Appendix B

Noise and Vibration Study

Agoura Business Center North

Noise and Vibration Study

prepared for

City of Agoura Hills
Planning Division
30001 Ladyface Court
Agoura Hills, California 91301
Contact: Eric Wang, Associate Planner

prepared by

Rincon Consultants, Inc.
250 East 1st, Suite 1400
Los Angeles, California 90012

October 2025

RINCON CONSULTANTS, INC. SINCE 1994

Table of Contents

Tables

Figures

Appendices

1 Introduction

This report details the analysis of potential noise and vibration impacts associated with the construction and operation of the proposed Agoura Business Center North Project (herein referred to as "proposed project" or "project") in Agoura Hills, California. Rincon Consultants, Inc. (Rincon) prepared this study for use by the City of Agoura Hills in support of environmental documentation being prepared for the project pursuant to the California Environmental Quality Act (CEQA).

1.1 Project Summary

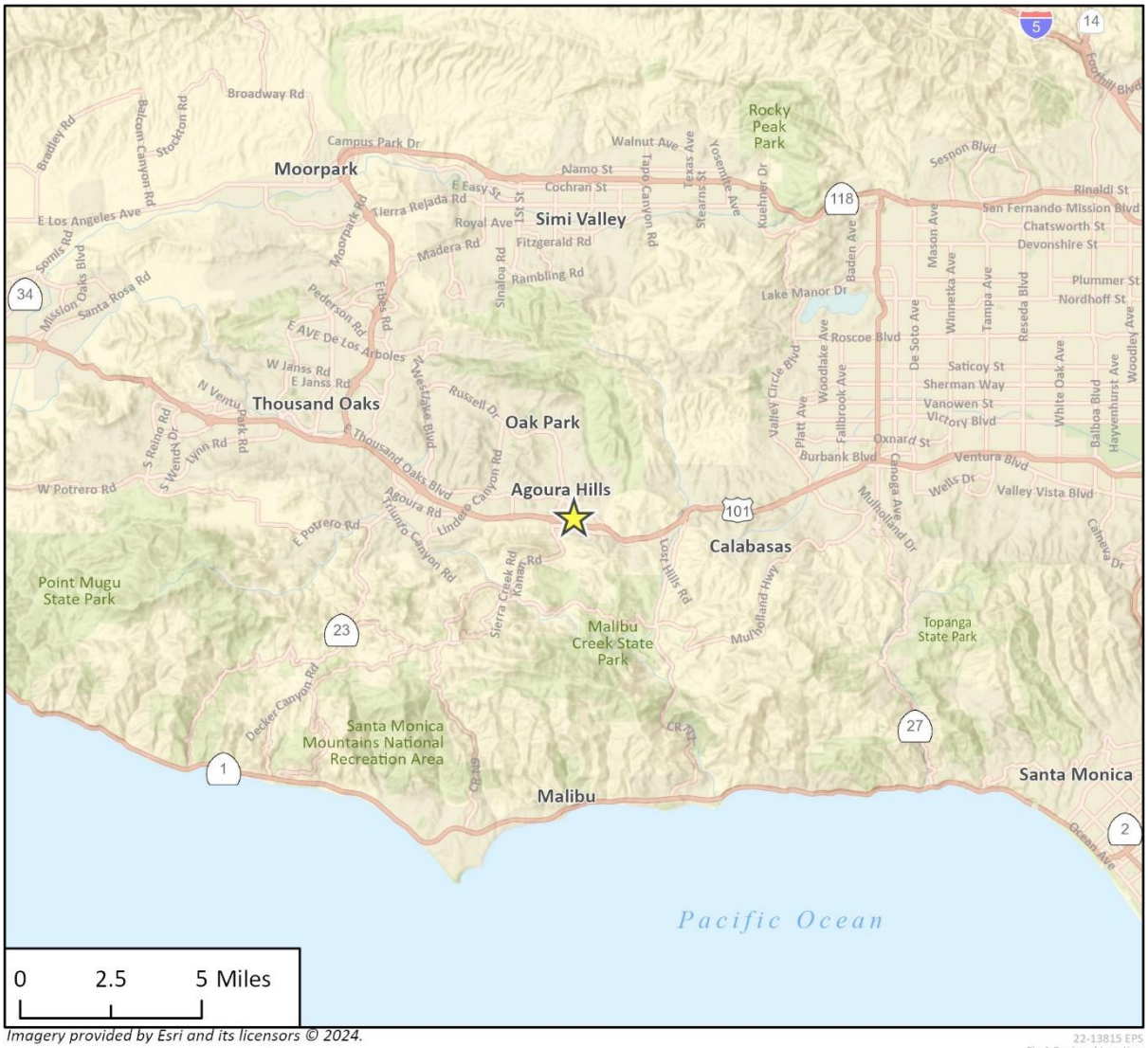
Project Location

The project site is in the City of Agoura Hills in western Los Angeles County in southern California. The regional location of the project site is shown in Figure 1. The 7.7-acre project site (Assessor's Parcel Number 2048-012-033) is located at 28721 Canwood Street, immediately north of U.S. Interstate 101. The project location is depicted in Figure 2. Surrounding land uses include commercial uses to the south, east, and west, in addition to multi-family residential uses to the north. The project site is currently occupied by two existing commercial buildings which would be undisturbed by project construction. The project is consistent with the existing Business Park-Manufacturing-Freeway Corridor (BP-M-FC) zoning. Site access would be provided via an existing driveway connection to Canwood Street.

Project Description

The proposed project would facilitate the development of two industrial buildings: Building C totaling 35,532 square feet (sf) and Building D totaling 36,545 sf, for an overall total of 71,077 square feet (sf). The project would also provide an additional 178 parking spaces and internal driveways, in addition to approximately 209,071 sf of undisturbed open space and landscaped area. The proposed new buildings would have the same architectural style and would use the same colors as the existing two buildings.

Figure 1 Regional Location



Imagery provided by Esri and its licensors © 2024.

22-13815 EPS
Fig 1 Regional Location

Figure 2 Project Site Location

Imagery provided by Microsoft Bing and its licensors © 2024.

22-13815 EPS
Fig 2 Project Location

2 Setting

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. 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] 2013).

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 and less sensitive to frequencies around and below 100 Hertz. 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 doubling of traffic volume, would increase the noise level by 3 dB; dividing the energy in half would result in a 3 dB decrease (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 changes of 3 dBA, increase or decrease (i.e., twice 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 (half) as loud (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 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 typically attenuate, or drop off, at a rate of 6 dBA per doubling of distance (e.g., construction, industrial machinery, ventilation units). Noise from a line source (e.g., roadway, pipeline, railroad) typically attenuates at about 3 dBA per doubling of distance (Caltrans 2013). 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 from simply 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 2013). 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 substantially 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 [FHWA] 2011). Structures can substantially reduce 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 loudness alone. The time of day when noise occurs and the duration of the noise are also important factors of noise impacts. 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 time.

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 (10:00 p.m. to 7:00 a.m.) hours. It is also measured using the 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 2013). Noise levels described by L_{dn} and CNEL usually differ by about 1 dBA. The relationship between the peak-hour L_{eq} value and the L_{dn}/CNEL depends on the distribution of traffic during the day, evening, and night.

2.2 Vibration

Vibration refers to ground-borne noise and perceptible motion. Ground-borne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may be discernible, but without the effects associated with the shaking of a building, there is less adverse reaction.

Typical outdoor sources of vibration that propagates through the ground and creates perceptible ground-borne vibration in nearby buildings include construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is fairly smooth, vibration from rubber-tired traffic is rarely perceptible (Federal Transit Administration [FTA] 2018).

Vibration amplitudes are usually expressed in peak particle velocity (PPV), or root mean squared (RMS) vibration velocity. The PPV and RMS velocity are normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used in monitoring of construction vibration because it is related to the stresses that are experienced by buildings (Caltrans 2020).

2.3 Sensitive Receptors

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. The Noise Element of the City of Agoura Hills General Plan (Agoura Hills 2010) identifies noise-sensitive land uses as schools, libraries, hospitals, other medical facilities and residences.

Vibration-sensitive receptors, which are similar to noise-sensitive receptors, include residences and institutional uses, such as schools, churches, and hospitals. However, vibration-sensitive receptors also include buildings where vibrations may interfere with vibration-sensitive equipment or historic buildings that could sustain damage from strong vibrations.

The closest sensitive receptors include multi-family residences to the north of the project site, as well as a school to the north of the project site.

2.4 Project Noise Setting

The most common source of noise in the project site vicinity is vehicular traffic from US Highway 101, Canwood Street, and existing industrial and commercial uses. To characterize ambient noise levels in the project vicinity and at the project site, two short term (15 minute) and one long term (24 hour) noise level measurements were conducted on January 8 and January 9, 2024. Short term noise measurement (ST)-1 was conducted at the northern project site boundary to capture noise levels at the multi-family residential uses to the north, and ST-2 was conducted on Canwood Street to the south of the project site to capture ambient noise levels at the nearest roadway to the project site. Long term noise measurement (LT) 1 was conducted near the southwest corner of the work area to capture ambient noise levels at the project site. The measurements were completed using a Piccolo II sound level meter fitted with a windscreen. The meter complies with American National Standards Institute (ANSI) Standard S1.4. The sound level meters were set to "slow" response and "A" weighting (dBA). The meters were calibrated prior to and after the monitoring period. All measurements were at least five feet above the ground and away from reflective surfaces. Table 1 and Table 2 summarize the results of the short-term and long-term noise measurements. The approximate noise measurement locations are shown in Figure 3 and see Appendix B for noise monitoring data.

Table 1 Short-Term Noise Level Measurement Results

Measurement Location	Measurement Location	Sample Times	Approximate Distance to Primary Noise Source	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)
ST-1	Northern Project site boundary.	9:57 – 10:12 a.m.	Approximately 930 feet to the center of the nearest lane on Canwood Street.	55	50	60
ST-2	North side of Canwood Street, south of southern project boundary.	10:22 – 10:37 a.m.	Approximately 15 feet to the center of the nearest lane on Canwood Street	70	57	80

dBA = A-weighted decibels; L_{eq} = equivalent noise level; L_{min} = minimum noise level, L_{max} = maximum noise level
See Figure 3 for measurement location; see Appendix B for full measurement details.

Figure 3 Noise Measurement Locations

Table 2 Long-Term Noise Measurement Results

Sample Time	dBA L_{eq}	Sample Time	dBA L_{eq}
24-hour Measurement – January 8-9, 2024			
10:00 AM	55	10:00 PM	56
11:00 AM	56	11:00 PM	54
12:00 PM	58	12:00 AM	52
1:00 PM	59	1:00 AM	52
2:00 PM	58	2:00 AM	52
3:00 PM	57	3:00 AM	53
4:00 PM	58	4:00 AM	55
5:00 PM	59	5:00 AM	58
6:00 PM	60	6:00 AM	59
7:00 PM	54	7:00 AM	58
8:00 PM	53	8:00 AM	54
9:00 PM	55	9:00 AM	50
24-hour Noise Level (dBA CNEL)			**62**

dBA = A-weighted decibels; L_{eq} = equivalent noise level; CNEL = community equivalent noise level

See Figure 3 for measurement location; see Appendix B for full measurement details.

2.5 Regulatory Setting

Federal

FTA Transit and Noise Vibration Impact Assessment Manual

The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction in their *Transit and Noise Vibration Impact Assessment Manual* (FTA 2018). For residential uses, the daytime noise threshold is 80 dBA L_{eq} (8-hour).

Occupational Health and Safety Administration

The federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the EPA. Noise limitations would apply to the operation of construction equipment and could also apply to operational equipment proposed as part of the project. Noise exposure of this type is dependent on work conditions and is addressed through a facility's Health and Safety Plan, as required under OSHA.

State

The state of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires each county and city to adopt a General Plan that includes a Noise Element prepared per guidelines adopted by the Governor's Office of Planning and Research. The purpose of the Noise Element is to limit the exposure of the community to excessive noise levels. The California Environmental Quality Act requires all known environmental effects of a project be analyzed, including environmental noise impacts.

Local

City of Agoura Hills General Plan

The City of Agoura Hills General Plan Noise Element includes noise policies and implementation programs to support the City's vision to create a place where people can live, work, and play in close proximity. The City's noise reduction and abatement strategy focuses on preventative techniques that protect noise-sensitive land uses from noise producing sources. Table 3 below provides noise performance standards for non-transportation noise sources for different receiving land uses.

Table 3 Noise/Land Use Compatibility Matrix

	Community Noise Equivalent Level (CNEL)						
Land Use Categories	**<55**	**60**	**65**	**70**	**75**	**80+**	
Residential - Single Family, Duplex, Multi- family	A	A	B	B	C	D	D
Residential – Mobile Homes	A	A	B	C	C	D	D
Commercial – Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
Commercial – Commercial Retail, Bank, Restaurant, Movie Theatre	A	A	A	A	B	B	C
Commercial/Industrial/Institutional – Office Building, Research and Development, Professional Offices, City Office Building	A	A	A	B	B	C	D
Commercial – Amphitheater, Concert Hall **Institutional –** Auditorium, Meeting Hall	B	B	C	C	D	D	D
Commercial - Children's Amusement Park, Miniature Golf Course, Go-Cart Track; Equestrian Center, Sports Club	A	A	A	B	B	D	D
Commercial/Industrial/Institutional - Automobile, Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
Institutional - Hospital, Church, Library, Schools' Classroom	A	A	B	C	C	D	D
Open Space - Parks	A	A	A	B	C	D	D
Open Space - Golf Course, Cemeteries, Nature Centers, Wildlife Habitat	A	A	A	A	B	C	C

Legend:

1. Zone A: CLEARLY COMPATIBLE: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
2. Zone B: NORMALLY COMPATIBLE: New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.
3. Zone C: NORMALLY INCOMPATIBLE: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.
4. Zone D: CLEARLY INCOMPATIBLE: New construction or development should generally not be undertaken.

Source: City of Agoura Hills General Plan, Table N-1

Additionally, the following policies are relevant to the analysis (Agoura Hills 2010):

Goal N-1: **Land Use Conflicts.** Require noise mitigation for all development where the projected noise levels exceed those shown in Table 3, to the extent feasible.

Policy N-1.1: **Noise Standards.** Locate noise sensitive land uses away from existing excessive noise sources and locate new excessive noise generators away from existing sensitive land uses.

Goal N-2: **Motor Vehicles.** Minimized motor vehicle traffic noise impacts on sensitive noise receptors.

Policy N-2.4: **New Development.** New development along the freeway corridor and major thoroughfares will be required to prepare noise studies, as deemed necessary by the Planning Department.

Goal N-3: **Non-Transportation-Related Noise.** Minimized non-transportation-related noise impacts on sensitive noise receptors.

Policy N-3.1: **Protection from Stationary Noise Sources.** Continue to enforce interior and exterior noise standards to ensure that sensitive noise receptors are not exposed to excessive noise levels from stationary noise sources, such as machinery, equipment, fans, and air conditioning equipment.

Policy N-3.3: **Enforcement of Hours of Construction and Maintenance Activity.** Continue to enforce restrictions on hours of construction activity so as to minimize the impacts of noise and vibration from the use of trucks, heavy drilling equipment, and other heavy machinery, including property maintenance equipment, to adjacent uses, particularly in residential areas.

City of Agoura Hills Municipal Code

The City of Agoura Hills Municipal Code (AHMC) includes noise standards and regulations. The following sections of the Noise Ordinance are relevant to the analysis:

Division 6, Section 9656.2 provides the following noise standards, unless otherwise specifically indicated, shall apply to all residential property within a designated noise zone, as shown in Table 4.

Table 4 Agoura Hills Operational Standards

Zone	Time	Sound Level (Decibels)[1]
All residential zones	7:00 a.m. to 10:00 p.m.	55 dBA
All residential zones	10:00 p.m. to 7:00 a.m.	50 dBA

Notes:

1. It shall be unlawful for any person at any location within 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, when the foregoing causes the noise level, when measured on any other residential property, either incorporated or unincorporated, to exceed:

- The noise standard for a cumulative period of more than fifteen (15) minutes in any hour; or
- The noise standard plus five (5) db(A) for a cumulative period of more than ten (10) minutes in any hour; or
- The noise standard plus ten (10) db(A) for a cumulative period of more than five (5) minutes in any hour; or
- The noise standard plus fifteen (15) db(A) for a cumulative period of more than one (1) minute in any hour; or
- The noise standard plus twenty (20) db(A) for any period of time.
- Source: City of Agoura Hills Municipal Code Section 9656.2

If the ambient noise level exceeds the applicable limit as noted in the above table, the ambient noise level shall be the standard.

Division 6, Section 9656.5 states that It shall be unlawful for any person to create any noise which causes the noise level at any school, hospital or church while the same is in use, to exceed the noise limits as specified in section 9656.2, prescribed for the assigned noise zone in which the school, hospital or church is located, or which noise level unreasonably interferes with the use of such institution or which unreasonably disturbs or annoys patients in a hospital provided conspicuous signs are displayed in three (3) separate locations within one-tenth of a mile of the institution indicating the presence of a school, church or hospital.

Chapter 3, Section 9305 states that all Industrial/Business Park and commercial activities shall not create any noise that would exceed an exterior noise level of sixty (60) dBA during the hours of 10:00 p.m. to 7:00 a.m. and sixty-five (65) dBA during the hours of 7:00 a.m. to 10:00 p.m.

Section 9656.4 of the Agoura Hills Municipal Code exempts specified activities from the provisions of Section 9656 including Noise sources associated with construction, repair, remodeling, or grading of any real property, provided said activities do not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a legal holiday.

3 Methodology

3.1 Construction Noise

Construction noise was estimated using the FHWA Roadway Construction Noise Model (RCNM) (FHWA 2006). RCNM predicts construction noise levels for a variety of construction operations based on empirical data and the application of acoustical propagation formulas. RCNM provides reference noise levels for standard construction equipment, with an attenuation of 6 dBA per doubling of distance for stationary equipment. Using RCNM, construction noise levels were estimated at noise sensitive receptor near the project site for each phase of construction based on the applicant-provided construction equipment and vehicle mix. It was assumed that diesel engines would power all construction equipment. It was also assumed that all equipment would operate simultaneously, which provides a conservative estimate because not all construction equipment would operate at the same time. In addition, construction equipment would not be in constant use during the 8-hour workday.

Construction equipment is typically dispersed in various areas of a site, with only a limited amount of equipment operating near a given location at a particular time. For this reason, the FTA's *Transit Noise and Vibration Impact Assessment* document (page 177) recommends to "assume that all equipment operates at the center of the project." Therefore, it is standard industry practice to analyze average construction noise from the center of the project site, which represents the approximate center of where noise would be generated because equipment moves around the project site throughout the workday. For the proposed project, this would be 250 feet.

3.2 Construction Vibration

Operation of the proposed project would not include any substantial vibration sources. Thus, construction activities have the greatest potential to generate ground-borne vibration affecting nearby receptors, especially during paving of the at-grade parking of the project site. The greatest vibratory source during construction would be a vibratory roller. Neither blasting nor pile driving would be required for construction of the proposed project. Construction vibration estimates are based on vibration levels reported by the FTA. Table 5 shows typical vibration levels for various pieces of construction equipment used in the assessment of construction vibration (FTA 2018).

Table 5 Vibration Source Levels for Construction Equipment

	Approximate Vibration Level (in/sec PPV)		
Equipment	**25 feet**	**50 feet**	**100 feet**
Small Bulldozer	0.003	0.001	0.0007
Jackhammer	0.035	0.016	0.008
Loaded Truck	0.076	0.036	0.017
Large Bulldozer	0.089	0.042	0.019
Vibratory Roller	0.210	0.098	0.046

Source: FTA 2018

Vibration limits used in this analysis to determine a potential impact to local land uses from construction activities are based on information contained in the FTA's *Transit Noise and Vibration Impact Assessment*. Maximum recommended vibration limits by the FTA are identified in Table 6.

Table 6 Criteria for Vibration Damage Potential

Building Category	PPV (in/sec)
I. Reinforced concrete, steel, or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Nonengineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

in/sec = inches per second; PPV = peak particle velocity
Source: FTA 2018

Based on FTA recommendations, limiting vibration levels to below 0.2 in/sec PPV at residential structures and 0.3 in/sec PPV at industrial or commercial buildings would prevent architectural damage. These limits are applicable regardless of the frequency of the source.

3.3 Operational Noise

Mechanical Equipment and Loading Docks

The proposed operational noise sources at the project site are those that would be typical of an industrial use building, such as rooftop mechanical equipment (e.g., HVAC equipment) and total of 24 loading docks on the north side of Building C and the south side of Building D.

Noise sources associated with operation of the proposed project would consist of primarily rooftop mechanical equipment (e.g., condenser fans and compressors). According to site plans provided by Rasmussen & Associates, the project would install one HVAC unit per building with a sound power level rated at 78 dBA, which is a sound pressure level (SPL) of approximately 70 dBA at 3 feet from the sources. To characterize the noise levels from the proposed mechanical equipment, this analysis assumes that all units could run for an entire 24-hour period. The loading docks would be located on the north side of Building C and would be operational during business hours. The loading docks would generate noise levels ranging up to 40 dBA L_{eq} at 50 feet (Placeworks 2012).

Backup Alarms

Backup alarms are typical features used during construction activities as a required safety measure on construction sites. RCNM construction equipment noise values used in Table 7 are based off extensive in-person measurements for the equipment. For example, RCNM uses data with a dozer having 55 measured samples, an excavator having 170 measured samples, and a jackhammer having 133 measured samples. This is an extensive sampling program that measured construction equipment over typical operation, which would include intermittent use of backup alarms on this equipment, as applicable. Therefore, use of backup alarms is already accounted for in the project's construction noise analysis. Furthermore, the FTA construction noise threshold is not an L_{max} threshold and is instead time-averaged over a one-hour period. As such, it is not appropriate to compare the maximum instantaneous noise level generated by backup alarms to the hourly noise level threshold. Therefore, noise generated by backup alarms over periodic use of such an alarm would not create a significant impact beyond the construction noise levels analyzed below.

Furthermore, the use of backup alarms should not be restricted in a way that compromises the safety they provide on a project site. Restricting the use of backup alarms would potentially create dangerous conditions on the project site that could result in serious injury to construction workers.

Transportation Noise

Noise levels affecting the proposed project site would be primarily influenced by traffic noise from US Highway 101, Canwood Street, Kanan Road and Derry Avenue. Canwood Street is a two-lane roadway with a posted speed limit of 40 miles per hour (mph). Kanan Road is a two-lane roadway with a posted speed limit of 40 mph. Derry Avenue is a two-lane roadway with a posted speed limit of 25 miles per hour (mph). The traffic counts used average daily traffic (ADT) data provided in the project traffic report (Associated Transportation Engineers 2023).

3.4 Significance Thresholds

The following thresholds are based on City noise standards and Appendix G of the CEQA guidelines. Noise impacts would be considered significant if:

- **Issue 1 – Noise in Excess of Established Standards.** The project would result in the 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.
  - **Temporary.** Construction noise would be significant if:
    - Noise levels exceed the FTA daytime criterion of 80 dBA L_{eq} (8-hour) at residential land uses; or
  - **Permanent.** Stationary operational noise would be significant if:
    - Pursuant to AHMC Section 9656.2, exterior noise levels at residences exceed 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.; or noise levels at Industrial/Business Park and Commercial uses exceed 65 dBA during daytime hours of 7:00 a.m. to 10:00 p.m. and 60 dBA during nighttime hours of 10:00 p.m. to 7:00 a.m.
    - Off-site traffic noise would be significant if the traffic noise increase would be:
      - Greater than 1.5 dBA increase for ambient noise environments of 65 dBA CNEL and higher
      - Greater than 3 dBA increase for ambient noise environments of 60-64 CNEL
      - Greater than 5 dBA increase for ambient noise environments of less than 60 dBA CNEL
- **Issue 2 – Vibration.** The project would result in the generation of excessive ground-borne vibration or ground-borne noise levels.
  - This would occur if the project would subject adjacent multi-family residential land uses to construction-related ground-borne vibration that exceeds a vibration limit of 0.2 in/sec and industrial/commercial land uses to construction-related ground-borne vibration that exceeds a vibration limit of 0.3 in/sec.
- **Issue 3 – Airport Noise.** For a project located in 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, if the project exposes people residing or working in the project area to excessive noise levels.

4 Impact Analysis

4.1 Issue 1 – Temporary and Permanent Noise Increase

Construction

As discussed above, construction-related noise is only considered substantial if construction activities are proposed outside normal hours or would occur for an extraordinarily long time. The project applicant has indicated that construction would occur over approximately twelve months and would take place within the City's acceptable hours for construction activities to occur.

Table 7 identifies the estimated noise levels at the closest sensitive receptors from the center of the site based on the conservatively assumed combined use of all construction equipment during each phase of construction. As shown in the table, noise levels at the nearest residential sensitive receptors would be up to 67 dBA L_{eq}, and up to 56 dBA L_{eq} at the nearest school use, which is well below the FTA daytime threshold of 80 dBA L_{eq} (8-hour). In addition, construction would occur within the allowed hours of the City's Municipal Code. Therefore, impacts would be less than significant.

Table 7 Estimated Noise Levels by Construction Phase

	dBA L_{eq}		
Construction Phase	RCNM Reference Noise Level[1] 50 feet	Multi-Family Residential to the North 250 feet	Agoura High School to the North 880 feet
Site Preparation	81	67	56
Grading	81	67	56
Building Construction	79	65	54
Paving	78	64	53
Architectural Coating	73	59	48

[1] RCNM reference noise levels are noise levels generated during each construction phase measured from a point 50 feet from the location of the construction phase. These reference noise levels are then used to calculate noise levels from the construction phase at a distance greater than 50 feet from the construction phase.

See Appendix A for modeling outputs.

Mechanical Equipment and Loading Docks

Specific planning data for the future HVAC systems are not available at this stage of project design; however, this analysis assumes the use of a typical HVAC system for commercial uses, which has a sound power level of 78 dBA that is equivalent to a sound pressure level (SPL) of 70 dBA at 3 feet. The unit used in this analysis is a 3-ton Goodman GPC1436H41DD HVAC unit (see Appendix B for manufacturer's specifications). Assuming that the two units were to run for an entire 24-hour period, the closest residential property line to the north, at a distance of approximately 135 feet from the proposed location of the rooftop HVAC location, would be exposed to a noise level of 37 dBA L_{eq}. The nearest industrial or commercial use to the west would be exposed to rooftop HVAC noise levels of up to 34 dBA L_{eq} at a distance of 200 feet. Agoura High School would be exposed to rooftop HVAC noise levels of up to 22 dBA L_{eq} at a distance of 790 feet to the north. This is

conservatively not accounting for noise reductions from any rooftop parapet wall or mechanical screening.

The combined noise level of the center of all 24 loading docks on the north side of Building C and the south side of Building D would expose the industrial use located 240 feet to the west to a noise level of 40 dBA L_{eq}. Additionally, accounting for an 8 dBA reduction from the on-site buildings to the north, loading dock noise would expose the residential uses located 260 feet to the north to a noise level of 32 dBA $L_{eq.}$ and the school use located 920 feet to the north to a noise level of 21 dBA L_{eq}. Therefore, this would not exceed the daytime exterior noise levels of 65 dBA for industrial uses or the daytime exterior noise levels of 55 dBA for residential and school uses. All other sensitive receptors would be located at a further distance away.

AHMC Section 9656.2 limits exterior noise levels at residences and schools 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.; and AHMC Section 9305 limits exterior noise levels at industrial and commercial uses to 65 dBA during daytime hours of 7:00 a.m. to 10:00 p.m. and 60 dBA during nighttime hours of 10:00 p.m. to 7:00 a.m. The noise level estimates from rooftop HVAC and loading dock noise would not exceed these standards, and impacts would be less than significant.

Combined Operational Noise

The combined noise level of the four loading docks and two HVAC units are shown in Table 8. These noise levels would be below the City's 50 dBA nighttime exterior noise threshold for residential and school uses, as well as the City's 60 dBA nighttime exterior noise threshold for Industrial and Commercial. Therefore, operational noise from the proposed project would be less than significant.

Table 8 Combined Operational Noise

Receiver	Land Use Type	All Loading Bays Noise Level (dBA)	HVAC Units Noise Level (dBA)	Combined Noise Level (dBA)	Exceed Threshold?[1]
Residential to the North	Single-family	24	37	37	No
Agoura High School	School	13	22	23	No
Nearest Industrial to the West	Commercial and Industrial	41	34	42	No

[1] Residential/School threshold: Night – 10:00 pm – 7:00 am – 50 dBA; Day – 7:00 am – 10:00 pm – 55 dBA; Industrial/Commercial threshold: Night – 10:00 pm – 7:00 am – 60 dBA; Day – 7:00 am – 10:00 pm – 65 dBA

Off-site Traffic Noise

The project would generate new vehicle trips that would use area roadways. The traffic noise increases caused by project traffic are shown in Table 9. As shown in the table, the project traffic noise increase would be up to 0.2 dBA CNEL along Canwood Street. Since the existing ambient noise environment is 62 dBA CNEL at the project site, the applicable threshold is 3 dBA CNEL, which would not be exceeded. Project traffic noise increases would be less than 1.5 dBA CNEL (the most stringent threshold) along all roadway study segments. Therefore, project traffic noise impacts would be less than significant.

Table 9 Off-site Project Traffic Noise Increases

Roadway Segment	Roadway Segment Volumes (ADT)				dBA (CNEL)		
	Existing (2022) ADT	Existing (2022) + Project ADT	Future (2035) ADT	Future (2035) + Project ADT	Project Noise Increase	Cumulative Increase	Project Cumulative Contribution
Kanan Road n/o US Highway 101	3,299	3,327	3,734	3,762	0.0	0.5	0.0
Kanan Road n/o Agoura Road	1,969	1,971	2,623	2,625	0.0	1.2	0.0
Canwood Street e/o Kanan Road	1,226	1,259	1,351	1,384	0.1	0.4	0.1
Canwood Street e/o Derry Avenue	397	411	426	440	0.2	0.3	0.1

Source: Associated Transportation Engineer 2023

Notes: ADT = average daily traffic The estimated traffic noise increase is based on the following formula: 10xLOG(future traffic volume/existing traffic volume).

4.2 Issue 2 – Vibration

The greatest anticipated source of vibration during general project construction activities would be from vibratory roller, which may be used at a distance of 75 feet from the nearest off-site residential building to the north of the project site. A vibratory roller would create approximately 0.210 in/sec PPV at 25 feet (FTA 2018). Construction vibration at a distance of 75 feet would be approximately 0.040 in/sec PPV. Therefore, vibration from construction activity would be lower than the nonengineered timber and masonry buildings threshold of 0.2 in/sec PPV for the multi-family residential building to the north and lower than the engineered concrete and masonry (no plaster) threshold of 0.3 in/sec PPV for the industrial/commercial buildings to the west, and impacts would be less than significant.

4.3 Issue 3 – Airport Noise

The Van Nuys Airport is located approximately 15.3 miles to the east of the project site. According to the Los Angeles County Airport Land Use Commission, Airport Influence Area Figure, the project is not located within noise contours of any airport (Los Angeles County Airport Land Use Commission 2003). Therefore, the proposed project would not expose people working in the project area to excessive aircraft overflight noise levels.

5 Conclusions

Construction noise would generate noise levels of up to 67 dBA L_{eq} at the nearest residential use, and up to 56 dBA L_{eq} at the nearest school use, which would not exceed the FTA daytime construction noise threshold of 80 dBA L_{eq} (8-hour). In addition, construction would be limited to hours allowed by the City's Municipal Code. Impacts would be less than significant.

The project would introduce sources of operational noise to the site, including mechanical equipment (HVAC) and loading dock noise. These noise levels would not exceed industrial/commercial and residential standards from the City's Municipal Code, and impacts would be less than significant.

Project traffic would increase traffic noise by less than 0.2 dBA over existing conditions on Canwood Street. Therefore, the project would not cause a traffic noise increase of more than 1.5 dBA, the most stringent threshold. Off-site traffic noise impacts would be less than significant.

Operation of the project would not include any substantial vibration sources. Groundborne vibration from construction activities would not exceed the applicable vibration thresholds. Therefore, vibration impacts would be less than significant.

The project is not located within the noise contours of any airport. Therefore, the proposed project would not expose people working in the project area to excessive aircraft overflight noise levels.

6 References

Agoura Hills, City of. 2010. *City of Agoura Hills General Plan, Noise Element*. March 2010. https://www.agourahillscity.org/home/showpublisheddocument/27652/638060875782730000 (accessed January 2024).

_____. 2023. *Agoura Hills Code of Ordinances.* November 10, 2023. (Accessed January 2024).

California Department of Transportation (Caltrans). 2013. *Technical Noise Supplement to the Traffic Noise Analysis Protocol*. (CT-HWANP-RT-13-069.25.2) September.

_____. 2020. *Transportation and Construction Vibration Guidance Manual.* CT-HWANP-RT-20-365.01.01. April. Available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf. Accessed January 2024.

Federal Highway Administration (FHWA). 2006*. FHWA Highway Construction Noise Handbook*. (FHWAHEP-06-015; DOT-VNTSC-FHWA-06-02). Available at: http://www.fhwa.dot.gov/environment/construction_noise/handbook. Accessed January 2024.

_____. 2018. Highway Traffic Noise Analysis and Abatement Policy and Guidance.

Federal Transit Administration (FTA). 2018. *Transit Noise and Vibration Impact Assessment*. November. Available at: 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 January 2024.

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

Los Angeles County Land Use Commission, 2003. *Van Nuys Airport – Airport Influence Area*. May 13, 2003. https://case.planning.lacounty.gov/assets/upl/project/aluc_airport-van-nuys.pdf. (Accessed January 2024)

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

PlaceWorks, 2012. *City of Industry: Macy's Trucking Yard Noise Survey.*

This page intentionally left blank.

Appendix A

Construction Noise Modeling Data

Construction Noise

	Noise Level @ 50 ft	Multi Family Res to the N	Agoura High School (N)
Distance		250	880
Site Preparation	**81**	**67.021**	**56.090**
Grading	**81**	**67.021**	**56.090**
Building Construction	**79**	**65.021**	**54.090**
Paving	**78**	**64.021**	**53.090**
Architectural Coating	**73**	**59.021**	**48.090**

Construction Vibration

	Vibration @ 25 ft	Multi Family Res to the N	Industrial/Commercial to the W	Industrial/Commercial to the E
Distance		75	135	245
Vibratory Roller	**0.21**	**0.040**	**0.017**	**0.007**
Large Bulldozer	**0.089**	**0.017**	**0.007**	**0.003**
Loaded Trucks	**0.076**	**0.015**	**0.006**	**0.002**
Small Bulldozer	**0.003**	**0.001**	**0.000**	**0.000**

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/06/2024
Case Description: Site Preparation

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site Preparation	Residential	65.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85.0		50.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/06/2024
Case Description: Grading

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Grading	Residential	65.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	50.0	0.0
Front End Loader	No	40		79.1	50.0	0.0
Compactor (ground)	No	20		83.2	50.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	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	N/A	N/A	N/A	N/A	N/A
Compactor (ground)	83.2	76.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	83.2	81.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/06/2024
Case Description: Building Construction

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Building Construction	Residential	65.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift	No	20		74.7	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Compactor (ground)	No	20		83.2	50.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Man Lift	74.7	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compactor (ground)	83.2	76.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	83.2	78.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/06/2024
Case Description: Paving

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Paving	Residential	65.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Roller	No	20		80.0	50.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Paver	77.2	74.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	80.0	73.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	80.0	78.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/06/2024
Case Description: Architectural Coating

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Architectural Coating	Residential	65.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift	No	20		74.7	50.0	0.0
Man Lift	No	20		74.7	50.0	0.0
Welder / Torch	No	40		74.0	50.0	0.0

Results

Noise Limits (dBA)

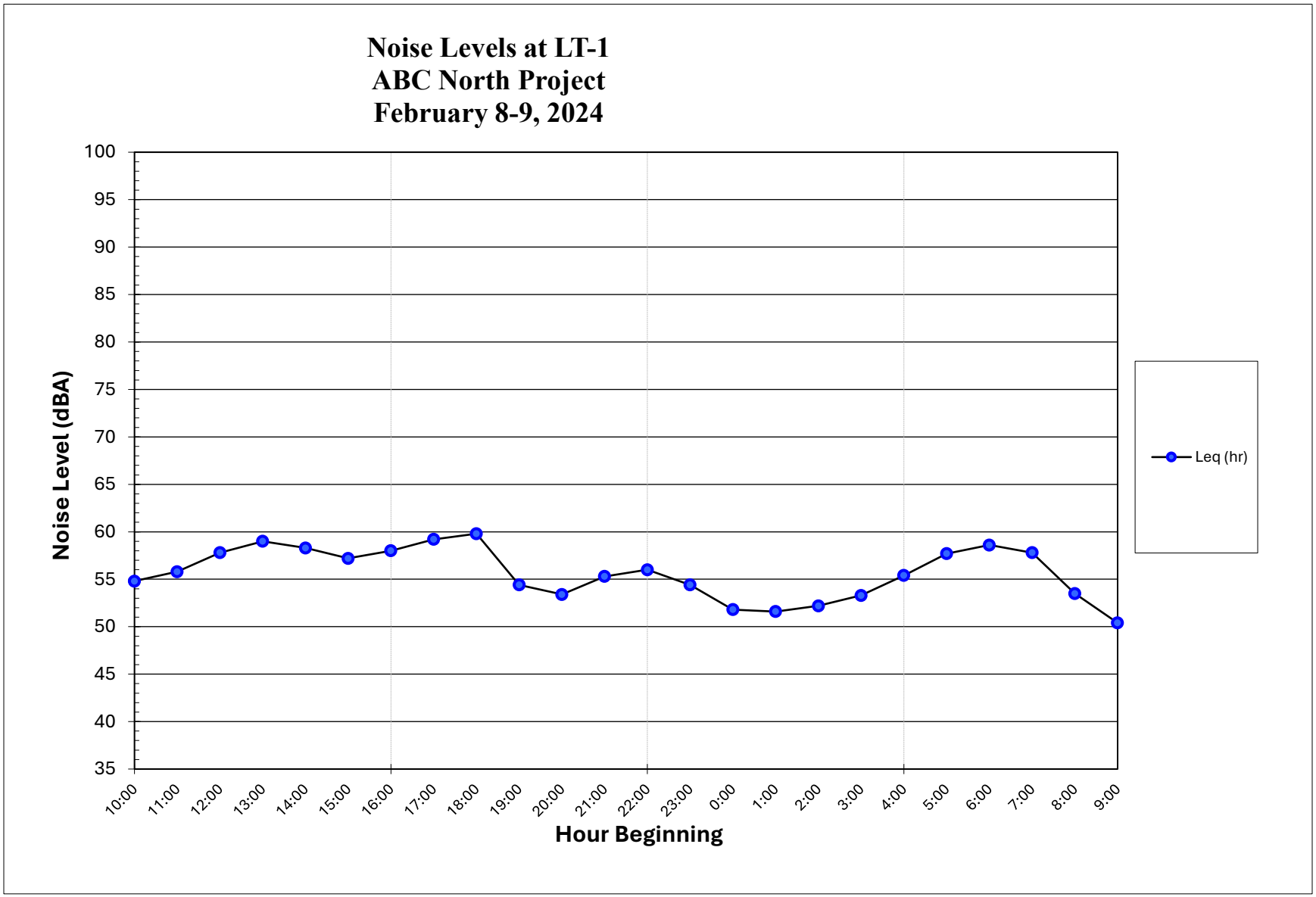
Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Man Lift	74.7	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	74.7	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	74.0	70.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	74.7	73.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix B

Ambient Noise Modeling Data/Manufacturer Specification Data

Long-Term Measurement (LT-1)



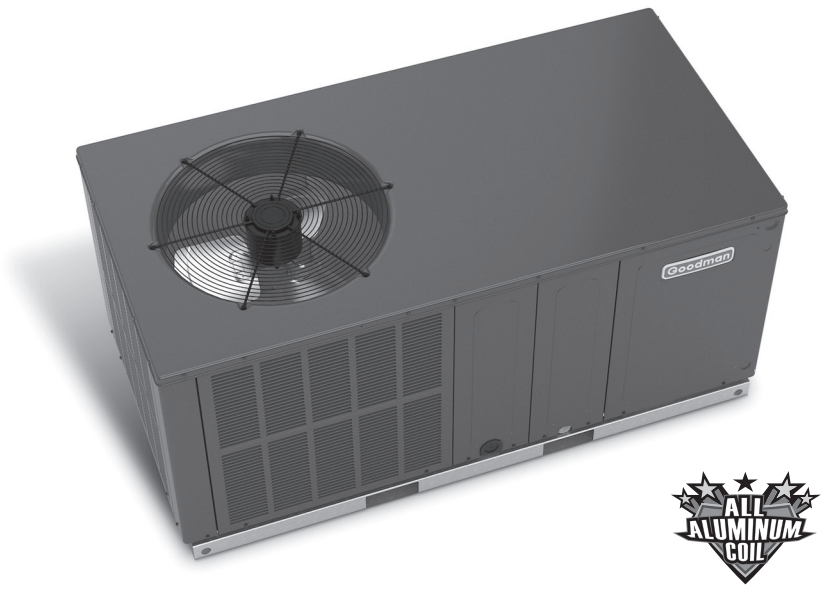
Goodman
Air Conditioning & Heating

GPC14H

COOLING CAPACITY: 23,600 - 57,500 BTU/H

PACKAGED AIR CONDITIONER
2 TO 5 TONS
14 SEER

Contents



Standard Features

- Energy-efficient compressor
- Multi-speed ECM indoor blower motor
- Quiet horizontal discharge
- Copper tube/aluminum fin condenser coil
- All-aluminum evaporator coil
- Totally enclosed, permanently lubricated condenser fan motor
- Fully charged system
- 5 kW to 20 kW electric heat kit available as a field-installed option
- AHRI Certified; ETL Listed

Cabinet Features

- Heavy-gauge galvanized-steel cabinet with attractive Architectural Gray powder-paint finish
- Louvered condenser coil protection
- Aluminum foil-facing internal insulation reinforced with fiberglass scrim
- Fully insulated blower compartment with convenient access panels
- Meets cabinet air leakage requirements when tested in accordance with ASHRAE standard 193
- One footprint for all tonnages

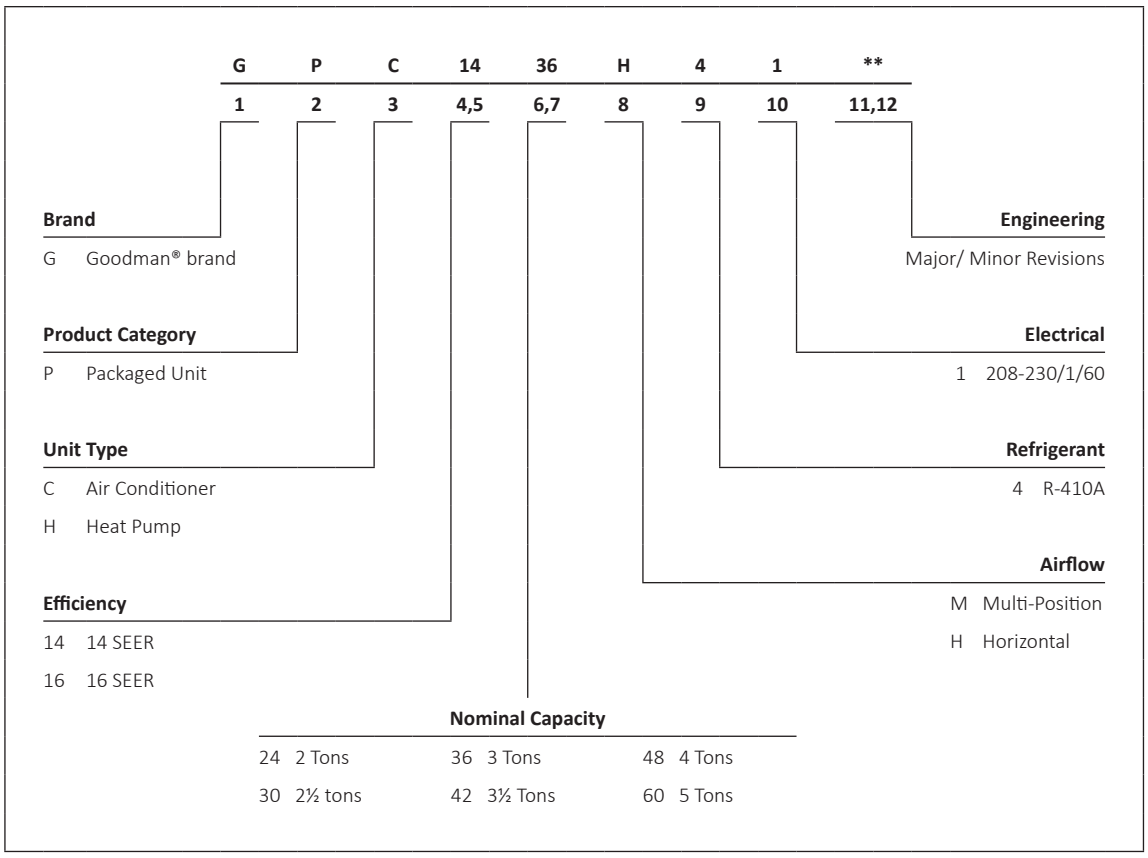
10 YEAR PARTS LIMITED WARRANTY* | 2 YEAR UNIT REPLACEMENT LIMITED WARRANTY*

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV GL ISO 9001

COMPANY WITH ENVIRONMENTAL SYSTEM CERTIFIED BY DNV GL ISO 14001

BBB ACCREDITED BUSINESS

* Complete warranty details available from your local dealer or at www.goodmanmfg.com. To receive the 2-Year Unit Replacement Limited Warranty and 10-Year Parts Limited Warranty, online registration must be completed within 60 days of installation. Online registration is not required in California or Quebec.


G P C 14 36 H 4 1 **
1 2 3 4,5 6,7 8 9 10 11,12
Brand
G Goodman® brand
Product Category
P Packaged Unit
Unit Type
C Air Conditioner
H Heat Pump
Efficiency
14 14 SEER
16 16 SEER
Nominal Capacity
24 2 Tons
30 2½ tons
36 3 Tons
42 3½ Tons
48 4 Tons
60 5 Tons
Airflow
M Multi-Position
H Horizontal
Refrigerant
4 R-410A
Electrical
1 208-230/1/60
Engineering
Major/ Minor Revisions

MODELS	GPC14 24H41E*	GPC14 30H41E*	GPC14 30H41G*	GPC14 36H41DD	GPC14 36H41DF	GPC14 42H41E*	GPC14 48H41E*	GPC14 60H41E*
COOLING CAPACITY								
Cooling Capacity (BTU/h)	23,600	28,400	28,400	35,600	35,600	40,000	46,000	57,500
Sensible BTU/h	17,500	21,000	21,000	26,400	26,400	28,800	34,600	41,000
SEER / EER	14.0 / 12.0	14.0 / 12.0	14.0 / 12.0	14.0 / 12.0	14.0 / 12.0	14.0 / 12.0	14.0 / 12.0	14.0 / 11.5
Decibels	76	76	76	78	78	78	80	80
AHRI Numbers	7428120	7428122	202031000	6892357	6892357	7428124	7428126	7428128
EVAPORATOR MOTOR								
Type	ECM	ECM	ECM	ECM	ECM	ECM	ECM	ECM
Wheel (D x W)	10 x 8	10 x 8	10 x 8	10 x 8	10 x 8	10 x 8	10 x 8	11 x 8
Cooling CFM	875	1,050	1,050	1,200	1,200	1,300	1,600	1,600
Fan-Only CFM	800	950	800	1,100	1,100	1,200	1,400	1,700
RLA	1.5	1.86	1.86	1.86	1.86	2.9	2.9	2.9
No. of Speeds	5	5	5	5	5	5	5	5
Horsepower- RPM	½- 1050	½- 1050	½- 1050	½- 1050	½- 1050	½- 1050	¾- 1050	¾- 1050
EVAPORATOR COIL								
Face Area (ft^2)	5.25	5.25	5.25	5.25	5.25	6.20	6.20	7.00
Rows Deep/ Fins per Inch	3/ 14	3/ 14	3/ 14	3/ 14	3/ 14	4/ 14	4/ 14	4/ 14
Indoor Orifice Size	0.055	0.063	0.063	0.068	0.068	0.076	0.076	0.086
Filter Size (")	20 x 20 x 1	20 x 25 x 1	20 x 25 x 1	25 x 25 x 1	25 x 25 x 1	(2) 20 x 20 x 1	(2) 20 x 20 x 1	(2) 20 x 25 x 1
All-aluminum coil	X	X	X	X	X	X	X	X
Drain Size (NPT)	¾"	¾"	¾"	¾"	¾"	¾"	¾"	¾"
Refrigerant Charge (oz.)	51	46	46	65	65	70	85	103
CONDENSER FAN / COIL								
Horsepower- RPM	1/6- 815	1/6- 815	1/6- 815	¼- 830	¼- 830	¼- 1075	¼- 1075	¼- 1075
RLA/LRA	1.1 / 1.7	1.1 / 1.7	1.1 / 1.7	1.3 / 3.0	1.6 / 3.5	1.4 / 2.9	1.4 / 2.9	1.4 / 2.9
Fan Diameter/ # Fan Blades	22 / 2	22 / 2	22 / 2	22 / 3	22 / 3	22 / 4	22 / 4	22 / 4
Face Area (ft^2)	9.3	9.3	9.3	12.3	12.3	12.3	16	15
Rows Deep/ Fins per Inch	1 / 27	1 / 27	1 / 27	1 / 26	1 / 26	1 / 27	1 / 27	2 /27
COMPRESSOR								
Quantity / Type	1 / Rotary	1 / Scroll	1 / Scroll	1 / Scroll	1 / Scroll	1 / Scroll	1 / Scroll	1 / Scroll
Stage	Single	Single	Single	Single	Single	Single	Single	Single
Compressor RLA/LRA	7.7/37	14.1/ 64	13.5/73	16.7 / 79	16.7 / 79	17.9 / 112	19.9 / 109	26.4 / 134
ELECTRICAL DATA								
Voltage-Phase (60 Hz)	208/230-1	208/230-1	208/230-1	208/230-1	208/230-1	208/230-1	208/230-1	208/230-1
Indoor Blower FLA	3.8	3.8	3.8	3.8	3.8	3.8	5.4	5.4
Outdoor Fan RLA	1.1	1.1	1.1	1.3	1.6	1.4	1.4	1.4
Total Unit Amps	12.6	19	18.4	22	22.1	23.1	26.7	33.2
Min. Circuit Ampacity[1]	15	23	22	26	26.3	28	32	40
Max. Overcurrent Protection (amps)[2]	20	35	35	40	40	45	50	60
OPERATING WEIGHT (LBS)	300	305	305	315	315	350	365	370
SHIP WEIGHT (LBS)	309	314	314	324	324	359	377	382

[1] Wire size should be determined in accordance with National Electrical Codes. Extensive wire runs will require larger wire sizes.

[2] May use fuses or HACR-type circuit breakers of the same size as noted.

Note: Always check the S&R plate for electrical data on the unit being installed.