband of frequencies having different sound pressure levels. The method for evaluating all the frequencies of the sound is to apply an A-weighting to reflect how the human ear responds to the different sound levels at different frequencies. The A-weighted sound level adequately describes the instantaneous noise whereas the equivalent sound level depicted as Leq represents a steady sound level containing the same total acoustical energy as the actual fluctuating sound level over a given time interval.

The Community Noise Equivalent Level (CNEL) is the 24 hour A-weighted average for sound, with corrections or penalties for evening and nighttime hours. The corrections require an addition of 5 decibels to sound levels in the evening hours between 7 p.m. and 10 p.m. and an addition of 10 decibels to sound levels at nighttime hours between 10 p.m. and 7 a.m. These additions are made to account for the increased sensitivity during the evening and nighttime hours when sounds appear louder.

A vehicle's noise level is from a combination of the noise produced by the engine, exhaust and tires. The cumulative traffic noise levels along a roadway segment are based on three primary factors: the amount of traffic, the travel speed of the traffic, and the vehicle mix ratio or number of medium and heavy trucks. The intensity of traffic noise is increased by higher traffic volumes, greater speeds and increased number of trucks.

Because mobile/traffic noise levels are calculated on a logarithmic scale, a doubling of the traffic noise or acoustical energy results in a noise level increase of 3 dBA. Therefore, the doubling of the traffic volume, without changing the vehicle speeds or mix ratio, results in a noise increase of 3 dBA. Mobile noise levels radiant in an almost oblique fashion from the source and drop off at a rate of 3 dBA for each doubling of distance under hard site conditions and at a rate of 4.5 dBA for soft site conditions. Hard site conditions consist of concrete, asphalt and hard pack dirt while soft site conditions exist in areas having slight grade changes, landscaped areas and vegetation. On the other hand, fixed/point sources radiate outward uniformly as it travels away from the source. Their sound levels attenuate or drop off at a rate of 6 dBA for each doubling of distance.

The most effective noise reduction methods consist of controlling the noise at the source, blocking the noise transmission with barriers or relocating the receiver. Any or all of these methods may be required to reduce noise levels to an acceptable level.

2.2 Vibration Fundamentals

Vibration is a trembling or oscillating motion of the ground. Like noise, vibration is transmitted in waves, but in this case through the ground or solid objects. Unlike noise, vibration is typically felt rather than heard. Vibration can be either natural as in the form of earthquakes, volcanic eruptions, or manmade as from explosions, heavy machinery, or trains. Both natural and manmade vibration may be continuous, such as from operating machinery; or infrequent, as from an explosion.

As with noise, vibration can be described by both its amplitude and frequency. Amplitude may be characterized in three ways: displacement, velocity, and acceleration. Particle displacement is a measure of the distance that a vibrated particle travels from its original position and for the purposes of soil displacement is typically measured in inches or millimeters. Particle velocity is the rate of speed at which soil particles move in inches per second or millimeters per second. Particle acceleration is the rate of change in velocity with respect to time and is measured in inches per second or millimeters per second. Typically, particle velocity (measured in inches or millimeters per second) and/or acceleration (measured in gravities) are used to describe vibration. Table 2-1 shows the human reaction to various levels of peak particle velocity.

Vibrations also vary in frequency and this affects perception. Typical construction vibrations fall in the 10 to 30 Hz range and usually occurring around 15 Hz. Traffic vibrations exhibit a similar range of frequencies; however, due to their suspension systems, it is less common, to measure traffic frequencies above 30 Hz.

Propagation of ground-borne vibrations is complicated and difficult to predict because of the endless variations in the soil through which the waves travel. There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by dropping an object into water. P-waves, or compression waves, are waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the energy is spread over an ever-increasing area such that the energy level is reduced with the distance from the energy source. This geometric spreading loss is inversely proportional to the square of the distance. Wave energy is also reduced

with distance as a result of material damping in the form of internal friction, soil layering, and special voids. The amount of attenuation provided by material damping varies with soil type and condition as well as the frequency of the wave.

Table 2-1: Human Reaction to Typical Vibration Levels

Vibration Level Peak Particle Velocity (in/sec)	Human Reaction	Effect on Buildings
0.006–0.019	Threshold of perception, possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibration begins to annoy people	Virtually no risk of "architectural" (i.e., not structural) damage to normal buildings
0.20	Vibrations annoying to people in buildings	Threshold at which there is a risk to "architectural" damage to normal dwelling – houses with plastered walls and ceilings
0.4–0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: Caltrans, Division of Environmental Analysis, *Transportation Related Earthborne Vibration, Caltrans Experiences*, Technical Advisory, Vibration, TAV-02-01-R9601, 2020 (Caltrans, 2020).

3.0 SIGNIFICANCE THRESHOLDS AND STANDARDS

3.1 Municipal Code

The City's municipal code provides, among other things, a basis for controlling excessive and annoying noise. The following ordinance sections, as adopted by the City Council as Municipal Code Amendment 21MCA02, December 14, 2021, would be applicable to the project (City of Chino Hills, 2021):

8.08.020 - Construction Noise

Except when necessary for the immediate preservation of life, health, or property, no person shall construct, repair, remodel, demolish, or grade any real property or structures thereon at any time other than between the hours of 7:00 a.m. and 7:00 p.m. on weekdays, and between 8:00 a.m. and 6:00 p.m. on Saturdays, excluding federal holidays. Notwithstanding the foregoing, an individual residential property owner or tenant in addition to the above permissible hours of construction may also construct, repair, or remodel his or her real property or any structure on such property during the hours of 7:00 p.m. and 10:00 p.m. on weekdays and between 6:00 p.m. and 10:00 p.m. on Saturdays, and between the hours of 8:00 a.m. and 10:00 p.m. on Sundays and federal holidays provided that the noise or sounds associated with such activities cannot be heard by a reasonable person beyond the boundary lines of the property. Construction activities will take place between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and between the hours of 8:00 a.m. and 6:00 p.m. on Saturdays, therefore, the Project construction noise levels are exempt from the exterior noise standards set in the City's Municipal Code (City of Chino Hills, 2021).

16.48.020 – Noise

The City Municipal Code prohibits the creation of noise on one property that results in noise levels increases on another property. The Municipal Code states that it is unlawful for any person at any location within the incorporated area of the City to create any noise, or to allow the creation of any noise, on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level, when measured on any other receiving property, to exceed the following:

a. The noise standard in the following table (reproduced in this report as Table 3-1) for a cumulative period of more than thirty (30) minutes in any hour; or
b. The noise standard in the above table plus five (5) dBA for a cumulative period of more than fifteen (15) minutes in any hour; or
c. The noise standard in the above table plus ten (10) dBA for a cumulative period of more than five (5) minutes in any hour; or

d. The noise standard in the above table plus fifteen (15) dBA for a cumulative period of more than one (1) minute in any hour; or
e. The noise standard in the above table plus twenty (20) dBA for any period of time.

Each of the above maximum permitted sound levels specified above shall be reduced by five dBA for impulsive noises, tonal noises, and noises consisting of speech or music.

Table 3-1: Exterior Noise Standards for Receiving Land Uses

Zone	Land Use of Receiving Property	Maximum Permitted Exterior Sound Pressure Level, Leq (dBA) 7 a.m. to 10 p.m.	Maximum Permitted Exterior Sound Pressure Level, Leq (dBA) 10 p.m. to 7 a.m.
I	Single-Family Residential	60	45
II	Multi-Family Residential, Mobile Home Parks	65	45
III	Commercial Property and Institutional Property	70	60
IV	Residential Portion of Mixed Use	65	45
V	Manufacturing and Industrial, Other Uses	75	70

Source: City 2021
Notes:
1. The City's Noise Element includes a Noise Compatibility Matrix [included in this report as Table 1] with Community Noise Equivalent Level (CNEL) and is intended to apply to long-term ambient noise levels that are produced by sources such as traffic and evaluated over 24 hours. This table includes Noise Standards in terms of LEQ. These levels are applicable to sounds that have shorter durations than 24-hours.
2. If the ambient noise level exceeds the maximum permitted sound level indicated in the table, the applicable maximum permitted sound pressure level shall be 3 dB above the ambient noise level.
3. Measurements for compliance are made on the affected property pursuant to the detail in Section C, Noise Measurements, 2. Exterior Noise Level Measurements.

3.2 Exemptions

The municipal code exempts noise generated by warning devices necessary for the protection of public safety (e.g., police, fire, and ambulance sirens. Therefore, the Project's operational noise levels are exempt from the property line noise thresholds of Section 16.48.020.

3.3 Vibration Standards

Notwithstanding other sections of the City's Municipal Code, it shall be unlawful for any person to create, maintain, or cause any ground vibration which is perceptible without instruments at any point on any affected property adjoining the property on which the vibration source is located, if known, unless a temporary permit for the activity creating the vibration is issued by the City. For the purpose of this section of the municipal code, the perception threshold shall be presumed to be more than 0.05 inch per second RMS vertical velocity.

3.4 Transportation Noise Standards

In February 2015, the City Council certified the General Plan Update EIR, adopting the 2015 General Plan. The City's General Plan Noise Element establishes noise compatibility guidelines for land uses affected by noise, reproduced here as Table 3-2, Land Use Noise/Compatibility Matrix. The purpose of the Noise Element is to define the City's role and responsibility in safeguarding against noise pollution, and to reduce the negative impacts of noise on future developments by identifying major noise sources and compatible land uses. The acceptable noise levels for the project and surrounding residential land uses are 65 CNEL for exterior spaces and 45 CNEL for interior habitable spaces (City of Chino Hills General Plan, 2015). The acceptable exterior noise level for schools and parks is 65 CNEL.

Table 3-2: Land Use/Noise Compatibility Matrix

Categories	Compatible Uses	Interior[1] CNEL	Exterior[2] CNEL
Residential	Single-Family, Duplex, Multiple-Family	45[3]	65[5]
	Mobile Homes	-	65[4]
Commercial	Hotel, Motel, Transient Lodging	45[3]	65
	Commercial, Retail, Bank, Restaurant, Health Clubs	55	-
	Office Buildings, Research and Development, Professional Offices	50	-
	Amphitheater, Concert Hall, Auditorium, Meeting Hall, Movie Theater	45	-
	Gymnasium (multi-purpose)	50	-
	Manufacturing, Warehousing, Wholesale, Utilities	65	-
Open Space	Parks	-	65
Institutional/Public Facility	Hospital, Schools, Classrooms	45[3]	65
	Churches, Libraries	45[3]	-

Source: City 2015

[1] Interior environment excludes bathrooms, toilets, closets, and corridors.

[2] Outdoor environments are limited to the private yard of a single-family or multifamily residential private patio that is accessed by a means of exit from inside the unit; mobile home park; hospital patio; park picnic area; school playground; and hotel and motel recreation area.

[3] Noise level requirement with closed windows. Mechanical ventilating system or other means of natural ventilation shall be provided pursuant to UBC requirements.

[4] Exterior noise level shall be such that interior noise level will not exceed 45 CNEL.

[5] Multifamily developments with balconies that do not meet the 65 CNEL standard are required to provide occupancy disclosure notices to all future tenants regarding potential noise impacts.

4.0 CONSTRUCTION NOISE

4.1 Construction Noise Prediction Methodology

Construction noise represents a short-term impact on the ambient noise levels. Noise generated by construction equipment includes haul trucks, water trucks, graders, dozers, loaders and scrapers can reach relatively high levels. Grading activities typically represent one of the highest potential sources for noise impacts. The most effective method of controlling construction noise is through local control of construction hours and by limiting the hours of construction to normal weekday working hours.

The U.S. Environmental Protection Agency (U.S. EPA) has compiled data regarding the noise generating characteristics of specific types of construction equipment. Noise levels generated by heavy construction equipment can range from 60 dBA to in excess of 100 dBA when measured at 50 feet. However, these noise levels diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 75 dBA measured at 50 feet from the noise source to the receptor would be reduced to 69 dBA at 100 feet from the source to the receptor and reduced to 63 dBA at 200 feet from the source.

4.2 Construction Noise Findings

Construction of the proposed Project will require equipment such as loaders, pick-up trucks, backhoe, water truck for dust suppression, crane, asphalt paver, and excavators. Project materials will be staged within the existing vacant parcels currently managed by the City of Chino Hills. All portions of the Project including the fire station, ERF, and site improvements would be constructed on-site.

Construction of the Essential Resources Facility will include a 6-bay apparatus room and offices area with support spaces. Construction of the fire station entails a 3-bay double deep apparatus room, individual dormitories, kitchen, dining room, day room, physical training room, and other support spaces.

The Project is expected to break ground early 2024 and be completed approximately a year later. Construction activities will take place between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and between the hours of 8:00 a.m. and 6:00 p.m. on Saturdays, in accordance with the City's Noise Ordinance.

The development construction will consist of grading, building construction, and paving. The building construction activities will consist of trenching, paving, and building construction. Noise would typically occur during this phase due to the operation of backhoes, and front-end loaders as well as air compressors and hand-held power tools. The nearest residences to be impacted by construction are the single-family homes located adjacent to the project to the west and east.

Noise monitoring was conducted during the construction at a larger construction site to determine the noise levels from the associated equipment (Campus Park Multi-Family, LDN Consulting, 2017). A list of the anticipated noise levels for each phase of construction is shown in Table 4-1.

Due to the smaller site area, less equipment will be utilized compared to the previously referenced project. Due to the site constraints, the construction equipment would not be running continuously and would be moving near the property line to other portions of the project site for an average distance of 60-feet. Utilizing a duty-cycle of 30 minutes of any given hour that the equipment would be operating at a single location would reduce the noise levels a minimum of 3 dBA hourly.

Table 4-1: Construction Phases and Noise Levels

Construction Phase	Source Level @ 50' (dBA)	Distance from Property Line (Feet)	Noise Reduction from distance (dBA)	Noise Reduction from Duty Cycle (dBA)	Resultant Noise Level (dBA)
Site Grading	75.7	60	-1.6	-3.0	71.1
Building Construction	68.2	60	-1.6	-3.0	63.6
Architectural Coating	62.3	60	-1.6	-3.0	57.7
Paving Equipment	71.6	60	-1.6	-3.0	67.0

Based on the EPA noise emissions, empirical data and the amount of equipment needed, worst-case noise levels from the construction equipment operations would occur during the base operations (grading/site preparation). The construction schedule identifies that grading activities will occur in a single phase all at the same time, with anticipated equipment including an excavator, a grader, a rubber tire dozer, and two tractors/backhoes. Due to physical constraints and normal site preparation operations, most of the equipment will be spread out over the site. A list of equipment used during grading is summarized in Table 4-2.

Table 4-2: Construction Noise Levels

Construction Equipment	Quantity	Source Level @ 50-Feet (dBA)*	Cumulative Noise Level @ 50-Feet (dBA)
Tractor/Loader/Backhoe	3	72	76.8
Rubber Tire Dozer	1	74	74.0
Grader	1	73	73.0
Excavator	1	79	79.0
*Source: U.S. Environmental Protection Agency (U.S. EPA), 1971 and Empirical Data			

At any given time, a piece of construction equipment would only be within 50 feet of a sensitive receptor for a very short duration, after which it would move to another part of the project site, further from existing sensitive receptors.

Construction activity noise levels are only expected to be 75 dBA or greater at residential property lines when activity is taking place in close proximity to the property line, and at all other times will be less than 75 dBA. Due to the area of the site, this scenario is only expected to take place for very brief periods of time throughout the day, and for this reason, construction limited to the allowable hours of operation established within the code will comply with City of Chino Hills noise regulations. At the time of this analysis, no Project construction activity is planned outside of the specified hours, therefore, no impacts are anticipated.

Haulage

Grading of the Project site will consist of approximately 14,307 cubic yards (CY) export. Assuming there could be up to 8 trucks in an hour. Community noise level changes greater than 3 dBA are often identified as audible and considered potentially significant, while changes less than 1 dBA will not be discernible to local residents. In the range of 1 to 3 dBA, residents who are very sensitive to noise may perceive a slight change. There is no scientific evidence available to support the use of 3 dBA as the significance threshold. Community noise exposures are typically over a long time period rather than the immediate comparison made in a laboratory situation. Therefore, the level at which changes in community noise levels become discernible is likely greater than 1 dBA and 3 dBA appears to be appropriate for most people. For the purposes for this analysis a direct and cumulative roadway noise impacts would be considered significant if the project increases noise levels for a noise sensitive land use by 3 dBA CNEL and if the project increases noise levels above an unacceptable noise level per the City's General Plan in the area adjacent to the roadway segment.

Typically, it requires a project to double (or add 100%) to the traffic volumes to result in a 3 dBA CNEL which is considered a potential impact. Based on a current traffic volume of over 5,000 ADT or more on the roadways along the site and along the anticipated haul route, the additional trucks would add 0.8 dBA to the overall noise level. This is well below a 3 dBA increase that is considered a potential impact. No noise impacts are anticipated at the residential uses that are located along the roadway and the trucks will be short term during the initial construction.

4.3 Construction Vibration Findings

The nearest vibration-sensitive uses are the existing single-family homes to the west located 200 feet or more from the center of the proposed construction. Table 4-2 lists the average vibration levels that would be experienced at the nearest vibration sensitive land uses from the temporary construction activities.

The FTA has determined vibration levels that would cause annoyance to a substantial number of people and potential damage to building structures. The FTA criterion for infrequent vibration induced annoyance is 80 Vibration Velocity (VdB) for residential uses. For the purpose of this section of the municipal code, the perception threshold shall be presumed to be more than 0.05 inch per second RMS vertical velocity. Construction activities would generate levels of vibration that would not exceed the FTA or City criteria for nuisance for nearby residential uses. Therefore, vibration impacts would be less than significant.

Table 4-2: Vibration Levels from Construction Activities (Residential Receptors)

Equipment	Approximate Velocity Level at 25 Feet (VdB)	Approximate RMS Velocity at 25 Feet (in/sec)	Approximate Velocity Level at 200 Feet (VdB)	Approximate RMS Velocity at 200 Feet (in/sec)
Large Dozer	87	0.089	59.9	0.0039
Backhoe Ram	87	0.089	59.9	0.0039
Jackhammer	79	0.035	51.9	0.0015
Loaded Trucks	86	0.076	58.9	0.0034
Criteria			80	0.05
Significant Impact?			**No**	**No**
[1] PPV at Distance D = PPVref x $(25/D)^{1.5}$				

No blasting or rock crushing is anticipated during the grading operations. Therefore, no impulsive noise sources are expected and the Project will comply with Section 16.48.030 of the City Noise Ordinance.

4.4 Construction Noise Conclusions

Project construction noise levels are considered exempt if activities occur within the hours specified in the City of Chino Hills Municipal Code, Section 8.08.020 of 7:00 a.m. and 7:00 p.m. on weekdays, and between 8:00 a.m. and 6:00 p.m. on Saturdays, excluding federal holidays. At the time of this analysis, no Project construction activity is planned outside of the specified hours, therefore, no impacts are anticipated.

Nonetheless, in addition to complying with the City's noise standards regarding construction working hours and noise levels, construction noise should be minimized through the implementation of best management practices (BMPs) that may include, but are not limited to, the following:

- Proper maintenance and tuning of all construction equipment engines to minimize noise emissions.
- Proper maintenance and functioning of the mufflers on all internal combustion and equipment engine.
- Locate fixed and/or stationary equipment as far as possible from noise-sensitive receptors.
- Appoint a public liaison for Project construction that would be responsible for addressing public concerns about construction activities, including excessive noise. As needed, the liaison would determine the cause of concern (e.g., starting too early, bad muffler) and implement measures to address the concern. These BMPs would reduce construction noise levels.

No blasting or rock crushing is anticipated during the grading operations. Therefore, no impulsive noise sources are expected and the Project will comply with Section 16.48.030 of the City Noise Ordinance.

5.0 TRANSPORTATION NOISE

5.1 Existing Noise Environment Onsite

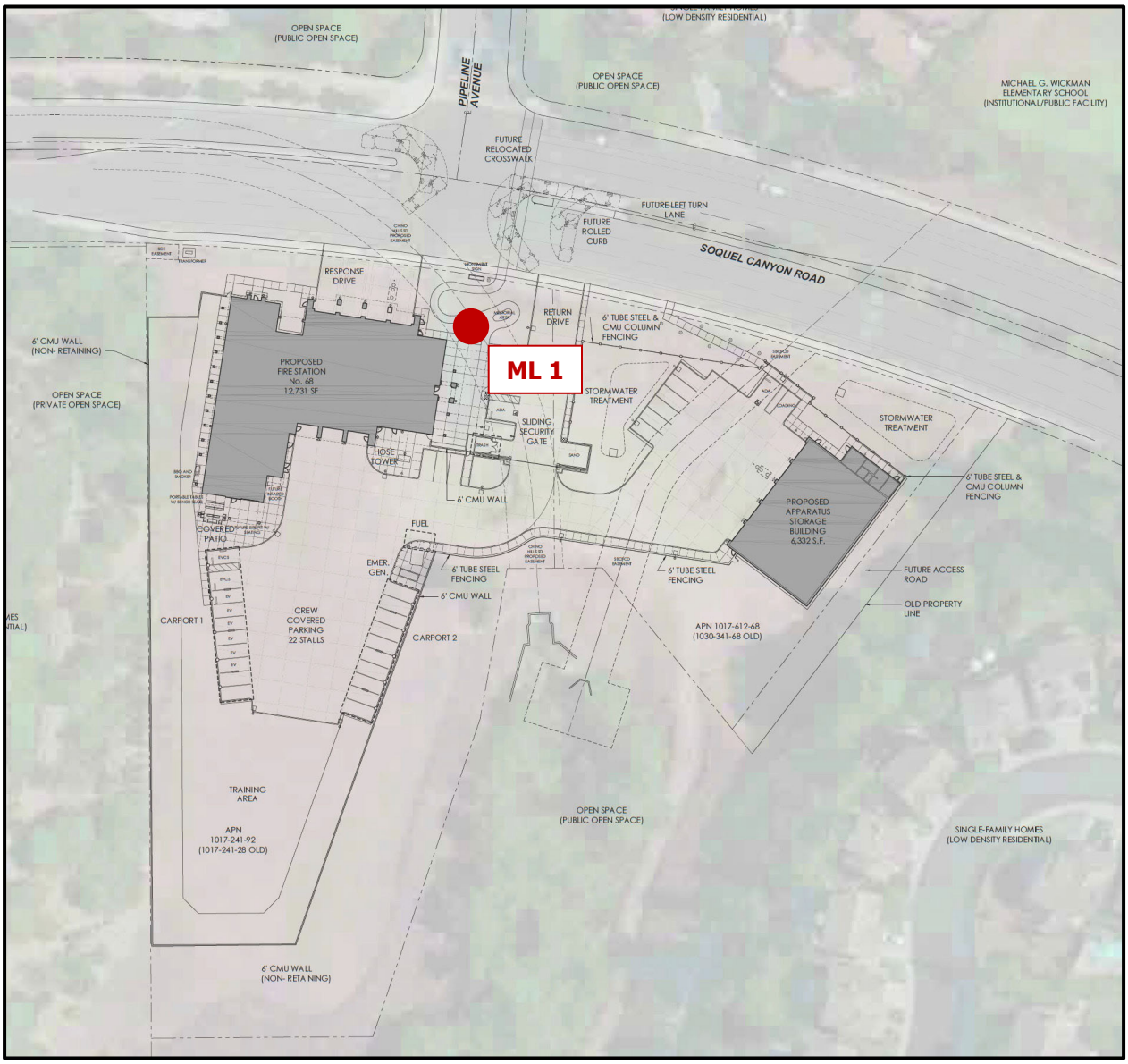
Noise measurements were taken using a Larson-Davis Model LxT Type 1 precision sound level meter, programmed, in "slow" mode, to record noise levels in "A" weighted form. The sound level meter and microphone were mounted on a tripod, five feet above the ground and equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200.

The ambient measurements were conducted on July 10, 2023 between 11:00 am – 11:15 am. The results of the noise level measurements are presented in Table 5-1. The measurements were taken on site to establish a baseline of the vehicle noise from Soquel Canyon Road. The measurements were free of obstruction and had a direct line of sight to the roadways. The overall sound level was found to be 57.8 dBA. The statistical indicators Lmax, Lmin, L10, L50 and L90, are also given for the monitoring location. The noise monitoring locations can be seen in Figure 5-A on the following page.

Table 5-1: Measured Ambient Noise Levels

Measurement Identification	Description	Time	Noise Levels (dBA Leq)					
			Leq	Lmax	Lmin	L10	L50	L90
ML 1	Soquel Canyon Road	11:00 a.m. – 11:15 a.m.	57.8	67.1	47.2	62.3	56.5	51.3
Source: Ldn Consulting July 10, 2023								

Figure 5-A: Ambient Monitoring Locations



5.2 Project Related Offsite Transportation Noise

A significant off-site traffic noise impact would occur if the project resulted in or created a significant increase in the existing ambient noise levels. Studies have shown that the average human ear can barely perceive a change in sound level of 3 dB(A). A change of at least 5 dB(A) is considered a readily perceivable change in a normal environment. A 10 dB(A) increase is subjectively heard as a doubling in loudness and would cause a community response. Based on these concepts of noise level increase and perception, if noise levels were to result in greater than a 3 dB(A) increase, then the impact would be considered significant.

To determine if direct or cumulative off-site noise level increases associated with the development of the proposed project would create noise impacts. The traffic volumes for the existing conditions were compared with the traffic volume increase of existing plus the proposed project. According to the Project traffic study, the project is estimated to only generate 87 daily trips with a peak hour volume of 9 trips (Linscott, Law & Greenspan Engineers, 2023). The existing average daily traffic (ADT) volumes on the area roadways are more than several thousand ADT. Typically, it requires a project to double (or add 100%) the traffic volumes to have a direct impact of 3 dBA CNEL or be a major contributor to the cumulative traffic volumes. The project will add less than a 3% increase to the exiting roadway volumes and no direct or cumulative impacts are anticipated.

5.3 Transportation Noise Conclusions

The project will not create a direct impact of more than 3 dBA CNEL on any roadway segment and no cumulative noise increase of 3 dBA CNEL or more were found. Therefore, the proposed project's direct and cumulative contributions to off-site roadway noise increases will not cause any significant impacts to any existing or future noise sensitive land uses.

6.0 OPERATIONAL NOISE

This section examines the potential operational noise source levels associated with the development and operation of the proposed project. Noise from a fixed or point source drops off at a rate of 6 dBA for each doubling of distance. Which means a noise level of 70 dBA at 5 feet would be 64 dBA at 10 feet and 58 dBA at 20 feet. A review of the proposed project indicates that noise sources such as the roof mounted mechanical ventilation system (HVAC), emergency generator, and fire apparatuses, are the primary sources of stationary noise.

Properties directly surrounding the project site to the east and west are all designated as single-family residential under the City General Plan. Therefore, the City Ordinance limits of 60 dBA hourly noise standard during the daytime hours between 7 a.m. and 10 p.m., a 45 dBA standard during the nighttime hours between 10 p.m. and 7 a.m. would apply at the residential property lines.

Air Conditioning Units

Roof-top mechanical ventilation units (HVAC) will be installed at the proposed fire station and ERF. In order to evaluate the HVAC noise impacts, the analysis utilized reference noise level measurements taken at a Lowe's Improvement Center in Murrieta, CA in 2020. The unshielded noise levels for the HVAC units were measured at 65.9 dBA Leq at a distance of 6-feet. The HVAC units will cycle on and off throughout the day. Typically, HVAC units run for approximately 20 minutes each operating cycle to provide the necessary heating or cooling. It is anticipated that the HVAC units will operate twice in any given hour or run for 40 minutes in any given hour. Noise levels drop 3 decibels each time the duration of the source is reduced in half.

Therefore, hourly HVAC noise level over a 40-minute period would be reduced approximately 2 decibels to 63.9 dBA based on operational time. To predict the property line noise level, a reference noise level of 63.9 dBA at 6-feet was used to represent the HVAC units.

The fire station building could have as many as three (3) temperature control units (HVAC) and the ERF building could have as many as two (2) units. No reductions from any parapet walls were incorporated into the modeling. Utilizing a 6 dBA decrease per doubling of distance, noise levels at the nearest residential property line as described above were calculated for the HVAC. The HVAC units are located a minimum of 200 feet from the nearest residential property lines. The noise level reductions due to distance and the building for the nearest property line is provided in Table 6-1 below.

Table 6-1: Project HVAC Noise Levels (Western Residential Property Line)

Building	Distance to Nearest Observer Location (Feet)	Hourly Reference Noise Level (dBA)	Noise Source Reference Distance (Feet)	Noise Reduction Due to Distance (dBA)	Noise Level at Property Line (dBA)	Quantity	Property Line Cumulative Noise Level (dBA)*
Fire Station	200	63.9	6.0	-30.5	33.4	3	38.2
ERF	485	63.9	6.0	-38.2	25.7	2	28.8
						Cumulative Noise Level (dBA)	**38.7**
*Complies with the nighttime Noise Standard of 45 dBA.							

Based on the distance to the property line to the west, noise associated with the operation of the HVAC units are expected to be 39.0 dBA or lower, which is below the 45 dBA nighttime threshold for residential uses.

The noise levels from the proposed HVAC would be considered less than significant at the residential property lines to the east and west and are in compliance with the City of Chino Hills Municipal Code Section 16.48.020.

Emergency Generator

The fire station is proposed with an emergency generator onsite for any loss of power and would be located approximately 290-feet from the residential property line to the west. The generator size would be comparable to a Cat C9 with a rating of 180 kW to 300 kW. Depending on the size and enclosure ratings, the generator could produce noise levels up to 89 dBA at a distance of 3.3 feet. The manufacturer's specifications and noise levels are provided in ***Attachment A.***

As part of routine maintenance, the back-up emergency generator would be tested frequently. Monday through Friday, for a duration of less than 30 minutes. Based on the unshielded reference noise levels and operation time, the expected noise level at the nearest residential property line would be reduced to approximately 47.1 dBA which is above the City's nighttime threshold of 45 dBA but under the City's daytime threshold of 60 dBA. It is advised that the generator testing be conducted between the hours of 8:00 a.m. and 4:00 p.m.

As per the Chino Hills Municipal Code, emergency equipment are exempt from the quantitative noise limits contained in the code. Therefore, in an emergency, generator usage is exempt from the noise level limits identified above.

Fire Apparatuses

Noise generating activities associated with the operation of the proposed fire station would include the sounds of vehicle engines, as emergency vehicles leave and return to the station and the testing of engines and equipment during the morning and weekly testing routines. The primary noise source associated with the normal daily activity at the fire station is the noise generated by the fire apparatus responding to emergencies as they exit and return to the station. Most emergency responses occur during the daytime hours when people are up and active although, of course, an emergency call can occur at any time during the day or night. Each call would include the sound of the trucks exiting the station during emergencies and returning to the station after responding to the call. Emergency calls at night could result in sleep disturbance at nearby residences. On a daily basis, the crews check equipment within the apparatus bay or behind the fire station, including the self-contained breathing apparatus, the fire pump on the engine itself, and the sirens and horn on apparatus. Additionally, ancillary equipment is checked behind the station on a weekly basis including the pump on the fire engine, sirens and horn on apparatus, self-contained breathing apparatus, chain saw, circular saw, extrication power unit similar to a small generator, generator on truck to power 100' aerial truck, and generator for the fire station.

Noise measurements conducted at similar fire stations during the morning equipment checkout and weekly maintenance of equipment indicate that maximum noise levels at a distance of 50 feet from the activity can reach 80 to 85 dBA. However, testing of equipment would be limited to short bursts to verify proper operation. Based on a reduced duty cycle of approximately 2 minutes, noise levels from the testing of equipment would be reduced up to 15 dBA. Therefore, noise levels as high as 58.5 dBA are expected at the nearest existing residences located immediately west of the project site and approximately 180 feet from the fire station. Noise from the weekly maintenance would have the potential to elevate daytime traffic noise levels at residences to the west of the site along Soquel Canyon Road for short periods of time. Noise levels would exceed existing ambient noise levels at the nearest residences while operational. However, the operational time is not anticipated to substantially increase the community noise equivalent level. It is recommended that testing of equipment be conducted during the late morning to early afternoon hours to limit the disruption to the neighboring community.

Additionally, the testing of emergency equipment is considered a part of the emergency services. The City of Chino Hills Municipal Code also specifically exempts noise generated by warning devices necessary for the protection of public safety (e.g., police, fire, and ambulance sirens). Therefore, these Project's operational noise levels are exempt from the property line noise thresholds of Section 16.48.020.

7.0 SUMMARY OF PROJECT IMPACTS, MITIGATION & CONCLUSION

Construction Noise

Project construction noise levels are considered exempt if activities occur within the hours specified in the City of Chino Hills Municipal Code, Section 8.08.020 of 7:00 a.m. and 7:00 p.m. on weekdays, and between 8:00 a.m. and 6:00 p.m. on Saturdays, excluding federal holidays. At the time of this analysis, no Project construction activity is planned outside of the specified hours, therefore, no impacts are anticipated.

Nonetheless, in addition to complying with the City's noise standards regarding construction working hours and noise levels, construction noise should be minimized through the implementation of best management practices (BMPs) that may include, but are not limited to, the following:

- Proper maintenance and tuning of all construction equipment engines to minimize noise emissions.
- Proper maintenance and functioning of the mufflers on all internal combustion and equipment engine.
- Locate fixed and/or stationary equipment as far as possible from noise-sensitive receptors.
- Appoint a public liaison for Project construction that would be responsible for addressing public concerns about construction activities, including excessive noise. As needed, the liaison would determine the cause of concern (e.g., starting too early, bad muffler) and implement measures to address the concern. These BMPs would further reduce construction noise levels.

No blasting or rock crushing is anticipated during the grading operations. Therefore, no impulsive noise sources are expected and the Project will comply with Section 16.48.030 of the City Noise Ordinance.

Offsite Transportation Noise

The project will not create a direct impact of more than 3 dBA CNEL on any roadway segment and no cumulative noise increase of 3 dBA CNEL or more were found. Therefore, the proposed project's direct and cumulative contributions to off-site roadway noise increases will not cause any significant impacts to any existing or future noise sensitive land uses.

Operational Noise

The noise levels from the proposed Project operations would be considered less than significant at the residential property lines to the east and west and are in compliance with the City of Chino Hills Municipal Code Section 16.48.020.

The City of Chino Hills Municipal Code also specifically exempts noise generated by warning devices necessary for the protection of public safety (e.g., police, fire, and ambulance sirens). Therefore, these Project's operational noise levels are exempt from the property line noise thresholds of Section 16.48.020.

8.0 REFERENCES

Caltrans. (2020). *Transportation Related Earthborne Vibration, Caltrans Experiences.* Retrieved from https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf

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ATTACHMENT A

GENERATOR SPECIFICATIONS

Cat® C9
DIESEL GENERATOR SETS

Image shown may not reflect actual configuration.

200 ekW – 300 ekW
60 Hz

	Standby	Prime
DE200SE0	200 ekW	180 ekW
DE250SE0	250 ekW	225 ekW
DE275SE0	275 ekW	250 ekW
DE300SE0, E3	300 ekW	270 ekW

BENEFITS & FEATURES

CAT® GENERATOR SET PACKAGE

Cat generator set packages have been fully prototype tested and certified torsional vibration analysis reports are available. The packages are designed to meet the NFPA 110 requirement for loading, conform to the ISO 8528-5 steady state and fill transient response requirements.

CAT DIESEL ENGINES

The four-cycle Cat diesel engine combines consistent performance with excellent fuel economy and transient response that meets or exceeds ISO 8528-5. The engines feature a reliable, rugged, and durable design that has been field proven in thousands of applications worldwide in emergency standby installations.

COOLING SYSTEM

The generators used on Cat packages have been designed and tested to work with the Cat engine. The generators are built with robust Class H insulation and provide industry-leading motor starting capability and altitude capabilities.

GENERATORS

The generators used on Cat packages have been designed and tested to work with the Cat engine. The generators are built with robust Class H insulation and provide industry-leading motor starting capability and altitude capabilities.

GCCP CONTROL PANELS

The GCCP controller features the reliability and durability you have to come to expect from your Cat equipment. Monitoring an extensive number of engine parameters, the controller will display warnings, shutdown and engine status information on the back-lit LCD screen, illuminated LEDs and remote PC. The controllers offer extensive number of flexible inputs, outputs and extensive engine protections so the system can be easily adapted to meet the most demanding industry requirements.

SPECIFICATIONS

ENGINE SPECIFICATIONS

Engine Model	Cat® C9 In-line 6, 4-cycle diesel
Bore x Stroke	112 mm x 149 mm (4.4 in x 5.9 in)
Displacement	8.8 L (538 in^3)
Compression Ratio	16.1:1
Aspiration	Turbocharged Air-to-Air Aftercooled
Fuel Injection System	MEUI
Governor	Electronic ADEM™ A4
Emission Certifications Options	Non-Regulated & EU IIIA

GENERATOR SET SPECIFICATIONS

Alternator Design	Brushless Single Bearing, 4 Pole
Stator	2/3 Pitch
Available Voltage Options	220V/240V/380V/440V/480V
Frequency	60 Hz
Engine Alternator Voltage	24V
Alternator Insulation & IP	Class H; IP21; IP23(Optional)
Standard Temperature Rise	125 Deg C
Available Excitation Options	Self-Excited, PMG
Voltage Regulation, Steady State+/-	≤1%

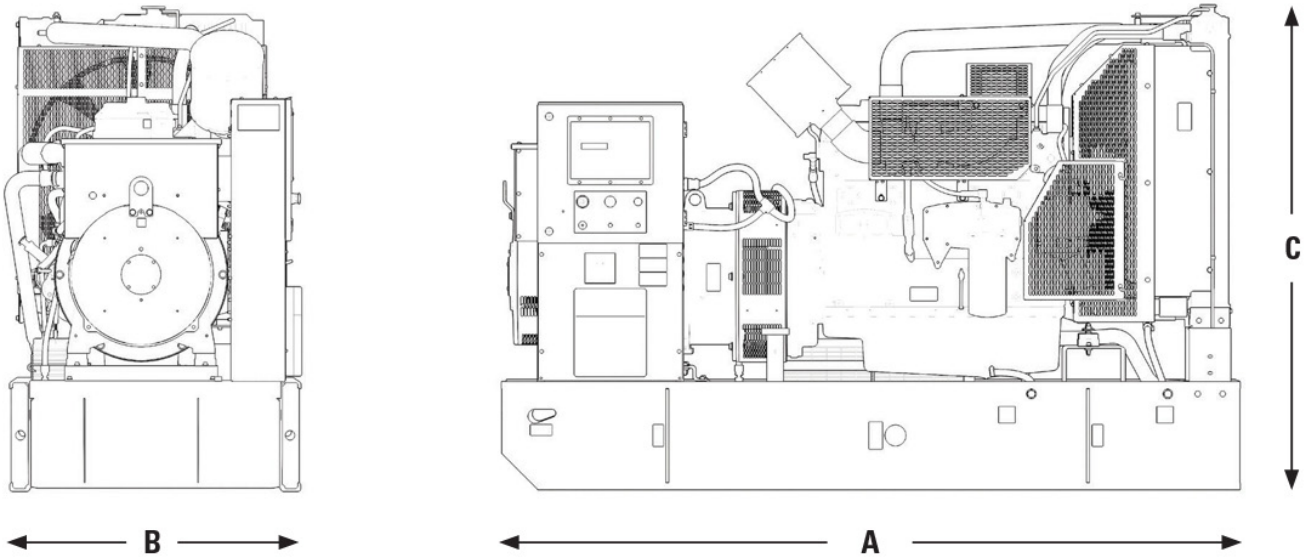
STANDARD EQUIPMENT

Air inlet system	Air cleaner Light duty with disposable paper filter
Control panels	GCCP1.3 control panel
Cooling system	Radiator and cooling fan with guard Coolant drain line with valve Fan drive, battery charging alternator drive – Caterpillar extended life coolant
Telematics	PL444 4G LTE
Exhaust system	Stainless steel exhaust flex, gaskets, rain cap & SAE exhaust flange
Fuel system	Standard open set fuel tank/base supplied Base, formed steel with single wall integral 8-hour fuel tank
Generators and generator attachments	IP23 protection Voltage regulator (single phase sensing) Power center, IP22 Segregated low voltage (AC/DC) wiring panel Mandatory option circuit breaker, IEC, 3 pole, mounted in Power-center
Governing system	Cat electronic governor (ADEM A4)
Lube system	Oil cooler Lubricating oil Oil drain valves
Starting/charging system	24V battery with rack and cables
General	Engine and alternator pre-paint, Caterpillar Yellow

OPTIONAL EQUIPMENT

Air inlet system	Single element air cleaner Dual element air cleaner
Control panels	GCCP1.4 control panel Local & remote annunciator
Telematics	PLG601, PLG641
Circuit breakers	3-Pole 100% rated – Single (manual & motorised) 4-Pole 100% rated – Single (manual & motorised)
Enclosures	Sound attenuated level 1 & level 2 High ambient enclosures
Cooling system	Stone guards
Radiator	High ambient radiator
Fuel storage	8 Hr single & dual wall 8 Hr dual wall – heavy duty 24 Hr dual wall – heavy duty
Generators and generator attachments	Space heater control Permanent magnet generator Ingress protection R-Frame auxiliary winding LC & A-Frame coastal insulation protection Optional LC-Frame
Mounting system	Captive linear vibration isolators
Starting/charging system	Battery chargers Jacket water heater
General	Tool set

WEIGHTS & DIMENSIONS



Note: General configuration not to be used for installation. See general dimension drawings for detail.

Genset Package		Length "A" mm (in)	Width "B" mm (in)	Height "C" mm (in)	Open Std. Generator Set Weight (Dry) Kg (lb)	Enclosed Generator Set Weight (Dry) Kg (lb)
Standby	Prime					
200 ekW	180 ekW	2662 (104.8)	1030 (40.5)	1754 (69)	2096 (4620.8)	3385 (7462.6)
250 ekW	225 ekW	2662 (104.8)	1030 (40.5)	1754 (69)	2096 (4620.8)	3385 (7462.6)
275 ekW	250 ekW	2662 (104.8)	1030 (40.5)	1754 (69)	2110 (4651.7)	3429 (7559.6)
300 ekW	275 ekW	2662 (104.8)	1030 (40.5)	1754 (69)	2261 (4984.6)	3429 (7559.6)

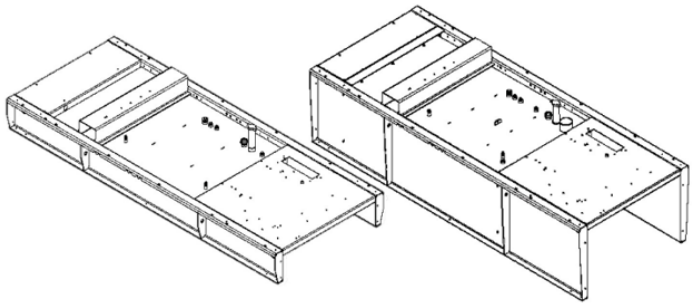


Image shown may not reflect actual configuration.

Integral Fuel Tank Bases

230 – 330 kVA 50 Hz

180 – 300 kW 60 Hz

FEATURES

- 8 Hour Fuel tank design provides capacity for thermal expansion of fuel.
- Integral diesel fuel tank is incorporated into the generator set base frame.
- Direct reading fuel level gauge.
- Fuel supply dip tubes positioned so as not to pick up fuel sediment.
- Fuel return and supply dip tubes are separated by an internal baffle to prevent recirculation of heated return fuel.
- Raised Fuel fill neck for easy access 50.8 mm (2 in)
- Tanks designed with a Max pressure head of 1.4m above tank top.
- Heavy gauge steel 4point lifting gussets suitable for easy lifting of Genset package
- Polyester powder coating – Gloss black textured finish
- Primary tanks are equipped with customer connections for remote fuel transfer in (1"), return (1.5") and vent (1")
- Right side stub-up.

SINGLE WALL TANKS

A. Standard Duty Narrow and Wide Base options

- Construction: 4 mm (0.16 in) steel plate side channels and 3 mm (0.12 in) sheet steel tank design
- Standard offering for open and Level 1 & 2, Level 1HA enclosed generator sets.

B. Heavy Duty wide base option (FTSW001)

- Construction: 6 mm (0.24 in) steel plate side channels with end plates and 3 mm (0.12 in) sheet steel tank design
- Available for Level 2, Level 1HA enclosed generator sets

DUAL WALL TANKS

- Secondary containment – closed top design
- Welded steel basin designed to contain a minimum of 110% of primary tank capacity (total fluid containment)
- Sloped top tank plate to front to contain accidental coolant, oil and fuel spillages with front ½" closed drain sockets and 4" open rear access drain socket. Multi containment setup. Auto drain with drip tray for service, with separate full fuel containment or Full containment of all fluids by removing ½" front drain plugs.
- Available for Level 2, Level 1HA enclosed generator sets.

FTBDW20 Standard Duty Dual Wall

- Construction: 4 mm (0.16 in) steel plate side channels and 3 mm (0.12 in) sheet steel tank design.

FTBDWH1 Heavy Duty Dual Wall

- Heavy construction 6 mm (0.24 in) steel plate side channels with End plates and 4mm (0.16 in) sheet steel tank design.

FTBDWH2 24-Hr Heavy Duty Dual Wall

- Heavy construction 6 mm (0.24 in) steel plate side channels with End plates and 4mm (0.16 in) sheet steel tank design

OPTIONS

- Low fuel level alarm
- Low fuel level shutdown
- High fuel level alarm

PACKAGE DIMENSIONS & CAPACITIES

250-275 kVA 180-300 kW OPEN	Single/ Dual Wall	Fillable Capacity		Usable Capacity		Dry Weight#		Width'		Length		Height		Package Height*	
		L	gal	L	gal	kg	lb	mm	in	mm	in	mm	in	mm	in
Standard Tank	Single	528	140	503	133	277	611	1030	40.6	2662	104.8	425	16.7	1818	72
MTSK001	Single	N.A	-	N.A	-	153	337	1030	40.6	2662	104.8	250	16.7	1643	65
SA L1 Enclosure															
Standard Tank	Single	473	125	438	116	316	697	1200	47.2	3483	137.2	350	13.8	1867	73.5
SA L2 & L1 High Ambient Enclosures															
Standard Tank	Single	542	143	508	134	388	855	1400	55.1	3498	137.7	350	13.8	2032	80
Standard Duty Dual Wall	Dual	530	140	501	132	568	1252	1400	55.1	3498	137.7	450	17.7	2132	84
Heavy Duty Wide Base	Single	542	143	508	134	454	1001	1410	55.5	3498	137.7	450	17.7	2032	80
Heavy Duty Dual Wall	Dual	530	140	501	132	647	1427	1410	55.5	3498	137.7	450	17.7	2132	84
Heavy Duty Dual Wall (24 hr)	Dual	1381	365	1250	330	945	2083	1400	55.1	3498	137.7	830	32.7	2512	99

Notes:
*The heights listed above do not include lumber used during manufacturing and shipping.
#Dry weight is for tank only. Does not include additions or removals required by price list.
All fuel tanks are shipped "installed."

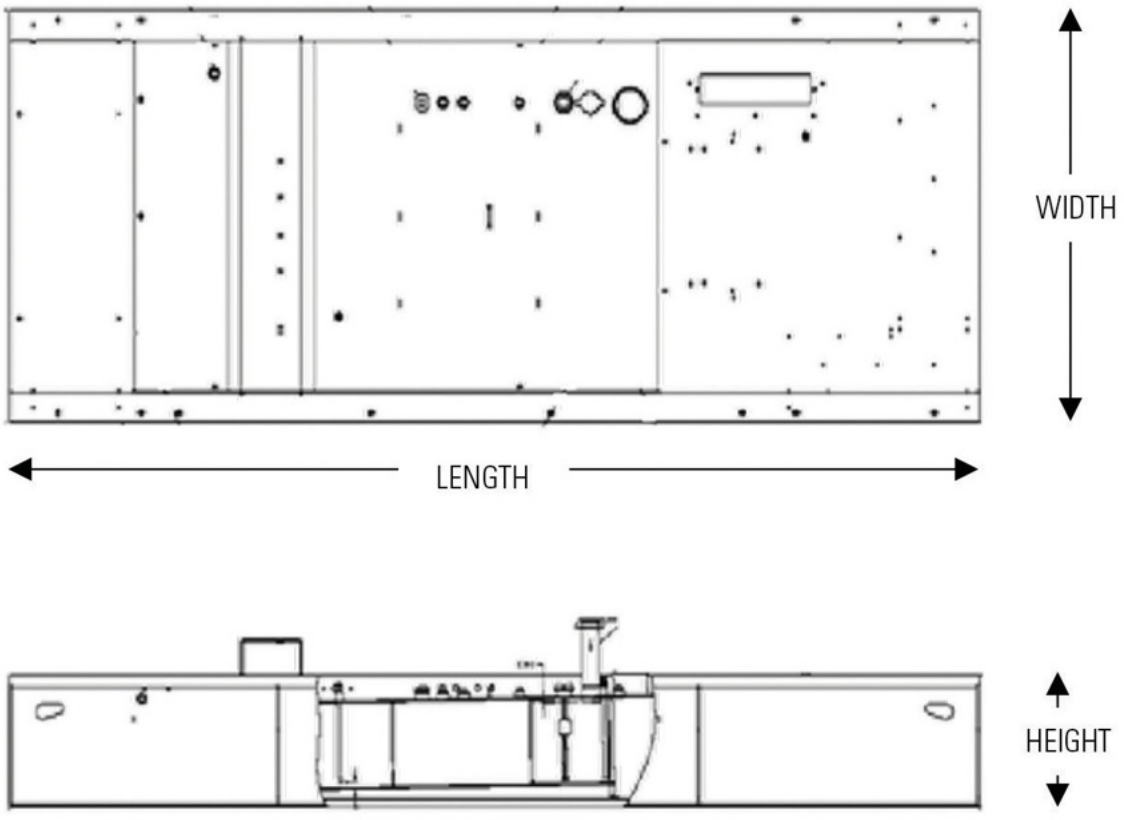


Image shown may not reflect actual configuration.

SOUND ATTENUATED & HIGH AMBIENT ENCLOSURES

FEATURES

Robust/Highly Corrosion Resistant Construction

- Galvanized steel construction
- Galvanized steel construction level 2 enclosure meeting EU noise levels
- Enclosures Designed for 43°C Ambient Capability
- Factory installed Standard Fabricated 4 mm steel base frame with integral fuel tank
- Environmentally friendly, polyester powder baked paint
- Compression door latches giving solid door seal
- Zinc-plated or black-coated stainless steel fasteners
- Internally-mounted critical exhaust silencing system

Excellent Access

- Large cable entry area for installation ease
- Accommodates side mounted breaker and control panel
- Vertically-hinged double doors on both sides
- Removable ducts providing maintenance access with enclosure in place
- Lube oil and coolant drains piped to base frame side rail, on exterior
- Radiator fill cover

Security and Safety

- Lockable access doors which give full access to control panel and breaker
- Cooling fan and battery charging alternator fully guarded
- Fuel fill, oil fill, and battery can only be reached via lockable access
- Externally-mounted emergency stop button
- Designed for spreader-bar lifting to ensure safety
- Control panel viewing window
- Stub-up area is rodent proof

Options

- Caterpillar yellow or white paint
- Heavy Duty Fabricated 6 mm Steel base frame

ENCLOSURE PACKAGE OPERATING CHARACTERISTICS

A. Sound Attenuated – Level 1

Model	Hz	kVA	SB/PP	Sound Pressure Levels dBA				Air Flow Rate		Ambient Capability @100% Load	
				1m (3.3 ft)		7m (23 ft)					
				75% Load	100% Load	75% Load	100% Load	m^3/s	cfm	°C	°F
DE250E0	50	250	SB	83	84	73	74	4.5	9535	47	117
	50	230	PP	83	84	73	74	4.5	9535	50	122
DE275E0	50	275	SB	83	84	73	74	4.5	9535	44	111
	50	250	PP	83	84	73	74	4.5	9535	47	117
DE200SE0	60	250	SB	88	88	78	79	6.0	12173	52	125
	60	225	PP	88	88	78	79	6.0	12173	55	131
DE250SE0	60	313	SB	88	89	79	79	6.0	12173	45	112
	60	281	PP	88	89	78	79	6.0	12173	48	119

B. Sound Attenuated – Level 2

Model	Hz	kVA	SB/PP	Sound Pressure Levels dBA				Air Flow Rate		Ambient Capability @100% Load	
				1m (3.3 ft)		7m (23 ft)					
				75% Load	100% Load	75% Load	100% Load	m^3/s	cfm	°C	°F
DE250E0	50	250	SB	75.2	76.0	67.3	68.5	4.6	9747	49	121
	50	230	PP	75.0	75.8	67.1	68.1	4.6	9747	52	125
DE275E0	50	275	SB	75.5	76.3	67.7	68.9	4.6	9747	47	116
	50	250	PP	75.2	76.0	67.3	68.5	4.6	9747	49	121
DE275E3	50	275	SB	75.0	76.6	67.6	69.3	4.6	9747	49	120
	50	250	PP	74.7	76.0	67.1	68.7	4.6	9747	52	126
DE300E0	50	300	SB	75.7	76.6	68.0	69.3	4.6	9747	44	111
	50	275	PP	75.5	76.3	67.7	68.9	4.6	9747	47	116
DE300E3	50	300	SB	75.4	77.2	68.1	70.0	4.6	9747	46	114
	50	275	PP	75.0	76.6	67.6	69.3	4.6	9747	49	120
DE330E0	50	330	SB	76.0	76.9	68.4	69.7	4.6	9747	40	104
	50	300	PP	75.7	76.6	68.0	69.3	4.6	9747	44	111
DE300SE3	60	375	SB	79.7	81.3	72.0	74.2	5.5	11654	44	111
	60	338	PP	79.2	80.6	71.3	73.3	5.5	11654	48	118

C. High Ambient – Level 1

Model	Hz	kVA	SB/PP	Sound Pressure Levels dBA				Air Flow Rate		Ambient Capability @100% Load	
				1m (3.3 ft)		7m (23 ft)					
				75% Load	100% Load	75% Load	100% Load	m^3/s	cfm	°C	°F
DE250E0	50	250	SB	75.2	76	67.3	68.5	5.5	11654	61	143
	50	230	PP	75	75.8	67.1	68.1	5.5	11654	63	146
DE275E0	50	275	SB	75.5	76.3	67.7	68.9	5.5	11654	59	138
	50	250	PP	75.2	76	67.3	68.5	5.5	11654	61	143
DE275E3	50	275	SB	75	76.6	67.6	69.3	5.5	11654	60	140
	50	250	PP	74.7	76	67.1	68.7	5.5	11654	63	145
DE300E0	50	300	SB	75.7	76.6	68	69.3	5.5	11654	57	134
	50	275	PP	75.5	76.3	67.7	68.9	5.5	11654	59	138
DE300E3	50	300	SB	75.4	77.2	68.1	70	5.5	11654	57	135
	50	275	PP	75	76.6	67.6	69.3	5.5	11654	60	140
DE330E0	50	330	SB	76	76.9	68.4	69.7	5.5	11654	54	129
	50	300	PP	75.7	76.6	68	69.3	5.5	11654	57	134
DE330SE3	60	375	SB	79.7	81.3	72	74.2	6.7	14197	51	124
	60	338	PP	79.2	80.6	71.3	73.3	6.7	14197	55	131

Note: Sound level measurements are subject to instrumentation, installation and manufacturing variability, as well as ambient site conditions.

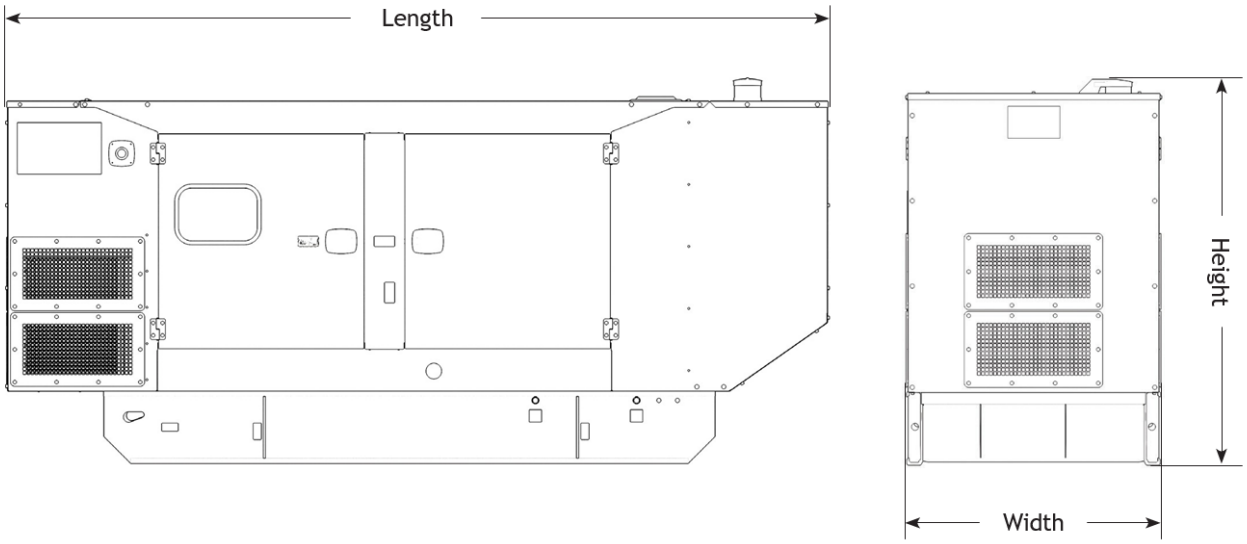
WEIGHTS & DIMENSIONS

A. Level 1

Model	Weight		Genset Overall Size (mm)		
	kg	lb	Length	Width	Height
DE250E0, DE275E0, DE250SE0	2447	5395	3988	1208	1779
DE300E3, DE300E0	3276	7222	3985	1410	2165
DE330E0	3396	7487	3985	1410	2165
DE275SE0, DE300SE0, DE300SE3	3276	7222	3988	1208	1779

B. Level 2

Model	Weight		Genset Overall Size (mm)		
	kg	lb	Length	Width	Height
DE250E0, DE275E0	2859	6303	3981	1410	2032
DE275E3, DE300E3, DE300E0	3404	7505	3981	1410	2032
DE330E0	3524	7769	3981	1410	2032
DE300SE0	3404	7769	3981	1410	2032



Cat® C9
CONTROL PANEL

Image shown may not reflect actual configuration.

GCCP 1.3 – Control Panel

GCCP 1.3 Control Module is suitable for a wide variety of generator set applications. It controls operation of the generator, monitors an extensive number of engine parameters, and displays warnings, shutdown, and engine status information on the back-lit LCD screen, illuminated LEDs and remote PC, if desired

KEY FEATURES

- 4-line back-lit LCD text display
- Multiple display languages
- Five-key menu navigation
- LCD alarm indication
- Customisable power-up text and images
- Data logging facility
- Internal PLC editor
- Protections disable feature
- Fully configurable via PC using USB & RS485 communication
- Front panel configuration with PIN protection
- Power save mode
- 3-phase generator sensing and protection
- 3-phase mains (utility) sensing and protection (Optional)
- Automatic load transfer control (optional)
- Auto Mains (Utility) Failure capable (optional)
- Mains (utility) current and power monitoring (kW, kvar, kVA, pf) (Optional)
- Generator current and power monitoring (kW, kvar, kVA, pf)
- kW and kvar overload and reverse power alarms
- Over current protection
- Unbalanced load protection
- Breaker control via fascia buttons
- Fuel and start outputs configurable when using CAN
- Support for 0 V to 10 V & 4 mA to 20 mA sensors
- 8 configurable digital inputs (3 available for Customer use)
- 8 configurable digital outputs (5 available for Customer use)
- 4 configurable analogue outputs (3 available for Customer Use)
- CAN, MPU and alternator frequency speed sensing in one variant
- Real time clock
- Engine pre-heat and post-heat functions
- Engine run-time scheduler
- Engine idle control for starting & stopping
- Fuel usage monitor and low fuel level alarms
- 3 configurable maintenance alarms

BENEFITS

- Hours counter provides accurate information for monitoring and maintenance periods
- User-friendly set-up and button layout for ease of use
- Multiple parameters are monitored & displayed simultaneously for full visibility
- The module can be configured to suit a wide range of applications for user flexibility
- PLC editor allows user configurable functions to meet user specific application requirements.
- RS485 Communication port can be used for the Remote Monitoring Communication (Compatible with Cat PLG)

SPECIFICATION

DC SUPPLY
CONTINUOUS VOLTAGE RATING
8V to 35V Continuous
5V for upto 1 minute

CRANKING CROPOUTS
Able to survive 0V for 100mS, providing supply was at least 10V before dropout and supply recovers to 5V. This is achieved without the need for internal batteries.
LEDs and backlight will not be maintained during cranking.

MAXIMUM OPERATING CURRENT
260 mA at 12V, 150 mA at 24V

MAXIMUM STANDBY CURRENT
145 mA at 12V, 85 mA at 24V

CHARGE FAIL/EXCITATION RANGE
0V to 35V

GENERATOR & MAINS (UTILITY) VOLTAGE RANGE
15V to 415V AC (Ph to N)
26V to 719V AC (Ph to Ph)

FREQUENCY RANGE
3.5 Hz to 75 Hz

MAGNETIC PICKUP VOLTAGE RANGE
+/-0.5V TO 70V

FREQUENCY RANGE
10,000 Hz (max)

INPUTS

DIGITAL INPUTS A TO H
Negative switching

ANALOGUE INPUTS A & D
Configurable as:
Negative switching digital input 0V to 10V sensor
4 mA 20 mA sensor resistive sensor

ANALOGUE INPUTS B & C
Configurable as:
Negative switching digital input resistive sensor

OUTPUTS

OUTPUT A 7B (FUEL & START)
15A DC at supply voltage

AUXILIARY OUTPUTS C, D, E, F, G & H
2A DC at supply voltage

DIMENSIONS OVERALL
216 mm x 158 mm x 43 mm
8.5" x 6.2" x 1.5"

PANEL CUT-OUT
184 mm x 137 mm
7.2" x 5.3"

MAXIMUM PANEL THICKNESS
8 mm
0.3"

STORAGE TEMPERATURE RANGE
-40°C TO +85°C
-40°F TO 185°F

OPERATING TEMPERATURE RANGE
-30°C to +70°C
-22°F to +158°F

LET'S DO THE WORK.™

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