

# NOISE FUNDAMENTALS

# Fundamentals of Noise

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## NOISE

Noise is most often defined as unwanted sound; whether it is loud, unpleasant, unexpected, or otherwise undesirable. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as “noisiness” or “loudness.”

### Noise Descriptors

The following are brief definitions of terminology used in this chapter:

- **Sound.** A disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.
- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- **Decibel (dB).** A unitless measure of sound, expressed on a logarithmic scale and with respect to a defined reference sound pressure. The standard reference pressure is 20 micropascals (20  $\mu\text{Pa}$ ).
- **Vibration Decibel (VdB).** A unitless measure of vibration, expressed on a logarithmic scale and with respect to a defined reference vibration velocity. In the U.S., the standard reference velocity is 1 micro-inch per second ( $1 \times 10^{-6}$  in/sec).
- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- **Equivalent Continuous Noise Level ( $L_{\text{eq}}$ ); also called the Energy-Equivalent Noise Level.** The value of an equivalent, steady sound level which, in a stated time period (often over an hour) and at a stated location, has the same A-weighted sound energy as the time-varying sound. Thus, the  $L_{\text{eq}}$  metric is a single numerical value that represents the equivalent amount of variable sound energy received by a receptor over the specified duration.
- **Statistical Sound Level ( $L_n$ ).** The sound level that is exceeded “n” percent of time during a given sample period. For example, the  $L_{50}$  level is the statistical indicator of the time-varying noise signal that is exceeded 50 percent of the time (during each sampling period); that is, half of the sampling time, the changing noise levels are above this value and half of the time they are below it. This is called the “median sound level.” The  $L_{10}$  level, likewise, is the value that is exceeded 10 percent of the time (i.e., near the maximum) and this is often known as the “intrusive sound level.” The  $L_{90}$  is the sound level exceeded 90 percent of the time and is often considered the “effective background level” or “residual noise level.”

- **Maximum Sound Level ( $L_{\max}$ ).** The highest RMS sound level measured during the measurement period.
- **Root Mean Square Sound Level (RMS).** The square root of the average of the square of the sound pressure over the measurement period.
- **Day-Night Sound Level ( $L_{\text{dn}}$  or DNL).** The energy-average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.
- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added from 7:00 PM to 10:00 PM and 10 dB from 10:00 PM to 7:00 AM. NOTE: For general community/environmental noise, CNEL and  $L_{\text{dn}}$  values rarely differ by more than 1 dB (with the CNEL being only slightly more restrictive – that is, higher than the  $L_{\text{dn}}$  value). As a matter of practice,  $L_{\text{dn}}$  and CNEL values are interchangeable and are treated as equivalent in this assessment.
- **Peak Particle Velocity (PPV).** The peak rate of speed at which soil particles move (e.g., inches per second) due to ground vibration.
- **Sensitive Receptor.** Noise- and vibration-sensitive receptors include land uses where quiet environments are necessary for enjoyment and public health and safety. Residences, schools, motels and hotels, libraries, religious institutions, hospitals, and nursing homes are examples.

## Characteristics of Sound

When an object vibrates, it radiates part of its energy in the form of a pressure wave. Sound is that pressure wave transmitted through the air. Technically, airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure that creates sound waves.

Sound can be described in terms of amplitude (loudness), frequency (pitch), or duration (time). Loudness or amplitude is measured in dB, frequency or pitch is measured in Hertz [Hz] or cycles per second, and duration or time variations is measured in seconds or minutes.

### *Amplitude*

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale. Because of the physical characteristics of noise transmission and perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 1 presents the subjective effect of changes in sound pressure levels. Ambient sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud). Changes of 1 to 3 dB are detectable under quiet, controlled conditions, and changes of less than 1 dB are usually not discernible (even under ideal conditions). A 3 dB change in noise levels is considered the minimum change that is detectable with human hearing in outside environments. A change of 5 dB is readily discernible to most people in an exterior environment, and a 10 dB change is perceived as a doubling (or halving) of the sound.

**Table 1**      **Noise Perceptibility**

Change in dB	Noise Level
± 3 dB	Barely perceptible increase
± 5 dB	Readily perceptible increase
± 10 dB	Twice or half as loud
± 20 dB	Four times or one-quarter as loud

Source: California Department of Transportation (Caltrans). 2013, September. Technical Noise Supplement ("TeNS").

### *Frequency*

The human ear is not equally sensitive to all frequencies. Sound waves below 16 Hz are not heard at all, but are “felt” more as a vibration. Similarly, though people with extremely sensitive hearing can hear sounds as high as 20,000 Hz, most people cannot hear above 15,000 Hz. In all cases, hearing acuity falls off rapidly above about 10,000 Hz and below about 200 Hz.

When describing sound and its effect on a human population, A-weighted (dBA) sound levels are typically used to approximate the response of the human ear. The A-weighted noise level has been found to correlate well with people’s judgments of the “noisiness” of different sounds and has been used for many years as a measure of community and industrial noise. Although the A-weighted scale and the energy-equivalent metric are commonly used to quantify the range of human response to individual events or general community sound levels, the degree of annoyance or other response also depends on several other perceptibility factors, including:

- Ambient (background) sound level
- General nature of the existing conditions (e.g., quiet rural or busy urban)
- Difference between the magnitude of the sound event level and the ambient condition
- Duration of the sound event
- Number of event occurrences and their repetitiveness
- Time of day that the event occurs

### *Duration*

Time variation in noise exposure is typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called  $L_{eq}$ ), or alternately, as a statistical description of the sound level that is exceeded over some fraction of a given observation period. For example, the  $L_{50}$  noise level represents the noise level that is exceeded 50 percent of the time; half the time the noise level exceeds this level and half the time the noise level is less than this level. This level is also representative of the level that is exceeded 30 minutes in an hour. Similarly, the  $L_2$ ,  $L_8$  and  $L_{25}$  values represent the noise levels that are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour, respectively. These “n” values are typically used to demonstrate compliance for stationary noise sources with many cities’ noise ordinances. Other values typically noted during a noise survey are the  $L_{min}$  and  $L_{max}$ . These values represent the minimum and maximum root-mean-square noise levels obtained over the measurement period, respectively.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law and many local jurisdictions use an adjusted 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL) or Day-Night Noise Level ( $L_{dn}$ ). The CNEL descriptor requires that an artificial increment (or “penalty”) of 5 dBA be added to the actual noise level for the hours from 7:00 PM to 10:00

PM and 10 dBA for the hours from 10:00 PM to 7:00 AM. The  $L_{dn}$  descriptor uses the same methodology except that there is no artificial increment added to the hours between 7:00 PM and 10:00 PM. Both descriptors give roughly the same 24-hour level, with the CNEL being only slightly more restrictive (i.e., higher). The CNEL or  $L_{dn}$  metrics are commonly applied to the assessment of roadway and airport-related noise sources.

## **Sound Propagation**

Sound dissipates exponentially with distance from the noise source. This phenomenon is known as “spreading loss.” For a single-point source, sound levels decrease by approximately 6 dB for each doubling of distance from the source (conservatively neglecting ground attenuation effects, air absorption factors, and barrier shielding). For example, if a backhoe at 50 feet generates 84 dBA, at 100 feet the noise level would be 79 dBA, and at 200 feet it would be 73 dBA. This drop-off rate is appropriate for noise generated by on-site operations from stationary equipment or activity at a project site. If noise is produced by a line source, such as highway traffic, the sound decreases by 3 dB for each doubling of distance over a reflective (“hard site”) surface such as concrete or asphalt. Line source noise in a relatively flat environment with ground-level absorptive vegetation decreases by an additional 1.5 dB for each doubling of distance.

## **Psychological and Physiological Effects of Noise**

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. Extended periods of noise exposure above 90 dBA results in permanent cell damage, which is the main driver for employee hearing protection regulations in the workplace. For community environments, the ambient or background noise problem is widespread, though generally worse in urban areas than in outlying, less-developed areas. Elevated ambient noise levels can result in noise interference (e.g., speech interruption/masking, sleep disturbance, disturbance of concentration) and cause annoyance. Since most people do not routinely work with decibels or A-weighted sound levels, it is often difficult to appreciate what a given sound pressure level number means. To help relate noise level values to common experience, Table 2 shows typical noise levels from familiar sources.

**Table 2 Typical Noise Levels**

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Onset of physical discomfort	120+	
	110	Rock Band (near amplification system)
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at three feet		
	90	
Diesel Truck at 50 feet, at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: California Department of Transportation (Caltrans). 2013, September. Technical Noise Supplement ("TeNS").

## Vibration Fundamentals

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities stemming from operations of railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. As with noise, vibration can be described by both its amplitude and frequency. Vibration displacement is the distance that a point on a surface moves away from its original static position; velocity is the instantaneous speed that a point on a surface moves; and acceleration is the rate of change of the speed. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During construction, the operation of construction equipment can cause groundborne vibration. During the operational phase of a project, receptors may be subject to levels of vibration that can cause annoyance due to noise generated from vibration of a structure or items within a structure.

Vibration amplitudes are usually described in terms of either the peak particle velocity (PPV) or the root mean square (RMS) velocity. PPV is the maximum instantaneous peak of the vibration signal and RMS is the

square root of the average of the squared amplitude of the signal. PPV is more appropriate for evaluating potential building damage and RMS is typically more suitable for evaluating human response.

As with airborne sound, annoyance with vibrational energy is a subjective measure, depending on the level of activity and the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Persons accustomed to elevated ambient vibration levels, such as in an urban environment, may tolerate higher vibration levels. Table 3 displays the human response and the effects on buildings resulting from continuous vibration (in terms of various levels of PPV).

**Table 3 Human Reaction to Typical Vibration Levels**

Vibration Level, PPV (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: California Department of Transportation (Caltrans). 2020, April. *Transportation and Construction Vibration Guidance Manual*. Prepared by ICF International.

# LOCAL REGULATIONS AND STANDARDS

## Fountain Valley Municipal Code

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[Title 6 HEALTH AND SANITATION](#)**Chapter 6.28 NOISE CONTROL****6.28.010 Declaration of policy.**

(a) In order to control unnecessary, excessive and annoying sounds emanating from incorporated areas of the city, it is declared to be the policy of the city to prohibit such sounds generated from all sources as specified in this chapter.

(b) It is determined that certain noise levels are detrimental to the public health, welfare and safety and contrary to public interest; therefore, the city council does ordain and declare that creating, maintaining, causing or allowing to create, maintain or cause any noise in a manner prohibited by or not in conformity with the provisions of this chapter, is a public nuisance and shall be punishable as such. (Ord. 806 § 2, 1976)

**6.28.020 Definitions.**

The following words, phrases and terms as used in this chapter shall have the meaning as indicated below:

- (1) “Ambient noise level” means the all-encompassing noise level associated with a given environment, being a composite of sounds from all sources, excluding the alleged offensive noise, at the location and approximate time at which a comparison with the alleged offensive noise is to be made.
- (2) “Cumulative period” means an additive period of time composed of individual time segments which may be continuous or interrupted.
- (3) “Decibel” (dB) means a unit which denotes the ratio between two quantities which are proportional to power; the number of decibels corresponding to the ratio of two amounts of power is ten times the logarithm to the base ten of this ratio.
- (4) “Dwelling unit” means a single unit providing complete, independent living facilities for one or more persons including permanent provisions for living, sleeping, eating, cooking and sanitation.
- (5) “Emergency machinery, vehicle or work” means any machinery, vehicle or work used, employed or performed in an effort to protect, provide or restore safe conditions in the community or for the citizenry, or work by private or public utilities when restoring utility service.
- (6) “Fixed noise source” means a stationary device which creates sounds while fixed or motionless including but not limited to industrial and commercial machinery and equipment, pumps, fans, compressors, generators, air conditioners and refrigerator equipment.
- (7) “Grading” means any excavating or filling of earth material, or any combination thereof, conducted at a site to prepare said site for construction or other improvements thereon.
- (8) “Impact noise” means the noise produced by the collision of one mass in motion with a second mass which may be either in motion or at rest.
- (9) “Mobile noise source” means any noise source other than a fixed noise source.
- (10) “Noise level” means the “A” weighted sound pressure level in decibels obtained by using a sound level meter at slow response with a reference pressure of twenty microNewtons per square meter. The unit of measurement shall be designated as dB(A).
- (11) “Noise variance board” means an administrative board of five members appointed by the board of supervisors of the county, per Title 4, Division 6, Article 1 of the codified ordinances of the county.
- (12) “Person” means a person, firm, association, copartnership, joint venture, corporation or any entity, public or private in nature.
- (13) “Residential property” means a parcel of real property which is developed and used either in part or in whole for residential purposes, other than transient uses such as hotels and motels.

(14) “Simple tone noise” means a noise characterized by a predominant frequency or frequencies so that other frequencies cannot be readily distinguished.

(15) “Sound level meter” means an instrument meeting American National Standard Institute’s Standard S1.4-1971 for Type 1 or Type 2 sound level meters or an instrument and the associated recording and analyzing equipment which will provide equivalent data.

(16) “Sound pressure level” of a sound, in decibels, means twenty times the logarithm to the base ten of the ratio of the pressure of the sound to a referenced pressure, which reference pressure shall be explicitly stated. (Ord. 806 § 2, 1976)

**6.28.030 Noise level measurement criteria.**

Any noise level measurements made pursuant to the provisions of this chapter shall be performed using a sound level meter as defined in Section [6.28.020](#). (Ord. 806 § 2, 1976)

**6.28.040 Designated noise zone.**

The residential properties hereinafter described are assigned to the following noise zones:

Noise Zone 1: All properties located in residential zone districts. (Ord. 806 § 2, 1976)

**6.28.050 Exterior noise standards.**

(a) The following noise standards, unless otherwise specifically indicated, shall apply to all residential property within a designated noise zone:

Noise Zone	Noise Standards	
	Noise Level	Time Period
1	55 dB(A)	7 a.m. — 10 p.m.
	50 dB(A)	10 p.m. — 7 a.m.

In the event the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by 5 dB(A).

(b) It is 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:

- (1) The noise standard for a cumulative period of more than thirty minutes in any hour; or
- (2) The noise standard plus five dB(A) for a cumulative period of more than fifteen minutes in any hour; or
- (3) The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour; or
- (4) The noise standard plus fifteen dB(A) for a cumulative period of more than one minute in any hour; or
- (5) The noise standard plus twenty dB(A) for any period of time.

(c) In the event the ambient noise level exceeds any of the first four noise limit categories set forth in subsection (b) of this section, the cumulative period applicable to said category shall be increased to reflect said ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level. (Ord. 806 § 2, 1976)

**6.28.060 Interior noise standards.**

(a) The following interior noise standards, unless otherwise specifically indicated, shall apply to all residential property within a designated noise zone:

**Interior Noise Standards**

Noise Zone	Noise Level	Time Period
1	55 dB(A)	7 a.m. — 10 p.m.
	45 dB(A)	10 p.m. — 7 a.m.

In the event the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the above noise levels shall be reduced by five dB(A).

(b) It is 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 within any other dwelling unit on any residential property, either incorporated or unincorporated, to exceed:

- (1) The interior noise standard for a cumulative period of more than five minutes in any hour; or
- (2) The interior noise standard plus five dB(A) for a cumulative period of more than one minute in any hour; or
- (3) The interior noise standard plus ten dB(A) for any period of time.

(c) In the event the ambient noise level exceeds either of the first two noise limit categories set forth in subsection (b) of this section, the cumulative period applicable to said category shall be increased to reflect said ambient noise level. In the event the ambient noise level exceeds the third noise limit category, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level. (Ord. 806 § 2, 1976)

**6.28.070 Special provisions.**

The following activities shall be exempted from the provisions of this chapter:

- (1) Activities conducted on the grounds of any public or private nursery, elementary, intermediate or secondary school or college;
- (2) Public dances, provided said events are conducted pursuant to a permit issued by the city pursuant to Chapter [5.24](#) relative to the staging of said events;
- (3) Activities conducted on any park or playground, provided such park or playground is owned and operated by a public entity;
- (4) Any mechanical device, apparatus or equipment used, related to or connected with emergency machinery, vehicle or work;
- (5) Noise sources associated with the construction, repair, remodeling or grading of any real property, provided said activities take place between the hours of seven a.m. and eight p.m. Monday through Friday, nine a.m. through eight p.m. on Saturday and at no time on Sunday or any legal holiday. For purposes of this exception the use of saws, buffers, sanders, drills, and sprayers shall be included, as shall similar activity;
- (6) All mechanical devices, apparatus or equipment which are utilized for the protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions;
- (7) Mobile noise sources associated with agricultural operations, provided such operations do not take place between the hours of eight p.m. and seven a.m. on weekdays, including Saturday, or at any time on Sunday or a legal holiday;
- (8) Mobile noise sources associated with agricultural pest control through pesticide application, provided that the application is made in accordance with the restricted material permits issued by or regulations enforced by the agricultural commissioner;
- (9) Noise sources associated with the landscape maintenance of real property, provided said activities take place between the hours of seven a.m. and eight p.m. Monday through Friday, nine a.m. through eight p.m. on Saturday, or nine a.m. through six p.m. on Sunday or legal holidays. For purposes of this exception, the phrase “landscape maintenance of real property” shall include, but not be limited to, the use of power mowers, edgers, chain saws, trimmers, hedgecutters,

and other devices that are not hand-powered. Leaf blowers shall not be included in said exception and shall be regulated as provided in Chapter [6.10](#) of this code;

(10) Any activity to the extent regulation thereof has been preempted by state or federal law. (Ord. 1282 § 1, 1998; Ord. 806 § 2, 1976)

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#### **6.28.080 Schools, hospitals and churches—Special provisions.**

It is 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 [6.28.050](#) 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 institutions or which unreasonably disturbs or annoys patients in the hospital, provided conspicuous signs are displayed in three separate locations within one-tenth of a mile of the institution indicating the presence of a school, church or hospital. (Ord. 806 § 2, 1976)

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#### **6.28.090 Air conditioning and refrigeration—Special provisions.**

Until January 19, 1979, the noise standards enumerated in Sections [6.28.050](#) and [6.28.060](#) shall be increased eight dB(A) where the alleged offensive noise source is an air conditioning or refrigeration system or associated equipment which was installed prior to November 26, 1976. (Ord. 806 § 2, 1976)

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#### **6.28.100 Noise level measurement.**

The location selected for measuring exterior noise levels shall be at any point on the affected property. Interior noise measurements shall be made within the affected dwelling unit. The measurement shall be made at a point at least four feet from the wall, ceiling, or floor nearest the alleged offensive noise source and may be made with the windows of the affected unit open. (Ord. 806 § 2, 1976)

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#### **6.28.110 Manner of enforcement.**

The county health officer and his duly authorized representatives are directed to enforce the provisions of this chapter. The county health officer and his duly authorized representatives are authorized, pursuant to [Penal Code](#) Section 836.5, to arrest any person without a warrant when they have reasonable cause to believe that such person has committed a misdemeanor in their presence.

No person shall interfere with, oppose or resist any authorized person charged with enforcement of this chapter while such person is engaged in the performance of his duty. (Ord. 806 § 2, 1976)

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#### **6.28.120 Variance procedure.**

The owner or operator of a noise source which violates any of the provisions of this chapter may file an application with the health officer for a variance from the provisions thereof wherein said owner or operator shall set forth all actions taken to comply with said provisions, the reasons why immediate compliance cannot be achieved, a proposed method of achieving compliance, and a proposed time schedule for its accomplishment. Said application shall be accompanied by a fee in the amount of seventy-five dollars. A separate application shall be filed for each noise source; provided, however, that several mobile sources under common ownership, or several fixed sources on a single property may be combined into one application. Upon receipt of said application and fee, the health officer shall refer it with his recommendation thereon within thirty days to the noise variance board of the county for action thereon in accordance with the provisions of this chapter.

An applicant for a variance shall remain subject to prosecution under the terms of this chapter until a variance is granted. (Ord. 806 § 2, 1976)

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#### **6.28.130 Noise variance board.**

The noise variance board shall evaluate all applications for variance from the requirements of this chapter and may grant said variances with respect to time for compliance, subject to such terms, conditions and requirements as it may deem reasonable to achieve maximum compliance with the provisions of this chapter. Said terms, conditions and requirements may include, but shall not be limited to, limitation on noise levels and operating hours. Each such variance shall set forth in detail the approved method of achieving maximum compliance and a time schedule for its accomplishment. In its determinations said board shall consider the magnitude of nuisance caused by the offensive noise, the uses of property within the area of impingement by the noise, the time factors related to study, design, financing and construction of remedial work, the economic factors related to age and useful life of equipment, and the general public interest and welfare. Any variance granted by said board shall be by resolution and shall be transmitted to the health officer for enforcement. Any violation of the terms of said variance shall be unlawful. (Ord. 806 § 2, 1976)

#### **6.28.140 Appeals.**

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(a) Within fifteen days following the decision of the variance board on an application the applicant, the health officer, or any member of the city council may appeal the decision to the city council by filing a notice of appeal with the secretary of the variance board. In the case of an appeal by the applicant for a variance, the notice of appeal shall be accompanied by a fee to be computed by the secretary on the basis of the estimated cost of preparing the materials required to be forwarded to the city council as discussed hereafter. If the actual cost of such preparation differs from the estimated cost appropriate payments shall be made either to or by the secretary.

(b) Within fifteen days following receipt of a notice of appeal and the appeal fee, the secretary of the variance board shall forward to the city council copies of the application for variance, the recommendation of the health officer, the notice of appeal, all evidence concerning said application received by the variance board and its decision thereon. In addition, any person may file with the city council written arguments supporting or attacking said decision and the city council may in its discretion hear oral arguments thereon. The city clerk shall mail to the applicant a notice of the date set for hearing of the appeal. The notice shall be mailed at least ten days prior to the hearing date.

(c) Within sixty days following its receipt of the notice of the appeal, the city council shall either affirm, modify or reverse the decision of the variance board. Such decision shall be based upon the city council's evaluation of the matters submitted to the city council in light of the powers conferred on the variance board and the factors to be considered, both as enumerated in Sections [6.28.120](#) and [6.28.130](#).

(d) As part of its decision the council may direct the variance board to conduct further proceedings on said application. Failure of the city council to affirm, modify or reverse the decision of the variance board within said sixty-day period shall constitute an affirmation of the decision. (Ord. 806 § 2, 1976)

#### **6.28.145 Alternative noise prohibition.**

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Notwithstanding any other provisions of this chapter and in addition thereto, it is unlawful for any person to wilfully make, continue, maintain, permit, or cause to be made, continued, maintained, or permitted, any loud, unnecessary and unusual noise which disturbs the peace or quiet of any residential neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitivity residing in the area. It shall be a prima facie violation of this section if any radio, receiving set, television, musical instrument or similar device is played, used or permitted to be played or used between the hours of nine p.m. and seven a.m. when audible from a distance of fifty feet from the property line of the noise source or from a distance of one hundred feet from any nonstationary noise source. The determination may be made by a peace officer or may be proven by the testimony of any other person. (Ord. 1018 § 1, 1985)

#### **6.28.147 Idling motor vehicles.**

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No person shall leave standing any motor vehicle, including refrigeration trailers, with engine idling or auxiliary motor running for in excess of ten minutes between the hours of ten p.m. and seven a.m. if the engine or motor noise disturbs the peace or quiet of any residential neighborhood or causes discomfort or annoyance to any reasonable person of normal sensitivity residing in the area. The driver, owner, registered owner and legal owner of the motor vehicle or refrigeration trailer shall each be guilty of the offense described herein. (Ord. 1156 § 1, 1990)

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**6.28.148 Commercial delivery prohibition.**

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No person shall make, cause, accept or permit a delivery of goods, merchandise, material, equipment, meat, poultry, fish, groceries, dairy products, foodstuffs, food, or beverage within one hundred feet of a residentially zoned property between the hours of ten p.m. and seven a.m. or at any time on a Sunday or legal holiday so as to disturb the peace and quiet of any reasonable person of normal sensitivity residing in the area. Proof of such a violation may be established by the testimony of a peace officer, code enforcement officer, or any other person. For purposes of this section “delivery” shall not only mean the completed act of a delivery, but all preparatory and related steps taken within the one hundred-foot distance including, but not limited to, driving, stopping, idling or parking a vehicle, the opening or shutting of doors, or the movement of pallets, dollies, floor jacks, or lifts. (Ord. 1173 § 1, 1992)

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**6.28.149 Parking lot sweepers.**

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No person shall operate a parking lot sweeper or similar device for cleaning or maintaining commercial property within one hundred feet of a residential area except during the hours of eight a.m. and six p.m., Monday through Friday, between nine a.m. and six p.m. on Saturday, and at no time on Sunday. (Ord. 1324 § 1, 2002)

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**6.28.150 Violation—Penalty.**

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Any person violating any of the provisions of this chapter shall be deemed guilty of a misdemeanor. Each day such violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such. The provisions of this chapter shall not be construed as permitting conduct not prescribed herein and shall not affect the enforceability of any other applicable provisions of law. (Ord. 806 § 2, 1976)

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# CONSTRUCTION NOISE MODELING

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil - Mass Rough Grading

\*\*\*\* Receptor #1 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Equipment						
Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	250.0	3.0
Grader	No	40	85.0		250.0	3.0
Scraper	No	40		83.6	250.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)						
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Excavator	63.7	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	68.0	64.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	66.6	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.0	67.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Equipment						
Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	500.0	3.0
Grader	No	40	85.0		500.0	3.0
Scraper	No	40		83.6	500.0	3.0

Results

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

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	57.7	53.7	N/A	N/A										
Grader	62.0	58.0	N/A	N/A										
Scraper	60.6	56.6	N/A	N/A										
Total	62.0	61.2	N/A	N/A										

\*\*\*\* Receptor #3 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	325.0	3.0
Grader	No	40	85.0		325.0	3.0
Scraper	No	40		83.6	325.0	3.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Excavator	61.5	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	65.7	61.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	64.3	60.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	65.7	65.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	625.0	0.0
Grader	No	40	85.0		625.0	0.0
Scraper	No	40		83.6	625.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	58.8	54.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	63.1	59.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	61.6	57.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	63.1	62.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil - Mass Site Preparation

\*\*\*\* Receptor #1 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40	81.7	81.7	250.0	3.0
Front End Loader	No	40	79.1	79.1	250.0	3.0
Backhoe	No	40	77.6	77.6	250.0	3.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Dozer	64.7	60.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Front End Loader	62.1	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Backhoe	60.6	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Total	64.7	63.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

\*\*\*\* Receptor #2 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40	81.7	81.7	500.0	3.0
Front End Loader	No	40	79.1	79.1	500.0	3.0
Backhoe	No	40	77.6	77.6	500.0	3.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Dozer	64.7	60.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Front End Loader	62.1	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Backhoe	60.6	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Total	64.7	63.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer	58.7	54.7	N/A	N/A										
Front End Loader	56.1	52.1	N/A	N/A										
Backhoe	54.6	50.6	N/A	N/A										
Total	58.7	57.6	N/A	N/A										

\*\*\*\* Receptor #3 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40	81.7	81.7	325.0	3.0
Front End Loader	No	40	79.1	79.1	325.0	3.0
Backhoe	No	40	77.6	77.6	325.0	3.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Dozer	62.4	58.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	59.9	55.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	58.3	54.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	62.4	61.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40	81.7	81.7	625.0	0.0
Front End Loader	No	40	79.1	79.1	625.0	0.0
Backhoe	No	40	77.6	77.6	625.0	0.0

Results

Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
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Equipment	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer	59.7	55.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	57.2	53.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	55.6	51.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.7	58.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P1 Fine Grading

\*\*\*\* Receptor #1 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Equipment						
Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	250.0	3.0
Grader	No	40	85.0		250.0	3.0
Scraper	No	40		83.6	250.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	63.7	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	68.0	64.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	66.6	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.0	67.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Equipment						
Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	500.0	3.0
Grader	No	40	85.0		500.0	3.0
Scraper	No	40		83.6	500.0	3.0

Results

Equipment	Noise Limits (dBA)						Noise Limit Exceedance (dBA)							
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	63.7	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	68.0	64.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	66.6	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.0	67.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	57.7	53.7	N/A	N/A										
Grader	62.0	58.0	N/A	N/A										
Scraper	60.6	56.6	N/A	N/A										
Total	62.0	61.2	N/A	N/A										

\*\*\*\* Receptor #3 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Equipment						
Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	325.0	3.0
Grader	No	40	85.0		325.0	3.0
Scraper	No	40		83.6	325.0	3.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Excavator	61.5	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	65.7	61.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	64.3	60.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	65.7	65.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Equipment						
Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	1000.0	0.0
Grader	No	40	85.0		1000.0	0.0
Scraper	No	40		83.6	1000.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	54.7	50.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	59.0	55.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	57.6	53.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.0	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P1 Utility Trenching

\*\*\*\* Receptor #1 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	75.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	150.0	3.0
Excavator	No	40		80.7	150.0	3.0
Front End Loader	No	40		79.1	150.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	65.0	61.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	68.2	64.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	66.6	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.2	67.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	165.0	3.0
Excavator	No	40		80.7	165.0	3.0
Front End Loader	No	40		79.1	165.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	65.0	61.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	68.2	64.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	66.6	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.2	67.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	64.2	60.2	N/A	N/A										
Excavator	67.3	63.4	N/A	N/A										
Front End Loader	65.7	61.8	N/A	N/A										
Total	67.3	66.7	N/A	N/A										

\*\*\*\* Receptor #3 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40	77.6	77.6	230.0	0.0
Excavator	No	40	80.7	80.7	230.0	0.0
Front End Loader	No	40	79.1	79.1	230.0	0.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Backhoe	64.3	60.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	67.5	63.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	65.9	61.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	67.5	66.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40	77.6	77.6	425.0	0.0
Excavator	No	40	80.7	80.7	425.0	0.0
Front End Loader	No	40	79.1	79.1	425.0	0.0

Results

Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
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Equipment	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	59.0	55.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	62.1	58.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	60.5	56.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	62.1	61.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P1 Building Construction

\*\*\*\* Receptor #1 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	75.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	50.0	3.0
Welder / Torch	No	40		74.0	50.0	3.0
Man Lift	No	20		74.7	50.0	3.0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)						
	Lmax	Leq	Day		Evening		Night		Day		Evening		Night		
			Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Backhoe	74.6	70.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	71.0	67.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	71.7	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	74.6	72.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	50.0	3.0
Welder / Torch	No	40		74.0	50.0	3.0
Man Lift	No	20		74.7	50.0	3.0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	Lmax	Leq	Day		Evening		Night		Day		Evening		Night	
			Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq		
Backhoe	74.6	70.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	71.0	67.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	71.7	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	74.6	72.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	74.6	70.6	N/A	N/A										
Welder / Torch	71.0	67.0	N/A	N/A										
Man Lift	71.7	64.7	N/A	N/A										
Total	74.6	72.9	N/A	N/A										

\*\*\*\* Receptor #3 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	115.0	3.0
Welder / Torch	No	40		74.0	115.0	3.0
Man Lift	No	20		74.7	115.0	3.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Backhoe	67.3	63.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Welder / Torch	63.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Man Lift	64.5	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Total	67.3	65.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	250.0	0.0
Welder / Torch	No	40		74.0	250.0	0.0
Man Lift	No	20		74.7	250.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	63.6	59.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	60.0	56.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	60.7	53.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	63.6	61.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P1 Paving

\*\*\*\* Receptor #1 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	75.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	80.0	3.0
Roller	No	20		80.0	80.0	3.0
Paver	No	50		77.2	80.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	70.1	67.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	72.9	65.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	70.1	67.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	72.9	71.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	85.0	3.0
Roller	No	20		80.0	85.0	3.0
Paver	No	50		77.2	85.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	70.1	67.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	72.9	65.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	70.1	67.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	72.9	71.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	69.6	66.6	N/A	N/A										
Roller	72.4	65.4	N/A	N/A										
Paver	69.6	66.6	N/A	N/A										
Total	72.4	71.0	N/A	N/A										

\*\*\*\* Receptor #3 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	165.0	3.0
Roller	No	20		80.0	165.0	3.0
Paver	No	50		77.2	165.0	3.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Paver	63.8	60.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	66.6	59.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	63.8	60.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	66.6	65.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	550.0	0.0
Roller	No	20		80.0	550.0	0.0
Paver	No	50		77.2	550.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	56.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	59.2	52.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	56.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.2	57.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P1 Architectural Coating

\*\*\*\* Receptor #1 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	75.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40	77.7	77.7	50.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	74.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	74.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40	77.7	77.7	50.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	74.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	74.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #3 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	110.0	3.0

Equipment	Results															
	Noise Limits (dBA)										Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night			
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq		
Compressor (air)	67.8	63.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Total	67.8	63.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	895.0	0.0

Equipment	Results															
	Noise Limits (dBA)										Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night			
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq		
Compressor (air)	52.6	48.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Total	52.6	48.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P1 Finishing/Landscaping

\*\*\*\* Receptor #1 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	75.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	125.0	3.0
Front End Loader	No	40		79.1	125.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	66.6	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	68.2	64.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.2	66.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	135.0	3.0
Front End Loader	No	40		79.1	135.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	65.9	62.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Front End Loader	67.5	63.5	N/A											
Total	67.5	65.8	N/A											

\*\*\*\* Receptor #3 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	100.0	3.0
Front End Loader	No	40		79.1	100.0	3.0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	68.5	64.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	70.1	66.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	70.1	68.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	840.0	0.0
Front End Loader	No	40		79.1	840.0	0.0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	53.1	49.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	54.6	50.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	54.6	52.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P2 Fine Grading

\*\*\*\* Receptor #1 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Equipment						
Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	250.0	3.0
Grader	No	40	85.0		250.0	3.0
Scraper	No	40		83.6	250.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	63.7	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	68.0	64.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	66.6	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.0	67.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Equipment						
Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	1000.0	3.0
Grader	No	40	85.0		1000.0	3.0
Scraper	No	40		83.6	1000.0	3.0

Results

Equipment	Noise Limits (dBA)						Noise Limit Exceedance (dBA)							
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	63.7	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	68.0	64.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	66.6	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.0	67.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	51.7	47.7	N/A	N/A										
Grader	56.0	52.0	N/A	N/A										
Scraper	54.6	50.6	N/A	N/A										
Total	56.0	55.2	N/A	N/A										

\*\*\*\* Receptor #3 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Equipment						
Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	295.0	3.0
Grader	No	40	85.0		295.0	3.0
Scraper	No	40		83.6	295.0	3.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Excavator	62.3	58.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	66.6	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	65.2	61.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	66.6	65.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Equipment						
Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	335.0	0.0
Grader	No	40	85.0		335.0	0.0
Scraper	No	40		83.6	335.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	64.2	60.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	68.5	64.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	67.1	63.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.5	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P2 Utility Trenching

\*\*\*\* Receptor #1 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	75.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	250.0	3.0
Excavator	No	40		80.7	250.0	3.0
Front End Loader	No	40		79.1	250.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	60.6	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	63.7	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	62.1	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	63.7	63.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	965.0	3.0
Excavator	No	40		80.7	965.0	3.0
Front End Loader	No	40		79.1	965.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	60.6	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	63.7	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	62.1	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	63.7	63.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	48.8	44.9	N/A	N/A										
Excavator	52.0	48.0	N/A	N/A										
Front End Loader	50.4	46.4	N/A	N/A										
Total	52.0	51.4	N/A	N/A										

\*\*\*\* Receptor #3 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	150.0	0.0
Excavator	No	40		80.7	150.0	0.0
Front End Loader	No	40		79.1	150.0	0.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Backhoe	68.0	64.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	71.2	67.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	69.6	65.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	71.2	70.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	175.0	0.0
Excavator	No	40		80.7	175.0	0.0
Front End Loader	No	40		79.1	175.0	0.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Backhoe	68.0	64.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Excavator	71.2	67.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Front End Loader	69.6	65.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Total	71.2	70.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Equipment	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	66.7	62.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	69.8	65.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	68.2	64.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	69.8	69.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P2 Building Construction

\*\*\*\* Receptor #1 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	265.0	3.0
Welder / Torch	No	40		74.0	265.0	3.0
Man Lift	No	20		74.7	265.0	3.0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	60.1	56.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	56.5	52.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	57.2	50.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	60.1	58.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	930.0	3.0
Welder / Torch	No	40		74.0	930.0	3.0
Man Lift	No	20		74.7	930.0	3.0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe														
Welder / Torch														
Man Lift														
Total														

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	49.2	45.2	N/A	N/A										
Welder / Torch	45.6	41.6	N/A	N/A										
Man Lift	46.3	39.3	N/A	N/A										
Total	49.2	47.5	N/A	N/A										

\*\*\*\* Receptor #3 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	110.0	3.0
Welder / Torch	No	40		74.0	110.0	3.0
Man Lift	No	20		74.7	110.0	3.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Backhoe	67.7	63.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	64.2	60.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	64.9	57.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	67.7	66.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	120.0	0.0
Welder / Torch	No	40		74.0	120.0	0.0
Man Lift	No	20		74.7	120.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	70.0	66.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	66.4	62.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	67.1	60.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	70.0	68.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P2 Paving

\*\*\*\* Receptor #1 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	75.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	200.0	3.0
Roller	No	20		80.0	200.0	3.0
Paver	No	50		77.2	200.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)						
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Paver	62.2	59.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	65.0	58.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	62.2	59.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	65.0	63.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	940.0	3.0
Roller	No	20		80.0	940.0	3.0
Paver	No	50		77.2	940.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	62.2	59.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	65.0	58.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	62.2	59.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	65.0	63.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	48.7	45.7	N/A	N/A										
Roller	51.5	44.5	N/A	N/A										
Paver	48.7	45.7	N/A	N/A										
Total	51.5	50.1	N/A	N/A										

\*\*\*\* Receptor #3 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	120.0	3.0
Roller	No	20		80.0	120.0	3.0
Paver	No	50		77.2	120.0	3.0

Results

Equipment	Noise Limits (dBA)										Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night			
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq		
Paver	66.6	63.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Roller	69.4	62.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Paver	66.6	63.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Total	69.4	68.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	150.0	0.0
Roller	No	20		80.0	150.0	0.0
Paver	No	50		77.2	150.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	67.7	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	70.5	63.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	67.7	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	70.5	69.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P2 Architectural Coating

\*\*\*\* Receptor #1 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	75.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40	77.7	77.7	150.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	65.1	61.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	65.1	61.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40	77.7	77.7	940.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	49.2	45.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	49.2	45.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #3 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	110.0	3.0

Equipment	Results															
	Noise Limits (dBA)										Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night			
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq		
Compressor (air)	67.8	63.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Total	67.8	63.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	140.0	0.0

Equipment	Results															
	Noise Limits (dBA)										Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night			
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq		
Compressor (air)	68.7	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Total	68.7	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P2 Finishing/Landscaping

\*\*\*\* Receptor #1 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	75.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	200.0	3.0
Front End Loader	No	40		79.1	200.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	62.5	58.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	64.1	60.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	64.1	62.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	920.0	3.0
Front End Loader	No	40		79.1	920.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	49.3	45.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Front End Loader	50.8	46.8	N/A											
Total	50.8	49.1	N/A											

\*\*\*\* Receptor #3 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	95.0	3.0
Front End Loader	No	40		79.1	95.0	3.0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)						
	Lmax	Leq	Day		Evening		Night		Day		Evening		Night		
			Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Backhoe	69.0	65.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	70.5	66.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	70.5	68.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	135.0	0.0
Front End Loader	No	40		79.1	135.0	0.0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)						
	Lmax	Leq	Day		Evening		Night		Day		Evening		Night		
			Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Backhoe	68.9	65.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	70.5	66.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	70.5	68.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P3 Fine Grading

\*\*\*\* Receptor #1 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	210.0	3.0
Grader	No	40	85.0		210.0	3.0
Scraper	No	40		83.6	210.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	65.2	61.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	69.5	65.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	68.1	64.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	69.5	68.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	1000.0	3.0
Grader	No	40	85.0		1000.0	3.0
Scraper	No	40		83.6	1000.0	3.0

Results

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

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	51.7	47.7	N/A	N/A										
Grader	56.0	52.0	N/A	N/A										
Scraper	54.6	50.6	N/A	N/A										
Total	56.0	55.2	N/A	N/A										

\*\*\*\* Receptor #3 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	485.0	3.0
Grader	No	40	85.0		485.0	3.0
Scraper	No	40		83.6	485.0	3.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Excavator	58.0	54.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	62.3	58.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	60.8	56.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	62.3	61.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	335.0	0.0
Grader	No	40	85.0		335.0	0.0
Scraper	No	40		83.6	335.0	0.0

Results

Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
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Equipment	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	64.2	60.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader	68.5	64.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	67.1	63.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.5	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P2 Utility Trenching

\*\*\*\* Receptor #1 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	75.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	150.0	3.0
Excavator	No	40		80.7	150.0	3.0
Front End Loader	No	40		79.1	150.0	3.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Backhoe	65.0	61.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Excavator	68.2	64.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Front End Loader	66.6	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Total	68.2	67.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

\*\*\*\* Receptor #2 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	965.0	3.0
Excavator	No	40		80.7	965.0	3.0
Front End Loader	No	40		79.1	965.0	3.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Backhoe	65.0	61.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Excavator	68.2	64.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Front End Loader	66.6	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Total	68.2	67.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	48.8	44.9	N/A	N/A										
Excavator	52.0	48.0	N/A	N/A										
Front End Loader	50.4	46.4	N/A	N/A										
Total	52.0	51.4	N/A	N/A										

\*\*\*\* Receptor #3 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	525.0	0.0
Excavator	No	40		80.7	525.0	0.0
Front End Loader	No	40		79.1	525.0	0.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Backhoe	57.1	53.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	60.3	56.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	58.7	54.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	60.3	59.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	175.0	0.0
Excavator	No	40		80.7	175.0	0.0
Front End Loader	No	40		79.1	175.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	66.7	62.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	69.8	65.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	68.2	64.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	69.8	69.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P3 Building Construction

\*\*\*\* Receptor #1 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	110.0	3.0
Welder / Torch	No	40		74.0	110.0	3.0
Man Lift	No	20		74.7	110.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	67.7	63.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	64.2	60.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	64.9	57.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	67.7	66.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	930.0	3.0
Welder / Torch	No	40		74.0	930.0	3.0
Man Lift	No	20		74.7	930.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	67.7	63.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	64.2	60.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	64.9	57.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	67.7	66.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	49.2	45.2	N/A	N/A										
Welder / Torch	45.6	41.6	N/A	N/A										
Man Lift	46.3	39.3	N/A	N/A										
Total	49.2	47.5	N/A	N/A										

\*\*\*\* Receptor #3 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	425.0	3.0
Welder / Torch	No	40		74.0	425.0	3.0
Man Lift	No	20		74.7	425.0	3.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Backhoe	56.0	52.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	52.4	48.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	53.1	46.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	56.0	54.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	120.0	0.0
Welder / Torch	No	40		74.0	120.0	0.0
Man Lift	No	20		74.7	120.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	70.0	66.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	66.4	62.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	67.1	60.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	70.0	68.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P3 Paving

\*\*\*\* Receptor #1 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	75.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	130.0	3.0
Roller	No	20		80.0	130.0	3.0
Paver	No	50		77.2	130.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	65.9	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	68.7	61.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	65.9	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.7	67.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	940.0	3.0
Roller	No	20		80.0	940.0	3.0
Paver	No	50		77.2	940.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	65.9	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	68.7	61.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	65.9	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.7	67.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	48.7	45.7	N/A	N/A										
Roller	51.5	44.5	N/A	N/A										
Paver	48.7	45.7	N/A	N/A										
Total	51.5	50.1	N/A	N/A										

\*\*\*\* Receptor #3 \*\*\*\*

Description	Baselines (dBA)			
	Land Use	Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	445.0	3.0
Roller	No	20		80.0	445.0	3.0
Paver	No	50		77.2	445.0	3.0

Results

Equipment	Noise Limits (dBA)									Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night		
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Paver	55.2	52.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	58.0	51.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	55.2	52.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	58.0	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	150.0	0.0
Roller	No	20		80.0	150.0	0.0
Paver	No	50		77.2	150.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	67.7	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	70.5	63.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	67.7	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	70.5	69.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P3 Architectural Coating

\*\*\*\* Receptor #1 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	75.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40	77.7	77.7	110.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	67.8	63.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	67.8	63.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40	77.7	77.7	940.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	49.2	45.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	49.2	45.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #3 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	420.0	3.0

Equipment	Results															
	Noise Limits (dBA)										Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night			
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq		
Compressor (air)	56.2	52.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Total	56.2	52.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	140.0	0.0

Equipment	Results															
	Noise Limits (dBA)										Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night			
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq		
Compressor (air)	68.7	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Total	68.7	64.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 02/14/2025  
 Case Description: CFV-18.0 Euclid and Heil -P3 Finishing/Landscaping

\*\*\*\* Receptor #1 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
North Receptor 6' Masonry Wall	Residential	50.0	75.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40	77.6	77.6	120.0	3.0
Front End Loader	No	40	79.1	79.1	120.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	67.0	63.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	68.5	64.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	68.5	66.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #2 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
East Receptor 6' Masonry Wall	Residential	50.0	50.0	45.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40	77.6	77.6	920.0	3.0
Front End Loader	No	40	79.1	79.1	920.0	3.0

Results

Equipment	Noise Limits (dBA)								Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	49.3	45.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Front End Loader	50.8	46.8	N/A											
Total	50.8	49.1	N/A											

\*\*\*\* Receptor #3 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
South Receptor 6' Masonry Wall	Residential	65.0	60.0	55.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	460.0	3.0
Front End Loader	No	40		79.1	460.0	3.0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	55.3	51.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	56.8	52.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	56.8	55.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

\*\*\*\* Receptor #4 \*\*\*\*

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
West Receptor	Commercial	70.0	65.0	60.0

Description	Impact Device	Usage (%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	135.0	0.0
Front End Loader	No	40		79.1	135.0	0.0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	68.9	65.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	70.5	66.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	70.5	68.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

# STATIONARY NOISE MODELING

**38HDR  
Performance™ Series Air Conditioner  
with Puron® Refrigerant  
1 – 1/2 to 5 Nominal Tons**



Turn to the Experts.™

## Product Data

### INDUSTRY LEADING FEATURES / BENEFITS



Performance  
SERIES

Carrier's Air Conditioners with Puron® refrigerant provide a collection of features unmatched by any other family of equipment. The 38HDR has been designed utilizing Carrier's Puron refrigerant. The environmentally sound refrigerant allows you to make a responsible decision in the protection of the earth's ozone layer.

As an Energy Star® Partner, Carrier Corporation has determined that this product meets the Energy Star® guidelines for energy efficiency. Refer to the combination ratings in the Product Data for system combinations that meet Energy Star® guidelines.

**NOTE: Ratings contained in this document are subject to change at any time. Always refer to the AHRI directory ([www.ahridirectory.org](http://www.ahridirectory.org)) for the most up-to-date ratings information.**

#### Energy Efficiency

- 13 - 15 SEER/10.9 - 12.5 EER

#### Sound

- Levels as low as 68 dBA

#### Design Features

- New aesthetics
- Small footprint, same as old model and "stackable"
- WeatherArmor™ cabinet
  - All steel cabinet construction
  - Baked on powder paint
  - Mesh coil guard

#### Reliability, Quality and Toughness

- Scroll compressor
- Crankcase Heater standard on sizes 030-060
- Factory-supplied filter drier
- High pressure switch
- Low pressure switch
- Line lengths up to 250' (76.2 m)
- Low ambient operation (down to -20°F/-28.9°C) with low ambient accessories.

# MODEL NUMBER NOMENCLATURE

1	2	3	4	5	6	7	8	9	10	11	12	13
N	N	A	A	A/N	N	N	N	A/N	A/N	A/N	N	N
3	8	H	D	R	0	1	8	A	0	0	3	0

Product Series      HDR = Horizontal Discharge Condensing Unit      Cooling Capacity      Variations      Open      Open      Voltage      Minor Series

38=AC/HP      Major Model      1,000 Btuh Nominal      A=Standard      0=Not Defined      0=Not Defined      3=208/230-1  
5=208/230-3  
6=460/3      0, 1, 2...



This product has been designed and manufactured to meet Energy Star® criteria for energy efficiency when matched with appropriate coil components. However, proper refrigerant charge and proper air flow are critical to achieve rated capacity and efficiency. Installation of this product should follow all manufacturing refrigerant charging and air flow instructions. **Failure to confirm proper charge and air flow may reduce energy efficiency and shorten equipment life.**

## PHYSICAL DATA

UNIT 38HDR	018	024	030	036	048	060
<b>NOMINAL CAPACITY (Tons)</b>	1.5	2.0	2.50	3.0	4.0	5.0
<b>OPERATING WEIGHT lb (kg)</b>	155 (70.3)	180 (81.6)	200 (90.7)	218 (98.9)	284 (128.8)	294 (133.4)
<b>REFRIGERANT TYPE</b>	R-410A					
<b>METERING DEVICE</b>	TXV					
<b>CHARGE lb (kg)</b>	6.3 (2.86)	6.0 (2.73)	8.7 (3.95)	8.7 (3.95)	11.5 (5.23)	12.0 (5.45)
<b>COMPRESSOR</b>	Scroll					
Type	Scroll					
Oil Charge (POE – oz)	25.0	25.0	25.0	25.0	42.0	42.0
Crankcase Heater (watts)	—	—	40	40	40	40
<b>OUTDOOR FAN</b>						
Rpm/Cfm	840/1720	840/1720	850/3900	850/3900	850/3900	850/3900
Diameter in. (mm)	18 (457)	18 (457)	24 (610)	24 (610)	24 (610)	24 (610)
No. Blades	3	3	3	3	3	3
Motor hp (w)	1/8 (93)	1/8 (93)	1/4 (187)	1/4 (187)	1/4 (187)	1/4 (187)
<b>OUTDOOR COIL</b>						
Face Area (sq ft)	5.8	7.3	12.1	12.1	14.1	14.1
No. Rows	2	2	2	2	2	2
FPI	20	20	20	20	20	20
<b>HIGH PRESSURE SWITCH</b>						
Cut-In (psig) Cutout (psig)	420 ± 25 650 ± 10	420 ± 25 650 ± 10	420 ± 25 650 ± 10			
<b>LOW PRESSURE SWITCH</b>						
Cut-In (psig) Cutout (psig)	45 ± 25 20 ± 5	45 ± 25 20 ± 5	45 ± 25 20 ± 5			
<b>REFRIGERANT LINES</b>						
Connection Type	Sweat					
Max. Liquid Line* (in.) OD	3/8	3/8	3/8	3/8	3/8	3/8
Rated Vapor Line† (in.) OD	5/8	5/8	3/4	3/4	7/8	1-1/8**
<b>CONTROLS</b>						
Control Voltage‡	24 vac					
System Voltage	208/230 v	208/230 v	208/230 v	208/230 v, Single and 3 Phase, 460 v, 3 Phase		
<b>FINISH</b>	Gray					

\* See *Liquid Line Sizing For Cooling Only Systems with Puron Refrigerant* tables.

† Units are rated with 25 ft (7.6 m) of lineset length. See *Vapor Line Sizing and Cooling Capacity Loss* table when using other sizes and lengths of lineset.

‡ 24 v and a minimum of 40 va is provided in the fan coil unit.

\*\* Vapor connection size is 7/8 inch.

FPI – Fins Per Inch

POE – Polyol Ester

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# REFRIGERANT PIPING LENGTH LIMITATIONS

## Liquid Line Sizing and Maximum Total Equivalent Lengths† for Cooling Only Systems with Puron® Refrigerant:

The maximum allowable length of a residential split system depends on the liquid line diameter and vertical separation between indoor and outdoor units.

See Table below for liquid line sizing and maximum lengths :

### Maximum Total Equivalent Length Outdoor Unit BELOW Indoor Unit

Size	Liquid Line Connection	Liquid Line Diam. w/ TXV	AC with Puron Refrigerant Maximum Total Equivalent Length†: Outdoor unit BELOW Indoor Vertical Separation ft (m)								
			0-5 (0-1.5)	6-10 (1.8-3.0)	11-20 (3.4-6.1)	21-30 (6.4-9.1)	31-40 (9.4-12.2)	41-50 (12.5-15.2)	51-60 (15.5-18.3)	61-70 (18.6-21.3)	71-80 (21.6-24.4)
018 AC with Puron	3/8	1/4	150	150	125	100	100	75	--	--	--
		5/16	250*	250*	250*	250*	250*	250*	250*	225*	150
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
024 AC with Puron	3/8	1/4	75	75	75	50	50	--	--	--	--
		5/16	250*	250*	250*	250*	250*	225*	175	125	100
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
030 AC with Puron	3/8	1/4	30	--	--	--	--	--	--	--	--
		5/16	175	225*	200	175	125	100	75	--	--
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
036 AC with Puron	3/8	5/16	175	150	150	100	100	100	75	--	--
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
048 AC with Puron	3/8	3/8	250*	250*	250*	250*	250*	250*	230	160	--
060 AC with Puron	3/8	3/8	250*	250*	250*	225*	190	150	110	--	--

\* Maximum actual length not to exceed 200 ft (61 m)

† Total equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.

-- = outside acceptable range

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### Maximum Total Equivalent Length Outdoor Unit ABOVE Indoor Unit

Size	Liquid Line Connection	Liquid Line Diam. w/ TXV	AC with Puron Refrigerant Maximum Total Equivalent Length†: Outdoor unit ABOVE Indoor Vertical Separation ft (m)								
			25 (7.6)	26-50 (7.9-15.2)	51-75 (15.5-22.9)	76-100 (23.2-30.5)	101-125 (30.8-38.1)	126-150 (38.4-45.7)	151-175 (46.0-53.3)	176-200 (53.6-61.0)	
018 AC with Puron	3/8	1/4	175	250*	250*	250*	250*	250*	250*	250*	250*
		5/16	250*	250*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
024 AC with Puron	3/8	1/4	100	125	175	200	225*	250*	250*	250*	250*
		5/16	250*	250*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
030 AC with Puron	3/8	1/4	30	--	--	--	--	--	--	--	--
		5/16	250*	250*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
036 AC with Puron	3/8	5/16	225*	250*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
048 AC with Puron	3/8	3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*
060 AC with Puron	3/8	3/8	250*	250*	250*	250*	250*	250*	250*	250*	250*

\* Maximum actual length not to exceed 200 ft (61 m)

† Total equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.

-- = outside acceptable range

## REFRIGERANT CHARGE ADJUSTMENTS

Liquid Line Size	Puron Charge oz/ft (g/m)
3/8	0.60 (17.74) (Factory charge for lineset = 9 oz / 266.16 g)
5/16	0.40 (11.83)
1/4	0.27 (7.98)

Units are factory charged for 15 ft (4.6 m) of 3/8" liquid line. The factory charge for 3/8" lineset 9 oz (266.16 g). When using other length or diameter liquid lines, charge adjustments are required per the chart above.

### Charging Formula:

$[(\text{Lineset oz/ft} \times \text{total length}) - (\text{factory charge for lineset})] = \text{charge adjustment}$

**Example 1:** System has 15 ft of line set using existing 1/4" liquid line. What charge adjustment is required?

Formula:  $(.27 \text{ oz/ft} \times 15\text{ft}) - (9 \text{ oz}) = (-4.95) \text{ oz.}$

Net result is to remove 4.95 oz of refrigerant from the system

**Example 2:** System has 45 ft of existing 5/16" liquid line. What is the charge adjustment?

Formula:  $(.40 \text{ oz/ft.} \times 45\text{ft}) - (9 \text{ oz.}) = 9 \text{ oz.}$

Net result is to add 9 oz of refrigerant to the system

## LONG LINE APPLICATIONS

An application is considered Long Line, when the refrigerant level in the system requires the use of accessories to maintain acceptable refrigerant management for systems reliability. See Accessory Usage Guideline table for required accessories. Defining a system as long line depends on the liquid line diameter, actual length of the tubing, and vertical separation between the indoor and outdoor units.

For Air Conditioner systems, the chart below shows when an application is considered Long Line.

### AC WITH PURON® REFRIGERANT LONG LINE DESCRIPTION ft (m)

**Beyond these lengths, long line accessories are required**

Liquid Line Size	Units On Same Level	Outdoor Below Indoor	Outdoor Above Indoor
1/4	No accessories needed within allowed lengths	No accessories needed within allowed lengths	175 (53.3)
5/16	120 (36.6)	50 (15.2) vertical or 120 (36.6) total	120 (36.6)
3/8	80 (24.4)	35 (10.7) vertical or 80 (24.4) total	80 (24.4)

**Note:** See Long Line Guideline for details

## VAPOR LINE SIZING AND COOLING CAPACITY LOSS

Acceptable vapor line diameters provide adequate oil return to the compressor while avoiding excessive capacity loss. The suction line diameters shown in the chart below are acceptable for AC systems with Puron refrigerant:

### Vapor Line Sizing and Cooling Capacity Losses — Puron® Refrigerant 1-Stage Air Conditioner Applications

Unit Nominal Size (Btuh)	Maximum Liquid Line Diameters (In. OD)	Vapor Line Diameters (In. OD)	Cooling Capacity Loss (%)								
			Total Equivalent Line Length ft. (m)								
			26-50 (7.9-15.2)	51-80 (15.5-24.4)	81-100 (24.7-30.5)	101-125 (30.8-38.1)	126-150 (38.4-45.7)	151-175 (46.0-53.3)	176-200 (53.6-61.0)	201-225 (61.3-68.6)	226-250 (68.9-76.2)
018 1 Stage AC with Puron	3/8	1/2	1	2	3	5	6	7	8	9	11
		5/8	0	1	1	1	2	2	2	3	3
		3/4	0	0	0	0	1	1	1	1	1
024 1 Stage AC with Puron	3/8	5/8	0	1	2	2	3	3	4	5	5
		3/4	0	0	1	1	1	1	1	2	2
		7/8	0	0	0	0	0	1	1	1	1
030 1 Stage AC with Puron	3/8	5/8	1	2	3	3	4	5	6	7	8
		3/4	0	0	1	1	1	2	2	2	3
		7/8	0	0	0	0	1	1	1	1	1
036 1 Stage AC with Puron	3/8	5/8	1	2	4	5	6	8	9	10	12
		3/4	0	1	1	2	2	3	3	4	4
		7/8	0	0	0	1	1	1	1	2	2
048 1 Stage AC with Puron	3/8	3/4	0	1	2	3	4	5	5	6	7
		7/8	0	0	1	1	2	2	2	3	3
		1 1/8	0	0	0	0	0	0	0	1	1
060 1 Stage AC with Puron	3/8	3/4	1	2	4	5	6	7	9	10	11
		7/8	0	1	2	2	3	4	4	5	5
		1 1/8	0	0	0	1	1	1	1	1	1

Applications in this area may be long line and may have height restrictions. See the *Residential Piping and Long Line Guideline*.

## ACCESSORY THERMOSTATS

THERMOSTAT / SUBBASE PKG.	DESCRIPTION
TP-PRH01-A	Programmable Thermidistat
TP-NRH01-A	Non-programmable Thermidistat
TP-PAC01	Performance Series Programmable AC Stat
TP-NAC01	Performance Series Non-programmable AC Stat
TSTATCCSEN01-B	Outdoor Air Temperature Sensor
TSTATXXBBP01	Backplate for Builder's Thermostat
TSTATXXNBP01	Backplate for Non-Programmable Thermostat
TSTATXXBP01	Backplate for Programmable Thermostat
TSTATXXCNV10	Thermostat Conversion Kit (4 to 5 wires) - 10 Pack

## ACCESSORIES

KIT NUMBER	KIT NAME	018	024	030	036	048	060
KAACH1401AAA	Crankcase Heater	X	X				
Standard	Crankcase Heater			S	S	S	S
KAFT0101AAA	Evaporator Freeze Stat	X	X	X	X	X	X
KAATD0101TDR	Time Delay Relay	X	X	X	X	X	X
KAWS0101AAA	Winter Start Kit (for low ambient)	X	X	X	X	X	X
53DS-900---086	Low Ambient Control (Puron)	X	X	X	X	X	X
53DS-900---070	Wind Baffle	X					
53DS-900---087	Wind Baffle		X				
53DS-900---071	Wind Baffle			X	X		
53DS-900---088	Wind Baffle					X	X
53DS-900---075	Stacking Kit	X	X				
53DS-900---076	Stacking Kit			X	X	X	X
53DS-900---077	Wall Mounting Kit	X	X				
53DS-900---078	Wall Mounting Kit			X	X	X	X

X = Accessory, S = Standard

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# ACCESSORY USAGE GUIDELINE

ACCESSORY	REQUIRED FOR LOW-AMBIENT COOLING APPLICATIONS (Below 55°F/12.8°C)	REQUIRED FOR LONG LINE APPLICATIONS* (Over 80 ft. / 24.4 m)	REQUIRED FOR SEA COAST APPLICATIONS (Within 2 miles / 3.2 km)
Compressor Start Assist Capacitor and Relay	Yes	Yes	No
Crankcase Heater	Yes	Yes	No
Evaporator Freeze Thermostat	Yes	No	No
Hard Shutoff TXV	Yes	Yes	Yes
Liquid Line Solenoid Valve	No	See Longline Application Guideline	No
Low-ambient Control	Yes	No	No
Winter Start Control	Yes	No	No

\* For tubing line sets between 80 and 200 ft. (24.38 and 60.96 m) and/or 35 ft. (10.7 m) vertical differential, refer to Residential Piping and Longline Guideline.

## Accessory Description and Usage (Listed Alphabetically)

### 1. Crankcase Heater

An electric resistance heater which mounts to the base of the compressor to keep the lubricant warm during off cycles. Improves compressor lubrication on restart and minimizes the chance of liquid slugging.

Usage Guideline:

Required in low ambient cooling applications.

Required in long line applications.

Suggested in all commercial applications.

### 2. Evaporator Freeze Thermostat

An SPST temperature-actuated switch that stops unit operation when evaporator reaches freeze-up conditions.

Usage Guideline:

Required when low ambient kit has been added.

### 3. Low-Ambient Control

A fan-speed control device activated by a temperature sensor, designed to control condenser fan motor speed in response to the saturated, condensing temperature during operation in cooling mode only. For outdoor temperatures down to -20°F (-28.9°C), it maintains condensing temperature at 100°F ±10°F (37.8°C ± 5.5°C).

Usage Guideline:

A Low Ambient Controller must be used when cooling operation is used at outdoor temperatures below 55°F (12.8°C).

Suggested for all commercial applications.

### 4. Outdoor Air Temperature Sensor

Designed for use with Carrier Thermostats listed in this publication. This device enables the thermostat to display the outdoor temperature. This device also

is required to enable special thermostat features such as auxiliary heat lock out.

Usage Guideline:

Suggested for all Carrier thermostats listed in this publication.

### 5. Thermostatic Expansion Valve (TXV)

A modulating flow-control valve which meters refrigerant liquid flow rate into the evaporator in response to the superheat of the refrigerant gas leaving the evaporator.

Kit includes valve, adapter tubes, and external equalizer tube. Hard shut off types are available.

**NOTE:** When using a hard shut off TXV with single phase reciprocating compressors, a Compressor Start Assist Capacitor and Relay is required.

Usage Guideline:

Accessory required to meet ARI rating and system reliability, where indoor not equipped.

Hard shut off TXV or LLS required in air conditioner long line applications.

Required for use on all zoning systems.

### 6. Time-Delay Relay

An SPST delay relay which briefly continues operation of indoor blower motor to provide additional cooling after the compressor cycles off.

**NOTE:** Most indoor unit controls include this feature. For those that do not, use the guideline below.

Usage Guideline:

Accessory required to meet ARI rating, where indoor not equipped.

### 7. Winter Start Control

This control is designed to alleviate nuisance opening of the low-pressure switch by bypassing it for the first 3 minutes of operation.

# ELECTRICAL DATA

38HDR UNIT SIZE	V-PH-Hz	VOLTAGE RANGE*		COMPRESSOR		OUTDOOR FAN MOTOR			MIN CKT AMPS	FUSE/CKT BKR AMPS
		Min	Max	RLA	LRA	FLA	NEC Hp	kW Out		
018-31	208/230-1-60	187	253	9.0	48.0	0.8	0.125	0.09	12.1	20
024-32	208/230-1-60	187	253	13.5	58.3	0.8	0.125	0.09	17.7	25
030-31	208/230-1-60	187	253	14.1	73.0	1.5	0.250	0.19	19.1	30
036-31	208/230-1-60	187	253	14.1	77.0	1.5	0.250	0.19	19.1	30
	208/230-3-60	187	253	9.2	71.0	1.5	0.250	0.19	13.0	20
	460-3-60	414	506	5.6	38.0	0.8	0.250	0.19	7.9	10
048-32	208/230-1-60	187	253	19.9	109.0	1.5	0.250	0.19	26.4	40
	208/230-3-60	187	253	13.1	83.1	1.5	0.250	0.19	17.9	25
	460-3-60	414	506	6.1	41.0	0.8	0.250	0.19	8.4	15
060-32	208/230-1-60	187	253	26.4	134.0	1.5	0.250	0.19	34.5	60
	208/230-3-60	187	253	16.0	110.0	1.5	0.250	0.19	21.5	30
	460-3-60	414	506	7.8	52.0	0.8	0.250	0.19	10.6	15

\* Permissible limits of the voltage range at which the unit will operate satisfactorily

- FLA – Full Load Amps
- HACR – Heating, Air Conditioning, Refrigeration
- LRA – Locked Rotor Amps
- NEC – National Electrical Code
- RLA – Rated Load Amps (compressor)

**NOTE:** Control circuit is 24-V on all units and requires external power source. Copper wire must be used from service disconnect to unit. All motors/compressors contain internal overload protection.

Complies with 2007 requirements of ASHRAE Standards 90.1

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## A-WEIGHTED SOUND POWER (dBA)

Unit Size	Standard Rating (dBA)	Typical Octave Band Spectrum ( dBA ) (without tone adjustment)						
		125	250	500	1000	2000	4000	8000
018-31	68	52.0	57.5	60.5	63.5	60.5	57.5	46.5
024-32	69	57.5	61.5	63.0	61.0	60.0	56.0	45.0
030-31	72	56.5	63.0	65.0	66.0	64.0	62.5	57.0
036-31	72	65.0	61.5	63.5	65.0	64.5	61.0	54.5
048-32	72	58.5	61.0	64.0	67.5	66.0	64.0	57.0
060-32	72	63.0	61.5	64.0	66.5	66.0	64.5	55.5

**NOTE:** Tested in accordance with ARI Standard 270-08 (not listed in AHRI).

## CHARGING SUBCOOLING (TXV-TYPE EXPANSION DEVICE)

UNIT SIZE-VOLTAGE, SERIES	REQUIRED SUBCOOLING °F (°C)
018-31	12 (6.7)
024-32	12 (6.7)
030-31	12 (6.7)
036-31	12 (6.7)
048-32	12 (6.7)
060-32	12 (6.7)

# TRAFFIC NOISE MODELING

Traffic Noise Calculator: FHWA 77-108																							
Euclid and Heil Residential (CFV-18.0) Existing 2024 Traffic Noise Traffic Conditions																							
ID	Output						Inputs														Auto Inputs		
	dBA at 50 feet			Distance to CNEL Contour			Roadway	Segment From - To	ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Receiver	Ground Absorption	Lane Distance	
L <sub>eq,24hr</sub>	L <sub>dn</sub>	CNEL	70 dBA	65 dBA	60 dBA																		
1	70.8	73.5	74.2	96	206	444	Euclid Street	the North	Edinger Ave	33,500	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
2	69.5	72.3	73.0	79	171	368	Euclid Street	Edinger Ave	Driveway 2	26,100	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	5	Soft	50	0.5	56
3	71.1	73.9	74.6	101	218	469	Euclid Street	Driveway 2	Heil Ave	37,500	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	5	Soft	50	0.5	56
4	71.1	73.9	74.6	101	217	467	Euclid Street	Heil Ave	Stonecress Ave	37,300	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	5	Soft	50	0.5	56
5	71.0	73.8	74.5	99	214	461	Euclid Street	Stonecress Ave	Warner Ave	35,500	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
6	69.6	72.4	73.1	80	173	373	Euclid Street	Warner Ave	Slater Ave	25,800	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
7	70.2	73.0	73.7	88	189	407	Euclid Street	Slater Ave	Talbert Ave	29,400	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
8	67.9	70.7	71.4	62	133	287	Euclid Street	Talbert Ave	the South	17,400	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
9	69.0	71.8	72.5	74	159	342	Newhope Street	Edinger Ave	Heil Ave	23,900	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
10	67.8	70.6	71.3	61	131	282	Newhope Street	Heil Ave	Quartz Ave	23,400	40	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
11	68.2	71.0	71.7	65	139	301	Newhope Street	Quartz Ave	Warner Ave	25,800	40	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
12	67.9	70.7	71.4	62	133	287	Newhope Street	Warner Ave	Slater Ave	24,100	40	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
13	47.5	50.3	51.0	3	6	13	Sugarloaf Street	Heil Ave	the South	600	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Soft	50	0.5	20
14	69.4	72.2	72.9	78	169	363	Edinger Avenue	the West	Euclid Ave	26,200	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
15	68.4	71.2	71.9	66	143	309	Edinger Avenue	Euclid Ave	the East	20,500	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
16	56.8	59.6	60.3	11	24	52	Heil Avenue	Euclid Ave	Driveway 1	5,100	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Soft	50	0.5	20
17	56.8	59.6	60.3	11	24	52	Heil Avenue	Street A	Street B/Sugarload St.	5,100	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Soft	50	0.5	20
18	62.3	65.1	65.8	26	56	121	Heil Avenue	Street B/Sugarload St.	Mt. Neota St.	5,200	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Soft	50	0.5	20
19	62.1	64.9	65.5	25	54	117	Heil Avenue	Mt. Neota St.	Newhope St.	4,800	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
20	58.2	61.0	61.7	14	30	65	Heil Avenue	Newhope St.	the East	6,800	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
21	71.7	74.5	75.2	111	240	517	Warner Avenue	the West	Euclid Ave	42,100	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
22	70.8	73.6	74.3	97	209	450	Warner Avenue	the West	Euclid Ave	34,200	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
23	71.5	74.2	74.9	107	230	495	Warner Avenue	Mt. Hope	Newhope St.	39,400	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
24	71.2	74.0	74.7	103	222	479	Warner Avenue	Newhope St.	the East	37,500	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
25	71.1	73.9	74.6	101	218	470	Talbert Avenue	the West	Euclid Ave	36,500	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
26	70.9	73.7	74.4	98	211	455	Talbert Avenue	Euclid Ave	the East	34,700	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68

Traffic Noise Calculator: FHWA 77-108																							
Euclid and Heil Residential (CFV-18.0) Opening Year 2026 No Project Traffic Noise Traffic Conditions																							
ID	Output						Inputs														Auto Inputs		
	dBA at 50 feet			Distance to CNEL Contour			Roadway	Segment From - To	ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Receiver	Ground Absorption	Lane Distance	
L <sub>eq,24hr</sub>	L <sub>dn</sub>	CNEL	70 dBA	65 dBA	60 dBA																		
1	71.0	73.7	74.4	99	213	458	Euclid Street	the North	Edinger Ave	35,100	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
2	71.1	73.9	74.6	102	219	471	Euclid Street	Edinger Ave	Driveway 2	37,800	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	5	Soft	50	0.5	56
3	70.9	73.7	74.4	98	211	455	Euclid Street	Driveway 2	Heil Ave	35,800	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	5	Soft	50	0.5	56
4	71.3	74.1	74.8	104	223	481	Euclid Street	Heil Ave	Stonecress Ave	39,000	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	5	Soft	50	0.5	56
5	71.2	74.0	74.7	103	221	476	Euclid Street	Stonecress Ave	Warner Ave	37,200	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
6	69.9	72.7	73.4	84	182	391	Euclid Street	Warner Ave	Slater Ave	27,700	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
7	70.4	73.1	73.8	90	194	418	Euclid Street	Slater Ave	Talbert Ave	30,600	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
8	68.2	70.9	71.6	64	138	298	Euclid Street	Talbert Ave	the South	18,400	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
9	69.1	71.9	72.6	74	160	346	Newhope Street	Edinger Ave	Heil Ave	24,300	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
10	67.9	70.7	71.4	62	133	286	Newhope Street	Heil Ave	Quartz Ave	23,900	40	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
11	68.3	71.1	71.8	66	141	304	Newhope Street	Quartz Ave	Warner Ave	26,300	40	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
12	68.0	70.8	71.5	63	135	291	Newhope Street	Warner Ave	Slater Ave	24,600	40	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
13	47.5	50.3	51.0	3	6	13	Sugarloaf Street	Heil Ave	the South	600	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Soft	50	0.5	20
14	69.6	72.3	73.0	80	172	370	Edinger Avenue	the West	Euclid Ave	26,900	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
15	68.5	71.3	72.0	68	146	314	Edinger Avenue	Euclid Ave	the East	21,000	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
16	56.9	59.7	60.4	11	25	53	Heil Avenue	Euclid Ave	Driveway 1	5,200	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Soft	50	0.5	20
17	56.9	59.7	60.4	11	25	53	Heil Avenue	Street A	Street B/Sugarload St.	5,200	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Soft	50	0.5	20
18	62.4	65.2	65.9	26	57	123	Heil Avenue	Street B/Sugarload St.	Mt. Neota St.	5,300	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Soft	50	0.5	20
19	62.2	65.0	65.6	26	55	119	Heil Avenue	Mt. Neota St.	Newhope St.	4,900	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
20	58.3	61.1	61.8	14	31	66	Heil Avenue	Newhope St.	the East	7,000	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
21	72.0	74.8	75.5	116	249	537	Warner Avenue	the West	Euclid Ave	44,500	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
22	71.0	73.8	74.5	99	213	460	Warner Avenue	Euclid Ave	Mt. Hope	35,300	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
23	71.6	74.4	75.1	109	234	505	Warner Avenue	Mt. Hope	Newhope St.	40,600	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
24	71.4	74.2	74.8	105	226	488	Warner Avenue	Newhope St.	the East	38,600	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
25	71.2	74.0	74.7	103	221	477	Talbert Avenue	the West	Euclid Ave	37,300	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
26	71.0	73.8	74.5	99	213	460	Talbert Avenue	Euclid Ave	the East	35,300	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68

Traffic Noise Calculator: FHWA 77-108																							
Euclid and Heil Residential (CFV-18.0) Opening Year 2026 with Project Traffic Noise Traffic Conditions																							
ID	Output						Inputs														Auto Inputs		
	dBA at 50 feet			Distance to CNEL Contour			Roadway	Segment From - To	ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Receiver	Ground Absorption	Lane Distance	
L <sub>eq,24hr</sub>	L <sub>dn</sub>	CNEL	70 dBA	65 dBA	60 dBA																		
1	71.0	73.8	74.5	100	215	462	Euclid Street	the North	Edinger Ave	35,600	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
2	71.3	74.1	74.7	104	223	480	Euclid Street	Edinger Ave	Driveway 2	38,900	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	5	Soft	50	0.5	56
3	71.0	73.8	74.5	100	215	464	Euclid Street	Driveway 2	Heil Ave	36,900	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	5	Soft	50	0.5	56
4	71.4	74.2	74.9	106	229	494	Euclid Street	Heil Ave	Stonecress Ave	40,500	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	5	Soft	50	0.5	56
5	71.4	74.2	74.9	105	227	489	Euclid Street	Stonecress Ave	Warner Ave	38,700	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
6	70.1	72.8	73.5	86	185	399	Euclid Street	Warner Ave	Slater Ave	28,500	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
7	70.5	73.3	73.9	92	197	425	Euclid Street	Slater Ave	Talbert Ave	31,400	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
8	68.2	71.0	71.7	65	140	302	Euclid Street	Euclid Street	the South	18,800	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
9	69.2	71.9	72.6	75	161	347	Newhope Street	Edinger Ave	Heil Ave	24,500	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
10	68.0	70.7	71.4	62	134	289	Newhope Street	Heil Ave	Quartz Ave	24,300	40	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
11	68.4	71.1	71.8	66	143	307	Newhope Street	Quartz Ave	Warner Ave	26,700	40	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
12	68.1	70.9	71.5	63	137	294	Newhope Street	Warner Ave	Slater Ave	25,000	40	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
13	47.5	50.3	51.0	3	6	13	Sugarloaf Street	Heil Ave	the South	600	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Soft	50	0.5	20
14	69.6	72.4	73.1	81	174	374	Edinger Avenue	the West	Euclid Ave	27,400	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
15	68.5	71.3	72.0	68	146	314	Edinger Avenue	Euclid Ave	the East	21,100	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
16	57.8	60.6	61.3	13	28	61	Heil Avenue	Euclid Ave	Driveway 1	6,400	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Soft	50	0.5	20
17	57.8	60.6	61.3	13	28	61	Heil Avenue	Street A	Street B/Sugarload St.	6,400	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Soft	50	0.5	20
18	63.0	65.8	66.5	29	63	135	Heil Avenue	Street B/Sugarload St.	Mt. Neota St.	6,100	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	2	Soft	50	0.5	20
19	62.7	65.5	66.2	28	60	130	Heil Avenue	Mt. Neota St.	Newhope St.	5,600	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
20	58.5	61.3	62.0	15	32	68	Heil Avenue	Newhope St.	the East	7,300	25	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	4	Soft	50	0.5	44
21	72.0	74.8	75.5	116	251	541	Warner Avenue	the West	Euclid Ave	45,000	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
22	71.0	73.8	74.5	99	214	461	Warner Avenue	Euclid Ave	Mt. Hope	35,500	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
23	71.6	74.4	75.1	109	235	506	Warner Avenue	Mt. Hope	Newhope St.	40,700	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
24	71.4	74.2	74.9	105	227	490	Warner Avenue	Newhope St.	the East	38,800	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
25	71.2	74.0	74.7	103	221	477	Talbert Avenue	the West	Euclid Ave	37,300	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68
26	71.0	73.8	74.5	100	215	463	Talbert Avenue	Euclid Ave	the East	35,700	45	0.0%	96.0%	2.5%	1.5%	75.0%	15.0%	10.0%	6	Soft	50	0.5	68