Visalia Rally's Development

Noise Study Report
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1.0 Introduction

1.1 Description of the Region/Project

This Noise Study Report (NSR) has been prepared for the purpose of identifying potential noise impacts that may result from the proposed Rally's Development, which seeks to develop a fast-food restaurant with drive through window in the City of Visalia. The Project is located at the southeast quadrant of the Road 124-Dinuba Boulevard (State Route 63) and Riggin Avenue intersection. The Project will be located to the north of an existing residential development, separated by a 7-foot-high concrete block wall. Figures 1 and 2 show the location of the Project along with major roadways and highways. Figure 3 provides the site plan prepared for the Project. The Project building area would comprise approximately 1,088 square feet which accounts for roughly 3.2% of the Project's site area.

When preparing an NSR, guidelines set by the City of Visalia must be followed. In analyzing noise levels, the guidelines and policies in the Noise section of the City of Visalia's Noise adopted General Plan was utilized. Unless otherwise stated, all sound levels reported are in A-weighted decibels (dBA). A-weighting de-emphasizes the very low and very high frequencies of sound in a manner similar to the human ear. Most community noise standards use A-weighting, as it provides a high degree of correlation with human annoyance and health effects.

1.2 Sound and the Human Ear

Sound levels are presented on a logarithmic scale to account for the large range of acoustic pressures that the human ear is exposed to and is expressed in units of decibels (dB). A decibel is defined as the ratio between a measured value and a reference value usually corresponding to the lower threshold of human hearing defined as 20 micropascals (µPa). Noise can generally be described as unwanted sound and has been cited as being a health problem, not just in terms of actual physiological damages such as hearing impairment, but also in terms of inhibiting general wellbeing and contributing to stress and annoyance. Long or repeated exposure to sounds at or above 85 dB can cause hearing loss. The louder the sound, the shorter the time period before hearing loss can occur. Sounds of less than 75 dB are unlikely to cause hearing loss even after long exposure.[1]

1.2.1 *A-Weighted Decibels*

Sound pressure level alone is not a reliable indicator of loudness. The frequency, or pitch, of a sound also has a substantial effect on how humans will respond. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear. Human hearing is limited not only in the range of audible frequencies but also in the way it perceives the SPL in that range. In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, and it perceives

1 Source: National Institute on Deafness and Other Hearing Disorders

a sound within that range as being more intense than a sound of higher or lower frequency with the same magnitude. To approximate the frequency response of the human ear, a series of SPL adjustments is usually applied to the sound measured by a sound level meter. The adjustments (referred to as a weighting network) are frequency dependent. The A-scale weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-scale, C-scale, D-scale), but these scales are rarely, if ever, used in conjunction with highway traffic noise. Noise levels for traffic noise reports are typically reported in terms of A-weighted dBAs. In environmental noise studies, A-weighted SPLs are commonly referred to as noise levels.

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance, and habituation to noise over differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment, referred to as the "ambient" environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by the hearers. Regarding increases in A-weighted noise level, knowledge of the following relationships will be helpful in understanding this report:

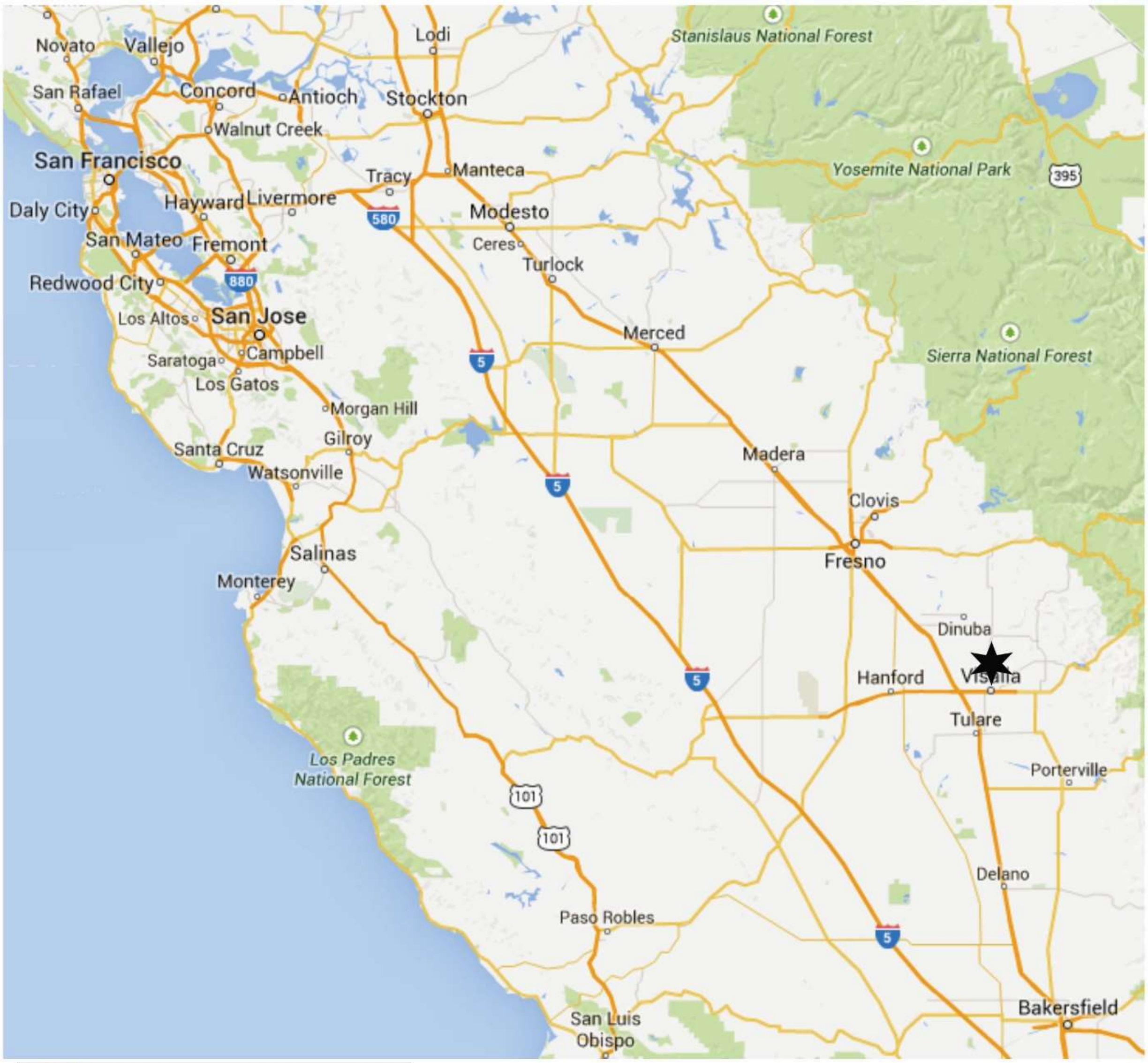
1. Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans.
2. Outside of the laboratory, a 3 dB change is considered a just-perceivable difference.
3. A change in level of at least 5 dB is required before any noticeable change in community response would be expected.
4. A 10 dB change is subjectively heard as approximately a doubling in loudness.

1.2.2 *Sound Pressure Levels and Decibels*

Because of the ability of the human ear to detect a wide range of sound pressure fluctuations, sound pressure levels are expressed in logarithmic units called decibels. The sound pressure level in decibels is calculated by taking the log of the ratio between the actual sound pressure and the reference sound pressure squared. The reference sound pressure is considered the absolute hearing threshold. In addition, because the human ear is not equally sensitive to all sound frequencies, a specific frequency-dependent rating scale was devised to relate noise to human sensitivity. A dBA scale performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. The basis for comparison is the faintest sound audible to the average ear at the frequency of maximum sensitivity. This dBA scale has been chosen by most authorities for purposes of environmental noise regulation. Typical indoor and outdoor noise levels are presented in Figure 4 (Common Environmental Sound Levels).

Visalia Rally's Development **Figure**
Regional Location **1**

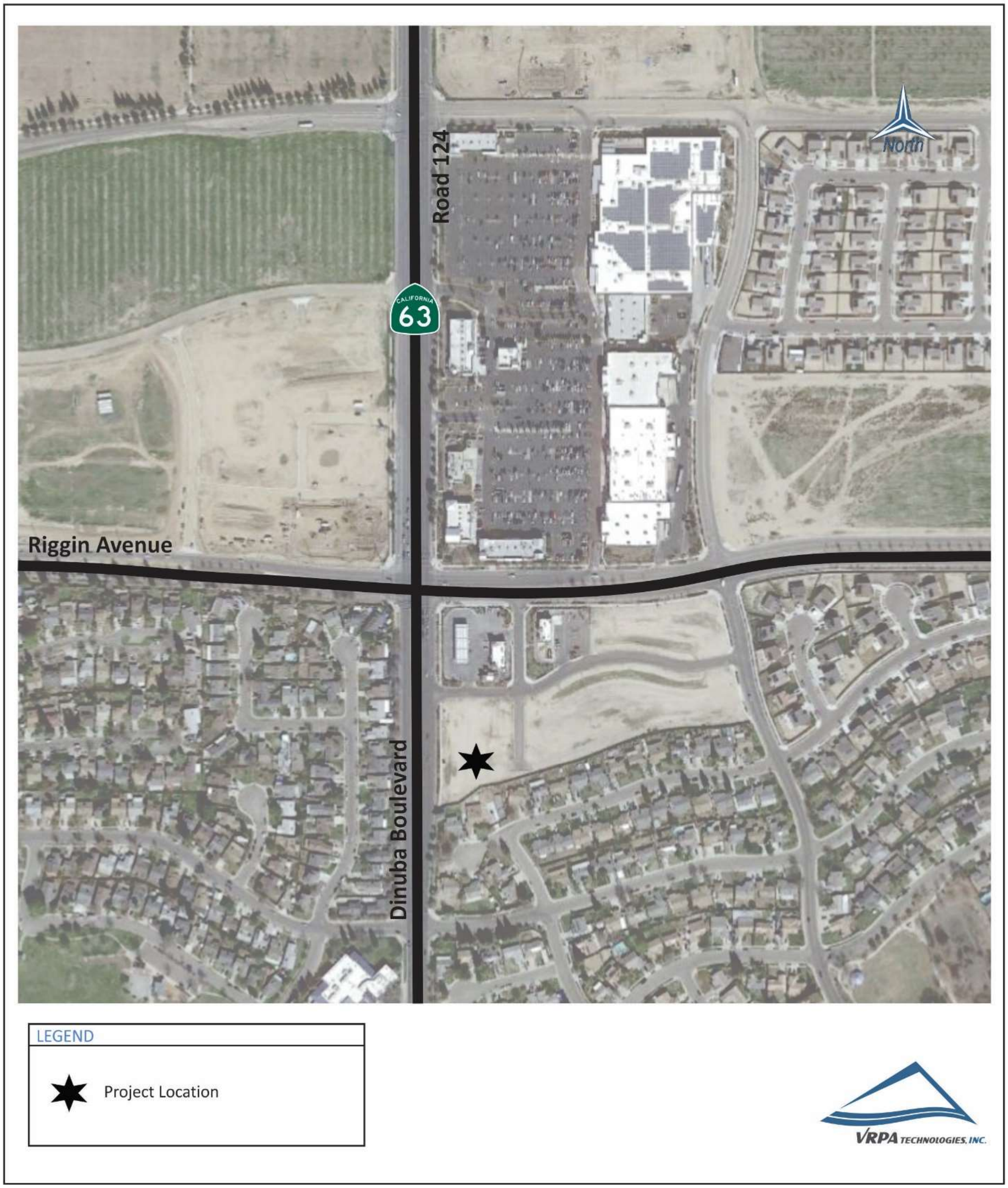
North



LEGEND
★ Project Location

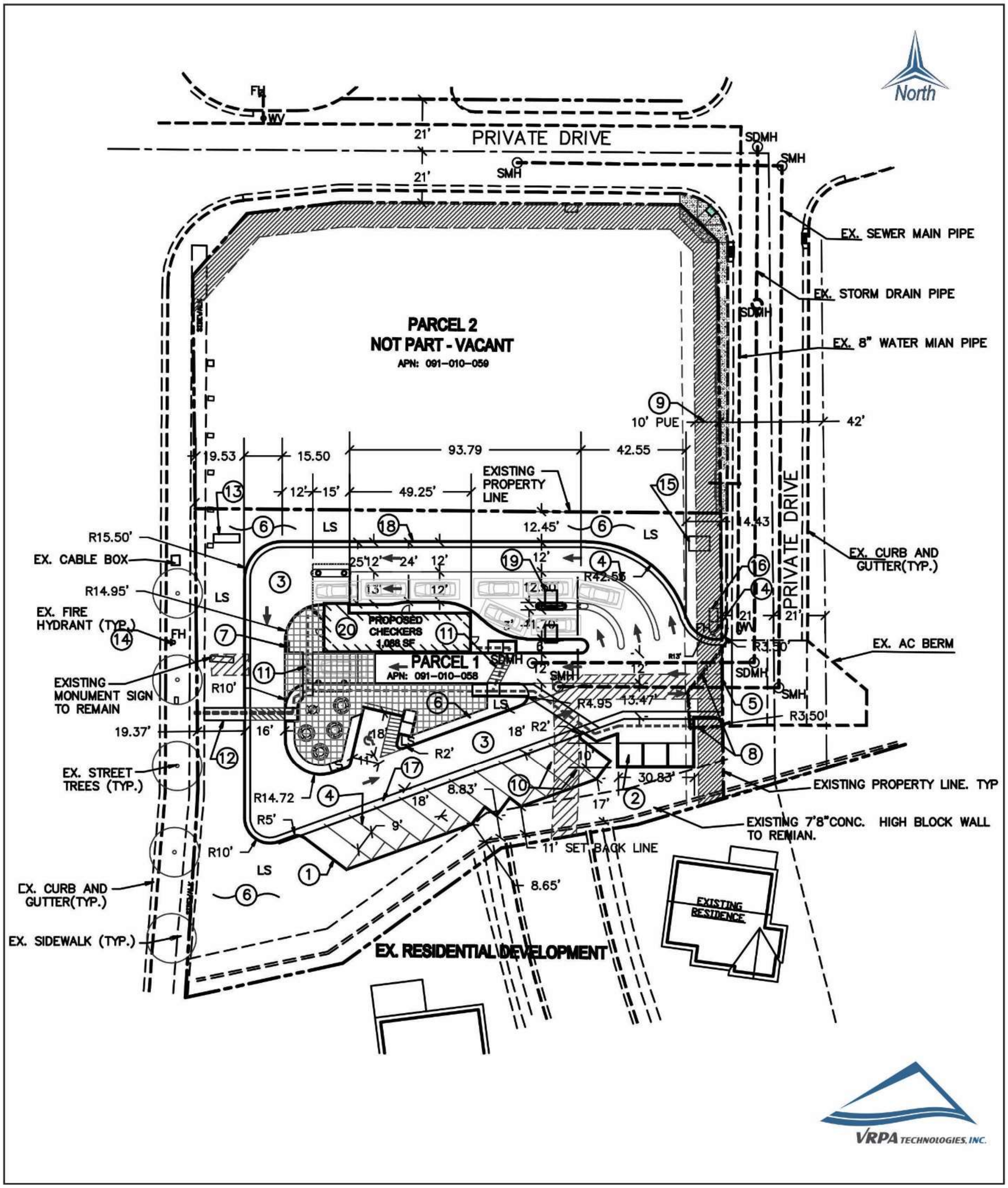
Visalia Rally's Development
Project Location

Figure 2



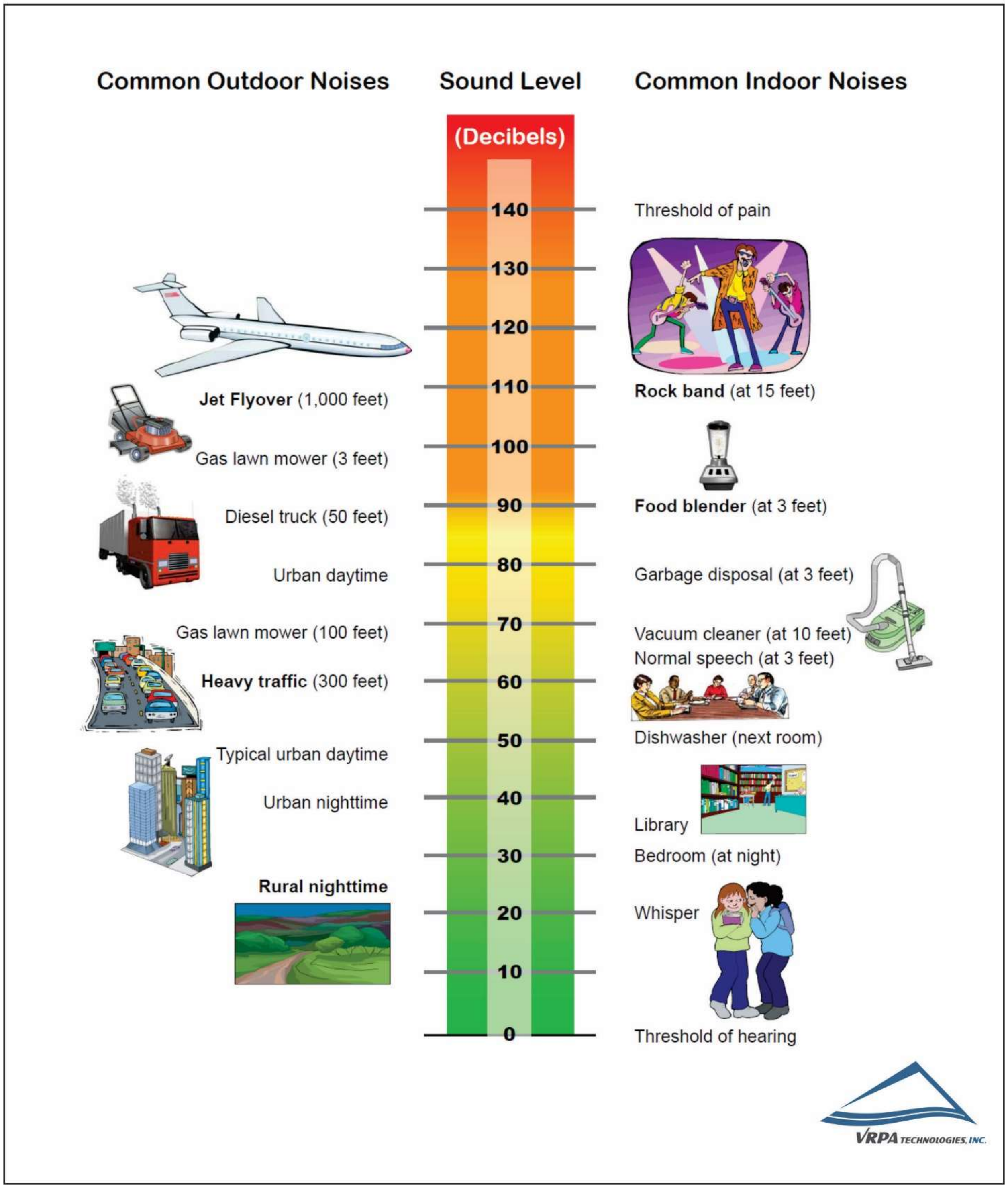
Visalia Rally's Development
Project Site Plan

Figure 3



Visalia Rally's Development
Common Environmental Sound Levels

Figure 4



1.2.3 *Sound, Noise, and Acoustics*

Sound is a disturbance created by a moving or vibrating source in a gaseous or liquid medium or the elastic stage of a solid and is capable of being detected by the hearing organs. Sound may be thought of as the mechanical energy of a vibrating object transmitted by pressure waves through a medium to a hearing organ, such as a human ear. For traffic sound, the medium of concern is air. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired. Sound is actually a process that consists of three components: the sound source, the sound path, and the sound receiver. All three components must be present for sound to exist. Without a source to produce sound, there is no sound. Likewise, without a medium to transmit sound pressure waves, there is also no sound. Finally, sound must be received; a hearing organ, sensor, or object must be present to perceive, register, or be affected by sound or noise. In most situations, there are many different sound sources, paths, and receivers rather than just one of each. Acoustics is the field of science that deals with the production, propagation, reception, effects, and control of sound.

1.2.4 *Frequency and Hertz*

A continuous sound can be described by its frequency (pitch) and its amplitude (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch, like the low notes on a piano, whereas high-frequency sounds are high in pitch, like the high notes on a piano. Frequency is expressed in terms of oscillations, or cycles, per second. Cycles per second are commonly referred to as Hertz (Hz). A frequency of 250 cycles per second is referred to as 250 Hz. High frequencies are sometimes more conveniently expressed in units of kilo-Hertz (kHz), or thousands of Hertz. The extreme range of frequencies that can be heard by the healthiest human ear spans from 16–20 Hz on the low end to about 20,000 Hz (or 20 kHz) on the high end.

1.2.5 *Addition of Decibels*

Because decibels are logarithmic units, sound pressure levels cannot be added or subtracted by ordinary arithmetic means. For example, if one automobile produces an SPL of 70 dBA as it passes an observer, two cars passing simultaneously would not produce 140 dBA; they would, in fact, combine to produce 73 dBA. When two sounds of equal SPL are combined, they will produce a combined SPL 3 dBA greater than the original individual SPL. In other words, sound energy must be doubled to produce a 3 dBA increase. If two sound levels differ by 10 dBA or more, the combined SPL is equal to the higher SPL; in other words, the lower sound level does not increase the higher sound level.

1.3 Characteristics of Sound Propagation and Attenuation

Noise can be generated by a number of sources, including mobile sources such as automobiles, trucks, and airplanes, and stationary sources such as construction sites, machinery, and industrial operations.

Noise generated by mobile sources typically attenuates (is reduced) at a rate between 3.0 and 4.5 dBA per doubling of distance. The rate depends on the ground surface and the number or type of objects between the noise source and the receiver. Hard and flat surfaces, such as concrete or asphalt, have an attenuation rate of 3.0 dBA per doubling of distance. Soft surfaces, such as uneven or vegetated terrain, have an attenuation rate of about 4.5 dBA per doubling of distance.

Noise generated by stationary sources typically attenuates at a rate between 6.0 and about 7.5 dBA per doubling of distance. Sound levels can be reduced by placing barriers between the noise source and the receiver (commonly called the "receptor"). In general, barriers contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver. Buildings, concrete walls, and berms can all act as effective noise barriers. Wooden fences or broad areas of dense foliage can also reduce noise but are less effective than solid barriers.

1.3.1 *Noise Descriptors*

Noise in the daily environment fluctuates over time. Some of the fluctuations are minor; some are substantial. Some noise levels occur in regular patterns; others are random. Some noise levels fluctuate rapidly, others slowly. Some noise levels vary widely; others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following is a list of the noise descriptors most commonly used in traffic noise analysis:

1. **Equivalent Sound Level (Leq) -** Leq represents an average of the sound energy occurring over a specified period. Leq is, in effect, the steady-state sound level that, in a stated period, would contain the same acoustical energy as the time-varying sound that actually occurs during the same period. The one-hour A-weighted equivalent sound level, Leq(h), is the energy average of the A-weighted sound levels occurring during a one-hour period and is the basis for the Noise Abatement Criteria (NAC) used by the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA).
2. **Percentile-Exceeded Sound Level (Lx) -** Lx represents the sound level exceeded for a given percentage of a specified period. For example, L10 is the sound level exceeded 10 percent of the time, and L90 is the sound level exceeded 90 percent of the time.
3. **Maximum Sound Level (Lmax) -** Lmax is the highest instantaneous sound level measured during a specified period.

1.3.2 *Sound Propagation*

When sound propagates over a distance, it changes in both level and frequency content. The manner in which noise reduces with distance depends on the following factors:

1. Geometric Spreading - Sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level

attenuates (or drops off) at a rate of six dBA for each doubling of distance. Highway noise is not a single, stationary point source of sound. The movement of the vehicles on a highway makes the source of the sound appear to emanate from a line (i.e., a line source) rather than a point. This line source results in cylindrical spreading rather than the spherical spreading that results from a point source. The change in sound level from a line source is 3 dBA per doubling of distance.

2. Ground Absorption - Most often, the noise path between the highway and the observer is very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is done for simplification only; for distances of less than 60 m (200 ft), prediction results based on this scheme are sufficiently accurate. For acoustically hard sites (i.e., those sites with a reflective surface, such as a parking lot or a smooth body of water, between the source and the receiver), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface, such as soft dirt, grass, or scattered bushes and trees, between the source and the receiver), an excess ground attenuation value of 1.5 dBA per doubling of distance is normally assumed. When added to the geometric spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dBA per doubling of distance for a line source and 7.5 dBA per doubling of distance for a point source.
3. Atmospheric Effects - Research by Caltrans and others has shown that atmospheric conditions can have a significant effect on noise levels within 60 m (200 ft) of a highway. Wind has been shown to be the most important meteorological factor within approximately 150 m (500 ft) of the source, whereas vertical air temperature gradients are more important for greater distances. Other factors such as air temperature, humidity, and turbulence also have significant effects. Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lower noise levels. Increased sound levels can also occur as a result of temperature inversion conditions (i.e., increasing temperature with elevation).
4. Shielding by Natural and Human-Made Features - A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by this shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in at least 5 dBA of noise reduction.

1.4 Ground-borne Vibration

Annoyance to humans and damage to buildings are the two ground-borne vibration impacts of general concern. The two measurements corresponding to human annoyance and building damage for evaluating ground-borne vibration are peak particle velocity (PPV) and root-mean square (RMS) velocity. PPV is the maximum instantaneous positive or negative peak of the vibration signal, measured as a distance per time (such as millimeters or inches per second). This measurement has been used historically to evaluate shock-wave type vibrations from actions like blasting, pile driving, and mining activities, and their relationship to building damage. RMS is an average, or smoothed, vibration amplitude, commonly measured over 1-second intervals. It is expressed on a log scale in decibels (VdB) referenced to 0.000001 x 10-6 inch per second and is not to be confused with noise decibels. It is more suitable for addressing human annoyance and characterizing background vibration conditions because it better represents the response time of humans to ground vibration signals.

1.5 Methodology

When preparing an NSR, guidelines set by affected agencies must be followed. Acoustical terminology used for this NSR is documented in Appendix A. In analyzing traffic noise levels, the FHWA Highway Traffic Noise Prediction methodology must be applied. Safety concerns must also be analyzed to determine the need for appropriate mitigation resulting from increased noise due to increased traffic and other evaluations such as the need for noise barriers and other noise abatement improvements. Stationary noise levels were evaluated using Section 2.1.4 of the California Department of Transportation's (Caltrans) Technical Noise Supplement which evaluates the decrease in noise as distance from the noise source increases. Unless otherwise stated, all sound levels reported are in A-weighted decibels (dBA). A-weighting de-emphasizes the very low and very high frequencies of sound in a manner similar to the human ear. Most community noise standards use A-weighting, as it provides a high degree of correlation with human annoyance and health effects.

1.5.1 *California Environmental Quality Act (CEQA)*

CEQA requires environmental impact reports to evaluate whether and to what extent a proposed project may result in significant effects on the environment. If a project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless such measures are also evaluated and determined to not be feasible. An EIR is also required to evaluate a reasonable range of alternatives to the proposed Project that could feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project. An EIR must also evaluate a "No Project" Alternative. CEQA Guidelines Appendix G suggests the following as potential thresholds for determining whether a project will result in significant impacts on the environment:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
b) Generation of excessive ground-borne vibration or ground-borne noise levels?
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use

airport, would the project expose people residing or working in the project area to excessive noise levels?

1.5.2 *City of Visalia*

The Safety and Noise section of the City of Visalia's adopted 2014 General Plan serves as the primary policy statement for the City for implementing policies to maintain and improve the noise environment in the City of Visalia. The Safety and Noise section presents Goals and Objectives relative to planning for the noise environment within the City. Section 8.36 of the City's Municipal Code establishes exterior and interior noise standards. Future noise/land use incompatibilities can be avoided or reduced with implementation of City of Visalia's noise criteria and standards. The City of Visalia realizes that it may not always be possible to avoid constructing noise-sensitive developments in existing noisy areas and therefore provides noise reduction strategies to be implemented in situations with potential noise/land use conflicts. It should be noted that the City of Visalia does not have specific zoning or general plan requirements related to vibration.

Table 1 shows the City of Visalia's maximum allowable noise exposure from Transportation Noise Sources as depicted in the City of Visalia General Plan. Table 2 shows the City of Visalia's maximum allowable noise exposure from Stationary Noise Sources. The information presented in Table 2 comes from Chapter 8.36 of the City of Visalia's Municipal Code which contains the City of Visalia's noise ordinance. It should be noted that the City of Visalia's Municipal Code does note include criteria related to transportation noise sources.

1.5.3 *Study Methods and Procedures*

Site Selection

Developed and undeveloped land uses in the project vicinity were identified through land use maps, aerial photography, and site inspection. Within each land use category, sensitive receptors were then identified. Land uses in the Project vicinity include agricultural, residential, and commercial uses. The generalized land use data and location of sensitive receptors were the basis for the selection of the noise monitoring and analysis sites.

Noise Level Measurement Program

Existing noise levels in the project vicinity were sampled during the PM peak hour because traffic counts conducted in the study area show a greater volume of traffic in the PM peak hour than the AM peak hour. All measurements were made using an Extech Type 2 sound level meter datalogger.

The following measurement procedure was utilized:

1. Calibrate sound level meter.

2. Set up sound level meter at a height of 1.5 m (5 ft).
3. Commence noise monitoring.
4. Collect site-specific data such as date, time, direction of traffic, and distance from sound level meter to the center of the roadway.
5. Stop measurement after 15 minutes.
6. Proceed to next monitoring site and repeat.

Table 1
Transportation Noise Sources

Noise-Sensitive Land Use	Outdoor Activity Areas [1]	Interior Spaces	
	DNL/CNEL[2], dB	DNL/CNEL[2], dB	L_{eq}, dB [3]
Residential	65	45	--
Transient lodging	65	45	--
Hospitals, Nursing Homes	65	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	65	--	45
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45

Notes:
(1) Outdoor activity areas generally include backyards of single-family residences and outdoor patios, decks or common recreation area of multi-family developments.
(2) The CNEL is used for quantification of aircraft noise exposure as required by CAC Title 21.
(3) As determined for a typical worst-case hour during periods of use.
-- = not applicable
DNL = Day-Night Average Level
CNEL = Community Noise Equivalent Level
dB = Decibles
L_{eq} = Noise Equivalent Level

Table 2
Stationary Noise Sources[1]

	Daytime (6:00 a.m. - 7:00 p.m.)	Nighttime (7:00 p.m. - 6:00 a.m.)
Hourly Equivalent Sound Level (L_{eq}), dBA	50	45
Maximum Sound Level (L_{max}), dBA	70	65

Notes:
(1) As determined at the property line of the receiving noise-sensitive use.
L_{eq} = Noise Equivalent Level
L_{max} = Maximum noise level recorded during a noise event

2.0 Existing Conditions

Existing noise levels in the City are principally generated by transportation noise sources. Vehicular traffic noise is the dominant source in most areas, but aircraft and rail activity are also significant sources of environmental noise in the local areas surrounding these operations. Noise is generated by either mobile or stationary sources.

- ✓ Mobile source noise is typically associated with transportation, such as cars, trains, and aircraft. The most significant sources of mobile noise in the City of Visalia are SR-198 and other major arterial roadways, the Visalia Municipal Airport, and the Burlington Northern and Union Pacific railroad lines.

- ✓ Stationary noise is that generated by any 'fixed' noise source. Examples of stationary sources include outdoor machinery (i.e. such as heating/air conditioning systems and power generators), farming activities, high voltage power lines, and industrial areas within the City. Noise generated from construction sites also falls into the category of stationary sources.

2.1 Traffic Noise

Highway and roadway traffic noise levels are generally dependent upon three primary factors, which include the traffic volume, the traffic speed, and the percent of heavy vehicles on the roadway. Traffic generated noise is the result of vehicle engines, exhaust, tires, and wind generated by taller vehicles. Vehicles with defective mufflers or faulty equipment have the propensity to increase traffic noise. Traffic noise levels are reduced by distance, terrain, vegetation, and natural/manmade obstacles between a noise receptor and the highway/roadway.

To assess existing noise conditions, VRPA Technologies staff conducted noise level measurements at two (2) locations (called receivers) in the vicinity of the Project site and tabulated the results. The weather during the time of the noise measurements taken consisted of sunshine and wind speeds of less than 5 mph. The purpose of the measurements was to determine baseline existing noise levels in the Project area and to calibrate the FHWA Traffic Noise model, which will be used to then predict and assess future year conditions.

The receivers evaluated for this Project were located near an existing residential development along Road 124 (SR 63) and Dove Court/Avenue. The receiver locations are shown in Figure 5. One (1) additional receiver was incorporated into the analysis to assess impacts of the Project to the backyard area of the residential uses to the south of the Project. The additional receiver is also reflected in Figure 5.

Visalia Rally's Development
Noise Receiver Locations

Figure 5

Table 3 characterizes the results of existing noise conditions at the two (2) field receivers evaluated in the study area. Ambient noise levels in the study area is primarily the result of traffic along Road 124 (SR 63).

Table 3
Existing Noise Levels

Receiver ID No.	Location	Distance from Noise Source-Roadway Centerline (feet)	Existing Noise Level Leq(h) dBA
1	Open area on Project site adjacent to Road 124 (SR 63) located south of Riggin Avenue	65	66.0
2	Open area adjacent to Private Road located south of Riggin Avenue	285	61.0

Source: VRPA Technologies, 2021

Traffic noise exposure is mainly a function of the number of vehicles on a given roadway per day, the speed of those vehicles, the percentage of medium and heavy trucks in the traffic volume, and the receiver's proximity to the roadway. Every vehicle passage on every roadway in the City radiates noise.

Existing high noise levels along major streets and highways are generally caused by traffic and congestion. Potential impacts along these facilities are generally classified as follows:

- ✓ Low - Ldn 59 dB or below
- ✓ Moderate - Ldn 60 dB to 65 dB
- ✓ High - Ldn 66 dB or greater

The potential for adverse noise impacts is generally moderate to high along most segments of State highways and is generally low to moderate along most segments of City streets and highways.

2.2 Railroad Noise

The Union Pacific (UP), Burlington Northern & Santa Fe (BNSF), and San Joaquin Valley Railroad (SJVRR) provide freight service to Visalia, connecting Visalia and Tulare County to other major markets and destinations throughout California. Passenger rail service in Tulare County is provided by Amtrak on its San Joaquin service, with the nearest rail station located in the City of Hanford, approximately 25 miles west of the site. Railroad noise will not impact the Project study area since the nearest rail line is located 1.5 miles away.

2.3 Airport Noise

The Visalia Municipal Airport (VIS), located in the southeast quadrant of the SR 198 and SR 99 interchange, serves Tulare and eastern Kings County. The airport is primarily used for general aviation operations, including local and itinerant services. The airport, which is owned and operated by the City of Visalia, is home to over 150 aircraft, which generate approximately 80,000 annual operations. Noise generated from the airport will not impact the Project study area since the Project is located nearly 6 miles away and falls outside of the airport noise contour zones.

2.4 Stationary Noise

There are a wide variety of industrial and other non-transportation noise sources throughout the City of Visalia, including heavy industrial or manufacturing operations, food packaging and processing facilities, lumber mills, and car washes to name a few. Stationary noise generated from the Project could potentially impact the surrounding area.

The change in noise level due to distance for point sources is determined by the following formula, which comes from the California Department of Transportation's (Caltrans) Technical Noise Supplement to the Traffic Noise Analysis Protocol.

$$dBA_2 = dBA_1 + 10\log_{10}[(D_1/D_2)]^2 = dBA_1 + 20\log_{10}(D_1/D_2)$$

Where:
dBA_1 = noise level at distance D_1
dBA_2 = noise level at distance D_2

Stationary noise impacts to the Project will be developed considering the formula above and the closest distance between the Project site and stationary noise sources in the surrounding area.

2.6 Ground-borne Vibration

Ambient vibration levels in residential areas are typically 50 VdB, which is well below human perception. The operation of heating/air conditioning systems and slamming of doors produce typical indoor vibrations that are noticeable to humans. The most common exterior sources of ground vibration that can be noticeable to humans inside residences include construction activities, train operations, and street traffic. Table 4 provides some common sources of ground vibration and the relationship to human perception. This information comes from the Federal Transit Administration's "Basic Ground-Bourne Vibration Concepts."

Table 4
Typical Levels of Ground-Borne Vibration

Human/Structural Response	Velocity Level*, VdB	Typical Events (50 ft. Setback)
Threshold, minor cosmetic damage fragile buildings	100	Blasting from construction projects
		Bulldozers, vibratory rollers, and other heavy tracked construction equiment
Difficulty with tasks such as reading a video or computer screen	90	
		Commuter rail, upper range
Residential annoyance, infrequent events (e.g commuter rail)	80	Rapid transit, upper range
		Commuter rail, typical
Residential annoyance, infrequent events (e.g rapid transit)		Bus or truck over bump
	70	Rapid transit, typical
Limit for vibration sensitive equipment. Approx. threshold for human perception of vibration		Bus or truck, typical
	60	
		Typical background vibration
	50	

* RMS velocity in decibels (VdB) are 10^{-6} inches/second

3.0 Short-Term Impacts

3.1 Construction Noise Impacts

The Project has the potential to result in short-term noise impacts to surrounding land uses due to construction activity noise (collectively referred to hereafter as just "construction" noise). Construction noise represents a short-term impact on ambient noise levels and includes activities such as site preparation, grading, and other construction-related activities. Noise generated from the transport of workers and the movement of materials to and from the construction site and the physical activities associated with any construction-related activities could potentially impact neighboring sensitive land uses. Although most of the types of exterior construction activities associated with the Project will not generate continually high noise levels, occasional single-event disturbances from grading and construction activities are possible.

Table 5 depicts typical construction equipment noise levels, based upon a distance of 50 feet between the noise source and the noise receptor. Noise emitted by construction equipment is controlled by the Environmental Protection Agency's (EPS's) Noise Control Program (Part 204 of Title 40, Code of Federal Regulations).

During construction of various components of the Project, noise from construction activities will add to the noise environment in the immediate area. Activities involved in building construction would generate maximum noise levels, as indicated in Table 5, ranging from 77 to 85 dBA at 50 feet. Construction activities will be temporary in nature and are expected to occur during normal daytime working hours. Construction noise impacts could result in annoyance or sleep disruption for nearby residences if nighttime operations occurred, or if unusually noisy equipment was used. It is not anticipated that any portion of the construction phase will take place during nighttime hours. Based on information provided in Table 5 and the noise attenuation formula provided in Section 2.2, the nearest residence adjacent to the southern boundary of the Project site would be subject to short-term noise reaching 74 to 84 dBA Lmax generated by construction activities in the absence of a noise barrier. As noted previously, there is a continuous concrete block wall along the southern boundary of the Project. Section 5 of Caltrans' Technical Noise Supplement indicates that barriers consisting of concrete have a transmission loss of 34 dBA. As a result, adjacent residential uses will experience noise levels less than the maximum sound level of 70 dBA Lmax from the City of Visalia's Stationary Noise Source criteria (Table 2).

Table 5
Construction Equipment Noise

TYPE OF EQUIPMENT	Sound Levles Measured (dBA of 50 feet)
Rock Drills	85
Jack Hammers	85
Pneumatic Tools	85
Pumps	77
Dozers	85
Tractor	84
Vibratory Rollers[1]	80
Front-End Loaders	80
Hydraulic Backhoe	80
Hydraulic Excavators	85
Graders	85
Air Compressors	80
Trucks	84

Source: Noise Control for Buildings and Manufacturing Plants (Bolt, Beranek and Newman, 1987).
1 - Federal Highway Administration Roadway Construction Noise Model, FHWA 2006

3.2 Ground-borne Vibration

Construction activity can result in ground vibration, depending upon the types of equipment used. Operation of construction equipment causes ground vibrations, which spread through the ground and diminish in strength with distance from the source generating the vibration. Building structures that are founded on the soil in the vicinity of the construction site respond to these vibrations, with varied results. Ground vibrations as a result of construction activities very rarely reach vibration levels that will damage structures but can cause low rumbling sounds and detectable vibrations for buildings very close to the site.

Vibration levels from various types of construction equipment are shown in Table 6. The primary concern with construction vibration is building damage. Therefore, construction vibration is generally assessed in terms of peak particle velocity (PPV). It should be noted that there is a considerable variation in reported ground vibration levels from construction activities. The data provides a reasonable estimate for a wide range of soil conditions.

Despite the perceptibility threshold of about 65 VdB, human reaction to vibration is not significant unless the vibration exceeds 75 VdB according to the United States Department of Transportation. The City of Visalia Municipal Code does not specifically identify vibration level impact standards. Caltrans has established vibration thresholds in terms of human annoyance of 0.04 in/sec PPV as documented in Caltrans' *Transportation and Construction Vibration Guidance Manual*. The vibration threshold of 0.04 in/sec PPV was used to estimate the impact of vibrations from construction activities associated with the Project. The following formula was used to estimate the human response (annoyance) at the Westlake Village located to the west of the Project site.

$PPVequip = PPVref \times (25/D)^{1.5}$

Using the vibratory roller vibration level shown in Table 6 (PPV 0.210) and the formula shown above, the anticipated vibration velocity levels at the residences at the southern boundary of the Project are expected to approach 0.040 in/sec PPV. Based on the vibration velocity levels provided in Table 6, vibrations generated by the construction phase of the Project are considered less than significant.

Table 6
Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 ft (in/sec)	PPV Levels at Residences South of the Project (in/sec)	Threshold (in/sec)	Threshold Exceeded
Vibratory roller	0.210	0.040	0.040	No
Large bulldozer	0.089	0.017	0.040	No
Caisson drilling	0.089	0.017	0.040	No
Loaded trucks	0.076	0.015	0.040	No
Jackhammer	0.035	0.007	0.040	No
Small bulldozer	0.003	0.001	0.040	No

Source: VRPA Technologies, Inc

4.0 Long-Term Impacts

4.1 Traffic Noise Impacts

This section provides an assessment of the anticipated noise conditions in the future as it relates to the Project and the impact of increased traffic noise generated by the Project on the surrounding land uses within the study area. The noise impacts from the Project were analyzed considering Existing Plus Project, Cumulative Year 2042 No Project, and Cumulative Year 2042 Plus Project Conditions.

<u>Existing Plus Project Conditions</u>

Existing Plus Project traffic noise levels were established based on previously collected traffic data and using the Traffic Noise Model (TNM) Version 2.5. Existing Plus Project levels, which are based on expected Project trip distribution, are calculated and compared to both the existing noise level and the maximum allowable noise exposure for transportation noise sources as described in the City of Visalia's General Plan. Referencing Table 1, the City of Visalia's criteria shows that mitigation must be considered when the exterior noise exposure level of 65 Ldn/CNEL for single family residential uses has been exceeded. Levels reported in this section are in terms of A-weighted levels. The Ldn is estimated to be within +/- 2 dBA of the peak hour L_{eq} under normal traffic conditions based upon Caltrans' Traffic Analysis Noise Protocol.

Traffic volumes associated with the Project in addition to existing traffic along roadway segments in the study area were entered into the model to estimate noise levels at various receivers that would be affected by the Project. In order to calibrate the TNM 2.5 model, the existing counts, lane geometry, and any other pertinent existing conditions were added to the model. The noise level measurements taken in the study area were then compared to the noise levels computed by the model. The difference between the measured and modeled noise levels, referred to as the "K constant", is then added to any additional receivers to be evaluated in the TNM 2.5 model.

Table 7 shows the predicted noise levels at sensitive receivers in the study area as a result of adding traffic associated with the Project. As shown in Table 7, the highest peak hour sound level expected at the residences to the south of the Project is 51.0 Leq(h) dBA considering the existing concrete barrier. When it comes to noise levels, the Ldn is determined to be within +/- 2 dBA of the peak hour Leq under normal traffic conditions based upon Caltrans' Traffic Analysis Noise Protocol. Therefore, the Existing Plus Project noise levels at the outdoor areas of the residential uses exceed the City of Visalia's Transportation Noise Sources criteria. TNM 2.5 printouts included are provided in the Appendix B.

Table 7
Existing Plus Project Noise Levels

Receiver ID No.	Location	Distance from Noise Source-Roadway Centerline (feet)	Existing Plus Project Noise Level Leq(h) dBA	City of Visalia's Transportation Noise Source Criterion	Impact
1	Open area on Project site adjacent to Road 124 (SR 63) located south of Riggin Avenue	65	66.0	--	--
2	Open area adjacent to Private Road located south of Riggin Avenue	285	61.0	--	--
3	Open area adjacent to Private Road located south of Riggin Avenue	180	51.0	65.0	None

Source: VRPA Technologies, 2021

<u>Cumulative Year 2042 Conditions</u>

This section provides an assessment of the anticipated noise conditions in the future as it relates to the Project and the impact of increased traffic noise generated by the Project on the surrounding land uses within the study area. The noise impacts from the development of the Project was analyzed considering Cumulative Year 2042 Conditions as a result of the City of Visalia and Tulare County General Plan. Future development within the planning area will result in increased traffic volumes, thus increasing noise levels in some areas. While there will be increases in some noise levels, efforts can be taken to help minimize such instances. For example, siting noise sensitive uses away from high-noise areas (e.g., major traffic routes) and buffering noise through design will help minimize future noise-related land use conflicts.

The levels of traffic expected in the year 2042 relate to the cumulative effect of traffic increases resulting from the implementation of the general plans of local agencies and pending development projects. Traffic conditions for the Cumulative Year 2042 scenario was determined by the Tulare County Association of Governments (TCAG) regional travel model and Caltrans' SR 63 TCR were used to develop Cumulative Year 2042 traffic volumes. Traffic volumes, truck mix, and vehicle speeds were used as inputs to the TNM 2.5 model for the Cumulative Year 2042 modeled scenarios consistent with generally-accepted engineering principles and methods.

Table 8 shows the predicted noise levels at the modeled receivers evaluated in the study area for the Cumulative Year 2042 No Project and Cumulative Year 2042 Plus Project conditions. Results of the analysis show that noise levels at the outdoor areas of the residential uses do not exceed the City of Visalia's Transportation Noise Sources criteria. As a result, the Project will not create a significant impact at sensitive receptors in the study area. Table 8 also shows the increase in noise levels for the Cumulative Year 2042 scenario once Project trips are added to the surrounding roadway system. Results show that trips associated with the Project will not cause an increase in noise levels at sensitive receivers in the study area.

Table 8
Cumulative Year 2042 Noise Levels

Receiver ID No.	Location	Distance from Noise Source-Roadway Centerline (feet)	Cumulative Year 2042 Without Project Noise Level Leq(h) dBA	Cumulative Year 2042 Plus Project Noise Level Leq(h) dBA	Noise Increase (+) or Decrease (-)	City of Visalia's Transportation Noise Source Criterion	Impact
1	Open area on Project site adjacent to Road 124 (SR 63) located south of Riggin Avenue	65	68.0	68.0	0.0	--	--
2	Open area adjacent to Private Road located south of Riggin Avenue	285	63.0	63.0	0.0	--	--
3	Open area adjacent to Private Road located south of Riggin Avenue	180	53.0	53.0	0.0	65.0	None

Source: VRPA Technologies, 2021

4.2 Stationary Noise Impacts

The City of Visalia's maximum allowable noise exposure from Stationary Noise Sources is reflected in Table 2. The hourly and maximum sound level allowed during daytime (6:00am to 7:00pm) hours is 50 dBA and 70 dBA respectively. This section evaluates the noise generated by on-site sources.

4.2.1 *On-Site Operational Noise*

Drive-Thru Noise

The Drive-Thru customer order display and idling vehicles is the most dominant stationary noise source generated by the Project. It should be noted that the proposed Project will include two (2) customer order displays. Caltrans' Technical Noise Supplement provides methodology (Figure 6) for determining the approximate noise level at sensitive receivers considering multiple noise sources (i.e., 2 Customer Order Displays). Estimated noise levels from customer order displays and idling vehicles is reflected in Table 9 and includes data from three (3) independent sources. For purposes of this analysis, the highest noise levels reflected in Table 9 were used to estimate impacts associated with the Project.

Truck Deliveries

Though the Project doesn't include a 'loading dock', reference noise levels at an Albertson's Shopping Center (Ldn Consulting 2011/San Diego) was used to conservatively estimate noise from truck deliveries at the Project site. The measurements include truck drive-by noise and a single truck's engine noise. Noise levels were measured at 66.5 dBA Leq at a distance of 25 feet. For purposes of this analysis, it was assumed that the truck engine would only idle for five minutes which is consistent with state air quality requirements. As a result, the truck engine would operate for up to 15 minutes of the total time required during the delivery process (five minutes for arrival, five minutes of idling, and five minutes during departure). The average hourly noise levels from truck deliveries (assuming one delivery completed over an hour period) would equate to 60.5 dBA Leq at a distance of 25 feet.

HVAC Units

An HVAC unit would be associated with the development of the Project site. Specific equipment/data for the HVAC unit to be included with the development of the Rally's was not known at the time this analysis was prepared. Representative sound power levels for the 2-ton Carrier 38HDRD018 was selected for this analysis. The manufacturer's noise data (See Appendix D for specifications) indicates a standard noise rating of 68 dBA.

Table 10 shows that maximum noise levels at the sensitive receivers (residences) directly to the south of the Project site considering the noise generated by the drive-thru customer display area, truck deliveries and the HVAC unit. Results show that stationary noise sources would not exceed 65 dBA considering the combined noise generated by the drive-thru customer display-idling vehicle area, truck deliveries, and HVAC unit. Results consider the presence of the existing concrete block wall.

The hourly sound level allowed during daytime (6:00am to 7:00pm) hours is 50 dBA according to the City of Visalia's maximum allowable noise exposure from Stationary Noise Sources criteria. To determine if operational noise from the Project would impact adjacent sensitive receivers directly to the south of the Project site, it was assumed that the drive-thru customer display-idling vehicles, truck delivery, and HVAC unit was operational for the entire hour. Results of the analysis shows that hourly noise levels at the sensitive receivers directly to the south of the Project site would not exceed 50 dBA considering noise generated by the Project's stationary noise sources.

Visalia Rally's Development
Decibel Addition

Figure 6

When Two Decibel Values Differ By:	Add This Amount to the Higher Value:	Example:
0 or 1 dB	3 dB	70+69 = 73
2 or 3 dB	2 dB	74+71 = 76
4 to 9 dB	1 dB	66+60 = 67
10 dB or more	0 dB	65+55 = 65

Source: Caltrans Technical Noise Supplement

VRPA TECHNOLOGIES, INC.

Table 9
Reference Noise Level Measurements

Noise Source	Distance from Noise Source (feet)	Reference Noise Level (dBA Leq)
Two Drive-Thru Customer Order Displays and Idling Vehicles [1]	20	64.0
One Drive-Thru Customer Order Display and Idling Vehicles [2]	20	59.0
Two Drive-Thru Customer Order Displays [3]	4 / 20	68 / 54

1: Noise Expert, LLC - Noise Analysis for Proposed McDonalds, November 2014

2: Extant Acoustical Consulting, LLC - 645 Horning Street Environmental Noise Assessment, February 2017

3: 3M XT-1 Intercom System Manufacturer Specifications (Considering two intercom systems). Caltrans methodolgy used to estimate noise levels at a distance of 20 feet

Table 10
On-Site Noise Source Impacts

Area	Hourly Equivalent Sound Level Leq dBA	Maximum Sound Level, dBA	City of Visalia's Stationary Noise Source Criterion	Impact
Residences South of the Project	48.0	51.0	50 L_{eq} (h) / 70 L_{max}	No / No

Source: VRPA Technologies, 2021

5.0 Impact Determinations and Recommended Mitigation

In accordance with CEQA, the effects of a project are evaluated to determine if they will result in significant adverse impacts on the environment. The criteria used to determine the significance of a noise impact are based on the following thresholds of significance, which come from Appendix G of the CEQA Guidelines. Accordingly, noise impacts resulting from the Project are considered significant if the Project would result in:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

b) Generation of excessive ground-borne vibration or ground-borne noise levels?

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Each of these thresholds are evaluated individually below to determine whether the Project will cause a significant effect on the environment. Where impacts are found to be significant, mitigation measures are recommended that would avoid or reduce the impact to less than significant.

5.1 Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies

5.1.1 Short-Term Impacts

Implementation of the Project has the potential to result in short-term construction noise impacts to surrounding land uses due to construction activities. Construction noise represents a short-term impact on ambient noise levels. Although most of the types of exterior construction activities associated with the Project will not generate continually high noise levels, occasional single-event disturbances from grading and construction activities are possible. Table 5 depicts typical construction equipment noise. Construction equipment noise is controlled by the EPA's

Noise Control Program (Part 204 of Title 40, Code of Federal Regulations).

During construction of various components of the Project, noise from construction activities will add to the noise environment in the immediate area. Activities involved in building construction would generate maximum noise levels, as indicated in Table 5, ranging from 77 to 85 dBA at 50 feet. Construction activities will be temporary in nature and are expected to occur during normal daytime working hours. Construction noise impacts could result in annoyance or sleep disruption for nearby residences if nighttime operations occurred, or if unusually noisy equipment was used. It is not anticipated that any portion of the construction phase will take place during nighttime hours. Based on information provided in Table 5 and the noise attenuation formula provided in Section 2.2, the nearest residence adjacent to the southern boundary of the Project site would be subject to short-term noise reaching 74 to 84 dBA Lmax generated by construction activities in the absence of a noise barrier. As noted previously, there is a continuous concrete block wall along the southern boundary of the Project. Section 5 of Caltrans' Technical Noise Supplement indicates that barriers consisting of concrete have a transmission loss of 34 dBA. As a result, adjacent residential uses will experience noise levels less than the maximum sound level of 70 dBA Lmax from the City of Visalia's Stationary Noise Source criteria (Table 2).

5.1.2 Long-Term Impacts

<u>Traffic Noise</u>

Tables 7 and 8 show the predicted noise levels at sensitive receivers in the study area as a result of adding traffic associated with the Project. Results of the analysis show that noise levels at outdoor areas of adjacent residential uses do not exceed the City of Visalia's Transportation Noise Sources criteria. As a result, the Project will not create a significant impact at sensitive receptors in the study area. Table 8 also shows the increase in noise levels for the Cumulative Year 2042 scenario once Project trips are added to the surrounding roadway system. Results show that trips associated with the Project will not cause an increase in noise levels at sensitive receivers in the study area. Therefore, no mitigation measures are needed.

<u>Stationary Noise</u>

Section 4.2 above indicates that maximum and hourly noise levels at the sensitive receivers directly south of the Project site would not exceed City of Visalia Stationary Noise Source criteria considering noise generated by the drive-thru customer display-idling vehicles, truck delivery, and HVAC unit. Therefore, no mitigation measures are needed.

5.2 Generation of excessive ground-borne vibration or ground-borne noise levels

Vibration levels from various types of construction equipment are shown in Table 6. The primary concern with construction vibration is building damage. Therefore, construction vibration is generally assessed in terms of peak particle velocity (PPV). It should be noted that there is a considerable variation in reported ground vibration levels from construction activities. The data provides a reasonable estimate for a wide range of soil conditions.

Despite the perceptibility threshold of about 65 VdB, human reaction to vibration is not significant unless the vibration exceeds 75 VdB according to the United States Department of Transportation. The City of Visalia Municipal Code does not specifically identify vibration level impact standards. Caltrans has established vibration thresholds in terms of human annoyance of 0.04 in/sec PPV as documented in Caltrans' Transportation and Construction Vibration Guidance Manual. The vibration threshold of 0.04 in/sec PPV was used to estimate the impact of vibrations from construction activities associated with the Project.

Using the vibratory roller vibration level shown in Table 6 (PPV 0.210), the anticipated vibration velocity levels at the residences to the south are expected to approach 0.040 in/sec PPV. Based on the vibration velocity levels provided in Table 6, vibrations generated by the construction phase of the Project are considered less than significant. Therefore, no mitigation measures are needed.

5.3 For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels

The Project is not located within the vicinity of a private airstrip or an airport land use plan or within two miles of a public airport or public use airport. The Visalia Municipal Airport (VIS) is the closest public use airport and is located approximately 6 miles southwest of the Project site. Therefore, the Project will not result in the stated impact.

APPENDIX A
Acoustical Terminology

ACOUSTICAL TERMINOLOGY

The following terminology has been used for purposes of this NSR:

Ambient Noise Level:	The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.
CNEL:	Community Noise Equivalent Level. The average equivalent sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7 p.m. to 10p.m. and ten decibels to sound levels in the night before 7 a.m. and after 10 p.m.
Decibel, dBA:	A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micro-newtons per square meter).
DNL/L_{dn}:	Day/Night Average Sound Level. The average equivalent sound level during a 24-hour day, obtained after addition often decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m.
L_{eq}:	Equivalent Sound Level. The sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over 1, 8 and 24-hour sample periods.
L_{eq}(h):	The hourly value of L_{eq}.
L_{max}:	The maximum noise level recorded during a noise event
L_n:	The sound level exceeded "n" percent of the time during a sample interval (L_{90}, L_{50}, L_{10}, etc.). L_{10} equals the level exceeded 10 percent of the time.
L_n(h):	The hourly value of L_n.
Noise Exposure Contours:	Lines drawn about a noise source indicating constant levels

of noise exposure. CNEL and DNL contours are frequently utilized to describe community exposure to noise.

SEL or SENEL: Sound Exposure Level or Single Event Noise Exposure Level. The level of noise accumulated during a single noise event, such as an aircraft overflight, with reference to the duration of one second. More specifically, it is the time-integrated A-weighted squared sound pressure for a stated time interval or event, based on a reference pressure of 20 micropascals and the reference duration of one second

Sound Level: The sound pressure level in decibels as measured on a sound level meter using the A-weighing filter network. The A-weighing filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.

Note: *CNEL and DNL represent daily levels of noise exposure averaged on an annual basis,* while L_n *represents the average noise exposure for a shorter time period, typically one hour.*

APPENDIX B

TNM 2.5 Sound Level Worksheets

City of Visalia
VRPA Technologies, Inc.

25 August 2021
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: Rally's Development
RUN: Existing Conditions
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	70.4	80	70.4	10	----	70.4	0.0	8	-8.0
Receiver2	2	1	0.0	57.6	80	57.6	10	----	57.6	0.0	8	-8.0
Receiver3	3	1	0.0	62.2	65	62.2	10	----	62.2	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

City of Visalia							**25 August 2021**						
VRPA Technologies, Inc.							**TNM 2.5**						
							Calculated with TNM 2.5						
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:	**Rally's Development**												
RUN:	**Existing Plus Project Conditions**												
BARRIER DESIGN:	**INPUT HEIGHTS**							**Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.**					
ATMOSPHERICS:	**68 deg F, 50% RH**												

Receiver Name	**No.**	**#DUs**	**Existing LAeq1h**	**No Barrier LAeq1h Calculated**	**Crit'n**	**Increase over existing Calculated**	**Crit'n Sub'l Inc**	**Type Impact**	**With Barrier Calculated LAeq1h**	**Noise Reduction Calculated**	**Goal**	**Calculated minus Goal**
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	66.2	80	66.2	10	----	66.2	0.0	8	-8.0
Receiver2	2	1	0.0	61.1	80	61.1	10	----	61.1	0.0	8	-8.0
Receiver3	3	1	0.0	51.3	65	51.3	10	----	51.3	0.0	8	-8.0

Dwelling Units	**# DUs**	**Noise Reduction Min**	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	3	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

City of Visalia							25 August 2021						
VRPA Technologies, Inc.							TNM 2.5						
							Calculated with TNM 2.5						
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:		Rally's Development											
RUN:		CY 2042 No Project Conditions											
BARRIER DESIGN:		INPUT HEIGHTS						Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.					
ATMOSPHERICS:		68 deg F, 50% RH											
Receiver													
Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal	
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB	
Receiver1	1	1	0.0	67.8	80	67.8	10	----	67.8	0.0	8	-8.0	
Receiver2	2	1	0.0	62.8	80	62.8	10	----	62.8	0.0	8	-8.0	
Receiver3	3	1	0.0	53.0	65	53.0	10	----	53.0	0.0	8	-8.0	

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

City of Visalia						25 August 2021						
VRPA Technologies, Inc.						TNM 2.5						
						Calculated with TNM 2.5						
RESULTS: SOUND LEVELS												
PROJECT/CONTRACT:	Rally's Development											
RUN:	CY 2042 Plus Project Conditions											
BARRIER DESIGN:	INPUT HEIGHTS						Average pavement type shall be used unless					
							a State highway agency substantiates the use					
ATMOSPHERICS:	68 deg F, 50% RH						of a different type with approval of FHWA.					

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	67.9	80	67.9	10	----	67.9	0.0	8	-8.0
Receiver2	2	1	0.0	62.9	80	62.9	10	----	62.9	0.0	8	-8.0
Receiver3	3	1	0.0	53.1	65	53.1	10	----	53.1	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	3	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX C
Reference Noise Level Measurements

NOISE ANALYSIS

PROPOSED MCDONALD'S RESTAURANT

MCDONALD'S RESTAURANT
3901 EAST 22ND ST.

Tucson, Arizona

Noise Expert Project No. 14092

Prepared for

McDonald's USA

Prepared by

Noise Expert, LLC
2850 East Laurel Street
Mesa, Arizona 85213
Phone: 480-332-9325
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Beth Ann Holliday

Beth Ann Holliday
Senior Acoustical Consultant

November, 2014

TABLE OF CONTENTS

1.0 Summary

McDonald's Restaurant is proposing to locate a new facility on the northeast corner of Alvernon Way and 22nd Street in Tucson, Arizona, as shown in Figures 1 and 2. Noise Expert was asked to perform a Noise Impact Assessment for the proposed McDonald's Restaurant to help evaluate the potential noise impacts of the Drive Thru Customer Order Display (COD), and compare them with the existing noise levels.

The predicted noise levels from the COD were 35 to 38 dBA. The Tucson City Code limits noise to 70 dBA during daytime hours and 62 dBA during nighttime hours. The predicted noise levels are well below the Tucson City Code.

In addition, the predicted noise levels are well below the existing noise levels at the closest residential properties (50 to 61 dBA).

This report presents the information developed by Noise Expert for the noise impact analysis. The information presented in the report includes a description of the proposed operation, measurement results showing the existing environment at noise sensitive properties, an evaluation of the future noise environment expected around the project site, and a discussion about the noise descriptors used in the analysis.

2.0 Overview of the Noise Impact Analysis Procedure

Noise Expert conducted a sound study to determine the noise impacts that will be associated with the proposed McDonald's restaurants Drive Thru speakers. The noise study was conducted in three steps:

1. The current ambient noise levels were measured at noise sensitive receivers (residences) in the vicinity of the proposed project.

2. Noise expected to radiate from the proposed McDonald's Restaurant Drive Thru Customer Order Display (COD) was predicted using standard acoustical formulas and reference sound levels for the proposed activities.

3. The predicted noise levels at the closest residence to the COD were compared with the relevant noise standards, and the existing noise levels.

This report presents the results of the study.

3.0 Overview of the Proposed Facility

McDonald's Restaurant is proposing to locate a facility at 3901 East 22nd St on the northeast corner of Alvernon Way and 22nd Street. in Tucson, Arizona, as shown in Figure 1.

The site is rectangular and measures approximately 310 feet east to west and 275 feet north to south, as shown in Figure 2. The existing elevation of the ground is 2,516 feet above sea level, the elevation at the adjacent residences to the north and east of the proposed facility is also 2,516 feet in elevation.

The proposed McDonald's is located in a mixed commercial-residential neighborhood. Currently, the site has a vacant building at the south side of the center of the property (previously gas station / convenient store). There is a vacant building at the northwest side of the center of the property (previously a carwash). A house at the northeast corner of the property will be demolished and will be part of the parking area for the proposed McDonald's restaurant.

To east of the proposed McDonald's site and to the north of 22nd street will be two vacant lots for sale. 3942 Camino De Palmas is a residents east of the proposed McDonald's site and to the south of Camino De Palmas. The north is bounded by Camino De Palmas with a commercial property on the north side, Alvernon Way Office Suites. The office building is located at 1037 Alvernon Way. To the east of the Alvernon Way Office Suites and still north of Camino De Palmas are residential properties. The residential property to the east of Alvernon Way Office Suites and directly north of the proposed McDonalds site is located at 3907 Camino De Palmas. The west is bounded by Alvernon Way and to the west of Alvernon Way is the Tucson Midway Police Department. The south is bounded by 22nd St and to the south of that are commercial properties including Walgreens, Taco Bell, and Jack in the Box.

Proposed McDonald's site-south

Proposed McDonald's site-north

Location 1 north of site

Location 2 east of site

The proposed McDonald's drive thru COD will operate 24-hours per day and 7 days per week. An 8-foot high wall will be located on the north and east side of the property between the restaurant and the residences closest to the proposed facility.

4.0 Noise Impact Criteria

The proposed McDonald's restaurant is located in the City of Tucson, County of Pima in the State of Arizona.

The Tucson Code (Section 16-31) states that the maximum noise allowed to radiated beyond a person’s property line will be no more than 70 dBA during daytime hours (7 AM to 10 PM) and 62 dBA during nighttime hours (10 PM to 7 AM).

5.0 Sound Level Measurements

Ambient sound levels were measured to get an understanding of the existing noise levels in the vicinity of the site. This will help us determine the noise impact of the proposed site.

5.1 Measurement Procedure

Noise levels were measured using a Larson Davis 820 sound level meter that meets the American National Standard Institute (ANSI) requirements for Type 1 sound level meter. The detector of the meter was set for "slow" response. The microphone was located approximately five feet above the ground. The sound level meter was calibrated prior to and after the noise measurements were taken.

Noise was measured during four different time periods, one on Thursday, October 23, 2014 between 6 PM and 7 PM. On Friday, October 24, 2014 noise levels where measured (Midnight -1 AM, 6 AM-7 AM and Noon-1 PM)

5.2 Measurement Locations and Results

Existing ambient noise levels were measured at two locations in the vicinity of the site, as shown in Figure 1. The following information describes the measurement locations:

Location1 On the south property line of the residence at 3907 Camino De Palmas. Approximately 50 feet north of the proposed McDonald's property line at 3901 E 22nd St. and 175 feet east of the east edge of Alvernon Way.

Location 2 On the west property line of the residence at 3926 Camino De Palmas. Approximately 90 feet south of the Camino De Palmas, and five feet to the west of the residence at 3926 Camino De Palmas. There is an existing six foot wall on the property line to the east, noise level measurements were taken just to the west of the wall.

A summary of the noise measurements is shown in Table 1.

Table 1
Measured L_{eq} Noise Level

Day	Time	Measured L_{eq} Noise Levels (dBA) at the Following Receivers	
		Location 1	Location 2
10/23/14	6-7 PM	59	59
10/24/14	Midnight-1 AM	50	53
10/24/14	6-7 AM	60	61
10/24/14	Noon-1 PM	60	59

5.3 Observations

Locations 1 and 2 were located approximately 140 feet apart. The primary noise sources at both locations were traffic on Alvernon Way and 22nd Street, and occasional aircraft.

The noise reduced to 52 dBA when there was a red light on Alvernon Way causing gaps in the traffic. The noise level reached 67-70 dBA when a loud vehicle, such as a truck or motorcycle, passed by the measurement locations. The measured noise level averaged 50 to 60 dBA depending on the time of day.

Airplanes occasionally flew in the vicinity of the site during daytime hours. The noise level increase depended on the type of aircraft and vicinity. David Monthan Air Force Base is one mile south-southeast, with the air traffic path directed over the proposed McDonalds site at 3901 East 22nd St. Tucson, Arizona. The location of the David Monthan Air Force Base caused the military planes to fly low to the ground as they were departing and landing and increased the noise levels when flying overhead. At times, aircraft caused the noise level to briefly increase to 76 dBA.

On Thursday, October 23, 2014, during the measurement starting at 6 PM, the weather was mostly sunny and clear. The temperature was approximately 82°F and the average humidity was approximately 26%. It was calm and there was a no breeze during this time.

On Friday, October 24, 2014 during the measurement at Midnight the weather was clear. The temperature was approximately 65°F and the average humidity was approximately 54%. It was calm and there was a no breeze during this time.

On Friday, October 24, 2014 during the measurements at 6 AM, the temperature was approximately 64°F and the average humidity was approximately 50%. It was calm and there was a no breeze during this time.

On Friday, October 24, 2014 during the measurements at noon, the temperature was approximately 87°F and the average humidity was approximately 26%. There was a slight breeze from the south, less than 4 mph.

6.0 Predicted Noise Levels Generated by the Proposed Project

6.1 Noise Prediction Methodology

Established acoustical formulas for outdoor sound propagation were used to predict the noise levels that will radiate from the proposed operations. The calculation accounts for sound attenuation due to distance, atmospheric conditions, barriers and vegetation.

6.2 Reference Noise Levels

Product noise data supplied by McDonalds shows the noise from the COD is 60 dBA at 16 feet. Noise Expert measured the noise levels from several existing CODs at existing McDonalds. It was observed that the noise from the idling car next to the COD blocked some of the loud speaker noise and the idling vehicle was the primary noise source. At 20 feet from the COD and the idling vehicle, the measured noise level was 59 to 61 dBA. The amount from the COD alone was calculated to be 54 to 57 dBA, at 20 feet.

6.3 Prediction Locations

Project generated noise levels were predicted at the residences north and east of the proposed site, shown in Figures 1 and 2.

Location1 On the south property line of the residence at 3907 Camino De Palmas. Approximately 50 feet north of the proposed McDonald's property line at 3901 E 22nd St. and 175 feet east of the east edge of Alvernon Way.

Location 3 At the east property line of the Proposed McDonalds close to the residence at 3942 Camino De Palmas. Approximately 90 feet south of the Camino De Palmas, and 315 feet to the east of 22nd St. (Location 3 is predicted measurements)

6.4 Assumptions Used in Predicting Project Generated Noise Levels

The noise predicted to radiate from the proposed McDonald's drive thru COD does not represent the noise that will be produced constantly during all hours. Instead, the scenario models the loudest noise that could be anticipated to radiate the COD to the surrounding residences. To insure the worst case levels are predicted, the model included all of the following assumptions:

- *80% humidity and 80°F were assumed.* The noise level at the receivers will be slightly lower, if the humidity is lower or if the temperature is higher.

- Noise reduction from the 8' high wall was considered. The wall will also reduce parking activity noise.

6.5 Prediction Results

The loudest hourly L_{eq} noise levels that could radiate from the proposed McDonald's drive thru COD were predicted to the nearest residence to the north and east, shown in Figure 2. The predicted noise levels are from the proposed drive thru COD and idling cars at the COD.

Table 2
Predicted Loudest L_{eq} Noise Levels and Existing Noise Levels during Various Times of Day at the Closest Residence to the North and East

Location	Time Period	Predicted L_{eq} Noise Levels (dBA)	Existing Measured L_{eq} Noise Levels (dBA)
1 - North	Evening	38	59
	Late Night		50
	Morning		60
	Mid-day		60
3 - East	Evening	35	59
	Late Night		53
	Morning		61
	Mid-day		59

As shown in Table 2, the predicted noise levels from the proposed drive thru COD is well below the existing measured noise levels at the closest residences to the north and to the east. In addition, the predicted noise levels are well below the Tucson City Code noise limits.

7.0 Acoustic Terminology

Sound Pressure Level

Sound, or noise, is the term given to variations in air pressure that are capable of being detected by the human ear. Small fluctuations in atmospheric pressure (sound pressure) constitute the physical property measured with a sound pressure level meter. Because the human ear can detect variations in atmospheric pressure over such a large range of magnitudes, sound pressure is expressed on a logarithmic scale in units called decibels (dB). Noise is defined as “unwanted” sound.

Technically, sound pressure level (SPL) is defined as:

$$SPL = 20 \log (P/P_{ref}) \text{ dB}$$

where P is the sound pressure fluctuation (above or below atmospheric pressure) and P_{ref} is the reference pressure, 20 μPa, which is approximately the lowest sound pressure that can be detected by the human ear.

The sound pressure level that results from a combination of noise sources is not the arithmetic sum of the individual sound sources, but rather the logarithmic sum. For example, two sound levels of 50 dB produce a combined sound level of 53 dB, not 100 dB. Two sound levels of 40 and 50 dB produce a combined level of 50.4 dB.

Human sensitivity to changes in sound pressure level is highly individualized. Sensitivity to sound depends on frequency content, background noise, time of occurrence, duration, and psychological factors such as emotions and expectations. However, in general, a change of 1 or 2 dB in the level of sound is difficult for most people to detect. A 3 dB change is commonly taken as the smallest perceptible change and a 6 dB change corresponds to a noticeable change in loudness. A 10 dB increase or decrease in sound level corresponds to an approximate doubling or halving of loudness, respectively.

A-Weighted Sound Level

Studies have shown conclusively that at equal sound pressure levels, people are generally more sensitive to certain higher frequency sounds (such as made by speech, horns, and whistles) than most lower frequency sounds (such as made by motors and engines) at the same level. To address this preferential response to frequency, the A-weighted scale was developed. The A-weighted scale adjusts the sound level in each frequency band in much the same manner that the human auditory system does. Thus the A-weighted sound level (read as "dBA") becomes a single number that defines the level of a sound and has some correlation with the sensitivity of the human ear to that sound. Different sounds with the same A-weighted sound level are perceived as being equally loud. The A-weighted noise level is commonly used today in environmental noise analysis and in noise regulations. Typical values of the A-weighted sound level of various noise sources are shown in Table 3.

Equivalent Sound Level

The Equivalent Sound Level (L_{eq}) is a type of average which represents the steady level that, integrated over a time period, would produce the same energy as the actual signal. The actual *instantaneous* noise levels typically fluctuate above and below the measured L_{eq} during the measurement period. The A-weighted L_{eq} is a common index for measuring environmental noise.

Table 3
Common Sound Levels in dBA

Common Outdoor Sounds	Sound Pressure Level (dBA)	Common Indoor Sounds	Subjective Evaluation
Auto horn at 10' Jackhammer at 50'	**100**	Newspaper press Textile mill	Deafening
Gas lawn mower at 4' Pneumatic drill at 50'	**90**	Auditorium during applause Food blender at 3'	Very Loud
Concrete mixer at 50' Jet flyover at 5000'	**80**	Telephone ringing at 8' Vacuum cleaner at 5'	
Large dog barking at 50' Large transformer at 50'	**70**	Electric shaver at 1' Clothes washer at 2'	Loud
Automobile at 55 mph at 150' Urban residential	**60**	Normal conversation at 3' Window air conditioning unit	
Birds at 25' Small town residence	**50**	Office noise Conference room background	Moderate
Wind in trees (5 mph) Farm valley	**40**	Soft stereo music in residence Library	
Rustling leaves	**30**	Average bedroom at night Soft whisper at 3'	Faint
Quiet rural nighttime	**20**	Broadcast and recording studio	
	10	Human breathing	Very Faint
	0	Threshold of hearing (audibility)	

NE Project: 14092	October 29, 2014	Beth Holliday

Figure No. 1

NoiseExpert.com

2850 E Laurel St
Mesa, AZ 85213
480-332-9325
www.noiseexpert.com
beth@noiseexpert.com

McDonald's at Alvernon Way & 22nd St
Tucson, Arizona

DESCRIPTION: Measurement Locations

SCALE: N/A

NE Project: 14092	October 29, 2014	Beth Holliday

Figure No. 2

NoiseExpert.com

2850 E Laurel St
Mesa, AZ 85213
480-332-9325
www.noiseexpert.com
beth@noiseexpert.com

McDonald's at Alvernon Way & 22nd St
Tucson, Arizona

DESCRIPTION: Site Plan

SCALE: N/A

Environmental Noise Assessment Report

645 Horning Street
San Jose, CA

Extant Project No. 160913.01

February 27, 2017

Prepared for:
Jim Rubnitz
17610 Blanchard Drive
Monte Sereno, CA 95030

645 Horning Street

Environmental Noise Assessment

Extant Report No. 160913.01

February 27, 2017

Prepared for:

Jim Rubnitz

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Executive Summary

The project under consideration is proposing the development of a gas station, self-storage and quick service restaurant in San Jose, CA. The project site is located on the northwest corner of the Horning Street and Oakland Road intersection; with a site address of 645 Horning Street in the City of San Jose, California. The project site bounded by light industrial uses to the west, with transportation right-of-way bounding the project on the northern, eastern and southern property lines. The location of the project site is shown in Figure 1. The proposed site plan and configuration of the proposed project is presented in Figure 2.

The project proposes to construct a new self-storage facility, a quick service restaurant and a gas station with convenience store, and automated car wash. The hours of operation for the self-storage were assumed to be 6:00 AM to 12:00 AM, the quick service restaurant hours are assumed to be 6:00 AM to 12:00 AM and the hours of operation for the gas station/car wash were assumed to be 5:30 AM to 12:00 AM.

Extant Acoustical Consulting LLC (Extant) was retained by the project applicant to perform a noise analysis for the proposed project. In this report, Extant reviews applicable noise standards and criteria, presents the noise monitoring program, evaluates the existing noise environment, and describes modeling assumptions and methodologies used to predict noise emissions due to the proposed project. Findings of the study were evaluated and analyzed against applicable City of San Jose noise standards.

The existing noise levels and observations from the noise monitoring program were used as the basis for modeling of the existing noise environment and evaluation of the potential for project noise levels to effect the existing noise environment. Modeled existing ambient traffic noise level exposures at noise-sensitive receivers in the project area were predicted to range from approximately 63 to 74 dBA DNL.

Noise levels from the operation of the proposed project are anticipated to range approximately 53 to 55 dBA DNL at the prediction receivers representing the noise-sensitive residential receptors. Based on existing noise levels experienced in the vicinity of the project site, project-generated average day-night noise levels are predicted to be at or below ambient noise levels in the majority of the project study area. Moreover, project-generated noise levels are not anticipated to cause a significant increase in the existing noise environment in the project study area.

Based on the assumptions and analysis presented in this report, we conclude the following:

- The predicted average day-night noise levels (DNL) generated from operation of the proposed project are predicted to comply with the City of San Jose exterior noise level standards at noise sensitive receptors in the project vicinity.
- Due to the elevated ambient noise environment in the general vicinity of the project, average day-night noise levels associated with project operations are predicted to be below ambient noise levels currently experienced in the majority project study area.
- Development of the proposed project is anticipated to comply with the City of San Jose significant increase criteria as outlined in General Plan Policy EC-1.2.
- Activities associated with the development and operation of the proposed project are predicted to comply with City of San Jose standards for protection of the existing noise environment.

Contents

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1 Introduction

The project under consideration is proposing the development of a gas station, self-storage and quick service restaurant in San Jose, CA. Extant Acoustical Consulting LLC (Extant) was retained by the project applicant to perform a noise analysis for the proposed project. This report reviews applicable noise standards and criteria, evaluates the existing noise environment, and describes modeling assumptions and methodologies used to predict noise emissions from project operations. Furthermore, the report assesses the potential for project-generated noise levels to result in noise impacts on nearby noise-sensitive receptors and land uses. Appendix A provides a description of the various noise metrics and terminology used in this report.

2 Project Description

The project site is located on the northwest corner of the Horning Street and Oakland Road intersection; with a site address of 645 Horning Street San Jose, California. The location of the project site is shown in Figure 1. The proposed site plan and configuration of the proposed project is presented in Figure 2.

The proposed project would redevelop the parcel to include a self-storage, a quick service restaurant and a gas station with a convenience store and car wash. The existing 3.26-acre parcel is currently occupied by approximately 50,000 square feet (sq. ft.) of various light-industrial and commercial uses which would be demolished as part of the project. Access to the proposed project and all incorporated uses, would remain via Horning Street. Parking for the project would consist of 56 spaces located throughout the site, adjacent to each associated use.

The self-storage portion of the project, as currently proposed, would include three separate buildings, with approximately 98,000 square feet of storage space and 1,300 square feet of office space. The self-storage portion of the project would be located across the northern portion of the project site, adjacent to the U.S. 101 ROW. Building "A" is a single-story, 11,871 square foot building, containing the self-storage office and approximately 10,500 square feet of mixed storage space. Building "B" is a 4-story, 79,257 square foot indoor self-storage building. Building "C" is a single-story, 3,800 square foot drive-up self-storage building.

The quick service restaurant (QSR) would be located in the southwest portion of the project site. The QSR building would be approximately 2,500 square feet and incorporate a drive-thru service window with a queuing capacity of 8 to 9 automobiles.

The gas station would be constructed on the southeastern portion of the site and include a convenience store and self-service automated car wash. The gas station portion of the project would include a new fueling canopy, with six (6) new fuel dispensing pumps and twelve (12) fueling positions. The gas station would also incorporate a queuing lane and mechanical room for the car wash, as well as an air-water station and vacuum station along the southeastern boundary of the site.

The proposed demolition of the existing structures, the construction of the various on-site uses proposed as part of the project and the proximity of nearby noise-sensitive receptors has prompted the City of San Jose to request an acoustical analysis be prepared to analyze potential noise impacts associated with the proposed project.

3 Environmental Setting

The Project site is generally located in the northern portion of the City of San Jose, within the City's central planning area. Land uses in the general project area include a mix of light-industrial, commercial, and single and multifamily residential. The project site bounded by light industrial/ commercial uses to the west, with transportation right-of-way bounding the project on the northern, eastern and southern property lines.

The existing noise environment in the project area is effected by a number of noise influences, which are characteristic of urbanized areas. The dominant noise source in the project area is generated by vehicular traffic on the local and regional roadway network. Light-industrial and commercial areas in the general project area contribute to the ambient noise level to a lesser extent. The project area experiences occasional aircraft overflights largely associated with the aviation operations of San Jose International Airport; which is located approximately 1.2 miles west.

3.1 Existing Noise Sensitive Land Uses

Noise-sensitive land uses are generally described as those uses where exposure to excessive noise would result in adverse effects, as well as uses where quiet is an essential element of the intended purpose. Residential dwellings are of primary concern due to the potential for increased and prolonged exposure of individuals to excessive interior and exterior noise levels.

There are no noise-sensitive receptors immediately adjacent to the proposed project boundary; however, there are noise-sensitive multifamily residential receptors in the project study area. Noise-sensitive residential receptors nearest the proposed project site are located to the southwest, across Horning Street; and to the east of the project, across Oakland Road.

3.2 Existing Ambient Noise Survey

An ambient noise survey was conducted by Extant from January 16, 2017 through January 18, 2017 to document the ambient noise in the vicinity of the proposed project and at nearby representative noise-sensitive receptors. Long-term unattended ambient noise monitoring was performed at two (2) locations in the study area. Short-term noise level monitoring was performed at three (3) locations in the project vicinity, on January 18th, 2017. Locations of the noise monitoring sites are presented on an aerial photograph of the area on Figure 1. On Figure 1, the long-term noise measurement sites are represented as LT-##; short-term measurement locations are shown as ST-##.

Noise measurements were performed using Larson Davis Laboratories (LDL) Model 831 precision integrating sound level meters (SLMs). Field calibrations were performed on the SLM with an acoustic calibrator before and after the measurements. Equipment meets all pertinent specifications of ANSI S1.4-1983 (R2006) for Type 1 SLMs. All instrumentation components, including microphones, preamplifiers and field calibrators have laboratory certified calibrations traceable to the National Institute of Standards and Technology (NIST). The microphones were located at a minimum height of 5-6 ft. above the ground, an average height for a person standing, and located a sufficient distance away from reflective surfaces in the monitoring area. Noise measurements were performed in accordance with American National Standards Institute (ANSI) and American Standards for Testing and Measurement (ASTM) guidelines.

The noise monitoring equipment was configured to catalog all noise metrics pertinent to identification and evaluation of noise levels (i.e., Leq, Lmax, Ln, etc.) in the study area. Monitoring data was collected for the overall measurement period and each hourly period.

The following sections discuss the overall monitoring results for the long-term and short-term measurements.

3.2.1 Long-Term Monitoring

Long-term noise monitoring data collected during the noise monitoring program serves to establish a baseline for ambient noise levels in the project vicinity. Additionally, the noise levels cataloged illustrate the dinural pattern experienced at the site; and allow for correlation of hourly noise levels collected at the short-term monitoring locations with the 24-hour day-night noise levels. Long-term noise monitoring equipment was deployed from January 16, 2107 through January 18, 2017 at two locations in the study area, to capture the 24-hour period on January 17th, 2017.

During the long-term monitoring, the primary background noise source affecting the monitoring location was vehicular traffic on the local and regional roadway network (Oakland Rd. and US 101). Additional noise sources experienced during the long-term noise monitoring period included aircraft over-flights, emergency vehicle pass-bys and general community noise in the area. Ambient noise level exposure at the monitoring locations were fairly dependent on the relative distance from nearby transportation noise sources.

Noise monitoring data is summarized below Table 1 for the long-term noise monitoring location in; with detailed noise level data provided in tabular and graph form in Appendix B. The average day-night (DNL) noise level measured during the long-term ambient noise monitoring survey ranged from approximately 71 to 74 dBA DNL. Maximum hourly noise levels (Lmax) documented during the long-term monitoring ranged from approximately 75 to 98 dBA Lmax; with average maximum levels ranging from 79 to 91 dBA Lmax. Maximum noise levels at measurement location LT-01 were found to be influenced by vehicles impacting a steel road plate/trench work cover plate near the measurement site. Noise levels at measurement location LT-02 were not found to be influenced by the road plate; and is therefore considered more representative of typical traffic noise exposure at uses adjacent to Oakland Road.

Table 1 – Summary of Long-Term Noise Monitoring

				Average Hourly Noise Levels, dBA							
				Daytime				Nighttime			
Site	Description[1]	Date	DNL	Leq	Lmax	L50	L90	Leq	Lmax	L50	L90
LT-01	Eastern Project Boundary	01/17/2017	74.3	71.6	90.8	66.6	60.3	66.7	88.9	66.6	53.3
LT-02	West end of Pavilion Loop (Modern Ice Community)	01/17/2017	71.4	68.9	87.7	65.7	60.4	63.9	79.5	56.4	51.0

Notes: dBA = A-weighted decibels; DNL = 24-hour day-night noise level; Leq = equivalent average noise level; Lmax = maximum noise level; L50 = sound level exceeded 50% of the hour; L90 = sound level exceeded 90% of the hour, typically represents the background noise level.

1 – Measurement locations are provided in Figure 1 as an overlay on an aerial photograph.

Source: Extant Acoustical Consulting LLC, 2017

3.2.2 Short-Term Noise Monitoring

Short-term attended monitoring was performed by Extant staff at three (3) locations on the project site on January 18, 2017. Detailed observations about the measurement environment, existing noise sources, and other elements with the potential to effect the measurement or the Project were documented throughout the monitoring program. Short-term monitoring locations are depicted on Figure 1.

Monitoring sites ST-01 was located near measurement location LT-01 to provide additional information about traffic noise levels along Oakland Road and to correspond with long-term monitoring at LT-01. Short-term monitoring sites ST-02 and ST-03 were located to represent nearby residential property lines of the Modern Ice townhome development and 552 Horning Street, respectively. Noise experienced at the short-term monitoring locations ST-01 through ST-03 was predominately due to vehicular traffic on the local roadway network.

Overall noise levels measured at the short-term environmental noise monitoring locations ranged from approximately 64 to 74 dBA Leq. Maximum noise levels documented during the monitoring survey ranged from approximately 80 to 93 dBA Lmax. Generally, noise level exposure was directly dependent on the distance of the monitoring location from surrounding traffic noise sources. Monitoring location ST-01 was influenced by vehicles traversing the road/trench plates, resulting in maximum (Lmax) noise levels being elevated when the trench plate was impacted. However, the average noise level (Leq) experienced at ST-01 was not significantly affected due to the trench plate. Table 2 presents the overall monitoring results for each of the short-term monitoring locations, along with some general notes from each site.

Table 2 – Summary of Short-Term Noise Monitoring

Site	Description[1]	Start Time	Average Noise Levels (dBA)					Notes/Sources
			Leq	Lmax	L50	L90	DNL[2]	
ST-01	Eastern Project Boundary - Oakland Rd Traffic	4:05 PM	73.7	92.5	70.5	63.1	76.6	Traffic on Oakland, trench plate noise.
ST-02	Adjacent to 973 Pavilion Loop Property Line.	4:25 PM	71.4	83.1	68.0	61.3	75.6	Traffic on Oakland.
ST-03	Adjacent to 552 Horning Street Property Line.	5:15 PM	63.8	80.2	58.9	54.7	66.7	Traffic on Horning and Oakland, Community Noise.

Notes: dB = A-weighted decibels; Leq = equivalent average noise level; Lmax = maximum noise level; L50 = sound level exceeded 50% of the period; L90 = sound level exceeded 90% of the hour, typically represents the background noise level.
1 – Measurement locations are provided in Figure 1 as an overlay on an aerial photograph.
2 – Average Day-Night Level (DNL) interpolated based on corresponding long-term measurement data.
Source: Extant Acoustical Consulting LLC, 2017

3.2.3 Existing Traffic Noise

Existing traffic noise levels were modeled for roadway segments in the project vicinity based on the Federal Highway Administration (FHWA) Highway Traffic Noise Model (TNM) Version 2.5® prediction methodologies, and traffic data for project area roadways from the traffic impact analysis prepared for the project (Hexagon 2017). The FHWA TNM incorporates state-of-the-art sound emissions and sound propagation algorithms, based on well-established theory and accepted international standards. The acoustical algorithms contained within the FHWA TNM have been validated with respect to carefully conducted noise measurement programs, and show excellent agreement in most cases for sites with and without noise barriers (FHWA 1998).

Noise modeling for the project was performed through the application of established assessment methodologies and algorithms to propagate noise levels into the surrounding community (e.g., traffic noise via FHWA TNM 2.5) within the SoundPLAN noise modeling program. The model incorporated a three-dimensional geometric model of the study area developed from digital terrain information, available GIS information, aerial photography and information provided by the project team. The noise modeling accounted for factors as vehicle volume, speed, vehicle type, roadway configuration, distance to the receiver, and propagation over different types of ground (acoustically soft and hard ground). In order to ensure that modeled existing traffic noise levels correlate with measured traffic noise levels, observations and data collected during short-term noise monitoring was used to calibrate the traffic model. Modeled average traffic noise levels were found to be reasonably consistent with traffic noise measurements conducted at the project site, over-predicting traffic noise levels by approximately 0 to 1.5 dB. As this is within the tolerances of the traffic noise prediction model calibration offsets were not applied to the model.

Noise prediction receivers were placed within the noise model, representing noise-sensitive receptors (i.e., single family residences, multi-family residential, outdoor activity areas, schools, etc.), locations of key interest, and the locations of the noise monitoring sites used during the field survey. Modeled traffic noise exposure levels at nearby noise-sensitive receivers in the immediate project vicinity are shown in Table 3. Equal level noise contours for the modeled existing traffic conditions in the project area are presented graphically in Figure 3. As shown in Table 3, modeled traffic noise level exposures at prediction receivers in the project area range from approximately 61 to 74 dBA DNL; with noise levels at the receivers representing the noise-sensitive residential receptors in the study area ranging from 63 to 74 dBA DNL.

Table 3 – Modeled Existing Traffic Noise Levels

Site	Location	Land Use	Threshold	Noise Level Exposure (DNL, dBA)
P-01	Eastern Project PL	Right-of-Way	-	70
P-02	Northwestern Project PL	Light Industrial	70	62
P-03	Southwest Project PL	Light Industrial	70	61
P-04	995 Oakland Rd.	Light Industrial	70	65
P-05	552 Horning Street	Multifamily Residential	60	63
P-06	973 Pavilion Loop	Multifamily Residential	60	74
P-07	961 Pavilion Loop	Multifamily Residential	60	72
P-08	951 Pavilion Loop	Multifamily Residential	60	71
P-09	End of Pavilion Loop	Multifamily Residential	60	70

Notes: dBA = A-weighted decibels; DNL = Day Night noise level.
Locations of noise monitoring sites and noise prediction receivers with modeled existing traffic noise level contours are shown on Figure 3.
Source: Extant Acoustical Consulting LLC, 2017

4 Regulatory Criteria

Standards and guidelines for addressing noise exposure within the City of San Jose are contained primarily in the City of San Jose General Plan, with additional guidelines found in the City of San Jose Municipal Code.

4.1 City of San Jose General Plan

The General Plan Noise Element establishes objectives, policies, and actions to protect its inhabitants against exposure of noise-sensitive uses to loud noise and to prevent encroachment of noise-sensitive uses on existing noise producing facilities.

The General Plan establishes exterior noise level standards and maximum allowable noise exposure levels at noise-sensitive land uses, which are considered “normally acceptable”, and represented below in Table 4 (Section EC-1.1 and Table EC-1 of the City of San Jose General Plan). The noise level guidelines are presented in terms of the 24-hour CNEL or DNL noise level in dBA. The intent of these guidelines is to affect new project development through the discretionary review process to reduce potential noise exposure and excessive noise within the community.

As outlined in policy EC-1.2, the General Plan seeks to minimize noise impacts of new development on existing noise-sensitive receptors by limiting the effect a project may have on the existing ambient noise environment. A project is considered to cause a significant noise impact if the DNL at noise-sensitive receptors would increase by 5 dBA or more, where ambient noise levels would remain “Normally Acceptable” (60 dBA DNL); or if a project would result in an increase of 3 dBA or more, where noise levels would equal or exceed the “Normally Acceptable” level (60 dBA DNL).

Policy EC-1.3 of the General Plan limits noise generation for new non-residential land uses which are adjacent to residential land uses, to 55 dBA DNL at the residential property line.

The effects of operational noise are discussed briefly in General Plan Policy EC-1.6, which prescribes regulation of commercial and industrial operational noise levels through application of the City’s Municipal Code. The Municipal Code standards are discussed in the following section.

The General Plan provides guidelines for construction operations within Policy EC-1.7, requiring construction operations within San Jose to use best available noise suppression devices and techniques; and limit construction hours near residential uses per the City’s Municipal Code (7 A.M. to 7 P.M., Monday through Friday).

Policy EC-1.8 of the General Plan states that commercial drive-thru uses will only be allowed “when consistency with the City’s exterior noise level guidelines and compatibility with adjacent land uses can be demonstrated.”

Table 4 – Land Use Compatibility Guidelines in San Jose
(City of San Jose General Plan Noise Element, Table EC-1)

Land Use Category	Exterior Noise Exposure (DNL in Decibels (dBA)) 55	60	65	70	75	80
1. Residential, Hotels and Motels, Hospitals and Residential Care[1]						
2. Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds						
3. Schools, Libraries, Churches, Hospitals, Nursing Homes						
4. Office Buildings – Business, Commercial & Professional						
5. Sports Area, Outdoor Spectator Sports						
6. Public and Quasi-Public Auditoriums, Concert Halls, Amphitheaters						

[1] Noise mitigation to reduce interior noise levels pursuant to Policy EC-1.1 is required.

(white)	**Normally Acceptable**	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
(light green)	**Conditionally Acceptable**	Specified land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features included in the design.
(green)	**Unacceptable**	New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies.

Source: Envision San Jose 2040 General Plan

4.2 The City of San Jose Municipal Code

The City of San Jose Municipal Code addresses and provides a means for protection of the citizens of San Jose through both qualitative and quantitative provisions and prohibitions. The primary purpose of the Code is intended to promote and secure the public health, comfort, safety, welfare and prosperity, and the peace and quiet of the city and its inhabitants. The Code serves as an implementation method for the General Plan and enforcement element for establishing the desired character of the City.

As a means of enforcement, the City of San Jose Code of ordinance contains subjective (qualitative) guidelines, codes and statutes within Chapter 10.16. The City of San Jose provides further guidance and regulation on allowable noise levels within Title 20 of the Code of Ordinances, which are specific to land use.

The City of San Jose Zoning Maps designates the parcel where the project under consideration is proposed as Light Industrial (LI). The adjoining parcels along the western project boundary is also zoned as Light Industrial (LI) and is used for light industrial and commercial purposes. All other parcel boundaries (north, east and west) are adjoining transportation right-of-ways.

The Municipal Code establishes in Section 20.50.300 that for Light Industrial Districts "*The sound pressure level generated by any use or combination of uses on a property shall not exceed the decibel levels indicated in Table 20-135 at any property line, except upon issuance and in compliance with a conditional use permit as provided in Chapter 20.100.*" Table 20-135 establishes a maximum noise level of 55 dB for industrial use adjacent to a property used or zoned for residential purposes (consistent with General Plan Policy EC 1.3); 60 dB for industrial use adjacent to a property used or zoned for commercial or other non-residential purposes; and, 70 dB for industrial use adjacent to a property used or zoned for industrial or use other than commercial or residential purposes.

4.3 Council Policy 6-10

The City of San Jose provides additional guidance for the development and issuance of land uses incorporating a drive-through use. This guidance is provided within Council Policy 6-10, "Criteria for the Review of Drive-Through Uses". Section II of Council Policy 6-10 pertains specifically to noise. The Policy requires that noise levels generated by drive-through speakers are not audible from adjacent residential uses; and limits the use of drive-through speakers where drive-through lanes directly abut residential uses.

5 Methodology

The SoundPLAN® computer noise model was used for computing sound levels from the proposed project throughout the surrounding community. An industry standard, SoundPLAN was developed by Braunstein + Berndt GmbH to provide estimates of sound levels at distances from specific noise sources taking into account the effects of terrain features including relative elevations of noise sources, receivers, and intervening objects (buildings, hills, trees), and ground effects due to areas of hard ground (pavement, water) and soft ground (grass, field, forest). In addition to computing sound levels at specific receiver positions, SoundPLAN can compute noise contours showing areas of equal and similar sound level.

The SoundPLAN model incorporates a geometric model of the study area and reference noise source levels for the project noise sources. SoundPLAN uses a sound propagation model to project noise levels from the project into the surrounding community. The three-dimensional geometric model of the study area was developed from CAD files provided by the project architect, digital terrain information and aerial photography.

Noise prediction receivers were placed within the noise model, representing noise-sensitive receptors (i.e., single family residences, multi-family residential outdoor activity areas, schools, etc.), locations of key interest (presented above in Table 3 and on Figure 3), and the locations of the noise monitoring sites used during the field survey. Noise levels at the specified noise prediction receivers are calculated based on the assessment methodologies and algorithms applicable to respective noise sources. In addition to computing sound levels at specific receiver locations, SoundPLAN can compute noise contours showing areas of equal and similar sound level, which are presented in the attached exhibits.

Construction-related noise effects were assessed with respect to nearby noise-sensitive receptors and their relative exposure (accounting for intervening topography, barriers, distance, etc.), based on application of FHWA Roadway Construction Noise Model (RCNM) and Federal Transit Administration reference noise level data and usage-factors.

Traffic noise levels were calculated using the FHWA Traffic Noise Model (TNM) Version 2.5® prediction algorithms within the SoundPLAN modeling software. Traffic noise levels for the roadway network in the project vicinity were incorporated into the noise model based on Caltrans traffic data for project area roadways and the findings of the field survey.

Potential effects associated with long-term (operation-related) noise sources were assessed based on project documentation, site reconnaissance data and reference noise level for the various noise sources. The sound propagation model within SoundPLAN that was used for this study was the General Noise Prediction Model. This international standard propagation model is used in the U.S. and abroad for industrial noise sources, due to its accurate and reliable propagation equations. The GPM accounts for advanced meteorological propagation effects, variations in terrain and ground type.

6 Project Impact Analysis

As stated in the introduction, the project under consideration proposes to demolish the existing buildings on the project site and construct a new a self-storage, a quick service restaurant and a gas station with a convenience store and car wash. Noise sources associated with each of the proposed uses and the potential impact on the surrounding community are discussed separately within this section.

6.1 Construction Noise

Construction activities are considered short-term, temporary noise source associated with developing projects; the specific level of effort required for this project is currently unknown but would be expected to have a duration of a several months. Construction activities associated with the proposed project are expected to be performed Monday through Friday, between the hours of 7:00 AM and 7:00 PM, consistent with the City of San Jose Municipal Code and Ordinance 26594.

Construction activities would involve demolition, site preparation, grading, utility and infrastructure placement, laying of foundation elements, and construction of structures. Each stage of the construction process utilizes a varied equipment mix, operational characteristics and noise emission characteristics. Construction noise levels in the project vicinity would fluctuate depending on the particular type, number, and duration of usage for the various pieces of equipment.

The specific equipment types, schedules and usage rates required for this project is not known at this time; however, minimal heavy equipment such as excavators, graders, and scrapers are expected to be required as a significant portion of the existing configuration will be able to be utilized for the proposed action. Heavy construction equipment would likely be used sparingly during the demolition phase of construction. The majority of project construction activities would be anticipated to involve the use of small to medium scale equipment such as skid steer tractors, backhoes, compressors, generators, breakers/hammers and power tools. Table 5 provides the reference noise emission levels typically generated by various types of construction equipment and their associated acoustical usage factors. The effect of construction equipment on the noise environment would depend largely on the types of construction activities occurring on any given day, the average operational location of the noise source, relative distances and exposure to noise-sensitive receptors.

The noise control and minimization measures outlined below will further minimize the effects of project-generated construction noise at the adjacent noise-sensitive receptors. Implementation of the following Best Management Practices and construction noise minimization efforts, in combination have been shown to effectively reduce construction noise levels within surrounding communities by 5 to 13 dBA, depending on application.

a) Project construction activities will be performed consisted with the hour of operation requirements of the City of San Jose Municipal Code.

b) Construction equipment and vehicles will be fitted with efficient, well-maintained mufflers that reduce equipment noise emission levels at the project site. Equip internal combustion powered equipment with properly operating noise suppression devices (e.g., mufflers, silencers, wraps) and keep properly maintained and tuned to minimize noise.

c) Portable, stationary and support equipment (such as generators, compressors, and pumps) shall be located as far as reasonably possible from nearby noise-sensitive receptors.

d) Construction equipment will not be idled for extended periods (e.g., 5 minutes or longer) of time in the immediate vicinity of noise-sensitive receptors.

e) Impact tools will be shrouded or shielded with intake and exhaust ports on power equipment muffled or shielded. This may necessitate the use of temporary or portable, application specific noise shields or barriers.

With the implementation of the above noise management and minimization practices, construction activities associated with the proposed project are anticipated to comply with the thresholds established by the City of San Jose.

Table 5 – Construction Equipment Noise Emissions and Usage Factors

Equipment	Maximum Noise Level, Lmax dBA @ 50-feet	Acoustical Usage Factor, Percent
Backhoe	80	40
Compactor (ground)	80	20
Compressor (air)	81	40
Dozer	85	40
Dump Truck	84	40
Excavator	85	40
Flat Bed Truck	84	40
Front End Loader	80	40
Generator	82	50
General Industrial Equipment	85	50
Grader	85	40
Pneumatic Tools	85	50
Pumps	77	50
Roller	85	20
Vibrating Hopper	85	50
Welder/Torch	73	40

Notes:
1- Acoustical use factor is the percentage of time each piece of equipment is operational during a typical day.
Source: Federal Highway Administration 2006; Federal Transit Administration 2006.

6.2 Traffic Noise

Long-term operation of the project would generate an increase in traffic volumes on the local roadway network in the project vicinity. Consequently, noise levels from vehicular traffic sources along affected roadway segments would increase. Traffic noise computations employed the latest version of the FHWA TNM 2.5 prediction algorithms within the SoundPLAN model. Potential off-site noise impacts resulting from the increase in vehicular traffic on the local roadway network, associated with long-term operations of the proposed project, were evaluated under existing and baseline conditions (existing plus approved but not yet constructed projects), with and without implementation of the proposed project.

Traffic volumes and the distribution of those volumes were obtained from the Traffic Impact Analysis prepared for the project (Hexagon 2017). ADT volumes were calculated by summing all traffic movements, for both the AM and PM peak-hours, existing on- or turning on to a particular roadway segment during the peak-hour and multiplying the total peak-hour volume by a “k-factor” of 5. Average vehicle speeds on local area roadways were assumed to be consistent with posted speed limits and remain as such, with or without implementation of the proposed project. Refer to Appendix F for complete modeling inputs and results.

As shown in Table 6, modeled traffic noise levels at noise-sensitive receivers in the project study area currently exceed the City of San Jose 60 dBA DNL transportation noise level thresholds under the existing no project condition. Therefore, the potential for the proposed project to result in a noise level impact at these receivers is evaluated by determining whether project traffic would cause a significant change, of 3 dB or more in the existing ambient noise environment.

6.2.1 Existing Conditions

Modeled traffic noise exposure levels at nearby noise-sensitive receivers in the project vicinity are shown in Table 6 for the existing conditions, with and without implementation of the proposed project. The table also presents relative traffic noise level increases (net change) resulting from implementation of the proposed project, along with an evaluation of relative significance. As discussed, noise level increases due to a project are considered significant if the project would result in a relative increase in the ambient noise environment of more than 5 dBA, for ambient levels below 60 dBA DNL; an increase of more than 3 dBA, for ambient noise levels greater than 60 dB DNL.

As shown in Table 6, increases in traffic noise levels due to development of the proposed project are calculated to range from less than +1 dBA to +1.3 dBA DNL in the project vicinity under existing conditions. The largest increase in roadway noise exposure levels at nearby noise-sensitive receptors in the vicinity of the plan area is projected to occur at the northeastern-most portion of the proposed project; with the proposed project resulting in a change of +1.3 dBA DNL traffic noise exposure at prediction receiver P-01. However, this change is caused by changes in shielding from buildings on the project site and not due to increases in traffic noise.

Development of the proposed project is not predicted to result in a significant relative increase in the ambient noise environment of more than 5 dBA, for ambient levels below 60 dBA DNL; or an increase of more than 3 dBA, for ambient noise levels for ambient noise levels greater than 60 dBA DNL, under the existing condition.

Table 6 – Existing Traffic Volumes

Receiver		Noise Level Exposure (DNL, dBA)				
No.	Description	Threshold	Existing No Project	Existing Plus Project	Net Change[1]	Significant Impact
P-01	Eastern Project PL	-	70	70	<1	No
P-02	Northwestern Project PL	70	62	64	+1.3	No
P-03	Southwest Project PL	70	61	62	+1.1	No
P-04	995 Oakland Rd.	70	65	65	<1	No
P-05	552 Horning Street	60	63	63	<1	No
P-06	973 Pavilion Loop	60	74	74	<1	No
P-07	961 Pavilion Loop	60	72	71	<1	No
P-08	951 Pavilion Loop	60	71	71	<1	No
P-09	End of Pavilion Loop	60	70	70	<1	No

Notes:
dBA = A-weighted decibels; DNL = day-night average noise level, with a penalty applied to noise occurring during nighttime hours (10:00 PM to 7:00 AM).
1- Net change = No-Project noise level, subtracted from Plus-Project noise level.
Source: Hexagon 2017, Extant Acoustical Consulting LLC 2017.

6.2.2 Baseline Conditions

Modeled traffic noise exposure levels at nearby noise-sensitive receivers in the project vicinity are shown in Table 7 for the baseline conditions, with and without implementation of the proposed project. The table also presents relative traffic noise level increases (net change) resulting from implementation of the proposed project along with an evaluation of relative significance.

As shown in Table 7, increases in traffic noise levels due to development of the proposed project are calculated to range from less than +1 dB to +1.3 dB DNL in the project vicinity under existing conditions. The largest increase in roadway noise exposure levels at nearby noise-sensitive receptors in the vicinity of the plan area is projected to occur at the northeastern-most portion of the proposed project; with the proposed project resulting in a change of +1.3 dB DNL traffic noise exposure at prediction receiver P-01. However, this change is caused by changes in shielding from buildings on the project site and not due to increases in traffic noise.

Development of the proposed project is not predicted to result in a significant relative increase in the ambient noise environment of more than 5 dB, for ambient levels below 60 dBA DNL; or an increase of more than 3 dB, for ambient noise levels for ambient noise levels greater than 60 dBA DNL, under the Baseline condition.

Table 7 – Baseline Traffic Volumes

Receiver		Noise Level Exposure (DNL, dBA)				
No.	Description	Threshold	Baseline No Project	Baseline Plus Project	Net Change[1]	Significant Impact
P-01	Eastern Project PL	70	71	71	<1	No
P-02	Northwestern Project PL	-	63	64	+1.3	No
P-03	Southwest Project PL	-	61	62	+1.2	No
P-04	995 Oakland Rd.	70	66	66	<1	No
P-05	552 Horning Street	60	64	64	<1	No
P-06	973 Pavilion Loop	60	75	75	<1	No
P-07	961 Pavilion Loop	60	73	73	<1	No
P-08	951 Pavilion Loop	60	73	73	<1	No
P-09	End of Pavilion Loop	60	72	72	<1	No

Notes:
dBA = A-weighted decibels; DNL = day-night average noise level, with a penalty applied to noise occurring during nighttime hours (10:00 PM to 7:00 AM).
1- Net change = No-Project noise level, subtracted from Plus-Project noise level.
Source: Hexagon 2017, Extant Acoustical Consulting LLC 2017.

6.2.3 Traffic Impact Discussion

Based on the thresholds applicable to the project, changes in the ambient noise environment created by development and implementation of the proposed project would be considered significant if the project would cause a relative increase in the ambient noise environment of more than 5 dB, for ambient levels below 60 dBA DNL; or an increase of more than 3 dB, for ambient noise levels greater than 60 dBA DNL. Traffic noise level impacts associated with development in the proposed project have been analyzed and presented for Existing and Baseline conditions, with and without build-out of the proposed project.

Under the existing conditions (Table 6), traffic noise associated with implementation of the proposed project within the Plan area would result in changes in traffic noise exposures ranging from less than +1 dB to +1.3 dB DNL at representative receptors in the project vicinity. Prediction receivers representing the nearest property boundary of noise-sensitive receptors in the study area were calculated to experience changes in traffic noise level exposures of less than 1 dB DNL.

Baseline conditions, with and without development of the project build-out, are typically considered the most appropriate measurement upon which to determine potential impacts associated with the project; as it represents the earliest date that the proposed project could reasonably be implemented and have the potential to impact the ambient environment. The baseline conditions account for traffic noise levels currently in the existing environment and those of all planned and approved projects anticipated for completion at that time. Baseline traffic noise level contours without implementation of the proposed project are shown in Figure 4 and noise level contours with implementation of the Plan are shown in Figure 5.

Under the baseline conditions build-out scenario (Table 7), traffic noise associated with implementation of the proposed project within the Plan area would result in changes in traffic noise exposures ranging from less than +1 dB to +1.3 dB DNL at representative receptors in the project vicinity. Prediction receivers representing the nearest property boundary of noise-sensitive receptors in the study area were calculated to experience changes in traffic noise level exposures of less than 1 dB DNL.

Therefore, the proposed project would not cause a significant increase in traffic noise levels without the project, under existing, or baseline conditions; and would comply with the City of San Jose ambient noise increase criteria of 3 dB DNL for transportation noise sources.

6.3 Project Operational Noise

6.3.1 Self-Storage

The Self-Storage portion of the proposed project would be located in the northern portion of the project site, incorporating three self-storage buildings with a total square footage of approximately 98,000 in total. The self-storage is currently proposed to be open for operation between the hours of 6:00 AM and 10:00 PM. Noise sources associated with the long-term operation of the self-storage facility are anticipated to be limited to patrons accessing the site, on-site parking and loading/unloading activities. No other significant noise sources were noted or called-out in the project design. The noise generated by the self-storage use would be almost completely shielded by on-site buildings and is not anticipated to result in additional noise exposure at nearby noise-sensitive receptors. Additionally, the noise generated by patrons of the self-storage facility would be similar to other commercial and light-industrial noise sources in the area, but at a lower level.

6.3.2 Quick Service Restaurant

The quick service restaurant portion of the proposed project would be located in the south west portion of the project site. The restaurant would have a square-footage of approximately 2,500 and incorporate a drive-through service window. Noise sources associated with the restaurant would predominately include parking lot activities, vehicles idling in the drive-through, and the drive-through speaker system. Additional noise attributable to restaurant use may include intermittent noise from loading and unloading of delivery trucks, as well as pedestrians accessing the site.

Activities making up a single parking event included vehicle arrival, limited idling, occupants exiting the vehicle, door closures, and conversations among passengers, occupants entering the vehicle, vehicle startup and departure. These parking actions can be described based on the duration of an event, the average noise level and the maximum noise level occurring with a discreet parking action. Noise levels generated by the turnover of vehicles in the store parking lots were estimated according to methodologies established by the Parking Area Noise Recommendations study (Bayer 2007) within the SoundPLAN noise model. Vehicle turnover within the parking lot was established based on the AM/PM peak-hour trip generation rates presented in the traffic study prepared for the project (Hexagon 2017).

The proposed drive-through lane would begin on the northwestern corner of the restaurant building and wrap around the restaurant to the east. Noise sources associated with the drive-through lane would include vehicles circulating along the drive-through lane, idling vehicles, and orders being placed at the drive-through speaker. Vehicles circulating along the drive-through lane and idling in the vehicle stack have previously been documented to produce noise levels of 53 dBA Leq and 58 dBA Lmax at a distance of 20-feet. Measurements performed to document the noise level generated by drive-through speakers have shown noise levels ranging from 46 to 58 dBA at a distance of 20 feet. Measured noise levels correspond well with the reference noise level data provided by drive-through communications system manufacturer, HME.

Based on these measured and reference noise levels and trip generation assumptions provided in the traffic analysis, Quick Service Restaurant noise levels were calculated within the computerized noise prediction model created for the proposed project. Modeled Quick Service Restaurant noise levels were found to range from 33 to 58 dBA DNL at the representative prediction receivers and more specifically, 41 to 45 dBA DNL at the prediction receivers representing nearby noise-sensitive residential property lines.

Council Policy 6-10 specifies that requires that drive-through speakers located adjacent to residential uses are not audible on the residential parcel. As mentioned, the proposed project is not located directly adjacent to or abutting any noise sensitive land uses. However, there are residential land uses in the project study area that may have the potential to be affected by the use of a drive-through speaker.

During the quietest portions of the long-term monitoring period, background noise levels in the project vicinity were noted to be as low as 49 dBA L90, during the proposed operational hours (6:00 AM to 12:00 PM). Maximum noise levels from the drive-through speaker would be 41 dBA Lmax at nearby noise-sensitive receptors. As such, depending on the interpretation of CP 6-10, the project would potentially need to have an automatic volume control installed on the drive-through speaker system. Automated volume control systems for drive-through speaker systems sense the noise levels in the area and adjust the volume of the speaker in accordance.

6.3.3 Gasoline Station, Convenience Store and Car Wash

The gasoline station with convenience store and car wash would be located in the southeast portion of the project site. The gas station is proposed to include six (6) dual sided gasoline pumps, twelve (12) fueling positions. The convenience store would be approximately 3,600 square feet; he associated car wash would be located within a 1,200 square-foot tunnel along the north side of the gas station and convenience store. The hours of operation for the gas station, convenience store and car wash are proposed to be 5:30 to 12:00 AM

The primary noise sources associated with the proposed gas station, convenience store and car wash would be the operation of the automated car wash. Additional noise sources associated with the gas station and convenience store would include an air-water station, vacuum station, and patrons or deliveries accessing the site.

Gas Station and Convenience Store Operations

As patrons access the site, the noise generating activities can be generally lumped into “events”. Activities making up a single-event would include the vehicle arrival, limited idling of the vehicle, occupants exiting the vehicle, door closure, conversations among passengers, occupants entering the vehicle, vehicle startup and departure.

To quantify these events, Extant conducted reference noise level measurements of filling station and parking activities. Sound level data for gasoline fueling events was gathered to determine the sound exposure levels (SEL) associated with a single filling/parking event. The single-event SELs measured at the existing filling station correlate well with empirical data for similar activities and indicate an average single-event SEL of approximately 71 dB SEL at a distance of 50 feet.

Based on ITE Trip Generation vehicle rates supplied by the project traffic consultant, the gasoline station and convenience store operations were assumed to have 16.57 trips per vehicle fueling position during AM peak hour conditions and 19.07 trips per vehicle fueling position per-hour, during PM peak hour operations. Applying these peak hour rates across a 24-hour period overstates the trips occurring during hours other than the peak hour; and as such, would be considered conservative. As before, the SoundPLAN noise prediction model developed for the project was employed.

Also incorporated in to the modeling of gas station and convenience store operations is the noise generated by the air/water station, vacuum station and general parking activities across the project site. The modeled noise levels for the car wash, additional operations, and overall project noise are presented below in Table 8.

Car Wash Noise

Automated car wash equipment and facilities have several potential noise generating sources associated with their general operation; including pumps, compressors, high-pressure applicators and spray nozzles, scrubbers, and dryers. The car wash mechanical equipment (pumps, compressors, etc.) can generate a substantial amount of noise; however, the majority of the mechanical equipment is proposed to be fully enclosed within a mechanical equipment room, adjacent to the car wash tunnel. Potential noise sources not enclosed within the equipment room would include the high-pressure applicators and spray nozzle manifolds; noise from the friction of the wash systems; and noise generated from the dryer system. The dryers however, are the dominate noise source associated with car wash systems; therefore, this analysis will examine car wash-generated noise levels through evaluation of sound levels generated by the dominant noise source, the dryer system.

The proposed full-service car wash will include the use of a Proto-Vest Windshear II Dryer system with incorporated Proto-Vest silencer. The Proto-Vest Windshear II is a stationary, stand-alone drying system, using one (1) 30 horse-power Magnum blower feeding an air plenum arch and three (3) Proto-Duck air delivery bags. The dryer would be located approximately 10-feet inside of the east end of the car wash tunnel. The car wash dryer manufacturer (Proto-Vest) provided reference sound level data for the dryer in the form of sound pressure levels at varying distances. The manufacturer sound level data is provided as a reference in Appendix C. The supplied reference sound level data and operational characteristics for the equipment were used to calculate sound power levels (LwA) for the dryer.

The manufacturer reference source noise levels are based upon continuous operation of the dryers; which is capable of processing cars at conveyor/line speeds up to 70 cars per hour. It should be noted, that the assumption of continuous operation of up to 70 cars per hour, as incorporated into the SoundPLAN noise prediction model, is expected to be conservative based on trip generation rates for similar facilities. The Institute of Transportation Engineers (ITE) Trip Generation, 8th Edition (2008), and the SANDAG Trip Generation Manual, would suggest overall trip rates between 25 and 50 during a peak hour.

Operational and temporal assumptions outlined above along with the calculated sound power levels were used as inputs to the SoundPLAN noise prediction model. Modeled noise levels generated from the operation of the proposed car wash at the representative noise prediction receiver locations are presented in Table 8.

As shown in Table 8, noise levels generated from the proposed car wash dryers are anticipated to range from approximately 47 to 69 dBA DNL, at the prediction receivers representing the adjoining property lines. Therefore, project noise levels are predicted to exceed City of San Jose 55 dBA noise level standards and mitigation will be necessary to achieve compliance with the applicable criteria.

Table 8 – Modeled Operational Noise Levels

Site	Location	Noise Level Exposure (dBA, DNL) Self-Storage	Quick Service Restaurant	Gas & Convenience[1]	Car Wash	Overall Project
Residential Property Line Receivers						
P-01	Eastern Project PL	43	46	64	54	65
P-02	Northwestern Project PL	41	33	38	59	59
P-03	Southwest Project PL	49	58	53	53	61
P-04	995 Oakland Rd.	45	48	56	59	61
Residential Property Line Receivers						
P-05	552 Horning Street	37	45	50	45	53
P-06	973 Pavilion Loop	41	43	53	41	54
P-07	961 Pavilion Loop	41	43	54	51	55
P-08	951 Pavilion Loop	40	42	52	48	54
P-09	End of Pavilion Loop	40	41	50	49	53

Notes: dBA = A-weighted decibels; DNL = Day Night noise level.
1- Incorporates operations associated with the gas station and convenience store portion of the project: patrons, fueling activities, on-site traffic movement, vacuums, air/water stations, and additional parking.
Source: Extant Acoustical Consulting LLC, 2017

Overall project noise levels are anticipated to range from approximately 59 to 65 dBA DNL at property line receptors in the project study area. Overall project levels at prediction receivers representing noise-sensitive residential receptors in the vicinity were found to range from 53 to 55 dBA DNL. Therefore, the proposed project is anticipated to comply with the City of San Jose 55 dBA DNL noise level noise standard for residential uses.

6.4 Effect on Existing Environment

As outlined, the City of San Jose General Plan establishes policy to limit the effect of new projects on the existing ambient noise environment. Existing traffic noise exposure levels, as previously presented, serve as the basis for evaluating the potential for the proposed project to result in increased noise levels. Incorporating existing traffic volumes on the local and regional roadway network into the noise simulation model for the overall project operations and comparing the resulting noise levels to those of the existing environment, the project-related effect on the existing noise environment was determined. Modeled noise levels for the baseline conditions, the overall project, and combined baseline plus project noise levels are presented in Table 9.

Baseline ambient noise levels in the project area are illustrated on Figure 4. The overall noise levels generated by the operation of the proposed project are shown on Figure 6. Modeled ambient noise levels, for the baseline traffic condition, following implementation of the proposed project are shown on Figure 7.

As shown Table 9, the project-related effects on the baseline ambient noise environment were calculated to result in a change of less than 1 dB to approximately 2 dB, from baseline ambient conditions. The project related effects on the baseline ambient noise environment at noise-sensitive residential receptors in the study area were calculated to result in a change of less than 1 dB from the baseline no-project condition. Based on this analysis, project-generated noise levels are not predicted to result in an increase of 3 dB or more in the existing noise environment, as set forth in Policy EC-1.2 of the City of San Jose General Plan. Therefore, the proposed project is predicted to comply with the City of San Jose General Plan existing ambient effect noise standards.

Table 9 – Modeled Project Noise Level Effect

Site	Location	Modeled Noise Level Exposure (DNL, dBA)				
		Baseline Traffic[1]	Overall Project[2]	Baseline Plus Project[3]	Effect on Ambient[4,5]	Impact
Commercial/Industrial Property Line Receivers						
P-01	Eastern Project PL	71	65	72	1	No
P-02	Northwestern Project PL	63	59	64	2	No
P-03	Southwest Project PL	61	61	63	2	No
P-04	995 Oakland Rd.	66	61	67	1	No
Residential Property Line Receivers						
P-05	552 Horning Street	64	53	64	<1	No
P-06	973 Pavilion Loop	75	54	75	<1	No
P-07	961 Pavilion Loop	73	55	73	<1	No
P-08	951 Pavilion Loop	73	54	73	<1	No
P-09	End of Pavilion Loop	72	53	72	<1	No

Notes: dBA = A-weighted decibels; DNL = Day Night noise level.
1. Baseline traffic noise level contours are shown on Figure 4.
2. Overall project noise level contours are shown on Figure 6.
3. Baseline traffic noise level Plus project operational noise levels are shown on Figure 7.
Source: Extant Acoustical Consulting LLC, 2017

7 Conclusion

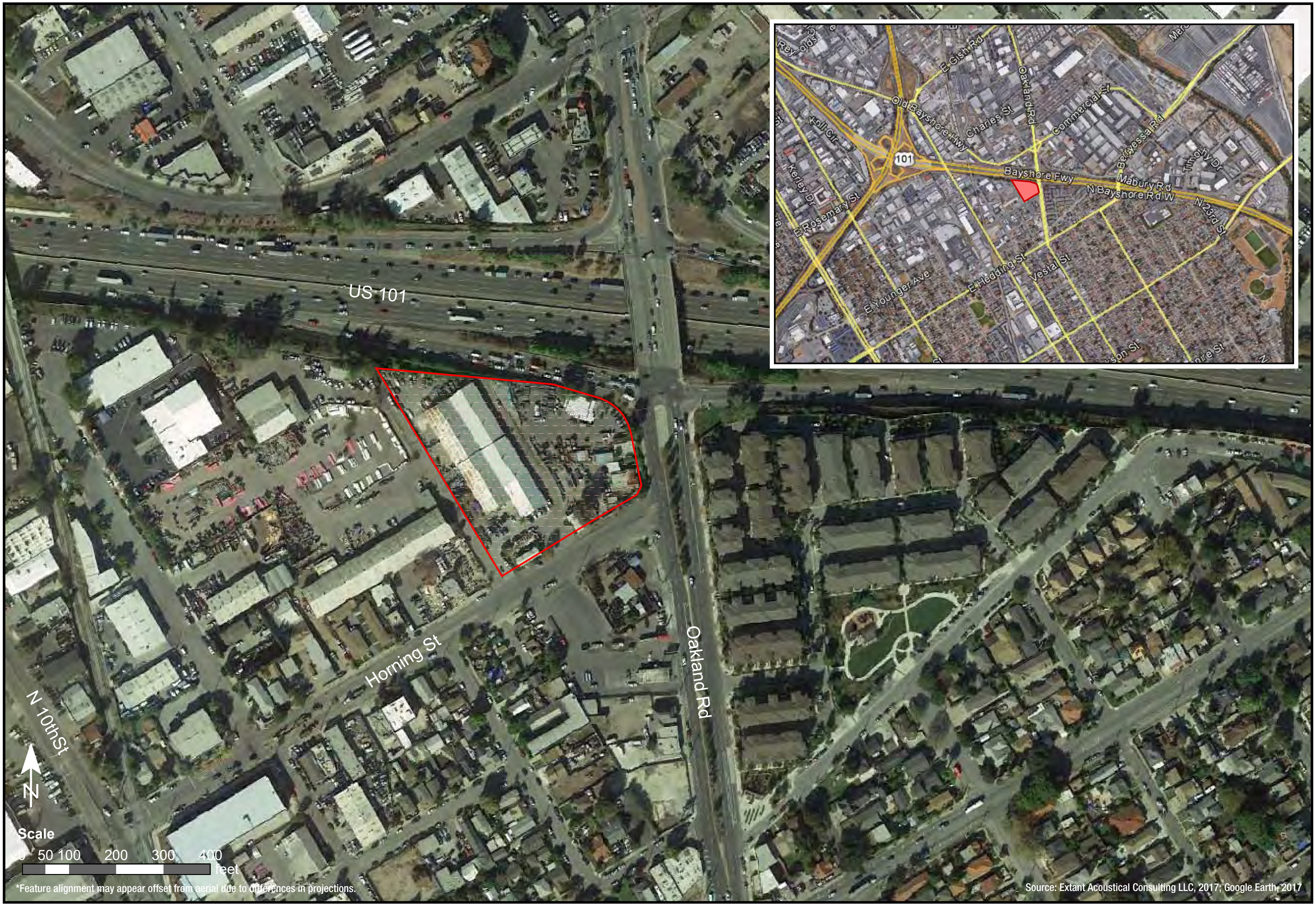
Extant Acoustical Consulting (Extant) has completed a noise assessment for the proposed project; located at 645 Horning Street in San Jose, California. The project is proposed to be located at the site of an existing light industrial use, at the intersection of Oakland Road and Horning Street; in the central planning area of San Jose. The project site is bounded by an adjoining light industrial site to the west and transportation right-of-ways on the north, east and southern project boundaries. The nearest noise-sensitive uses in the project vicinity are located to the south across Horning Street and to the east across Oakland Road.

The project proposes to construct a new self-storage facility, a quick service restaurant and a gas station with convenience store, and automated car wash. The analysis summarized the existing noise environment, presented the noise levels that are predicted to be generated by the proposed project site, and compared the resultant noise levels with applicable City of San Jose noise standards.

Project noise levels are anticipated to range approximately 53 to 55 dBA DNL, at the prediction receivers representing the surrounding noise-sensitive land uses. Based on the analysis presented, the predicted average day-night noise levels (DNL) generated from the operation of the proposed project are predicted to comply with the City of San Jose 60 dBA DNL exterior noise level standards set forth in Table EC-1 of the City of San Jose General Plan (normally acceptable criteria for residences). Project noise levels are also predicted to comply with the 55 dBA noise level standard for new non-residential uses affecting residential land uses as established in the City of San Jose General Plan Policy EC-1.3 and the City of San Jose Municipal Code.

Based on existing noise levels experienced in the vicinity of the project site, project-generated average day-night noise levels are predicted to be at or below ambient noise levels in the majority of the project study area. Noise levels generated from the proposed project were modeled to result in less than a 1 dBA increase in the existing noise environment at noise-sensitive receivers in the project study area. Project-generated noise levels are not predicted to exceed the existing noise environment protection criteria; causing an increase of 3 dBA or more in the existing noise environment, as set forth in Policy EC-1.2 of the City of San Jose General Plan.

Development and operation of the proposed Convenience Store, Gas Station, Car Wash and Retail Location at 645 Horning Street is anticipated to comply with the applicable City of San Jose noise standards.



Signs and Symbols

Project Area

Figure 1

Project Location

Jim Rubnitz
645 Horning Street
San Jose, CA

EXTANT ACOUSTICAL CONSULTING LLC

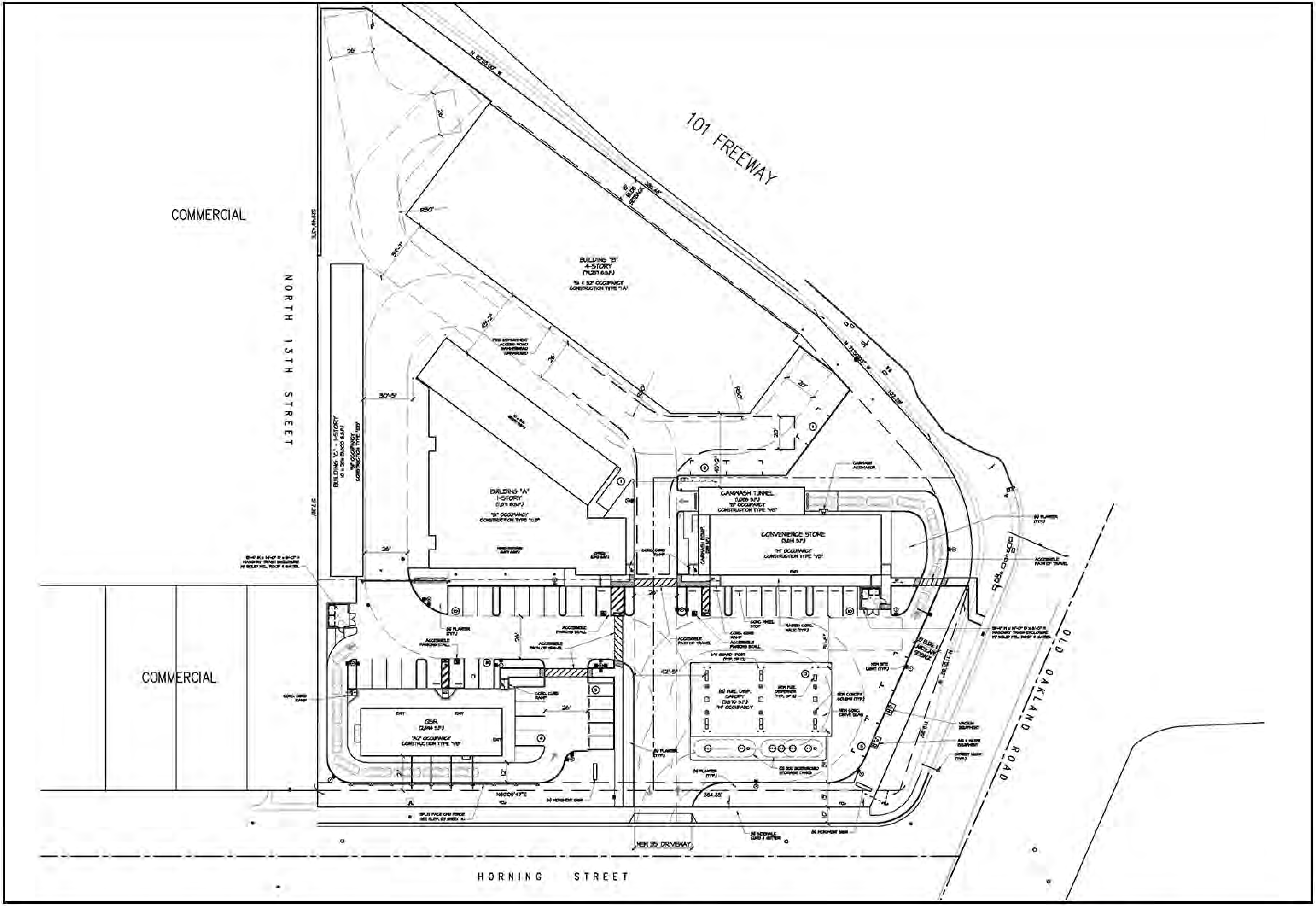
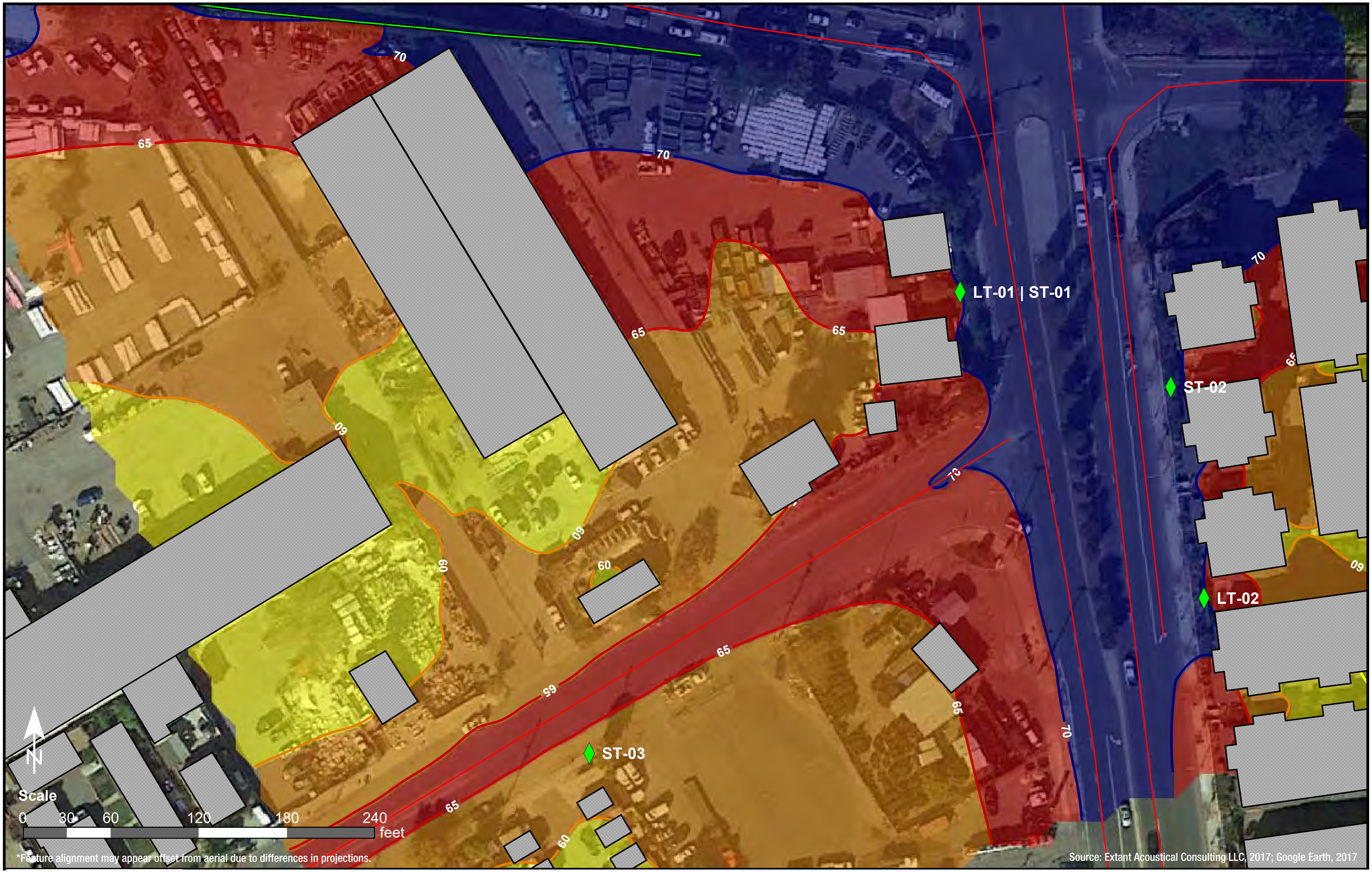


Figure 2

Proposed Site Plan

Jim Rubnitz
645 Horning Street
San Jose, CA
EXTANT ACOUSTICAL CONSULTING LLC



Signs and Symbols

- Project Area
- Receiver
- Building
- Road Emission

Noise Level
Ldn, dB(A)

- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65
- 65 - 70
- >= 70

Figure 3

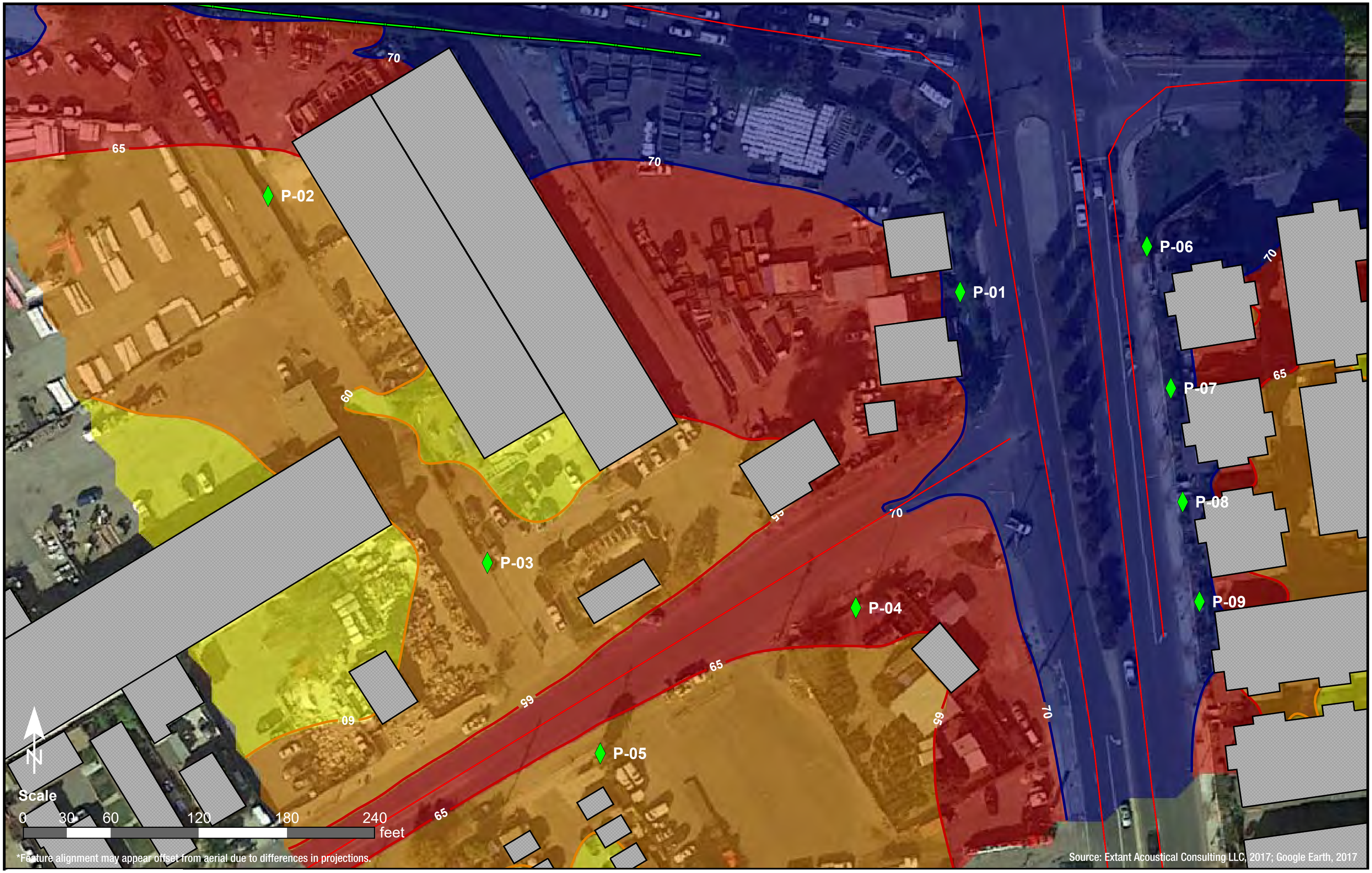
Existing Traffic Noise Levels

Day/Night Noise Level Contours, dBA Ldn
Measurement Locations

Jim Rubnitz
645 Horning Street
San Jose, CA

EXTANT ACOUSTICAL CONSULTING LLC

Published: 02/27/2017
Engineer: MJC



Signs and Symbols

- Project Area
- Receiver
- Building
- Road Emission

Noise Level
Ldn, dB(A)

- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65
- 65 - 70
- >= 70

Figure 4

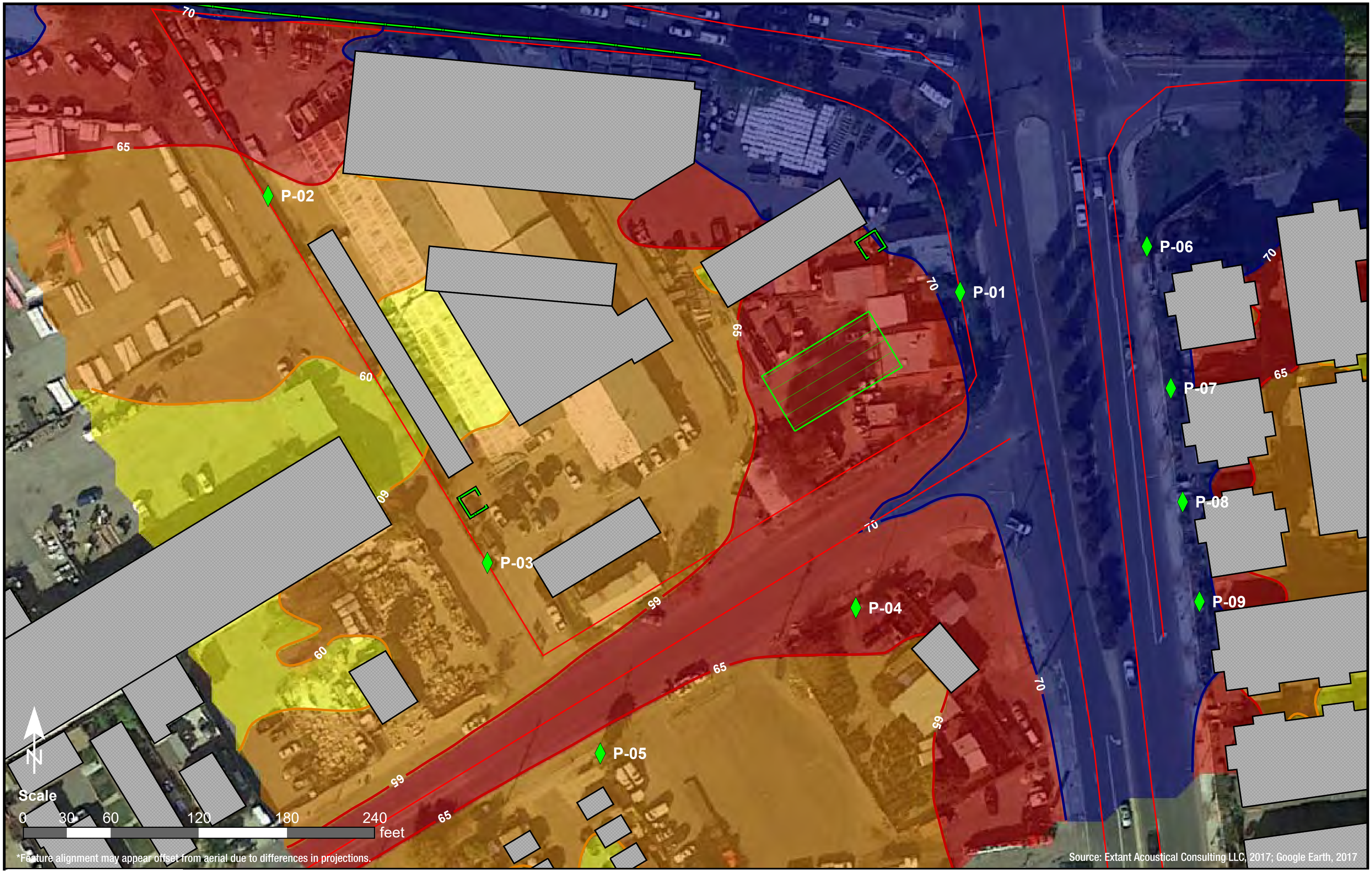
Baseline Traffic Noise Levels

Day/Night Noise Level Contours, dBA Ldn
Prediction Recievers

Jim Rubnitz
645 Horning Street
San Jose, CA

EXTANT ACOUSTICAL CONSULTING LLC

Published: 02/27/2017
Engineer: MJC



Signs and Symbols

- Project Area
- Receiver
- Building
- Road Emission

Noise Level
Ldn, dB(A)

45 - 50	
50 - 55	
55 - 60	
60 - 65	
65 - 70	
>= 70	

Figure 5

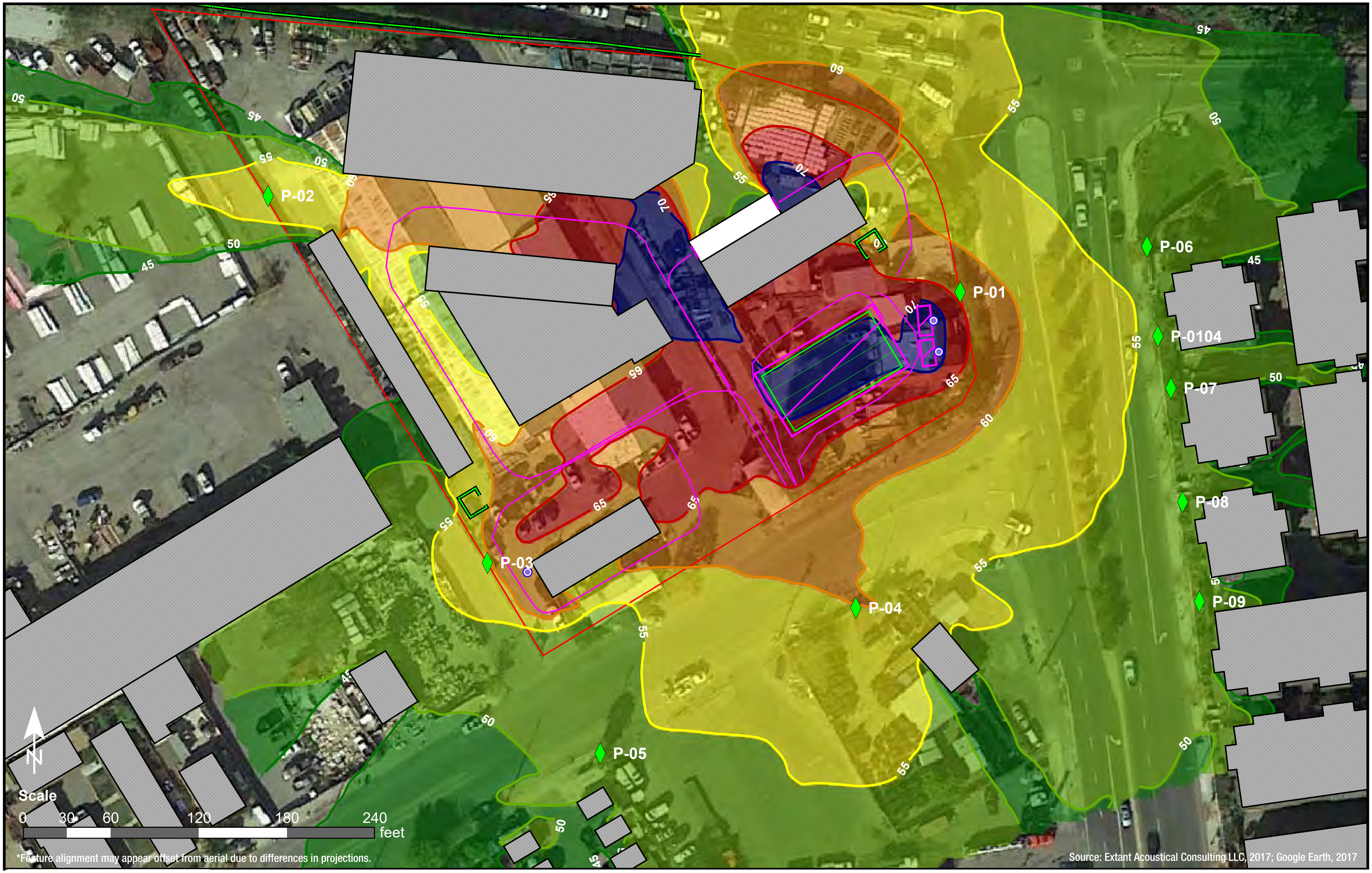
Baseline Plus Project Traffic Noise Levels

Day/Night Noise Level Contours, dBA Ldn
Prediction Recievers

Jim Rubnitz
645 Horning Street
San Jose, CA

EXTANT ACOUSTICAL CONSULTING LLC

Published: 02/27/2017
Engineer: MJC



Signs and Symbols

- Project Area
- Point source
- Receiver
- Building
- Auxiliary Structures
- Emission line
- Surface
- Bridge
- Wall

Noise Level
Ldn, dB(A)

- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65
- 65 - 70
- >= 70

Figure 6

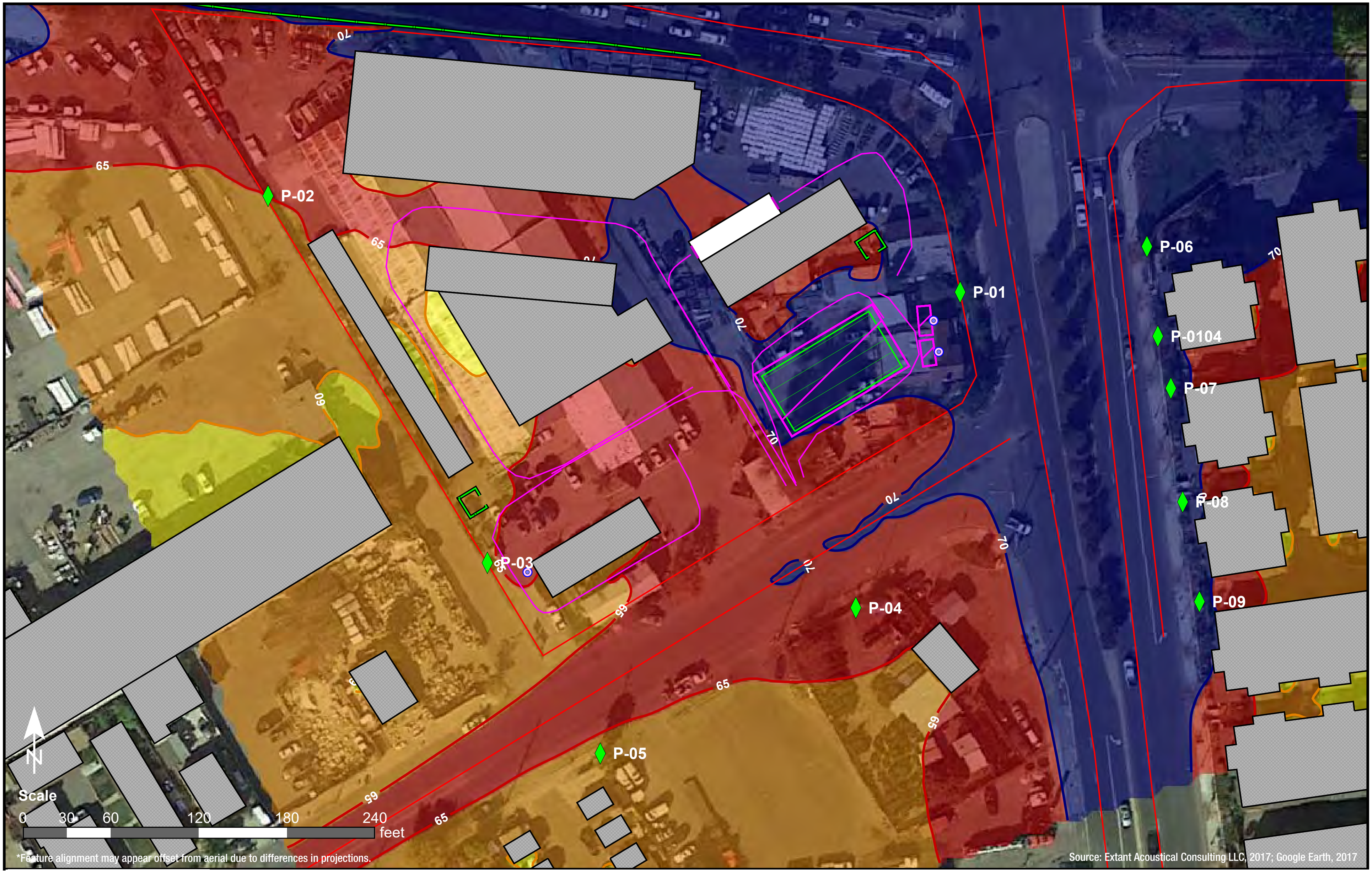
Project Operational Noise Levels

Day/Night Noise Level Contours, dBA Ldn
Prediction Recievers

Jim Rubnitz
645 Horning Street
San Jose, CA

EXTANT ACOUSTICAL CONSULTING LLC

Published: 02/27/2017
Engineer: MJC



Signs and Symbols

- Project Area
- Receiver
- Building
- Parking lot
- Fueling Canopy
- Car Wash
- On-Site Traffic
- Emission line
- Point source

Noise Level
Ldn, dB(A)

- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65
- 65 - 70
- >= 70

Figure 7

Baseline Plus Project Operational Noise Levels

Day/Night Noise Level Contours, dBA Ldn
Prediction Recievers

Jim Rubnitz
645 Horning Street
San Jose, CA

EXTANT ACOUSTICAL CONSULTING LLC

Published: 02/27/2017
Engineer: MJC

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Appendix A Description of Noise Metrics

This Appendix describes the noise terminology and metrics used in this report.

A.1 A-weighted Sound Level, dBA

Loudness is a subjective quantity that enables a listener to order the magnitude of different sounds on a scale from soft to loud. Although the perceived loudness of a sound is based somewhat on its frequency and duration, chiefly it depends upon the sound pressure level. Sound pressure level is a measure of the sound pressure at a point relative to a standard reference value; sound pressure level is always expressed in decibels (dB), a logarithmic quantity.

Another important characteristic of sound is its frequency, or "pitch." This is the rate of repetition of sound pressure oscillations as they reach our ears. Frequency is expressed in units known as Hertz (abbreviated "Hz" and equivalent to one cycle per second). Sounds heard in the environment usually consist of a range of frequencies. The distribution of sound energy as a function of frequency is termed the "frequency spectrum." The frequency spectrum of sound is often represented as the sum of the sound energy in frequency bands that are one octave or 1/3-octave wide. An octave represents a doubling of frequency.

The human ear does not respond equally to identical noise levels at different frequencies. Although the normal frequency range of hearing for most people extends from a low of about 20 Hz to a high of 10,000 Hz to 20,000 Hz, people are most sensitive to sounds in the voice range, between about 500 Hz to 2,000 Hz. Therefore, to correlate the amplitude of a sound with its level as perceived by people, the sound energy spectrum is adjusted, or "weighted."

The weighting system most commonly used to correlate with people's response to noise is "A-weighting" (or the "A-filter") and the resultant noise level is called the "A-weighted noise level" (dBA). A-weighting significantly de-emphasizes those parts of the frequency spectrum from a noise source that occurs both at lower frequencies (those below about 500 Hz) and at very high frequencies (above 10,000 Hz) where we do not hear as well. The filter has very little effect, or is nearly "flat," in the middle range of frequencies between 500 and 10,000 Hz. A-weighted sound levels have been found to correlate better than other weighting networks with human perception of "noisiness." One of the primary reasons for this is that the A-weighting network emphasizes the frequency range where human speech occurs, and noise in this range interferes with speech communication. The figure below shows common indoor and outdoor A-weighted sound levels and the environments or sources that produce them.

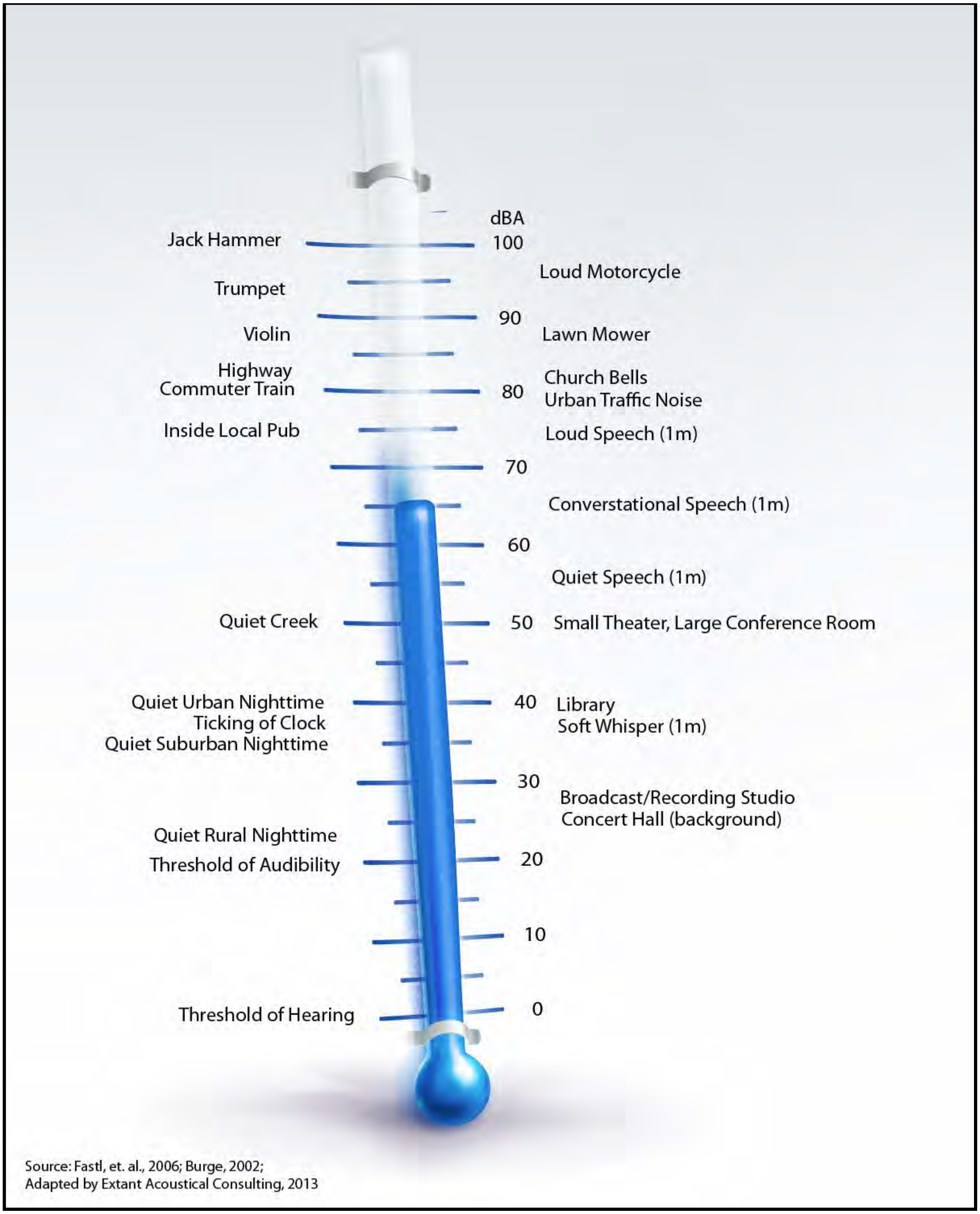


Exhibit A.1 – Common Noise Levels

A.2 Equivalent Sound Level, Leq

The Equivalent Sound Level, abbreviated L_{eq}, is a measure of the total exposure resulting from the accumulation of A-weighted sound levels over a particular period of interest -- for example, an hour, an 8-hour school day, nighttime, or a full 24-hour day. However, because the length of the period can be different depending on the time frame of interest, the applicable period should always be identified or clearly understood when discussing the metric. Such durations are often identified through a subscript, for example L_{eq1h}, or $L_{eq\ (24)}$.

L_{eq} may be thought of as a constant sound level over the period of interest that contains as much sound energy as (is "equivalent" to) the actual time-varying sound level with its normal peaks and valleys. It is important to recognize, however, that the two signals (the constant one and the time-varying one) would sound very different from each other. Also, the "average" sound level suggested by L_{eq} is not an arithmetic value, but a logarithmic, or "energy-averaged" sound level. Thus, the loudest events may dominate the noise environment described by the metric, depending on the relative loudness of the events.

A.3 Statistical Sound Level Descriptors

Statistical descriptors of the time-varying sound level are often used instead of, or in addition to L_{eq} to provide more information about how the sound level varied during the time period of interest. The descriptor includes a subscript that indicates the percentage of time the sound level is exceeded during the period. The L_{50} is an example, which represents the sound level exceeded 50 percent of the time, and equals the median sound level. Another commonly used descriptor is the L_{10}, which represents the sound level exceeded 10 percent of the measurement period and describes the sound level during the louder portions of the period. The L_{90} is often used to describe the quieter background sound levels that occurred, since it represents the level exceeded 90 percent of the period.

A.4 DNL (Day-Night Noise Level)

The 24-hour L_{eq} with a 10 dB "penalty" applied during nighttime noise-sensitive hours, 10:00 p.m. through 7:00 a.m. The DNL attempts to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours.

A.5 CNEL (Community Noise Equivalent Level)

The CNEL is similar to the DNL described above, but with an additional 5 dB "penalty" for the noise-sensitive hours between 7:00 p.m. to 10:00 p.m., which are typically reserved for relaxation, conversation, reading, and television. If using the same 24-hour noise data, the CNEL is typically 0.5 dB higher than the DNL.

A.6 SEL (Sound Exposure Level)

The SEL describes the cumulative exposure to sound energy over a stated period of time; typically reference to one (1) second.

Appendix B Long-Term Noise Monitoring Data

Appendix B-1
Long-Term 24 Hour Continuous Noise Monitoring

Project: **645 Horning Street**
Date: January 17, 2017
Site: LT-01

Hour	Leq	Lmax	L50	L90
0:00	64.0	87.8	55.4	50.6
1:00	60.7	82.3	53.5	49.5
2:00	60.2	84.3	53.1	48.7
3:00	60.7	81.8	54.8	50.9
4:00	65.5	89.3	58.9	54.1
5:00	68.3	90.1	62.4	57.8
6:00	70.4	92.6	64.7	60.6
7:00	70.7	91.1	65.8	61.0
8:00	70.4	89.0	65.6	60.4
9:00	71.5	91.5	65.5	60.3
10:00	72.1	92.0	66.3	60.2
11:00	72.4	91.7	66.8	60.6
12:00	73.2	90.9	68.0	61.3
13:00	72.5	90.8	67.7	60.9
14:00	73.1	92.5	68.7	61.7
15:00	72.0	88.2	69.0	62.3
16:00	71.7	91.4	68.3	61.5
17:00	71.2	91.7	67.0	60.4
18:00	71.1	89.1	66.8	59.9
19:00	71.8	94.7	67.1	59.8
20:00	69.7	88.8	64.0	58.3
21:00	68.5	89.0	62.4	56.4
22:00	68.8	93.5	60.6	55.3
23:00	68.7	98.0	58.2	52.6

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	68.5	88.2	62.4	56.4
Nighttime (10 p.m. - 7 a.m.)	60.2	81.8	53.1	48.7

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	71.6	90.8	66.6	60.3
Nighttime (10 p.m. - 7 a.m.)	66.7	88.9	58.0	53.3

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	73.2	94.7	69.0	62.3
Nighttime (10 p.m. - 7 a.m.)	70.4	98.0	64.7	60.6

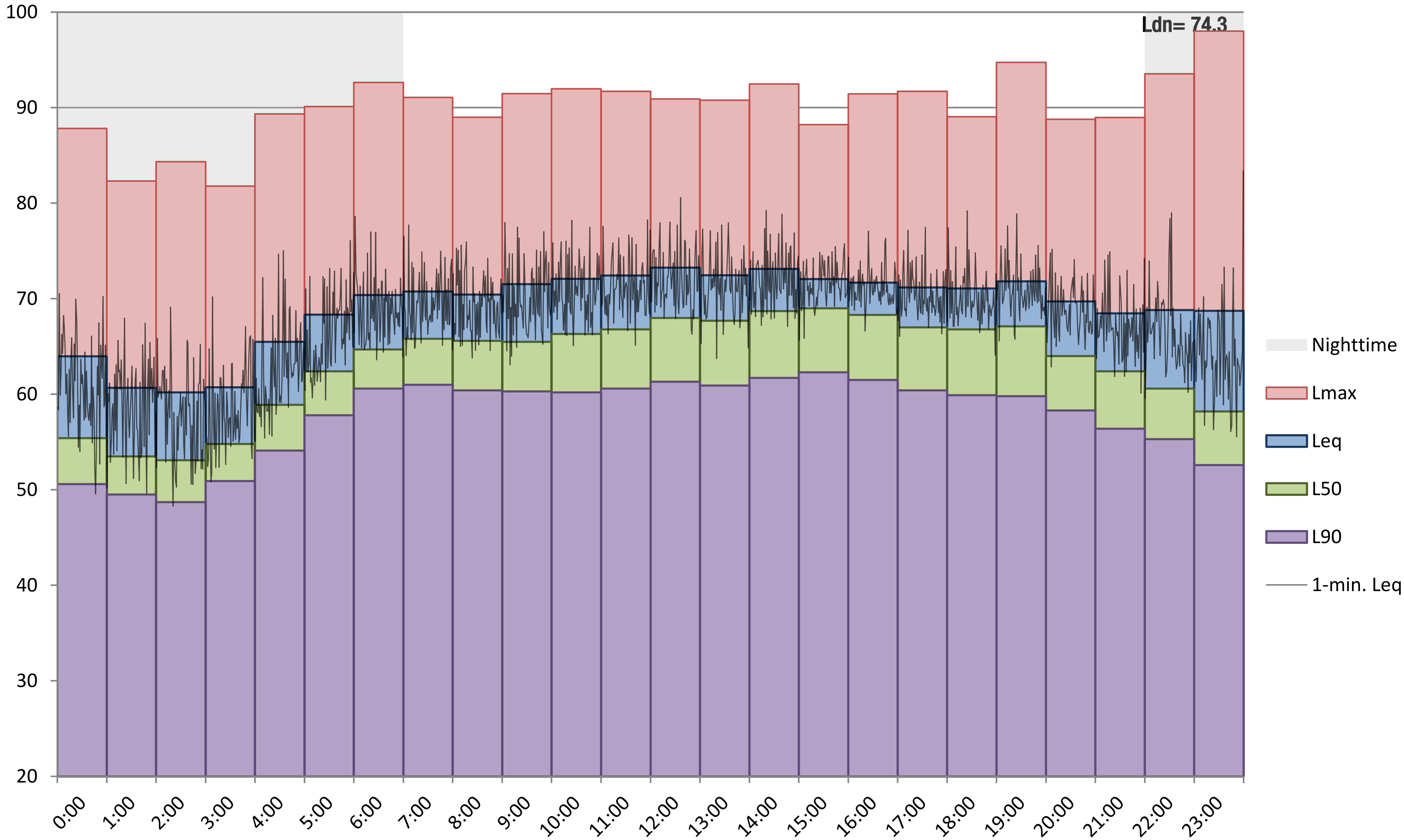
Energy Distribution

Daytime	84%
Nighttime	16%

Calculated L_{dn}, dBA

74.3

Appendix B-1
645 Horning Street - LT-01
January 17, 2017



Appendix B-2
Long-Term 24 Hour Continuous Noise Monitoring

EXTANT ACOUSTICAL CONSULTING LLC

Project: **645 Horning Street**
Date: January 17, 2017
Site: LT-02

Hour	Leq	Lmax	L50	L90
0:00	59.6	78.0	52.5	49.2
1:00	58.5	76.5	51.0	47.7
2:00	58.0	74.7	50.2	46.6
3:00	60.0	78.3	51.9	48.4
4:00	62.9	80.2	56.4	50.9
5:00	67.3	84.0	63.6	55.3
6:00	69.0	85.7	66.6	59.9
7:00	68.8	84.3	67.1	61.5
8:00	69.3	84.1	67.4	61.4
9:00	68.8	85.2	66.8	61.5
10:00	69.2	87.2	67.0	61.7
11:00	70.5	88.4	67.0	60.7
12:00	69.2	83.3	67.4	63.6
13:00	69.1	86.5	67.3	62.5
14:00	72.0	94.4	66.9	62.7
15:00	68.4	84.5	66.7	62.5
16:00	69.9	96.1	66.0	62.0
17:00	68.6	94.6	63.8	60.1
18:00	66.2	88.6	63.5	60.0
19:00	67.1	87.6	64.8	59.2
20:00	65.3	84.6	62.8	55.1
21:00	64.6	85.5	61.1	51.3
22:00	63.0	80.8	59.1	51.0
23:00	61.5	77.2	56.4	49.6

Lowermost Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	64.6	83.3	61.1	51.3
Nighttime (10 p.m. - 7 a.m.)	58.0	74.7	50.2	46.6

Average Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	68.9	87.7	65.7	60.4
Nighttime (10 p.m. - 7 a.m.)	63.9	79.5	56.4	51.0

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	72.0	96.1	67.4	63.6
Nighttime (10 p.m. - 7 a.m.)	69.0	85.7	66.6	59.9

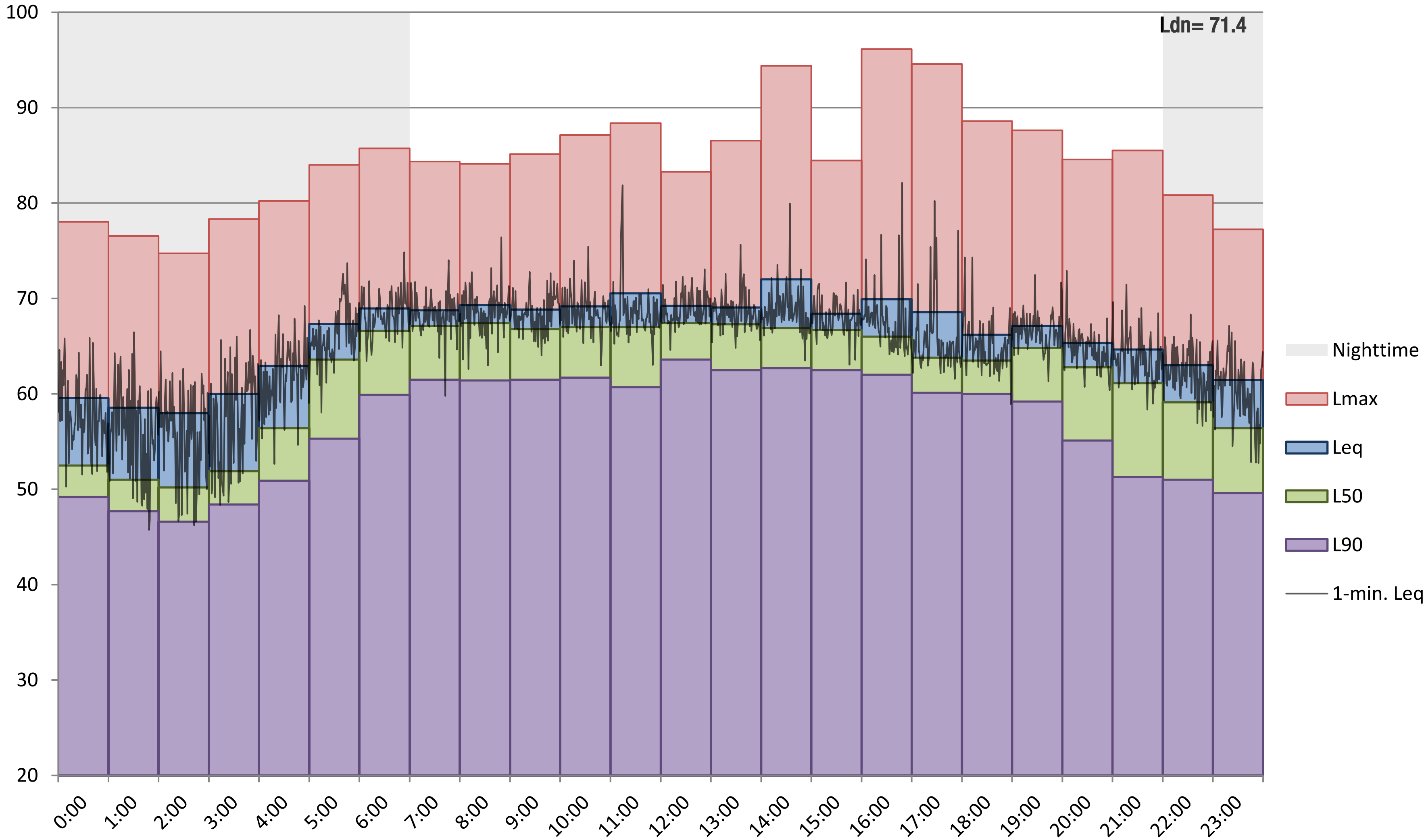
Energy Distribution

Daytime	84%
Nighttime	16%

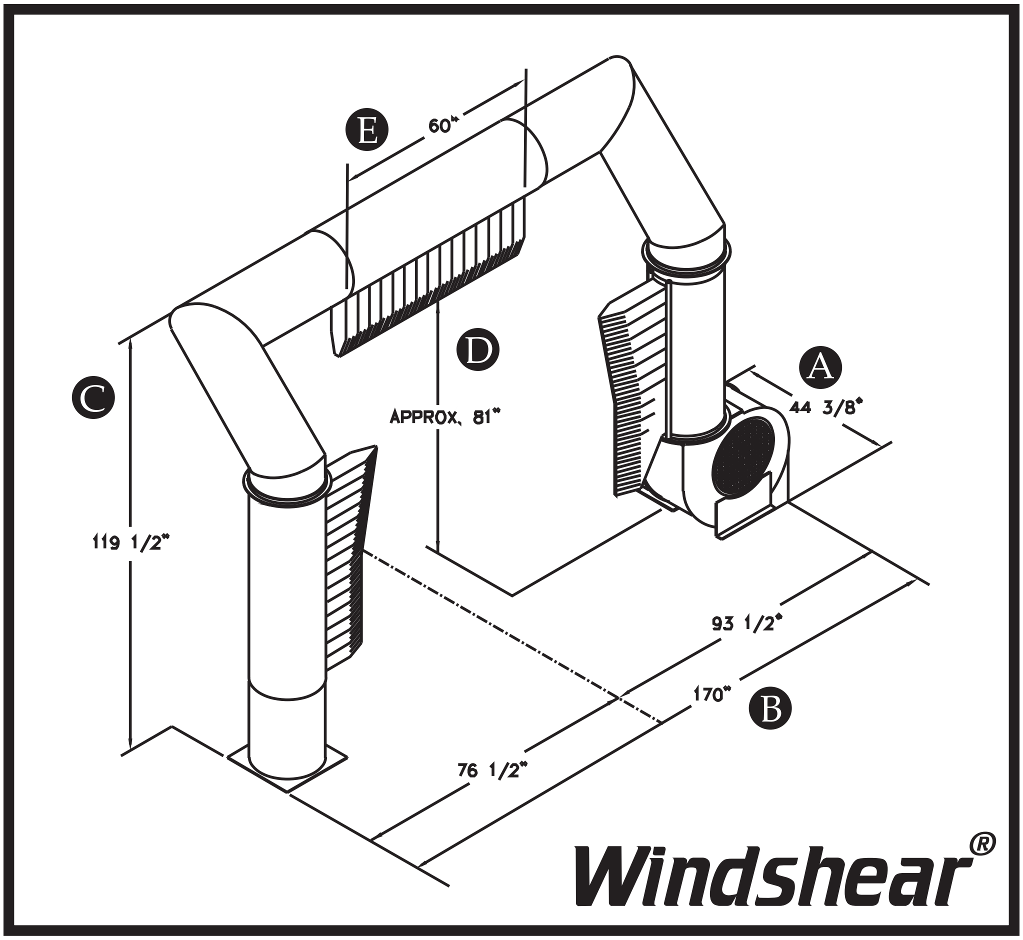
Calculated L_{dn}, dBA

71.4

Appendix B-2
645 Horning Street - LT-02
January 17, 2017



Appendix C Manufacturer Sound Level Data



EQUIPMENT

- **A** OVERALL LENGTH 44 ⅜ in.
- **B** OVERALL WIDTH 170 in.
- **C** OVERALL HEIGHT 119 ½ in.
- **D** BAG HEIGHT 81 in.
- **E** BAG WIDTH 60 in.

Machine Operating Requirements*

MOTORS

- 30 hp, 3600 RPM's
- 208-230 / 460 volts
- 1.25 service factor
- Frame: 286T
- 3 Phase
- Fan-cooled, totally enclosed

NOTE: Wiring and controls to be provided by the purchaser: Additional motor specifications available upon request. Additional voltages available on special order.

EQUIPMENT OPTIONS

- Colors: Blue or Red bags
- The Silencer Package
- Vehicle Recognition System (VRS)

Weight: 1250 lbs. (approximate)

GENERAL DESCRIPTION

The Proto-Vest "Windshear®" is designed as a stand alone drying system. It is ideal for tunnels with line speeds of up to 70 cars/hr, rollovers and self-service applications. This patented system utilizes one (1) 30 hp Magnum blowers, plenum and three (3) Proto-Duck™ air delivery bags designed to direct air around the vehicle as it passes under the equipment arch. Proto-Vest's blower/motor assemblies are engineered for both maximum efficiency and cost effectiveness. The magnum blower was designed to require only 30 hp to operate. With the improved blower performance of the Windshear® the drying quality far surpasses any comparable horsepower dryer in its class.

Proto-Vest's stringent standards in material selection for dryers result in extended equipment life and reduced maintenance. The blower assembly is manufactured from steel that is hot dipped galvanized and the impeller is electroplated. The blower is AMCA Class IV certified. The plenum is made from 5052-H32 aluminum, while the bags are produced from Proto-Duck™ materials. These materials resist corrosion and tearing.

FEATURES / BENEFITS

Patented Touchless Design: Pressurized air flows through three (3) patented bags which direct the air to the vehicle's horizontal and vertical surfaces. It dries the hood, roof, deck, windows, and sides of the vehicle without touching.

Low Maintenance: Other than the blower / impeller assemblies, there are no moving parts to wear-out or break down. (Please note that Proto-Vest recommends routine maintenance in order to maximize product life.)

Line Speed Efficiency: As a stand alone unit the "Windshear®" will give you approximately a 90% dry car at line speeds up to 70 cars per hour.

Compact / Modular design: Designed to fit into limited space as a stand alone or supplemental dryer.

DECIBEL READINGS

With Silencer / Without Silencer
(WS) (WOS)

Windshear® - (1) 30hp dryer:

WS: 10 ft=76.9 dBa;	WOS: 10 ft=91 dBa
WS: 20 ft=70.9 dBa;	WOS: 20 ft=84.9 dBa
WS: 30 ft=67.4 dBa;	WOS: 30 ft=81.4 dBa
WS: 40 ft=64.9 dBa;	WOS: 40 ft=78.9 dBa
WS: 50 ft=63 dBa;	WOS: 50 ft=77 dBa

(The above decibel readings are interpolated.)

SERVICE / SUPPORT

Proto-Vest recognizes that support after the sale of equipment is critical to the success of our customers. Our company offers its customers access to a wide range of services including: field service technicians, factory direct aftermarket parts, and an engineering staff for custom designed applications.

Proto-Vest Patents:
U.S.: 3,942,430; 4,161,801; 4,409,035; 4,418,442; 4,433,450; 4,445,251; 4,446,592; 4,589,160; 4,700,426; 5,027,714; 5,184,369; 5,187,881; 5,195,207; 5,280,665; 5,421,102; 5,553,346; 5,886,648; 5,901,461; 5,950,324; 5,960,564; 6,038,781; 6,176,024; 6,519,872; others pending.
Canada: 1,021,996; 1,111,328; 1,190,453; 1,201,040; 1,197,439; 1,219,195; 1,219,192; 1,219,194; 1,258,026; 1,219,193; 2,013,749; 2,071,568; 2,071,239; 2,071,388; others pending.

*Specifications subject to change without notice.
**If starting motor over 10-12 times an hour it may be more efficient to leave blower on.

Proto-Vest, Inc., 7400 N. Glen Harbor Blvd., Glendale, AZ 85307 • 800-521-8218 • 623-872-8300 • Fax 623-872-6150
www.proto-vest.com

HME

Customer Driven

Memo

Re: Drive-Thru Sound Pressure Levels From the Menu Board or Speaker Post

The sound pressure levels from the menu board or speaker post are as follows:

1. Sound pressure level (SPL) contours (A weighted) were measured on a typical HME SPP2 speaker post. The test condition was for pink noise set to 84 dBA at 1 foot in front of the speaker. All measurements were conducted outside with the speaker post placed 8 feet from a non-absorbing building wall and at an oblique angle to the wall. These measurements should not be construed to guarantee performance with any particular speaker post in any particular environment. They are typical results obtained under the conditions described above.

2. The SPL levels are presented for different distances from the speaker post:

Distance from the Speaker (Feet)	SPL (dBA)
1 foot	84 dBA
2 feet	78 dBA
4 feet	72 dBA
8 feet	66 dBA
16 feet	60 dBA
32 feet	54 dBA

3. The above levels are based on factory recommended operating levels, which are preset for HME components and represent the optimum level for drive-thru operations in the majority of the installations.

Also, HME incorporates automatic volume control (AVC) into many of our Systems. AVC will adjust the outbound volume based on the outdoor, ambient noise level. When ambient noise levels naturally decrease at night, AVC will reduce the outbound volume on the system. See below for example:

Distance from Outside Speaker	Decibel Level of standard system with 45 dB of outside noise without AVC	Decibel level of standard system with 45 dB of outside noise with AVC active
1 foot	84 dBA	60 dBA
2 feet	78 dBA	54 dBA
4 feet	72 dBA	48 dBA
8 feet	66 dBA	42 dBA
16 feet	60 dBA	36 dBA

If there are any further questions regarding this issue please contact HME customer service at 1-800-848-4468.

Thank you for your interest in HME's products.

3M™ Wireless Communication System Model XT-1
Technical Data

3M Wireless Communications System Model XT-1's Night Volume feature to comply with City Decibel Level output ordinance.

With the concern over environmental noise today, many communities restrict the audio level of drive-thru intercom systems during normal day-time business hours and for business operations during night time. Usually, this audio level is specified to be below some number at the property line.

Audio levels are measured in terms of "Sound Pressure Level" with the unit of change being the "Decibel". For example, the city of South Plainfield, NJ requires that sound levels not exceed 65 decibels SPL (sound pressure level) in an industrial area. Taking this into consideration, 3M intercom systems provide an adjustable menu speaker volume to assure compliance with city sound ordinances.

The 3M XT-1 Intercom System can be adjusted at installation to produce an audio sound pressure level of 65 decibels (*) at a distance of 4 feet on axis to the center of the speaker. It is VERY easy for the installation company to verify this reading using an Audio dB meter (set to A weighing, slow response). Please note that sound diminishes at the rate of 6 decibels every time the distance from the sound source is doubled. So, at a distance of 8 feet, the level is 59 decibels, at 16 feet it is 53 decibels and so on.

The 3M XT-1 Intercom System also provides an AUTOMATIC reduction of sound volume for night time operation to maintain compliance with cities that require lower operating sound levels after normal business hours. This feature assures compliance 24 hours a day.

To give you a reference of comparative audio levels, please peruse the attached list of typical sound levels. Be aware that acoustic barriers (shrubbery, trees, fences, walls, etc) will reduce the distance faster than shown in the chart.

(* These level measurements assume the use of recommended 3M components.)

3M

Building and Commercial Services Division

St. Paul, MN 55144-1000
1-800-328-0033
www.3M.com/XT1

1209 DMR

Table of Sound Levels and Corresponding Sound Pressure and Sound Intensity

To get a feel for decibels, look at the table below which gives values for the sound pressure levels of common sounds in our environment. Also shown are the corresponding sound pressures and sound intensities.

From these, you can see that the decibel scale gives numbers in a much more manageable range.

Chart of sound levels *L* and corresponding sound pressure and sound intensity

Examples	Sound Pressure Level dBSPL	Sound Pressure *p* N/m² = Pa	Sound Intensity *I* watts/m²
Jet aircraft, 50 m away	140	200	100
Threshold of pain	130	63.2	10
Threshold of discomfort	120	20	1
Chainsaw 1m distance	110	6.3	0.1
Disco, 1 m from speaker	100	2	0.01
Diesel truck, 10 m away	90	0.63	0.001
Curbside of busy road, 5 m	80	0.2	0.0001
Vacuum cleaner, distance 1 m	70	0.063	0.00001
Conversational speech, 1m	60	0.02	0.000001
Average home	50	0.0063	1E-07
Quiet library	40	0.002	1E-08
Quiet bedroom at night	30	0.00063	1E-09
Background in TV studio	20	0.0002	1E-10
Rustling leaf	10	0.000063	1E-11
Threshold of hearing	0	0.00002	1E-12

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1209 DMR

A given sound pressure level L_p in dBSPL without the distance of the measurement to the specific sound source is useless.

The reference for 0 dBSPL sound pressure level is p = 20 µPa = 2 * 10^{-5} pascal, the threshold of hearing.
The sound pressure level decreases in the free field with 6dB per distance doubling.
That is the 1/r law.

Often it is argued the sound pressure would decrease after the $1/r^2$ law (inverse square law).
That is wrong.

The sound pressure in a free field is inversely proportional to the distance from the mic to the source.
p ~ 1/r

Distance From Menu Post	3M Intercom SPL (dB)
4'	65
8'	59
16'	53
32'	47
64'	41
128'	35
256'	29
512'	23
1024'	17
2048'	11
4096'	5

Note: *20 dB is approximately the threshold of hearing. This occurs at approximately 700 feet from the speaker post in a very QUIET environment. In an environment of average traffic noise, a 35 dB limit is virtually inaudible and should be considered the practical limit. This occurs are approximately 125 feet from the speaker post.*

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APPENDIX D

Carrier 38HDR Performance Series Specifications

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

Turn to the Experts.℠

Product Data

Puron
the environmentally sound refrigerant

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) for the most up-to-date ratings information.**

INDUSTRY LEADING FEATURES / BENEFITS

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
NOMINAL CAPACITY (Tons)	1.5	2.0	2.50	3.0	4.0	5.0
OPERATING WEIGHT lb (kg)	155 (70.3)	180 (81.6)	200 (90.7)	218 (98.9)	284 (128.8)	294 (133.4)
REFRIGERANT TYPE	R−410A					
METERING DEVICE	TXV					
CHARGE lb (kg)	6.3 (2.86)	6.0 (2.73)	8.7 (3.95)	8.7 (3.95)	11.5 (5.23)	12.0 (5.45)
COMPRESSOR						
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
OUTDOOR FAN						
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)
OUTDOOR COIL						
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
HIGH PRESSURE SWITCH						
Cut−In (psig) Cutout (psig)	420 ± 25 650 ± 10	420 ± 25 650 ± 10	420 ± 25 650 ± 10	420 ± 25 650 ± 10	420 ± 25 650 ± 10	420 ± 25 650 ± 10
LOW PRESSURE SWITCH						
Cut−In (psig) Cutout (psig)	45 ± 25 20 ± 5	45 ± 25 20 ± 5	45 ± 25 20 ± 5	45 ± 25 20 ± 5	45 ± 25 20 ± 5	45 ± 25 20 ± 5
REFRIGERANT LINES						
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**
CONTROLS						
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		
FINISH	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

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

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*
		5/16	250*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*
024 AC with Puron	3/8	1/4	100	125	175	200	225*	250*	250*	250*
		5/16	250*	250*	250*	250*	250*	250*	250*	250*
		3/8	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*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*
036 AC with Puron	3/8	5/16	225*	250*	250*	250*	250*	250*	250*	250*
		3/8	250*	250*	250*	250*	250*	250*	250*	250*
048 AC with Puron	3/8	3/8	250*	250*	250*	250*	250*	250*	250*	250*
060 AC with Puron	3/8	3/8	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

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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:

[(Lineset oz/ft x total length) – (factory charge for lineset)] = charge adjustment

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

Formula: (.27 oz/ft x 15ft) – (9 oz) = (-4.95) 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 oz/ft. x 45ft) – (9 oz.) = 9 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
TSTATXXPBP01	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
KAAFT0101AAA	Evaporator Freeze Stat	X	X	X	X	X	X
KAATD0101TDR	Time Delay Relay	X	X	X	X	X	X
KAAWS0101AAA	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

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)

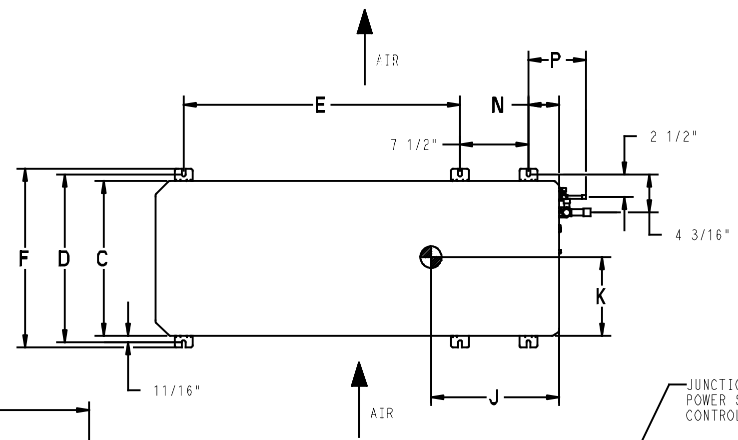
UNIT SIZE–VOLTAGE, SERIES	REQUIRED SUBCOOLING °F (°C)
018–31	12 (6.7)
024–32	12 (6.7)
030–31	12 (6.7)
036–31	12 (6.7)
048–32	12 (6.7)
060–32	12 (6.7)

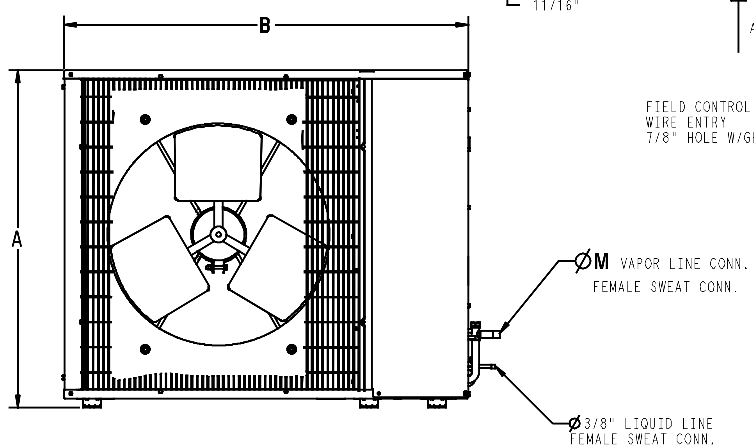
DIMENSIONS - ENGLISH

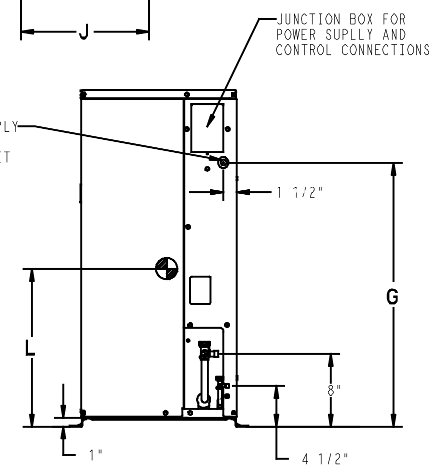
UNIT	SERIES	ELECTRICAL CHARACTERISTICS 208-230-1-60	230-1-60	208/230-3-60	460-3-60	A	B	C	D	E	F	G	H	J	K	L	M	N	P	OPERATING WEIGHT(lbs)	SHIPPING WEIGHT(lbs)	SHIPPING DIMENSIONS (L x W x H)
38HDR018	1	X	O	O	O	25 1/8"	36 15/16"	14 9/16"	16"	23 7/16"	17 3/16"	17 1/8"	22"	13"	6 5/8"	11 1/4"	5/8"	2 15/16"	6"	155	171	42 9/10" X 18" X 28 1/10"
38HDR024	1,2	X	O	O	O	31 1/8"	36 15/16"	14 9/16"	16"	23 7/16"	17 3/16"	23 1/8"	28"	14"	6 3/4"	11 5/8"	5/8"	2 15/16"	6"	180	198	42 9/10" X 18" X 34 1/10"
38HDR030	1	X	O	O	O	37 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	29 3/16"	34 1/16"	13 11/16"	8 1/8"	15 7/8"	3/4"	3 7/16"	6 1/2"	200	223	50 1/2" X 20 1/2" X 40 2/10"
38HDR036	1	X	O	X	X	37 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	29 3/16"	34 1/16"	13 11/16"	8 1/8"	15 7/8"	3/4"	3 7/16"	6 1/2"	218	240	50 1/2" X 20 1/2" X 40 2/10"
38HDR048	1,2	X	O	X	X	43 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	35 3/16"	40 1/16"	14 1/2"	8 1/2"	18 7/8"	7/8"	3 7/16"	6 1/2"	284	309	50 1/2" X 20 1/2" X 46 2/10"
38HDR060	1,2	X	O	X	X	43 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	35 3/16"	40 1/16"	14 1/2"	8 1/2"	18 7/8"	7/8"	3 7/16"	6 1/2"	294	319	50 1/2" X 20 1/2" X 46 2/10"

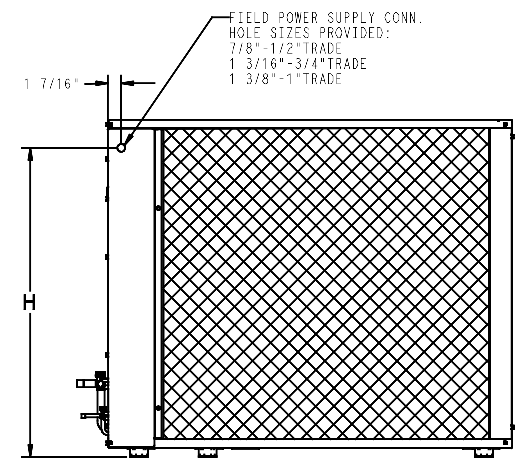
X = YES
O = NO

1. REQUIRED CLEARANCES: WITH COIL FACING WALL; ALLOW 6" MIN CLEARANCE ON COIL SIDE AND COIL END AND 36" MIN CLEARANCE ON COMPRESSOR END AND FAN SIDE. WITH FAN FACING WALL; ALLOW 8" MIN CLEARANCE ON FAN SIDE AND COIL END AND 36" MIN CLEARANCE ON COMPRESSOR END AND COIL SIDE. WITH MULTI UNIT APPLICATION; ARRANGE UNITS SO DISCHARGE OF ONE DOES NOT ENTER INLET OF ANOTHER.
2. MINIMUM OUTDOOR OPERATING AMBIENT IN COOLING MODE IS 55°F, MAX. 125°F.
3. SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.
4. CENTER OF GRAVITY
5. ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.









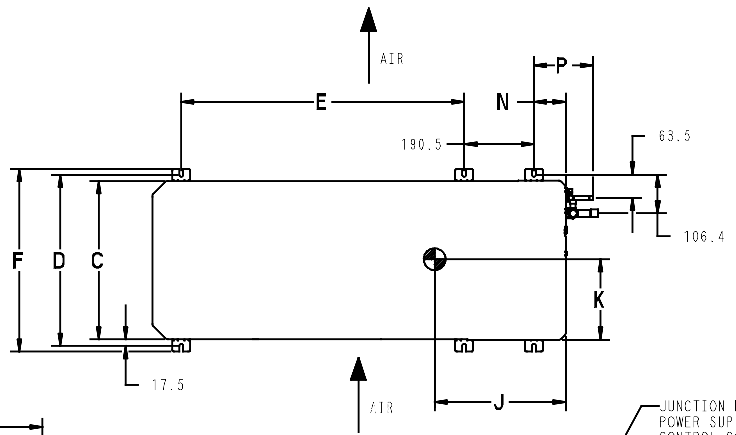
UNIT SIZE	MINIMUM MOUNTING PAD DIMENSIONS
18,24	23" X 42"
30,36,48,60	24" X 50"

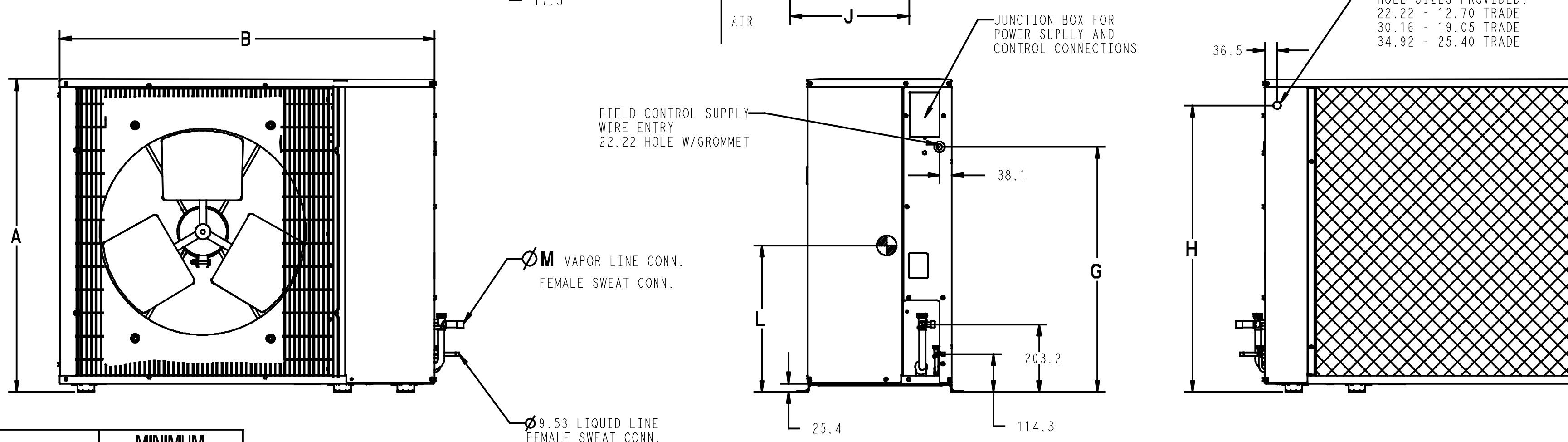
DIMENSIONS - SI

UNIT	SERIES	ELECTRICAL CHARACTERISTICS				A	B	C	D	E	F	G	H	J	K	L	M	N	P	OPERATING WEIGHT(KG)	SHIPPING WEIGHT(KG)	SHIPPING DIMENSIONS (L x W x H)
		208-230-1-60	230-1-60	208/230-3-60	460-3-60																	
38HDR018	1	X	O	O	O	638.2	938.2	369.9	406.4	595.3	436.6	435.0	558.8	330.2	168.3	285.8	15.9	74.6	152.4	70.4	77.7	1090.2 X 457.7 X 714.3
38HDR024	1,2	X	O	O	O	790.6	938.2	369.9	406.4	595.3	436.6	587.4	711.2	355.6	171.5	295.3	15.9	74.6	152.4	81.8	90.0	1090.2 X 457.7 X 866.7
38HDR030	1	X	O	O	O	944.6	1131.9	433.4	468.3	774.7	498.5	741.4	865.2	347.7	206.4	403.2	19.0	87.3	165.1	90.9	101.4	1282.7 X 520.7 X 1020.7
38HDR036	1	X	O	X	X	944.6	1131.9	433.4	468.3	774.7	498.5	741.4	865.2	347.7	206.4	403.2	19.0	87.3	165.1	99.0	109.0	1282.7 X 520.7 X 1020.7
38HDR048	1,2	X	O	X	X	1097.0	1131.9	433.4	468.3	774.7	498.5	893.8	1017.6	368.3	215.9	479.4	22.2	87.3	165.1	129.0	140.4	1282.7 X 520.7 X 1173.1
38HDR060	1,2	X	O	X	X	1097.0	1131.9	433.4	468.3	774.7	498.5	893.8	1017.6	368.3	215.9	479.4	22.2	87.3	165.1	133.6	145.0	1282.7 X 520.7 X 1173.1

X = YES
O = NO

1. REQUIRED CLEARANCES: WITH COIL FACING WALL; ALLOW 152.4 MIN CLEARANCE ON COIL SIDE AND COIL END AND 914.4 MIN CLEARANCE ON COMPRESSOR END AND FAN SIDE. WITH FAN FACING WALL; ALLOW 203.2 MIN CLEARANCE ON FAN SIDE AND COIL END AND 914.4 MIN CLEARANCE ON COMPRESSOR END AND COIL SIDE. WITH MULTI UNIT APPLICATION; ARRANGE UNITS SO DISCHARGE OF ONE DOES NOT ENTER INLET OF ANOTHER.
2. MINIMUM OUTDOOR OPERATING AMBIENT IN COOLING MODE IS 12.8°C, MAX. 51.7°C.
3. SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.
4. CENTER OF GRAVITY
5. ALL DIMENSIONS ARE IN "MM" UNLESS NOTED.





UNIT SIZE	MINIMUM MOUNTING PAD DIMENSIONS
18,24	584.2 X 1066.8
30,36,48,60	609.6 X 1270.0

COMBINATION RATINGS

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
1085392	38HDR018−31	†CNPV*1814A**+TDR		17,000	11.0	13.0
1117974	38HDR018−31	40QAC024−−−3		18,000	11.5	13.0
1085396	38HDR018−31	CAP**1814A**	58CV(A,X)070−12	17,000	11.5	14.0
3015375	38HDR018−31	CAP**1814A**	58PH*045−08	17,000	11.5	14.0
1085394	38HDR018−31	CAP**1814A**+TDR		17,000	10.9	13.0
1085400	38HDR018−31	CAP**2414A**	58CV(A,X)070−12	17,400	11.5	14.0
3015376	38HDR018−31	CAP**2414A**	58PH*045−08	17,400	12.0	14.5
1085398	38HDR018−31	CAP**2414A**+TDR		17,400	11.0	13.0
1085456	38HDR018−31	CAP**2417A**	58CV(A,X)070−12	17,400	11.5	14.0
1085406	38HDR018−31	CAP**2417A**	58CV(A,X)090−16	17,400	11.5	14.0
3112072	38HDR018−31	CAP**2417A**	58MEB040−12	17,400	12.0	14.5
3112073	38HDR018−31	CAP**2417A**	58MEB060−12	17,400	12.0	14.5
1390388	38HDR018−31	CAP**2417A**	58MV(B,C)060−14	17,400	11.5	14.0
1085402	38HDR018−31	CAP**2417A**+TDR		17,400	11.0	13.0
1085432	38HDR018−31	CNPF*2418A**+TDR		17,400	11.0	13.0
1085428	38HDR018−31	CNPH*2417A**	58CV(A,X)070−12	17,400	11.5	14.0
1085430	38HDR018−31	CNPH*2417A**	58CV(A,X)090−16	17,400	11.5	14.0
3112076	38HDR018−31	CNPH*2417A**	58MEB040−12	17,400	12.0	14.5
3112077	38HDR018−31	CNPH*2417A**	58MEB060−12	17,400	12.0	14.5
1390392	38HDR018−31	CNPH*2417A**	58MV(B,C)060−14	17,400	11.5	14.0
1390396	38HDR018−31	CNPH*2417A**	58MV(B,C)080−14	17,400	11.5	14.0
3015379	38HDR018−31	CNPH*2417A**	58PH*045−08	17,400	12.0	14.5
1085420	38HDR018−31	CNPH*2417A**+TDR		17,400	11.0	13.0
1085408	38HDR018−31	CNPV*1814A**	58CV(A,X)070−12	17,000	11.5	14.0
3015377	38HDR018−31	CNPV*1814A**	58PH*045−08	17,000	11.5	14.0
1085412	38HDR018−31	CNPV*2414A**	58CV(A,X)070−12	17,400	11.5	14.0
3015378	38HDR018−31	CNPV*2414A**	58PH*045−08	17,400	12.0	14.5
1085410	38HDR018−31	CNPV*2414A**+TDR		17,400	11.0	13.0
1085458	38HDR018−31	CNPV*2417A**	58CV(A,X)070−12	17,400	11.5	14.0
1085418	38HDR018−31	CNPV*2417A**	58CV(A,X)090−16	17,400	11.5	14.0
3112074	38HDR018−31	CNPV*2417A**	58MEB040−12	17,400	12.0	14.5
3112075	38HDR018−31	CNPV*2417A**	58MEB060−12	17,400	12.0	14.5
1390390	38HDR018−31	CNPV*2417A**	58MV(B,C)060−14	17,400	11.5	14.0
1085414	38HDR018−31	CNPV*2417A**+TDR		17,400	11.0	13.0
1085442	38HDR018−31	CSPH*2412A**	58CV(A,X)070−12	17,400	11.5	14.0
1085444	38HDR018−31	CSPH*2412A**	58CV(A,X)090−16	17,400	11.5	14.0
3112078	38HDR018−31	CSPH*2412A**	58MEB040−12	17,400	12.0	14.5
3112079	38HDR018−31	CSPH*2412A**	58MEB060−12	17,400	12.0	14.5
1390394	38HDR018−31	CSPH*2412A**	58MV(B,C)060−14	17,400	11.5	14.0
1390398	38HDR018−31	CSPH*2412A**	58MV(B,C)080−14	17,400	11.5	14.0
3015380	38HDR018−31	CSPH*2412A**	58PH*045−08	17,400	12.0	14.5
1085434	38HDR018−31	CSPH*2412A**+TDR		17,400	11.0	13.0
1086232	38HDR018−31	FE4ANF002+UI		17,400	11.5	14.0
1085450	38HDR018−31	FF1ENP018		17,400	11.0	13.0
1085452	38HDR018−31	FF1ENP024		17,400	11.0	13.0
1085454	38HDR018−31	FV4BNF002		17,400	11.5	14.0
3404623	38HDR018−31	FV4CNF002		17,400	11.5	14.0
1085446	38HDR018−31	FX4CNF018		17,000	11.5	14.0
1085448	38HDR018−31	FX4CNF024		17,400	11.5	14.0
3465486	38HDR024−32	†CNPV*2414A**+TDR		23,400	11.0	13.0
3465806	38HDR024−32	40QAC024−3		22,800	11.5	13.0
3465488	38HDR024−32	CAP**2414A**	58CV(A,X)070−12	23,400	11.5	14.0
3465489	38HDR024−32	CAP**2414A**	58PH*045−08	23,400	11.5	14.0
3465487	38HDR024−32	CAP**2414A**+TDR		23,400	11.0	13.0
3465492	38HDR024−32	CAP**2417A**	58CV(A,X)090−16	23,400	11.5	14.0
3465493	38HDR024−32	CAP**2417A**	58MEB040−12	23,400	12.0	14.5
3465494	38HDR024−32	CAP**2417A**	58MEB060−12	23,400	12.0	14.5
3465495	38HDR024−32	CAP**2417A**	58MEB080−12	23,400	12.0	14.5
3465491	38HDR024−32	CAP**2417A**	58MV(B,C)060−14	23,400	11.5	14.0
3465490	38HDR024−32	CAP**2417A**+TDR		23,400	11.0	13.0
3465497	38HDR024−32	CAP**3014A**	58CV(A,X)070−12	23,400	11.5	14.0
3465498	38HDR024−32	CAP**3014A**	58PH*045−08	23,600	12.0	14.5
3465496	38HDR024−32	CAP**3014A**+TDR		23,600	11.0	13.0
3465501	38HDR024−32	CAP**3017A**	58CV(A,X)090−16	23,600	11.5	14.0
3465502	38HDR024−32	CAP**3017A**	58MEB040−12	23,600	12.0	14.5
3465503	38HDR024−32	CAP**3017A**	58MEB060−12	23,600	12.0	14.5
3465504	38HDR024−32	CAP**3017A**	58MEB080−12	23,600	12.0	14.5
3465500	38HDR024−32	CAP**3017A**	58MV(B,C)060−14	23,600	11.5	14.0
3465499	38HDR024−32	CAP**3017A**+TDR		23,600	11.0	13.0
3465554	38HDR024−32	CNPF*2418A**+TDR		23,400	11.0	13.0
3465529	38HDR024−32	CNPH*2417A**	58CV(A,X)070−12	23,400	11.5	14.0
3465530	38HDR024−32	CNPH*2417A**	58CV(A,X)090−16	23,400	11.5	14.0
3465531	38HDR024−32	CNPH*2417A**	58CV(A,X)110−20	23,400	11.5	14.0
3465532	38HDR024−32	CNPH*2417A**	58CV(A,X)135−22	23,400	11.5	14.0
3465533	38HDR024−32	CNPH*2417A**	58CV(A,X)155−22	23,400	11.5	14.0
3465535	38HDR024−32	CNPH*2417A**	58MEB040−12	23,400	12.0	14.5
3465536	38HDR024−32	CNPH*2417A**	58MEB060−12	23,400	12.0	14.5
3465537	38HDR024−32	CNPH*2417A**	58MEB080−12	23,400	12.0	14.5

See notes on page 26

COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465524	38HDR024–32	CNPH*2417A**	58MV(B,C)060–14	23,400	11.5	14.0
3465525	38HDR024–32	CNPH*2417A**	58MV(B,C)080–14	23,400	11.5	14.0
3465526	38HDR024–32	CNPH*2417A**	58MV(B,C)080–20	23,200	11.5	14.0
3465527	38HDR024–32	CNPH*2417A**	58MV(B,C)100–20	23,400	11.5	14.0
3465528	38HDR024–32	CNPH*2417A**	58MV(B,C)120–20	23,400	11.5	14.0
3465523	38HDR024–32	CNPH*2417A**	58MVB040–14	23,400	11.5	14.0
3465534	38HDR024–32	CNPH*2417A**	58PH*045–08	23,400	11.5	14.0
3465522	38HDR024–32	CNPH*2417A**+TDR		23,400	11.0	13.0
3465545	38HDR024–32	CNPH*3017A**	58CV(A,X)070–12	23,400	11.5	14.0
3465546	38HDR024–32	CNPH*3017A**	58CV(A,X)090–16	23,600	11.5	14.0
3465547	38HDR024–32	CNPH*3017A**	58CV(A,X)110–20	23,600	11.5	14.0
3465548	38HDR024–32	CNPH*3017A**	58CV(A,X)135–22	23,600	11.5	14.0
3465549	38HDR024–32	CNPH*3017A**	58CV(A,X)155–22	23,600	11.5	14.0
3465551	38HDR024–32	CNPH*3017A**	58MEB040–12	23,600	12.0	14.5
3465552	38HDR024–32	CNPH*3017A**	58MEB060–12	23,600	12.0	14.5
3465553	38HDR024–32	CNPH*3017A**	58MEB080–12	23,600	12.0	14.5
3465540	38HDR024–32	CNPH*3017A**	58MV(B,C)060–14	23,600	11.5	14.0
3465541	38HDR024–32	CNPH*3017A**	58MV(B,C)080–14	23,400	11.5	14.0
3465542	38HDR024–32	CNPH*3017A**	58MV(B,C)080–20	23,400	11.5	14.0
3465543	38HDR024–32	CNPH*3017A**	58MV(B,C)100–20	23,600	11.5	14.0
3465544	38HDR024–32	CNPH*3017A**	58MV(B,C)120–20	23,600	11.5	14.0
3465539	38HDR024–32	CNPH*3017A**	58MVB040–14	23,600	11.5	14.0
3465550	38HDR024–32	CNPH*3017A**	58PH*045–08	23,600	12.0	14.5
3465538	38HDR024–32	CNPH*3017A**+TDR		23,600	11.0	13.0
3465505	38HDR024–32	CNPV*2414A**	58CV(A,X)070–12	23,400	11.5	14.0
3465506	38HDR024–32	CNPV*2414A**	58PH*045–08	23,400	11.5	14.0
3465509	38HDR024–32	CNPV*2417A**	58CV(A,X)090–16	23,400	11.5	14.0
3465510	38HDR024–32	CNPV*2417A**	58MEB040–12	23,400	12.0	14.5
3465511	38HDR024–32	CNPV*2417A**	58MEB060–12	23,400	12.0	14.5
3465512	38HDR024–32	CNPV*2417A**	58MEB080–12	23,400	12.0	14.5
3465508	38HDR024–32	CNPV*2417A**	58MV(B,C)060–14	23,400	11.5	14.0
3465507	38HDR024–32	CNPV*2417A**+TDR		23,400	11.0	13.0
3465514	38HDR024–32	CNPV*3014A**	58CV(A,X)070–12	23,400	11.5	14.0
3465515	38HDR024–32	CNPV*3014A**	58PH*045–08	23,600	11.5	14.0
3465513	38HDR024–32	CNPV*3014A**+TDR		23,600	11.0	13.0
3465518	38HDR024–32	CNPV*3017A**	58CV(A,X)090–16	23,600	11.5	14.0
3465519	38HDR024–32	CNPV*3017A**	58MEB040–12	23,600	12.0	14.5
3465520	38HDR024–32	CNPV*3017A**	58MEB060–12	23,600	12.0	14.5
3465521	38HDR024–32	CNPV*3017A**	58MEB080–12	23,600	12.0	14.5
3465517	38HDR024–32	CNPV*3017A**	58MV(B,C)060–14	23,600	11.5	14.0
3465516	38HDR024–32	CNPV*3017A**+TDR		23,600	11.0	13.0
3465562	38HDR024–32	CSPH*2412A**	58CV(A,X)070–12	23,400	11.5	14.0
3465563	38HDR024–32	CSPH*2412A**	58CV(A,X)090–16	23,400	11.5	14.0
3465564	38HDR024–32	CSPH*2412A**	58CV(A,X)110–20	23,400	11.5	14.0
3465565	38HDR024–32	CSPH*2412A**	58CV(A,X)135–22	23,400	11.5	14.0
3465566	38HDR024–32	CSPH*2412A**	58CV(A,X)155–22	23,400	11.5	14.0
3465568	38HDR024–32	CSPH*2412A**	58MEB040–12	23,400	12.0	14.5
3465569	38HDR024–32	CSPH*2412A**	58MEB060–12	23,400	12.0	14.5
3465570	38HDR024–32	CSPH*2412A**	58MEB080–12	23,400	12.0	14.5
3465557	38HDR024–32	CSPH*2412A**	58MV(B,C)060–14	23,400	11.5	14.0
3465558	38HDR024–32	CSPH*2412A**	58MV(B,C)080–14	23,400	11.5	14.0
3465559	38HDR024–32	CSPH*2412A**	58MV(B,C)080–20	23,400	11.5	14.0
3465560	38HDR024–32	CSPH*2412A**	58MV(B,C)100–20	23,400	11.5	14.0
3465561	38HDR024–32	CSPH*2412A**	58MV(B,C)120–20	23,400	11.5	14.0
3465556	38HDR024–32	CSPH*2412A**	58MVB040–14	23,400	11.5	14.0
3465567	38HDR024–32	CSPH*2412A**	58PH*045–08	23,400	11.5	14.0
3465555	38HDR024–32	CSPH*2412A**+TDR		23,400	11.0	13.0
3465578	38HDR024–32	CSPH*3012A**	58CV(A,X)070–12	23,600	11.5	14.0
3465579	38HDR024–32	CSPH*3012A**	58CV(A,X)090–16	23,600	11.5	14.0
3465580	38HDR024–32	CSPH*3012A**	58CV(A,X)110–20	23,600	11.5	14.0
3465581	38HDR024–32	CSPH*3012A**	58CV(A,X)135–22	23,600	11.5	14.0
3465582	38HDR024–32	CSPH*3012A**	58CV(A,X)155–22	23,600	11.5	14.0
3465584	38HDR024–32	CSPH*3012A**	58MEB040–12	23,600	12.0	14.5
3465585	38HDR024–32	CSPH*3012A**	58MEB060–12	23,600	12.0	14.5
3465586	38HDR024–32	CSPH*3012A**	58MEB080–12	23,600	12.0	14.5
3465573	38HDR024–32	CSPH*3012A**	58MV(B,C)060–14	23,600	11.5	14.0
3465574	38HDR024–32	CSPH*3012A**	58MV(B,C)080–14	23,600	11.5	14.0
3465575	38HDR024–32	CSPH*3012A**	58MV(B,C)080–20	23,400	11.5	14.0
3465576	38HDR024–32	CSPH*3012A**	58MV(B,C)100–20	23,600	11.5	14.0
3465577	38HDR024–32	CSPH*3012A**	58MV(B,C)120–20	23,600	11.5	14.0
3465572	38HDR024–32	CSPH*3012A**	58MVB040–14	23,600	11.5	14.0
3465583	38HDR024–32	CSPH*3012A**	58PH*045–08	23,600	12.0	14.5
3465571	38HDR024–32	CSPH*3012A**+TDR		23,600	11.0	13.0
3465594	38HDR024–32	FE4AN(B,F)003+UI		23,800	12.0	14.5
3465592	38HDR024–32	FE4ANF002+UI		23,600	12.0	14.5
3465596	38HDR024–32	FE5ANB004+UI		24,000	12.0	14.5
3465597	38HDR024–32	FF1ENP024		22,800	11.0	13.0
3465606	38HDR024–32	FF1ENP025		23,400	11.5	14.0
3465600	38HDR024–32	FF1ENP030		23,000	11.0	13.0

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465608	38HDR024−32	FF1ENP031		23,600	11.5	14.0
3465609	38HDR024−32	FF1ENP037		23,800	11.5	14.0
3465603	38HDR024−32	FV4BN(B,F)003		23,800	12.0	14.5
3465601	38HDR024−32	FV4BNF002		23,600	12.0	14.5
3465613	38HDR024−32	FV4CN(B,F)003		23,800	12.0	14.5
3465611	38HDR024−32	FV4CNF002		23,600	12.0	14.5
3465589	38HDR024−32	FX4CNF024		23,400	11.5	14.0
3465590	38HDR024−32	FX4CNF030		23,800	11.5	14.0
3465587	38HDR024−32	FY4ANF024		23,200	11.0	13.0
3465588	38HDR024−32	FY4ANF030		23,600	11.0	13.0
1085620	38HDR030−31	†CNPV*3014A**+TDR		28,000	11.0	13.0
1117978	38HDR030−31	40QAC036−−−3		29,000	12.0	13.0
1085624	38HDR030−31	CAP**3014A**	58CV(A,X)070−12	28,000	11.5	14.0
1085622	38HDR030−31	CAP**3014A**+TDR		28,000	11.0	13.0
1085788	38HDR030−31	CAP**3017A**	58CV(A,X)070−12	28,000	11.5	14.0
1085630	38HDR030−31	CAP**3017A**	58CV(A,X)090−16	28,000	11.5	14.0
3112104	38HDR030−31	CAP**3017A**	58MEB040−12	28,000	12.0	14.5
3112105	38HDR030−31	CAP**3017A**	58MEB060−12	28,000	12.0	14.5
3112106	38HDR030−31	CAP**3017A**	58MEB080−12	28,000	12.0	14.5
3112107	38HDR030−31	CAP**3017A**	58MEB080−16	28,000	12.0	14.5
1390448	38HDR030−31	CAP**3017A**	58MV(B,C)060−14	28,000	11.5	14.0
3015389	38HDR030−31	CAP**3017A**	58PH*070−16	28,000	11.5	14.0
1085626	38HDR030−31	CAP**3017A**+TDR		28,000	11.0	13.0
1085634	38HDR030−31	CAP**3614A**	58CV(A,X)070−12	28,600	11.5	14.0
1085632	38HDR030−31	CAP**3614A**+TDR		28,600	11.0	13.0
1085790	38HDR030−31	CAP**3617A**	58CV(A,X)070−12	28,600	11.5	14.0
1085640	38HDR030−31	CAP**3617A**	58CV(A,X)090−16	28,600	11.5	14.0
3112108	38HDR030−31	CAP**3617A**	58MEB040−12	28,600	12.0	14.5
3112109	38HDR030−31	CAP**3617A**	58MEB060−12	28,600	12.0	14.5
3112110	38HDR030−31	CAP**3617A**	58MEB080−12	28,600	12.0	14.5
3112111	38HDR030−31	CAP**3617A**	58MEB080−16	28,600	12.0	14.5
1390450	38HDR030−31	CAP**3617A**	58MV(B,C)060−14	28,600	11.5	14.0
3015390	38HDR030−31	CAP**3617A**	58PH*070−16	28,600	12.0	14.5
1085636	38HDR030−31	CAP**3617A**+TDR		28,600	11.0	13.0
1085794	38HDR030−31	CAP**3621A**	58CV(A,X)090−16	28,600	11.5	14.0
1085650	38HDR030−31	CAP**3621A**	58CV(A,X)110−20	28,600	11.5	14.0
1390464	38HDR030−31	CAP**3621A**	58MV(B,C)060−14	28,600	11.5	14.0
1390468	38HDR030−31	CAP**3621A**	58MV(B,C)080−14	28,600	11.5	14.0
1390480	38HDR030−31	CAP**3621A**	58MV(B,C)080−20	28,600	11.5	14.0
1390492	38HDR030−31	CAP**3621A**	58MV(B,C)100−20	28,600	11.5	14.0
3015391	38HDR030−31	CAP**3621A**	58PH*090−16	28,600	12.0	14.5
1085642	38HDR030−31	CAP**3621A**+TDR		28,600	11.0	13.0
1085724	38HDR030−31	CNPF*3618A**+TDR		28,600	11.0	13.0
1085690	38HDR030−31	CNPH*3017A**	58CV(A,X)070−12	28,000	11.5	14.0
1085692	38HDR030−31	CNPH*3017A**	58CV(A,X)090−16	28,000	11.5	14.0
1085694	38HDR030−31	CNPH*3017A**	58CV(A,X)110−20	28,000	11.5	14.0
1085696	38HDR030−31	CNPH*3017A**	58CV(A,X)135−22	28,000	11.5	14.0
1085698	38HDR030−31	CNPH*3017A**	58CV(A,X)155−22	28,000	11.5	14.0
3112120	38HDR030−31	CNPH*3017A**	58MEB040−12	28,000	12.0	14.5
3112121	38HDR030−31	CNPH*3017A**	58MEB060−12	28,000	12.0	14.5
3112122	38HDR030−31	CNPH*3017A**	58MEB080−12	28,000	12.0	14.5
3112123	38HDR030−31	CNPH*3017A**	58MEB080−16	28,000	12.0	14.5
1390456	38HDR030−31	CNPH*3017A**	58MV(B,C)060−14	28,000	11.5	14.0
1390472	38HDR030−31	CNPH*3017A**	58MV(B,C)080−14	28,000	11.5	14.0
1390484	38HDR030−31	CNPH*3017A**	58MV(B,C)080−20	28,000	11.5	14.0
1390496	38HDR030−31	CNPH*3017A**	58MV(B,C)100−20	28,000	11.5	14.0
1390504	38HDR030−31	CNPH*3017A**	58MV(B,C)120−20	28,000	11.5	14.0
3015395	38HDR030−31	CNPH*3017A**	58PH*070−16	28,000	11.5	14.0
3015396	38HDR030−31	CNPH*3017A**	58PH*090−16	28,000	11.5	14.0
1085676	38HDR030−31	CNPH*3017A**+TDR		28,000	11.0	13.0
1085714	38HDR030−31	CNPH*3617A**	58CV(A,X)070−12	28,600	11.5	14.0
1085716	38HDR030−31	CNPH*3617A**	58CV(A,X)090−16	28,600	11.5	14.0
1085718	38HDR030−31	CNPH*3617A**	58CV(A,X)110−20	28,600	11.5	14.0
1085720	38HDR030−31	CNPH*3617A**	58CV(A,X)135−22	28,600	11.5	14.0
1085722	38HDR030−31	CNPH*3617A**	58CV(A,X)155−22	28,600	11.5	14.0
3112124	38HDR030−31	CNPH*3617A**	58MEB040−12	28,600	12.0	14.5
3112125	38HDR030−31	CNPH*3617A**	58MEB060−12	28,600	12.0	14.5
3112126	38HDR030−31	CNPH*3617A**	58MEB080−12	28,600	12.0	14.5
3112127	38HDR030−31	CNPH*3617A**	58MEB080−16	28,600	12.0	14.5
1390458	38HDR030−31	CNPH*3617A**	58MV(B,C)060−14	28,600	11.5	14.0
1390474	38HDR030−31	CNPH*3617A**	58MV(B,C)080−14	28,600	11.5	14.0
1390486	38HDR030−31	CNPH*3617A**	58MV(B,C)080−20	28,600	11.5	14.0
1390498	38HDR030−31	CNPH*3617A**	58MV(B,C)100−20	28,600	11.5	14.0
1390506	38HDR030−31	CNPH*3617A**	58MV(B,C)120−20	28,600	11.5	14.0
3015397	38HDR030−31	CNPH*3617A**	58PH*070−16	28,600	12.0	14.5
3015398	38HDR030−31	CNPH*3617A**	58PH*090−16	28,600	12.0	14.5
1085700	38HDR030−31	CNPH*3617A**+TDR		28,600	11.0	13.0
1085652	38HDR030−31	CNPV*3014A**	58CV(A,X)070−12	28,000	11.5	14.0

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
1085796	38HDR030−31	CNPV*3017A**	58CV(A,X)070−12	28,000	11.5	14.0
1085658	38HDR030−31	CNPV*3017A**	58CV(A,X)090−16	28,000	11.5	14.0
3112112	38HDR030−31	CNPV*3017A**	58MEB040−12	28,000	12.0	14.5
3112113	38HDR030−31	CNPV*3017A**	58MEB060−12	28,000	12.0	14.5
3112114	38HDR030−31	CNPV*3017A**	58MEB080−12	28,000	12.0	14.5
3112115	38HDR030−31	CNPV*3017A**	58MEB080−16	28,000	12.0	14.5
1390452	38HDR030−31	CNPV*3017A**	58MV(B,C)060−14	28,000	11.5	14.0
3015392	38HDR030−31	CNPV*3017A**	58PH*070−16	28,000	11.5	14.0
1085654	38HDR030−31	CNPV*3017A**+TDR		28,000	11.0	13.0
1085798	38HDR030−31	CNPV*3617A**	58CV(A,X)070−12	28,600	11.5	14.0
1085664	38HDR030−31	CNPV*3617A**	58CV(A,X)090−16	28,600	11.5	14.0
3112116	38HDR030−31	CNPV*3617A**	58MEB040−12	28,600	12.0	14.5
3112117	38HDR030−31	CNPV*3617A**	58MEB060−12	28,600	12.0	14.5
3112118	38HDR030−31	CNPV*3617A**	58MEB080−12	28,600	12.0	14.5
3112119	38HDR030−31	CNPV*3617A**	58MEB080−16	28,600	12.0	14.5
1390454	38HDR030−31	CNPV*3617A**	58MV(B,C)060−14	28,600	11.5	14.0
3015393	38HDR030−31	CNPV*3617A**	58PH*070−16	28,600	12.0	14.5
1085660	38HDR030−31	CNPV*3617A**+TDR		28,600	11.0	13.0
1085802	38HDR030−31	CNPV*3621A**	58CV(A,X)090−16	28,600	11.5	14.0
1085674	38HDR030−31	CNPV*3621A**	58CV(A,X)110−20	28,600	11.5	14.0
1390466	38HDR030−31	CNPV*3621A**	58MV(B,C)060−14	28,600	11.5	14.0
1390470	38HDR030−31	CNPV*3621A**	58MV(B,C)080−14	28,600	11.5	14.0
1390482	38HDR030−31	CNPV*3621A**	58MV(B,C)080−20	28,600	11.5	14.0
1390494	38HDR030−31	CNPV*3621A**	58MV(B,C)100−20	28,600	11.5	14.0
3015394	38HDR030−31	CNPV*3621A**	58PH*090−16	28,600	12.0	14.5
1085666	38HDR030−31	CNPV*3621A**+TDR		28,600	11.0	13.0
1085740	38HDR030−31	CSPH*3012A**	58CV(A,X)070−12	28,000	11.5	14.0
1085742	38HDR030−31	CSPH*3012A**	58CV(A,X)090−16	28,000	11.5	14.0
1085744	38HDR030−31	CSPH*3012A**	58CV(A,X)110−20	28,000	11.5	14.0
1085746	38HDR030−31	CSPH*3012A**	58CV(A,X)135−22	28,000	11.5	14.0
1085748	38HDR030−31	CSPH*3012A**	58CV(A,X)155−22	28,000	11.5	14.0
3112128	38HDR030−31	CSPH*3012A**	58MEB040−12	28,000	12.0	14.5
3112129	38HDR030−31	CSPH*3012A**	58MEB060−12	28,000	12.0	14.5
3112130	38HDR030−31	CSPH*3012A**	58MEB080−12	28,000	12.0	14.5
3112131	38HDR030−31	CSPH*3012A**	58MEB080−16	28,000	12.0	14.5
1390460	38HDR030−31	CSPH*3012A**	58MV(B,C)060−14	28,000	11.5	14.0
1390476	38HDR030−31	CSPH*3012A**	58MV(B,C)080−14	28,000	11.5	14.0
1390488	38HDR030−31	CSPH*3012A**	58MV(B,C)080−20	28,000	11.5	14.0
1390500	38HDR030−31	CSPH*3012A**	58MV(B,C)100−20	28,000	11.5	14.0
1390508	38HDR030−31	CSPH*3012A**	58MV(B,C)120−20	28,000	11.5	14.0
3015399	38HDR030−31	CSPH*3012A**	58PH*070−16	28,000	11.5	14.0
3015400	38HDR030−31	CSPH*3012A**	58PH*090−16	28,000	11.5	14.0
1085726	38HDR030−31	CSPH*3012A**+TDR		28,000	11.0	13.0
1085764	38HDR030−31	CSPH*3612A**	58CV(A,X)070−12	28,600	11.5	14.0
1085766	38HDR030−31	CSPH*3612A**	58CV(A,X)090−16	28,600	11.5	14.0
1085768	38HDR030−31	CSPH*3612A**	58CV(A,X)110−20	28,600	11.5	14.0
1085770	38HDR030−31	CSPH*3612A**	58CV(A,X)135−22	28,600	11.5	14.0
1085772	38HDR030−31	CSPH*3612A**	58CV(A,X)155−22	28,600	11.5	14.0
3112132	38HDR030−31	CSPH*3612A**	58MEB040−12	28,600	12.0	14.5
3112133	38HDR030−31	CSPH*3612A**	58MEB060−12	28,600	12.0	14.5
3112134	38HDR030−31	CSPH*3612A**	58MEB080−12	28,600	12.0	14.5
3112135	38HDR030−31	CSPH*3612A**	58MEB080−16	28,600	12.0	14.5
1390462	38HDR030−31	CSPH*3612A**	58MV(B,C)060−14	28,600	11.5	14.0
1390478	38HDR030−31	CSPH*3612A**	58MV(B,C)080−14	28,600	11.5	14.0
1390490	38HDR030−31	CSPH*3612A**	58MV(B,C)080−20	28,600	11.5	14.0
1390502	38HDR030−31	CSPH*3612A**	58MV(B,C)100−20	28,600	11.5	14.0
1390510	38HDR030−31	CSPH*3612A**	58MV(B,C)120−20	28,600	11.5	14.0
3015401	38HDR030−31	CSPH*3612A**	58PH*070−16	28,600	12.0	14.5
3015402	38HDR030−31	CSPH*3612A**	58PH*090−16	28,600	12.0	14.5
1085750	38HDR030−31	CSPH*3612A**+TDR		28,600	11.0	13.0
1086240	38HDR030−31	FE4AN(B,F)003+UI		28,600	11.5	14.0
1086242	38HDR030−31	FE4AN(B,F)005+UI		29,000	12.5	15.0
1086238	38HDR030−31	FE4ANF002+UI		28,600	11.5	14.0
1085782	38HDR030−31	FF1ENP030		28,000	11.0	13.0
1085784	38HDR030−31	FF1ENP036		28,600	11.0	13.0
1085786	38HDR030−31	FV4BNF002		28,600	11.5	14.0
3404625	38HDR030−31	FV4CNF002		28,600	11.5	14.0
1085780	38HDR030−31	FX4CN(B,F)036		28,600	11.5	14.0
1085778	38HDR030−31	FX4CNF030		28,000	11.5	14.0
1085774	38HDR030−31	FY4ANF030		28,000	11.0	13.0
1085776	38HDR030−31	FY4ANF036		28,600	11.0	13.0
1085804	38HDR036−31	†CNPV*4221A**+TDR		33,400	11.0	13.0
1117980	38HDR036−31	40QAC036−−−3		33,000	11.4	13.0
1085808	38HDR036−31	CAP**3614A**	58CV(A,X)070−12	32,600	11.5	13.5
3015403	38HDR036−31	CAP**3614A**	58PH*045−08	33,000	11.5	14.0
1085806	38HDR036−31	CAP**3614A**+TDR		32,600	11.0	13.0
1085982	38HDR036−31	CAP**3617A**	58CV(A,X)070−12	33,000	11.5	14.0
1085814	38HDR036−31	CAP**3617A**	58CV(A,X)090−16	33,000	11.5	14.0

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ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3112136	38HDR036−31	CAP**3617A**	58MEB040−12	33,000	12.0	14.5
3112137	38HDR036−31	CAP**3617A**	58MEB060−12	33,000	12.0	14.5
3112138	38HDR036−31	CAP**3617A**	58MEB080−12	33,000	12.0	14.5
3112139	38HDR036−31	CAP**3617A**	58MEB080−16	33,000	12.0	14.5
1390512	38HDR036−31	CAP**3617A**	58MV(B,C)060−14	33,000	11.5	13.5
3015404	38HDR036−31	CAP**3617A**	58PH*070−16	33,000	11.5	14.0
1085810	38HDR036−31	CAP**3617A**+TDR		33,000	11.0	13.0
1085986	38HDR036−31	CAP**3621A**	58CV(A,X)090−16	33,000	11.5	14.0
1085824	38HDR036−31	CAP**3621A**	58CV(A,X)110−20	33,000	11.5	14.0
3112140	38HDR036−31	CAP**3621A**	58MEB100−20	33,000	12.0	14.5
1390524	38HDR036−31	CAP**3621A**	58MV(B,C)060−14	33,000	11.5	14.0
1390532	38HDR036−31	CAP**3621A**	58MV(B,C)080−14	33,000	11.5	13.5
1390550	38HDR036−31	CAP**3621A**	58MV(B,C)080−20	33,000	11.5	13.5
1390568	38HDR036−31	CAP**3621A**	58MV(B,C)100−20	33,000	11.5	14.0
3015405	38HDR036−31	CAP**3621A**	58PH*090−16	33,000	12.0	14.5
3015406	38HDR036−31	CAP**3621A**	58PH*110−20	33,000	12.0	14.5
1085816	38HDR036−31	CAP**3621A**+TDR		33,000	11.0	13.0
1085990	38HDR036−31	CAP**4221A**	58CV(A,X)090−16	33,400	11.5	14.0
1085834	38HDR036−31	CAP**4221A**	58CV(A,X)110−20	33,400	11.5	14.0
3112141	38HDR036−31	CAP**4221A**	58MEB100−20	33,400	12.0	14.5
1390526	38HDR036−31	CAP**4221A**	58MV(B,C)060−14	33,400	11.5	14.0
1390534	38HDR036−31	CAP**4221A**	58MV(B,C)080−14	33,400	11.5	13.5
1390552	38HDR036−31	CAP**4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390570	38HDR036−31	CAP**4221A**	58MV(B,C)100−20	33,400	11.5	14.0
3015407	38HDR036−31	CAP**4221A**	58PH*090−16	33,400	12.0	14.5
3015408	38HDR036−31	CAP**4221A**	58PH*110−20	33,400	12.0	14.5
1085826	38HDR036−31	CAP**4221A**+TDR		33,400	11.0	13.0
1085998	38HDR036−31	CAP**4224A**	58CV(A,X)110−20	33,400	11.5	14.0
1085842	38HDR036−31	CAP**4224A**	58CV(A,X)135−22	33,400	11.5	14.0
1085844	38HDR036−31	CAP**4224A**	58CV(A,X)155−22	33,400	11.5	14.0
1390548	38HDR036−31	CAP**4224A**	58MV(B,C)080−14	33,400	11.5	14.0
1390566	38HDR036−31	CAP**4224A**	58MV(B,C)080−20	33,400	11.5	14.0
1390584	38HDR036−31	CAP**4224A**	58MV(B,C)100−20	33,400	11.5	14.0
1390586	38HDR036−31	CAP**4224A**	58MV(B,C)120−20	33,400	11.5	13.5
1085836	38HDR036−31	CAP**4224A**+TDR		33,400	11.0	13.0
1085918	38HDR036−31	CNPF*3618A**+TDR		33,000	11.0	13.0
1085884	38HDR036−31	CNPH*3617A**	58CV(A,X)070−12	33,000	11.5	13.5
1085886	38HDR036−31	CNPH*3617A**	58CV(A,X)090−16	33,000	11.5	13.5
1085888	38HDR036−31	CNPH*3617A**	58CV(A,X)110−20	33,000	11.5	13.5
1085890	38HDR036−31	CNPH*3617A**	58CV(A,X)135−22	33,000	11.5	13.5
1085892	38HDR036−31	CNPH*3617A**	58CV(A,X)155−22	33,000	11.5	14.0
3112156	38HDR036−31	CNPH*3617A**	58MEB040−12	33,000	12.0	14.5
3112157	38HDR036−31	CNPH*3617A**	58MEB060−12	33,000	12.0	14.5
3112158	38HDR036−31	CNPH*3617A**	58MEB080−12	33,000	12.0	14.5
3112159	38HDR036−31	CNPH*3617A**	58MEB080−16	33,000	12.0	14.5
3112160	38HDR036−31	CNPH*3617A**	58MEB100−20	33,000	12.0	14.5
1390516	38HDR036−31	CNPH*3617A**	58MV(B,C)060−14	33,000	11.5	13.5
1390540	38HDR036−31	CNPH*3617A**	58MV(B,C)080−14	33,000	11.5	13.5
1390558	38HDR036−31	CNPH*3617A**	58MV(B,C)080−20	33,000	11.5	13.5
1390576	38HDR036−31	CNPH*3617A**	58MV(B,C)100−20	33,000	11.5	13.5
1390588	38HDR036−31	CNPH*3617A**	58MV(B,C)120−20	33,000	11.5	13.5
3015414	38HDR036−31	CNPH*3617A**	58PH*045−08	33,000	11.5	14.0
3015415	38HDR036−31	CNPH*3617A**	58PH*070−16	33,000	11.5	14.0
3015416	38HDR036−31	CNPH*3617A**	58PH*090−16	33,000	12.0	14.5
3015417	38HDR036−31	CNPH*3617A**	58PH*110−20	33,000	12.0	14.5
1085870	38HDR036−31	CNPH*3617A**+TDR		33,000	11.0	13.0
1085908	38HDR036−31	CNPH*4221A**	58CV(A,X)070−12	33,400	11.5	14.0
1085910	38HDR036−31	CNPH*4221A**	58CV(A,X)090−16	33,400	11.5	14.5
1085912	38HDR036−31	CNPH*4221A**	58CV(A,X)110−20	33,400	11.5	14.5
1085914	38HDR036−31	CNPH*4221A**	58CV(A,X)135−22	33,400	11.5	14.5
1085916	38HDR036−31	CNPH*4221A**	58CV(A,X)155−22	33,400	11.5	14.5
3112161	38HDR036−31	CNPH*4221A**	58MEB040−12	33,400	12.0	14.5
3112162	38HDR036−31	CNPH*4221A**	58MEB060−12	33,400	12.0	14.5
3112163	38HDR036−31	CNPH*4221A**	58MEB080−12	33,400	12.0	14.5
3112164	38HDR036−31	CNPH*4221A**	58MEB080−16	33,400	12.0	14.5
3112165	38HDR036−31	CNPH*4221A**	58MEB100−20	33,400	12.0	14.5
1390518	38HDR036−31	CNPH*4221A**	58MV(B,C)060−14	33,400	11.5	14.0
1390542	38HDR036−31	CNPH*4221A**	58MV(B,C)080−14	33,400	11.5	14.0
1390560	38HDR036−31	CNPH*4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390578	38HDR036−31	CNPH*4221A**	58MV(B,C)100−20	33,400	11.5	14.0
1390590	38HDR036−31	CNPH*4221A**	58MV(B,C)120−20	33,400	11.5	14.5
3015418	38HDR036−31	CNPH*4221A**	58PH*045−08	33,400	11.5	14.0
3015419	38HDR036−31	CNPH*4221A**	58PH*070−16	33,400	11.5	14.0
3015420	38HDR036−31	CNPH*4221A**	58PH*090−16	33,400	12.0	14.5
3015421	38HDR036−31	CNPH*4221A**	58PH*110−20	33,400	12.0	14.5
1085894	38HDR036−31	CNPH*4221A**+TDR		33,400	11.0	13.0
1086000	38HDR036−31	CNPV*3617A**	58CV(A,X)070−12	33,000	11.5	14.0
1085850	38HDR036−31	CNPV*3617A**	58CV(A,X)090−16	33,000	11.5	13.5
3112142	38HDR036−31	CNPV*3617A**	58MEB040−12	33,000	12.0	14.5

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3112143	38HDR036−31	CNPV*3617A**	58MEB060−12	33,000	12.0	14.5
3112144	38HDR036−31	CNPV*3617A**	58MEB080−12	33,000	12.0	14.5
3112145	38HDR036−31	CNPV*3617A**	58MEB080−16	33,000	12.0	14.5
1390514	38HDR036−31	CNPV*3617A**	58MV(B,C)060−14	33,000	11.5	13.5
3015409	38HDR036−31	CNPV*3617A**	58PH*070−16	33,000	11.5	14.0
1085846	38HDR036−31	CNPV*3617A**+TDR		33,000	11.0	13.0
1086004	38HDR036−31	CNPV*3621A**	58CV(A,X)090−16	33,000	11.5	14.5
1085860	38HDR036−31	CNPV*3621A**	58CV(A,X)110−20	33,000	11.5	13.5
3112146	38HDR036−31	CNPV*3621A**	58MEB100−20	33,000	12.0	14.5
1390528	38HDR036−31	CNPV*3621A**	58MV(B,C)060−14	33,000	11.5	14.5
1390536	38HDR036−31	CNPV*3621A**	58MV(B,C)080−14	33,000	11.5	13.5
1390554	38HDR036−31	CNPV*3621A**	58MV(B,C)080−20	33,000	11.5	13.5
1390572	38HDR036−31	CNPV*3621A**	58MV(B,C)100−20	33,000	11.5	13.5
3015410	38HDR036−31	CNPV*3621A**	58PH*090−16	33,000	12.0	14.5
3015411	38HDR036−31	CNPV*3621A**	58PH*110−20	33,000	12.0	14.5
1085852	38HDR036−31	CNPV*3621A**+TDR		33,000	11.0	13.0
3112149	38HDR036−31	CNPV*4217A**	58CV(A,X)090−16	33,400	12.0	14.5
3112151	38HDR036−31	CNPV*4217A**	58MEB040−12	33,400	12.0	14.5
3112152	38HDR036−31	CNPV*4217A**	58MEB060−12	33,400	12.0	14.5
3112153	38HDR036−31	CNPV*4217A**	58MEB080−12	33,400	12.0	14.5
3112154	38HDR036−31	CNPV*4217A**	58MEB080−16	33,400	12.0	14.5
3112148	38HDR036−31	CNPV*4217A**	58MV(B,C)060−14	33,400	12.0	14.5
3112150	38HDR036−31	CNPV*4217A**	58PH*070−16	33,400	12.0	14.5
3112147	38HDR036−31	CNPV*4217A**+TDR		33,400	11.0	13.0
1086008	38HDR036−31	CNPV*4221A**	58CV(A,X)090−16	33,400	11.5	14.5
1085868	38HDR036−31	CNPV*4221A**	58CV(A,X)110−20	33,400	11.5	14.5
3112155	38HDR036−31	CNPV*4221A**	58MEB100−20	33,400	12.0	14.5
1390530	38HDR036−31	CNPV*4221A**	58MV(B,C)060−14	33,400	11.5	14.5
1390538	38HDR036−31	CNPV*4221A**	58MV(B,C)080−14	33,400	11.5	14.0
1390556	38HDR036−31	CNPV*4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390574	38HDR036−31	CNPV*4221A**	58MV(B,C)100−20	33,400	11.5	14.0
3015412	38HDR036−31	CNPV*4221A**	58PH*090−16	33,400	12.0	14.5
3015413	38HDR036−31	CNPV*4221A**	58PH*110−20	33,400	12.0	14.5
1085934	38HDR036−31	CSPH*3612A**	58CV(A,X)070−12	33,000	11.5	14.0
1085936	38HDR036−31	CSPH*3612A**	58CV(A,X)090−16	33,000	11.5	14.5
1085938	38HDR036−31	CSPH*3612A**	58CV(A,X)110−20	33,000	11.5	14.5
1085940	38HDR036−31	CSPH*3612A**	58CV(A,X)135−22	33,000	11.5	14.5
1085942	38HDR036−31	CSPH*3612A**	58CV(A,X)155−22	33,000	11.5	14.5
3112166	38HDR036−31	CSPH*3612A**	58MEB040−12	33,000	12.0	14.5
3112167	38HDR036−31	CSPH*3612A**	58MEB060−12	33,000	12.0	14.5
3112168	38HDR036−31	CSPH*3612A**	58MEB080−12	33,000	12.0	14.5
3112169	38HDR036−31	CSPH*3612A**	58MEB080−16	33,000	12.0	14.5
3112170	38HDR036−31	CSPH*3612A**	58MEB100−20	33,000	12.0	14.5
1390520	38HDR036−31	CSPH*3612A**	58MV(B,C)060−14	33,000	11.5	14.5
1390544	38HDR036−31	CSPH*3612A**	58MV(B,C)080−14	33,000	11.5	14.0
1390562	38HDR036−31	CSPH*3612A**	58MV(B,C)080−20	33,000	11.5	14.0
1390580	38HDR036−31	CSPH*3612A**	58MV(B,C)100−20	33,000	11.5	14.5
1390592	38HDR036−31	CSPH*3612A**	58MV(B,C)120−20	33,000	11.5	14.5
3015422	38HDR036−31	CSPH*3612A**	58PH*045−08	33,000	11.5	14.0
3015423	38HDR036−31	CSPH*3612A**	58PH*070−16	33,000	11.5	14.0
3015424	38HDR036−31	CSPH*3612A**	58PH*090−16	33,000	12.0	14.5
3015425	38HDR036−31	CSPH*3612A**	58PH*110−20	33,000	12.0	14.5
1085920	38HDR036−31	CSPH*3612A**+TDR		33,000	11.0	13.0
1085958	38HDR036−31	CSPH*4212A**	58CV(A,X)070−12	33,400	11.5	14.0
1085960	38HDR036−31	CSPH*4212A**	58CV(A,X)090−16	33,400	11.5	14.5
1085962	38HDR036−31	CSPH*4212A**	58CV(A,X)110−20	33,400	11.5	14.5
1085964	38HDR036−31	CSPH*4212A**	58CV(A,X)135−22	33,400	11.5	14.5
1085966	38HDR036−31	CSPH*4212A**	58CV(A,X)155−22	33,400	11.5	14.5
3112171	38HDR036−31	CSPH*4212A**	58MEB040−12	33,400	12.0	14.5
3112172	38HDR036−31	CSPH*4212A**	58MEB060−12	33,400	12.0	14.5
3112173	38HDR036−31	CSPH*4212A**	58MEB080−12	33,400	12.0	14.5
3112174	38HDR036−31	CSPH*4212A**	58MEB080−16	33,400	12.0	14.5
3112175	38HDR036−31	CSPH*4212A**	58MEB100−20	33,400	12.0	14.5
1390522	38HDR036−31	CSPH*4212A**	58MV(B,C)060−14	33,400	11.5	14.0
1390546	38HDR036−31	CSPH*4212A**	58MV(B,C)080−14	33,400	11.5	14.0
1390564	38HDR036−31	CSPH*4212A**	58MV(B,C)080−20	33,400	11.5	14.0
1390582	38HDR036−31	CSPH*4212A**	58MV(B,C)100−20	33,400	11.5	14.0
1390594	38HDR036−31	CSPH*4212A**	58MV(B,C)120−20	33,400	11.5	14.0
3015426	38HDR036−31	CSPH*4212A**	58PH*045−08	33,400	11.5	14.0
3015427	38HDR036−31	CSPH*4212A**	58PH*070−16	33,400	11.5	14.0
3015428	38HDR036−31	CSPH*4212A**	58PH*090−16	33,400	12.0	14.5
3015429	38HDR036−31	CSPH*4212A**	58PH*110−20	33,400	12.0	14.5
1085944	38HDR036−31	CSPH*4212A**+TDR		33,400	11.0	13.0
1086246	38HDR036−31	FE4AN(B,F)003+UI		33,000	11.5	14.0
1086248	38HDR036−31	FE4AN(B,F)005+UI		33,400	12.5	15.0
1086250	38HDR036−31	FE4ANB006+UI		33,400	12.5	15.0
1086244	38HDR036−31	FE4ANF002+UI		33,000	11.5	13.5
1085976	38HDR036−31	FF1ENP036		33,000	11.0	13.0
1085980	38HDR036−31	FV4BNB006		33,400	12.5	15.0

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
1085978	38HDR036−31	FV4BNF002		33,000	11.5	13.5
3404627	38HDR036−31	FV4CNB006		33,400	12.5	15.0
3404626	38HDR036−31	FV4CNF002		33,000	11.5	13.5
1085972	38HDR036−31	FX4CN(B,F)036		33,000	11.5	14.0
1085974	38HDR036−31	FX4CN(B,F)042		33,400	11.5	14.0
1085968	38HDR036−31	FY4ANF036		33,000	11.0	13.0
1085970	38HDR036−31	FY4ANF042		33,400	11.0	13.0
1117042	38HDR036−51	†CNPV*4221A**+TDR		33,400	11.0	13.0
1117982	38HDR036−51	40QAC036−−−3		33,000	11.4	13.0
1117046	38HDR036−51	CAP**3614A**	58CV(A,X)070−12	32,600	11.5	13.5
3015466	38HDR036−51	CAP**3614A**	58PH*045−08	33,000	11.5	14.0
1117044	38HDR036−51	CAP**3614A**+TDR		32,600	11.0	13.0
1117228	38HDR036−51	CAP**3617A**	58CV(A,X)070−12	33,000	11.5	14.0
1117052	38HDR036−51	CAP**3617A**	58CV(A,X)090−16	33,000	11.5	14.0
3116284	38HDR036−51	CAP**3617A**	58MEB040−12	33,000	12.0	14.5
3116285	38HDR036−51	CAP**3617A**	58MEB060−12	33,000	12.0	14.5
3116286	38HDR036−51	CAP**3617A**	58MEB080−12	33,000	12.0	14.5
3116287	38HDR036−51	CAP**3617A**	58MEB080−16	33,000	12.0	14.5
1390596	38HDR036−51	CAP**3617A**	58MV(B,C)060−14	33,000	11.5	13.5
3015467	38HDR036−51	CAP**3617A**	58PH*070−16	33,000	11.5	14.0
1117048	38HDR036−51	CAP**3617A**+TDR		33,000	11.0	13.0
1117232	38HDR036−51	CAP**3621A**	58CV(A,X)090−16	33,000	11.5	14.0
1145786	38HDR036−51	CAP**3621A**	58CV(A,X)110−20	33,000	11.5	14.0
3116288	38HDR036−51	CAP**3621A**	58MEB100−20	33,000	12.0	14.5
1390602	38HDR036−51	CAP**3621A**	58MV(B,C)060−14	33,000	11.5	14.0
1390616	38HDR036−51	CAP**3621A**	58MV(B,C)080−14	33,000	11.5	13.5
1390634	38HDR036−51	CAP**3621A**	58MV(B,C)080−20	33,000	11.5	13.5
1390658	38HDR036−51	CAP**3621A**	58MV(B,C)100−20	33,000	11.5	14.0
3015468	38HDR036−51	CAP**3621A**	58PH*090−16	33,000	12.0	14.5
3015469	38HDR036−51	CAP**3621A**	58PH*110−20	33,000	12.0	14.5
1117054	38HDR036−51	CAP**3621A**+TDR		33,000	11.0	13.0
1117236	38HDR036−51	CAP**4221A**	58CV(A,X)090−16	33,400	11.5	14.0
1145796	38HDR036−51	CAP**4221A**	58CV(A,X)110−20	33,400	11.5	14.0
3116289	38HDR036−51	CAP**4221A**	58MEB100−20	33,400	12.0	14.5
1390604	38HDR036−51	CAP**4221A**	58MV(B,C)060−14	33,400	11.5	14.0
1390624	38HDR036−51	CAP**4221A**	58MV(B,C)080−14	33,400	11.5	13.5
1390642	38HDR036−51	CAP**4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390660	38HDR036−51	CAP**4221A**	58MV(B,C)100−20	33,400	11.5	14.0
3015470	38HDR036−51	CAP**4221A**	58PH*090−16	33,400	12.0	14.5
3015471	38HDR036−51	CAP**4221A**	58PH*110−20	33,400	12.0	14.5
1145788	38HDR036−51	CAP**4221A**+TDR		33,400	11.0	13.0
1117244	38HDR036−51	CAP**4224A**	58CV(A,X)110−20	33,400	11.5	14.0
1145804	38HDR036−51	CAP**4224A**	58CV(A,X)135−22	33,400	11.5	14.0
1145806	38HDR036−51	CAP**4224A**	58CV(A,X)155−22	33,400	11.5	14.0
1390622	38HDR036−51	CAP**4224A**	58MV(B,C)080−14	33,400	11.5	14.0
1390640	38HDR036−51	CAP**4224A**	58MV(B,C)080−20	33,400	11.5	14.0
1390656	38HDR036−51	CAP**4224A**	58MV(B,C)100−20	33,400	11.5	14.0
1390674	38HDR036−51	CAP**4224A**	58MV(B,C)120−20	33,400	11.5	13.5
1145798	38HDR036−51	CAP**4224A**+TDR		33,400	11.0	13.0
1117156	38HDR036−51	CNPF*3618A**+TDR		33,000	11.0	13.0
1145846	38HDR036−51	CNPH*3617A**	58CV(A,X)070−12	33,000	11.5	13.5
1145848	38HDR036−51	CNPH*3617A**	58CV(A,X)090−16	33,000	11.5	13.5
1145850	38HDR036−51	CNPH*3617A**	58CV(A,X)110−20	33,000	11.5	13.5
1145852	38HDR036−51	CNPH*3617A**	58CV(A,X)135−22	33,000	11.5	13.5
1145854	38HDR036−51	CNPH*3617A**	58CV(A,X)155−22	33,000	11.5	14.0
3116304	38HDR036−51	CNPH*3617A**	58MEB040−12	33,000	12.0	14.5
3116305	38HDR036−51	CNPH*3617A**	58MEB060−12	33,000	12.0	14.5
3116306	38HDR036−51	CNPH*3617A**	58MEB080−12	33,000	12.0	14.5
3116307	38HDR036−51	CNPH*3617A**	58MEB080−16	33,000	12.0	14.5
3116308	38HDR036−51	CNPH*3617A**	58MEB100−20	33,000	12.0	14.5
1390612	38HDR036−51	CNPH*3617A**	58MV(B,C)060−14	33,000	11.5	13.5
1390630	38HDR036−51	CNPH*3617A**	58MV(B,C)080−14	33,000	11.5	13.5
1390648	38HDR036−51	CNPH*3617A**	58MV(B,C)080−20	33,000	11.5	13.5
1390666	38HDR036−51	CNPH*3617A**	58MV(B,C)100−20	33,000	11.5	13.5
1390676	38HDR036−51	CNPH*3617A**	58MV(B,C)120−20	33,000	11.5	13.5
3015477	38HDR036−51	CNPH*3617A**	58PH*045−08	33,000	11.5	14.0
3015478	38HDR036−51	CNPH*3617A**	58PH*070−16	33,000	11.5	14.0
3015479	38HDR036−51	CNPH*3617A**	58PH*090−16	33,000	12.0	14.5
3015480	38HDR036−51	CNPH*3617A**	58PH*110−20	33,000	12.0	14.5
1145832	38HDR036−51	CNPH*3617A**+TDR		33,000	11.0	13.0
1145870	38HDR036−51	CNPH*4221A**	58CV(A,X)070−12	33,400	11.5	14.0
1145872	38HDR036−51	CNPH*4221A**	58CV(A,X)090−16	33,400	11.5	14.5
1145874	38HDR036−51	CNPH*4221A**	58CV(A,X)110−20	33,400	11.5	14.5
1117152	38HDR036−51	CNPH*4221A**	58CV(A,X)135−22	33,400	11.5	14.5
1117154	38HDR036−51	CNPH*4221A**	58CV(A,X)155−22	33,400	11.5	14.5
3116309	38HDR036−51	CNPH*4221A**	58MEB040−12	33,400	12.0	14.5
3116310	38HDR036−51	CNPH*4221A**	58MEB060−12	33,400	12.0	14.5
3116311	38HDR036−51	CNPH*4221A**	58MEB080−12	33,400	12.0	14.5

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3116312	38HDR036−51	CNPH*4221A**	58MEB080−16	33,400	12.0	14.5
3116313	38HDR036−51	CNPH*4221A**	58MEB100−20	33,400	12.0	14.5
1390614	38HDR036−51	CNPH*4221A**	58MV(B,C)060−14	33,400	11.5	14.0
1390632	38HDR036−51	CNPH*4221A**	58MV(B,C)080−14	33,400	11.5	14.0
1390650	38HDR036−51	CNPH*4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390668	38HDR036−51	CNPH*4221A**	58MV(B,C)100−20	33,400	11.5	14.0
1390678	38HDR036−51	CNPH*4221A**	58MV(B,C)120−20	33,400	11.5	14.5
3015481	38HDR036−51	CNPH*4221A**	58PH*045−08	33,400	11.5	14.0
3015482	38HDR036−51	CNPH*4221A**	58PH*070−16	33,400	11.5	14.0
3015483	38HDR036−51	CNPH*4221A**	58PH*090−16	33,400	12.0	14.5
3015484	38HDR036−51	CNPH*4221A**	58PH*110−20	33,400	12.0	14.5
1145856	38HDR036−51	CNPH*4221A**+TDR		33,400	11.0	13.0
1117246	38HDR036−51	CNPV*3617A**	58CV(A,X)070−12	33,000	11.5	14.0
1145812	38HDR036−51	CNPV*3617A**	58CV(A,X)090−16	33,000	11.5	13.5
3116290	38HDR036−51	CNPV*3617A**	58MEB040−12	33,000	12.0	14.5
3116291	38HDR036−51	CNPV*3617A**	58MEB060−12	33,000	12.0	14.5
3116292	38HDR036−51	CNPV*3617A**	58MEB080−12	33,000	12.0	14.5
3116293	38HDR036−51	CNPV*3617A**	58MEB080−16	33,000	12.0	14.5
1390610	38HDR036−51	CNPV*3617A**	58MV(B,C)060−14	33,000	11.5	13.5
3015472	38HDR036−51	CNPV*3617A**	58PH*070−16	33,000	11.5	14.0
1145808	38HDR036−51	CNPV*3617A**+TDR		33,000	11.0	13.0
1117250	38HDR036−51	CNPV*3621A**	58CV(A,X)090−16	33,000	11.5	14.5
1145822	38HDR036−51	CNPV*3621A**	58CV(A,X)110−20	33,000	11.5	13.5
3116294	38HDR036−51	CNPV*3621A**	58MEB100−20	33,000	12.0	14.5
1390606	38HDR036−51	CNPV*3621A**	58MV(B,C)060−14	33,000	11.5	14.5
1390626	38HDR036−51	CNPV*3621A**	58MV(B,C)080−14	33,000	11.5	13.5
1390644	38HDR036−51	CNPV*3621A**	58MV(B,C)080−20	33,000	11.5	13.5
1390662	38HDR036−51	CNPV*3621A**	58MV(B,C)100−20	33,000	11.5	13.5
3015473	38HDR036−51	CNPV*3621A**	58PH*090−16	33,000	12.0	14.5
3015474	38HDR036−51	CNPV*3621A**	58PH*110−20	33,000	12.0	14.5
1145814	38HDR036−51	CNPV*3621A**+TDR		33,000	11.0	13.0
3116297	38HDR036−51	CNPV*4217A**	58CV(A,X)090−16	33,400	12.0	14.5
3116299	38HDR036−51	CNPV*4217A**	58MEB040−12	33,400	12.0	14.5
3116300	38HDR036−51	CNPV*4217A**	58MEB060−12	33,400	12.0	14.5
3116301	38HDR036−51	CNPV*4217A**	58MEB080−12	33,400	12.0	14.5
3116302	38HDR036−51	CNPV*4217A**	58MEB080−16	33,400	12.0	14.5
3116296	38HDR036−51	CNPV*4217A**	58MV(B,C)060−14	33,400	12.0	14.5
3116298	38HDR036−51	CNPV*4217A**	58PH*070−16	33,400	12.0	14.5
3116295	38HDR036−51	CNPV*4217A**+TDR		33,400	11.0	13.0
1117254	38HDR036−51	CNPV*4221A**	58CV(A,X)090−16	33,400	11.5	14.5
1145830	38HDR036−51	CNPV*4221A**	58CV(A,X)110−20	33,400	11.5	14.5
3116303	38HDR036−51	CNPV*4221A**	58MEB100−20	33,400	12.0	14.5
1390608	38HDR036−51	CNPV*4221A**	58MV(B,C)060−14	33,400	11.5	14.5
1390628	38HDR036−51	CNPV*4221A**	58MV(B,C)080−14	33,400	11.5	14.0
1390646	38HDR036−51	CNPV*4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390664	38HDR036−51	CNPV*4221A**	58MV(B,C)100−20	33,400	11.5	14.0
3015475	38HDR036−51	CNPV*4221A**	58PH*090−16	33,400	12.0	14.5
3015476	38HDR036−51	CNPV*4221A**	58PH*110−20	33,400	12.0	14.5
1117172	38HDR036−51	CSPH*3612A**	58CV(A,X)070−12	33,000	11.5	14.0
1117174	38HDR036−51	CSPH*3612A**	58CV(A,X)090−16	33,000	11.5	14.5
1117176	38HDR036−51	CSPH*3612A**	58CV(A,X)110−20	33,000	11.5	14.5
1117178	38HDR036−51	CSPH*3612A**	58CV(A,X)135−22	33,000	11.5	14.5
1117180	38HDR036−51	CSPH*3612A**	58CV(A,X)155−22	33,000	11.5	14.5
3116314	38HDR036−51	CSPH*3612A**	58MEB040−12	33,000	12.0	14.5
3116315	38HDR036−51	CSPH*3612A**	58MEB060−12	33,000	12.0	14.5
3116316	38HDR036−51	CSPH*3612A**	58MEB080−12	33,000	12.0	14.5
3116317	38HDR036−51	CSPH*3612A**	58MEB080−16	33,000	12.0	14.5
3116318	38HDR036−51	CSPH*3612A**	58MEB100−20	33,000	12.0	14.5
1390598	38HDR036−51	CSPH*3612A**	58MV(B,C)060−14	33,000	11.5	14.5
1390618	38HDR036−51	CSPH*3612A**	58MV(B,C)080−14	33,000	11.5	14.0
1390636	38HDR036−51	CSPH*3612A**	58MV(B,C)080−20	33,000	11.5	14.0
1390652	38HDR036−51	CSPH*3612A**	58MV(B,C)100−20	33,000	11.5	14.5
1390670	38HDR036−51	CSPH*3612A**	58MV(B,C)120−20	33,000	11.5	14.5
3015485	38HDR036−51	CSPH*3612A**	58PH*045−08	33,000	11.5	14.0
3015486	38HDR036−51	CSPH*3612A**	58PH*070−16	33,000	11.5	14.0
3015487	38HDR036−51	CSPH*3612A**	58PH*090−16	33,000	12.0	14.5
3015488	38HDR036−51	CSPH*3612A**	58PH*110−20	33,000	12.0	14.5
1117158	38HDR036−51	CSPH*3612A**+TDR		33,000	11.0	13.0
1117196	38HDR036−51	CSPH*4212A**	58CV(A,X)070−12	33,400	11.5	14.0
1117198	38HDR036−51	CSPH*4212A**	58CV(A,X)090−16	33,400	11.5	14.5
1117200	38HDR036−51	CSPH*4212A**	58CV(A,X)110−20	33,400	11.5	14.5
1117202	38HDR036−51	CSPH*4212A**	58CV(A,X)135−22	33,400	11.5	14.5
1117204	38HDR036−51	CSPH*4212A**	58CV(A,X)155−22	33,400	11.5	14.5
3116319	38HDR036−51	CSPH*4212A**	58MEB040−12	33,400	12.0	14.5
3116320	38HDR036−51	CSPH*4212A**	58MEB060−12	33,400	12.0	14.5
3116321	38HDR036−51	CSPH*4212A**	58MEB080−12	33,400	12.0	14.5
3116322	38HDR036−51	CSPH*4212A**	58MEB080−16	33,400	12.0	14.5
3116323	38HDR036−51	CSPH*4212A**	58MEB100−20	33,400	12.0	14.5
1390600	38HDR036−51	CSPH*4212A**	58MV(B,C)060−14	33,400	11.5	14.0

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
1390620	38HDR036−51	CSPH*4212A**	58MV(B,C)080−14	33,400	11.5	14.0
1390638	38HDR036−51	CSPH*4212A**	58MV(B,C)080−20	33,400	11.5	14.0
1390654	38HDR036−51	CSPH*4212A**	58MV(B,C)100−20	33,400	11.5	14.0
1390672	38HDR036−51	CSPH*4212A**	58MV(B,C)120−20	33,400	11.5	14.0
3015489	38HDR036−51	CSPH*4212A**	58PH*045−08	33,400	11.5	14.0
3015490	38HDR036−51	CSPH*4212A**	58PH*070−16	33,400	11.5	14.0
3015491	38HDR036−51	CSPH*4212A**	58PH*090−16	33,400	12.0	14.5
3015492	38HDR036−51	CSPH*4212A**	58PH*110−20	33,400	12.0	14.5
1117182	38HDR036−51	CSPH*4212A**+TDR		33,400	11.0	13.0
1117216	38HDR036−51	FE4AN(B,F)003+UI		33,000	11.5	14.0
1117218	38HDR036−51	FE4AN(B,F)005+UI		33,400	12.5	15.0
1117220	38HDR036−51	FE4ANB006+UI		33,400	12.5	15.0
1117214	38HDR036−51	FE4ANF002+UI		33,000	11.5	13.5
1117222	38HDR036−51	FF1ENP036		33,000	11.0	13.0
1117226	38HDR036−51	FV4BNB006		33,400	12.5	15.0
1117224	38HDR036−51	FV4BNF002		33,000	11.5	13.5
3404631	38HDR036−51	FV4CNB006		33,400	12.5	15.0
3404630	38HDR036−51	FV4CNF002		33,000	11.5	13.5
1117210	38HDR036−51	FX4CN(B,F)036		33,000	11.5	14.0
1117212	38HDR036−51	FX4CN(B,F)042		33,400	11.5	14.0
1117206	38HDR036−51	FY4ANF036		33,000	11.0	13.0
1117208	38HDR036−51	FY4ANF042		33,400	11.0	13.0
1117484	38HDR036−61	†CNPV*4221A**+TDR		33,400	11.0	13.0
1117984	38HDR036−61	40QAC036−−−3		33,000	11.4	13.0
1117488	38HDR036−61	CAP**3614A**	58CV(A,X)070−12	32,600	11.5	13.5
3015493	38HDR036−61	CAP**3614A**	58PH*045−08	33,000	11.5	14.0
1117486	38HDR036−61	CAP**3614A**+TDR		32,600	11.0	13.0
1117670	38HDR036−61	CAP**3617A**	58CV(A,X)070−12	33,000	11.5	14.0
1117494	38HDR036−61	CAP**3617A**	58CV(A,X)090−16	33,000	11.5	14.0
3116353	38HDR036−61	CAP**3617A**	58MEB040−12	33,000	12.0	14.5
3116354	38HDR036−61	CAP**3617A**	58MEB060−12	33,000	12.0	14.5
3116355	38HDR036−61	CAP**3617A**	58MEB080−12	33,000	12.0	14.5
3116356	38HDR036−61	CAP**3617A**	58MEB080−16	33,000	12.0	14.5
1390680	38HDR036−61	CAP**3617A**	58MV(B,C)060−14	33,000	11.5	13.5
3015494	38HDR036−61	CAP**3617A**	58PH*070−16	33,000	11.5	14.0
1117490	38HDR036−61	CAP**3617A**+TDR		33,000	11.0	13.0
1117674	38HDR036−61	CAP**3621A**	58CV(A,X)090−16	33,000	11.5	14.0
1117504	38HDR036−61	CAP**3621A**	58CV(A,X)110−20	33,000	11.5	14.0
3116357	38HDR036−61	CAP**3621A**	58MEB100−20	33,000	12.0	14.5
1390692	38HDR036−61	CAP**3621A**	58MV(B,C)060−14	33,000	11.5	14.0
1390700	38HDR036−61	CAP**3621A**	58MV(B,C)080−14	33,000	11.5	13.5
1390718	38HDR036−61	CAP**3621A**	58MV(B,C)080−20	33,000	11.5	13.5
1390736	38HDR036−61	CAP**3621A**	58MV(B,C)100−20	33,000	11.5	14.0
3015495	38HDR036−61	CAP**3621A**	58PH*090−16	33,000	12.0	14.5
3015496	38HDR036−61	CAP**3621A**	58PH*110−20	33,000	12.0	14.5
1117496	38HDR036−61	CAP**3621A**+TDR		33,000	11.0	13.0
1117678	38HDR036−61	CAP**4221A**	58CV(A,X)090−16	33,400	11.5	14.0
1117514	38HDR036−61	CAP**4221A**	58CV(A,X)110−20	33,400	11.5	14.0
3116358	38HDR036−61	CAP**4221A**	58MEB100−20	33,400	12.0	14.5
1390694	38HDR036−61	CAP**4221A**	58MV(B,C)060−14	33,400	11.5	14.0
1390702	38HDR036−61	CAP**4221A**	58MV(B,C)080−14	33,400	11.5	13.5
1390720	38HDR036−61	CAP**4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390738	38HDR036−61	CAP**4221A**	58MV(B,C)100−20	33,400	11.5	14.0
3015497	38HDR036−61	CAP**4221A**	58PH*090−16	33,400	12.0	14.5
3015498	38HDR036−61	CAP**4221A**	58PH*110−20	33,400	12.0	14.5
1117506	38HDR036−61	CAP**4221A**+TDR		33,400	11.0	13.0
1117686	38HDR036−61	CAP**4224A**	58CV(A,X)110−20	33,400	11.5	14.0
1117522	38HDR036−61	CAP**4224A**	58CV(A,X)135−22	33,400	11.5	14.0
1117524	38HDR036−61	CAP**4224A**	58CV(A,X)155−22	33,400	11.5	14.0
1390716	38HDR036−61	CAP**4224A**	58MV(B,C)080−14	33,400	11.5	14.0
1390734	38HDR036−61	CAP**4224A**	58MV(B,C)080−20	33,400	11.5	14.0
1390752	38HDR036−61	CAP**4224A**	58MV(B,C)100−20	33,400	11.5	14.0
1390754	38HDR036−61	CAP**4224A**	58MV(B,C)120−20	33,400	11.5	13.5
1117516	38HDR036−61	CAP**4224A**+TDR		33,400	11.0	13.0
1117598	38HDR036−61	CNPF*3618A**+TDR		33,000	11.0	13.0
1117564	38HDR036−61	CNPH*3617A**	58CV(A,X)070−12	33,000	11.5	13.5
1117566	38HDR036−61	CNPH*3617A**	58CV(A,X)090−16	33,000	11.5	13.5
1117568	38HDR036−61	CNPH*3617A**	58CV(A,X)110−20	33,000	11.5	13.5
1117570	38HDR036−61	CNPH*3617A**	58CV(A,X)135−22	33,000	11.5	13.5
1117572	38HDR036−61	CNPH*3617A**	58CV(A,X)155−22	33,000	11.5	14.0
3116373	38HDR036−61	CNPH*3617A**	58MEB040−12	33,000	12.0	14.5
3116374	38HDR036−61	CNPH*3617A**	58MEB060−12	33,000	12.0	14.5
3116375	38HDR036−61	CNPH*3617A**	58MEB080−12	33,000	12.0	14.5
3116376	38HDR036−61	CNPH*3617A**	58MEB080−16	33,000	12.0	14.5
3116377	38HDR036−61	CNPH*3617A**	58MEB100−20	33,000	12.0	14.5
1390684	38HDR036−61	CNPH*3617A**	58MV(B,C)060−14	33,000	11.5	13.5
1390708	38HDR036−61	CNPH*3617A**	58MV(B,C)080−14	33,000	11.5	13.5
1390726	38HDR036−61	CNPH*3617A**	58MV(B,C)080−20	33,000	11.5	13.5

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
1390744	38HDR036−61	CNPH*3617A**	58MV(B,C)100−20	33,000	11.5	13.5
1390756	38HDR036−61	CNPH*3617A**	58MV(B,C)120−20	33,000	11.5	13.5
3015504	38HDR036−61	CNPH*3617A**	58PH*045−08	33,000	11.5	14.0
3015505	38HDR036−61	CNPH*3617A**	58PH*070−16	33,000	11.5	14.0
3015506	38HDR036−61	CNPH*3617A**	58PH*090−16	33,000	12.0	14.5
3015507	38HDR036−61	CNPH*3617A**	58PH*110−20	33,000	12.0	14.5
1117550	38HDR036−61	CNPH*3617A**+TDR		33,000	11.0	13.0
1117588	38HDR036−61	CNPH*4221A**	58CV(A,X)070−12	33,400	11.5	14.0
1117590	38HDR036−61	CNPH*4221A**	58CV(A,X)090−16	33,400	11.5	14.5
1117592	38HDR036−61	CNPH*4221A**	58CV(A,X)110−20	33,400	11.5	14.5
1117594	38HDR036−61	CNPH*4221A**	58CV(A,X)135−22	33,400	11.5	14.5
1117596	38HDR036−61	CNPH*4221A**	58CV(A,X)155−22	33,400	11.5	14.5
3116378	38HDR036−61	CNPH*4221A**	58MEB040−12	33,400	12.0	14.5
3116379	38HDR036−61	CNPH*4221A**	58MEB060−12	33,400	12.0	14.5
3116380	38HDR036−61	CNPH*4221A**	58MEB080−12	33,400	12.0	14.5
3116381	38HDR036−61	CNPH*4221A**	58MEB080−16	33,400	12.0	14.5
3116382	38HDR036−61	CNPH*4221A**	58MEB100−20	33,400	12.0	14.5
1390686	38HDR036−61	CNPH*4221A**	58MV(B,C)060−14	33,400	11.5	14.0
1390710	38HDR036−61	CNPH*4221A**	58MV(B,C)080−14	33,400	11.5	14.0
1390728	38HDR036−61	CNPH*4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390746	38HDR036−61	CNPH*4221A**	58MV(B,C)100−20	33,400	11.5	14.0
1390758	38HDR036−61	CNPH*4221A**	58MV(B,C)120−20	33,400	11.5	14.5
3015508	38HDR036−61	CNPH*4221A**	58PH*045−08	33,400	11.5	14.0
3015509	38HDR036−61	CNPH*4221A**	58PH*070−16	33,400	11.5	14.0
3015510	38HDR036−61	CNPH*4221A**	58PH*090−16	33,400	12.0	14.5
3015511	38HDR036−61	CNPH*4221A**	58PH*110−20	33,400	12.0	14.5
1117574	38HDR036−61	CNPH*4221A**+TDR		33,400	11.0	13.0
1117688	38HDR036−61	CNPV*3617A**	58CV(A,X)070−12	33,000	11.5	14.0
1117530	38HDR036−61	CNPV*3617A**	58CV(A,X)090−16	33,000	11.5	13.5
3116359	38HDR036−61	CNPV*3617A**	58MEB040−12	33,000	12.0	14.5
3116360	38HDR036−61	CNPV*3617A**	58MEB060−12	33,000	12.0	14.5
3116361	38HDR036−61	CNPV*3617A**	58MEB080−12	33,000	12.0	14.5
3116362	38HDR036−61	CNPV*3617A**	58MEB080−16	33,000	12.0	14.5
1390682	38HDR036−61	CNPV*3617A**	58MV(B,C)060−14	33,000	11.5	13.5
3015499	38HDR036−61	CNPV*3617A**	58PH*070−16	33,000	11.5	14.0
1117526	38HDR036−61	CNPV*3617A**+TDR		33,000	11.0	13.0
1117692	38HDR036−61	CNPV*3621A**	58CV(A,X)090−16	33,000	11.5	14.5
1117540	38HDR036−61	CNPV*3621A**	58CV(A,X)110−20	33,000	11.5	13.5
3116363	38HDR036−61	CNPV*3621A**	58MEB100−20	33,000	12.0	14.5
1390696	38HDR036−61	CNPV*3621A**	58MV(B,C)060−14	33,000	11.5	14.5
1390704	38HDR036−61	CNPV*3621A**	58MV(B,C)080−14	33,000	11.5	13.5
1390722	38HDR036−61	CNPV*3621A**	58MV(B,C)080−20	33,000	11.5	13.5
1390740	38HDR036−61	CNPV*3621A**	58MV(B,C)100−20	33,000	11.5	13.5
3015500	38HDR036−61	CNPV*3621A**	58PH*090−16	33,000	12.0	14.5
3015501	38HDR036−61	CNPV*3621A**	58PH*110−20	33,000	12.0	14.5
1117532	38HDR036−61	CNPV*3621A**+TDR		33,000	11.0	13.0
3116366	38HDR036−61	CNPV*4217A**	58CV(A,X)090−16	33,400	12.0	14.5
3116368	38HDR036−61	CNPV*4217A**	58MEB040−12	33,400	12.0	14.5
3116369	38HDR036−61	CNPV*4217A**	58MEB060−12	33,400	12.0	14.5
3116370	38HDR036−61	CNPV*4217A**	58MEB080−12	33,400	12.0	14.5
3116371	38HDR036−61	CNPV*4217A**	58MEB080−16	33,400	12.0	14.5
3116365	38HDR036−61	CNPV*4217A**	58MV(B,C)060−14	33,400	12.0	14.5
3116367	38HDR036−61	CNPV*4217A**	58PH*070−16	33,400	12.0	14.5
3116364	38HDR036−61	CNPV*4217A**+TDR		33,400	11.0	13.0
1117696	38HDR036−61	CNPV*4221A**	58CV(A,X)090−16	33,400	11.5	14.5
1117548	38HDR036−61	CNPV*4221A**	58CV(A,X)110−20	33,400	11.5	14.5
3116372	38HDR036−61	CNPV*4221A**	58MEB100−20	33,400	12.0	14.5
1390698	38HDR036−61	CNPV*4221A**	58MV(B,C)060−14	33,400	11.5	14.5
1390706	38HDR036−61	CNPV*4221A**	58MV(B,C)080−14	33,400	11.5	14.0
1390724	38HDR036−61	CNPV*4221A**	58MV(B,C)080−20	33,400	11.5	14.0
1390742	38HDR036−61	CNPV*4221A**	58MV(B,C)100−20	33,400	11.5	14.0
3015502	38HDR036−61	CNPV*4221A**	58PH*090−16	33,400	12.0	14.5
3015503	38HDR036−61	CNPV*4221A**	58PH*110−20	33,400	12.0	14.5
1117614	38HDR036−61	CSPH*3612A**	58CV(A,X)070−12	33,000	11.5	14.0
1117616	38HDR036−61	CSPH*3612A**	58CV(A,X)090−16	33,000	11.5	14.5
1117618	38HDR036−61	CSPH*3612A**	58CV(A,X)110−20	33,000	11.5	14.5
1117620	38HDR036−61	CSPH*3612A**	58CV(A,X)135−22	33,000	11.5	14.5
1117622	38HDR036−61	CSPH*3612A**	58CV(A,X)155−22	33,000	11.5	14.5
3116383	38HDR036−61	CSPH*3612A**	58MEB040−12	33,000	12.0	14.5
3116384	38HDR036−61	CSPH*3612A**	58MEB060−12	33,000	12.0	14.5
3116385	38HDR036−61	CSPH*3612A**	58MEB080−12	33,000	12.0	14.5
3116386	38HDR036−61	CSPH*3612A**	58MEB080−16	33,000	12.0	14.5
3116387	38HDR036−61	CSPH*3612A**	58MEB100−20	33,000	12.0	14.5
1390688	38HDR036−61	CSPH*3612A**	58MV(B,C)060−14	33,000	11.5	14.5
1390712	38HDR036−61	CSPH*3612A**	58MV(B,C)080−14	33,000	11.5	14.0
1390730	38HDR036−61	CSPH*3612A**	58MV(B,C)080−20	33,000	11.5	14.0
1390748	38HDR036−61	CSPH*3612A**	58MV(B,C)100−20	33,000	11.5	14.5
1390760	38HDR036−61	CSPH*3612A**	58MV(B,C)120−20	33,000	11.5	14.5
3015512	38HDR036−61	CSPH*3612A**	58PH*045−08	33,000	11.5	14.0

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ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3015513	38HDR036−61	CSPH*3612A**	58PH*070−16	33,000	11.5	14.0
3015514	38HDR036−61	CSPH*3612A**	58PH*090−16	33,000	12.0	14.5
3015515	38HDR036−61	CSPH*3612A**	58PH*110−20	33,000	12.0	14.5
1117600	38HDR036−61	CSPH*3612A**+TDR		33,000	11.0	13.0
1117638	38HDR036−61	CSPH*4212A**	58CV(A,X)070−12	33,400	11.5	14.0
1117640	38HDR036−61	CSPH*4212A**	58CV(A,X)090−16	33,400	11.5	14.5
1117642	38HDR036−61	CSPH*4212A**	58CV(A,X)110−20	33,400	11.5	14.5
1117644	38HDR036−61	CSPH*4212A**	58CV(A,X)135−22	33,400	11.5	14.5
1117646	38HDR036−61	CSPH*4212A**	58CV(A,X)155−22	33,400	11.5	14.5
3116388	38HDR036−61	CSPH*4212A**	58MEB040−12	33,400	12.0	14.5
3116389	38HDR036−61	CSPH*4212A**	58MEB060−12	33,400	12.0	14.5
3116390	38HDR036−61	CSPH*4212A**	58MEB080−12	33,400	12.0	14.5
3116391	38HDR036−61	CSPH*4212A**	58MEB080−16	33,400	12.0	14.5
3116392	38HDR036−61	CSPH*4212A**	58MEB100−20	33,400	12.0	14.5
1390690	38HDR036−61	CSPH*4212A**	58MV(B,C)060−14	33,400	11.5	14.0
1390714	38HDR036−61	CSPH*4212A**	58MV(B,C)080−14	33,400	11.5	14.0
1390732	38HDR036−61	CSPH*4212A**	58MV(B,C)080−20	33,400	11.5	14.0
1390750	38HDR036−61	CSPH*4212A**	58MV(B,C)100−20	33,400	11.5	14.0
1390762	38HDR036−61	CSPH*4212A**	58MV(B,C)120−20	33,400	11.5	14.0
3015516	38HDR036−61	CSPH*4212A**	58PH*045−08	33,400	11.5	14.0
3015517	38HDR036−61	CSPH*4212A**	58PH*070−16	33,400	11.5	14.0
3015518	38HDR036−61	CSPH*4212A**	58PH*090−16	33,400	12.0	14.5
3015519	38HDR036−61	CSPH*4212A**	58PH*110−20	33,400	12.0	14.5
1117624	38HDR036−61	CSPH*4212A**+TDR		33,400	11.0	13.0
1117658	38HDR036−61	FE4AN(B,F)003+UI		33,000	11.5	14.0
1117660	38HDR036−61	FE4AN(B,F)005+UI		33,400	12.5	15.0
1117662	38HDR036−61	FE4ANB006+UI		33,400	12.5	15.0
1117656	38HDR036−61	FE4ANF002+UI		33,000	11.5	13.5
1117664	38HDR036−61	FF1ENP036		33,000	11.0	13.0
1117668	38HDR036−61	FV4BNB006		33,400	12.5	15.0
1117666	38HDR036−61	FV4BNF002		33,000	11.5	13.5
3404635	38HDR036−61	FV4CNB006		33,400	12.5	15.0
3404634	38HDR036−61	FV4CNF002		33,000	11.5	13.5
1117652	38HDR036−61	FX4CN(B,F)036		33,000	11.5	14.0
1117654	38HDR036−61	FX4CN(B,F)042		33,400	11.5	14.0
1117648	38HDR036−61	FY4ANF036		33,000	11.0	13.0
1117650	38HDR036−61	FY4ANF042		33,400	11.0	13.0
3465144	38HDR048−32	†CNPV*4821A**+TDR		47,000	11.0	13.0
3465807	38HDR048−32	40QAC048−3		45,500	11.5	13.0
3465146	38HDR048−32	CAP**4817A**	58CV(A,X)090−16	46,500	11.5	13.5
3465148	38HDR048−32	CAP**4817A**	58MEB080−16	46,500	11.5	14.0
3465147	38HDR048−32	CAP**4817A**	58PH*070−16	46,500	11.5	13.5
3465145	38HDR048−32	CAP**4817A**+TDR		46,500	11.0	13.0
3465152	38HDR048−32	CAP**4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465155	38HDR048−32	CAP**4821A**	58MEB100−20	46,500	11.5	14.0
3465150	38HDR048−32	CAP**4821A**	58MV(B,C)080−20	46,000	11.5	13.5
3465151	38HDR048−32	CAP**4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465153	38HDR048−32	CAP**4821A**	58PH*090−16	46,500	11.5	14.0
3465154	38HDR048−32	CAP**4821A**	58PH*110−20	46,500	11.5	14.0
3465149	38HDR048−32	CAP**4821A**+TDR		47,000	11.0	13.0
3465158	38HDR048−32	CAP**4824A**	58CV(A,X)135−22	46,500	11.5	13.5
3465159	38HDR048−32	CAP**4824A**	58CV(A,X)155−22	46,500	11.5	13.5
3465161	38HDR048−32	CAP**4824A**	58MEB120−20	46,500	11.5	14.0
3465157	38HDR048−32	CAP**4824A**	58MV(B,C)120−20	46,500	11.5	13.5
3465160	38HDR048−32	CAP**4824A**	58PH*135−20	46,500	11.5	14.0
3465156	38HDR048−32	CAP**4824A**+TDR		47,000	11.0	13.0
3465165	38HDR048−32	CAP**6021A**	58CV(A,X)110−20	47,000	11.5	13.5
3465168	38HDR048−32	CAP**6021A**	58MEB100−20	47,000	12.0	14.5
3465163	38HDR048−32	CAP**6021A**	58MV(B,C)080−20	47,000	11.5	13.5
3465164	38HDR048−32	CAP**6021A**	58MV(B,C)100−20	47,000	11.5	13.5
3465166	38HDR048−32	CAP**6021A**	58PH*090−16	47,000	12.0	14.5
3465167	38HDR048−32	CAP**6021A**	58PH*110−20	47,000	12.0	14.5
3465162	38HDR048−32	CAP**6021A**+TDR		47,500	11.0	13.0
3465171	38HDR048−32	CAP**6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465172	38HDR048−32	CAP**6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465174	38HDR048−32	CAP**6024A**	58MEB120−20	47,000	12.0	14.5
3465170	38HDR048−32	CAP**6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465173	38HDR048−32	CAP**6024A**	58PH*135−20	47,000	12.0	14.5
3465169	38HDR048−32	CAP**6024A**+TDR		47,500	11.0	13.0
3465221	38HDR048−32	CNPF*4818A**+TDR		46,000	11.0	13.0
3465197	38HDR048−32	CNPH*4821A**	58CV(A,X)090−16	46,500	11.5	13.5
3465198	38HDR048−32	CNPH*4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465199	38HDR048−32	CNPH*4821A**	58CV(A,X)135−22	46,500	11.5	13.5
3465200	38HDR048−32	CNPH*4821A**	58CV(A,X)155−22	46,500	11.5	13.5
3465204	38HDR048−32	CNPH*4821A**	58MEB080−16	46,500	11.5	14.0
3465205	38HDR048−32	CNPH*4821A**	58MEB100−20	46,500	11.5	14.0
3465206	38HDR048−32	CNPH*4821A**	58MEB120−20	46,500	11.5	14.0
3465194	38HDR048−32	CNPH*4821A**	58MV(B,C)080−20	46,500	11.5	13.5

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ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465195	38HDR048−32	CNPH*4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465196	38HDR048−32	CNPH*4821A**	58MV(B,C)120−20	46,500	11.5	13.5
3465201	38HDR048−32	CNPH*4821A**	58PH*090−16	46,500	11.5	13.5
3465202	38HDR048−32	CNPH*4821A**	58PH*110−20	46,500	11.5	13.5
3465203	38HDR048−32	CNPH*4821A**	58PH*135−20	46,500	11.5	13.5
3465193	38HDR048−32	CNPH*4821A**+TDR		47,000	11.0	13.0
3465211	38HDR048−32	CNPH*6024A**	58CV(A,X)090−16	47,000	11.5	13.5
3465212	38HDR048−32	CNPH*6024A**	58CV(A,X)110−20	47,000	11.5	13.5
3465213	38HDR048−32	CNPH*6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465214	38HDR048−32	CNPH*6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465218	38HDR048−32	CNPH*6024A**	58MEB080−16	47,000	11.5	14.0
3465219	38HDR048−32	CNPH*6024A**	58MEB100−20	47,000	12.0	14.5
3465220	38HDR048−32	CNPH*6024A**	58MEB120−20	47,000	12.0	14.5
3465208	38HDR048−32	CNPH*6024A**	58MV(B,C)080−20	47,000	11.5	13.5
3465209	38HDR048−32	CNPH*6024A**	58MV(B,C)100−20	47,000	11.5	13.5
3465210	38HDR048−32	CNPH*6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465215	38HDR048−32	CNPH*6024A**	58PH*090−16	47,000	12.0	14.5
3465216	38HDR048−32	CNPH*6024A**	58PH*110−20	47,000	12.0	14.5
3465217	38HDR048−32	CNPH*6024A**	58PH*135−20	47,000	12.0	14.5
3465207	38HDR048−32	CNPH*6024A**+TDR		47,500	11.0	13.0
3465177	38HDR048−32	CNPV*4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465180	38HDR048−32	CNPV*4821A**	58MEB100−20	46,500	11.5	13.5
3465175	38HDR048−32	CNPV*4821A**	58MV(B,C)080−20	46,500	11.5	13.5
3465176	38HDR048−32	CNPV*4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465178	38HDR048−32	CNPV*4821A**	58PH*090−16	46,500	11.5	14.0
3465179	38HDR048−32	CNPV*4821A**	58PH*110−20	46,500	11.5	14.0
3465183	38HDR048−32	CNPV*4824A**	58CV(A,X)135−22	46,500	11.5	13.5
3465184	38HDR048−32	CNPV*4824A**	58CV(A,X)155−22	46,500	11.5	13.5
3465186	38HDR048−32	CNPV*4824A**	58MEB120−20	46,500	11.5	14.0
3465182	38HDR048−32	CNPV*4824A**	58MV(B,C)120−20	46,500	11.5	13.5
3465185	38HDR048−32	CNPV*4824A**	58PH*135−20	46,500	11.5	14.0
3465181	38HDR048−32	CNPV*4824A**+TDR		47,000	11.0	13.0
3465189	38HDR048−32	CNPV*6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465190	38HDR048−32	CNPV*6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465192	38HDR048−32	CNPV*6024A**	58MEB120−20	47,000	12.0	14.5
3465188	38HDR048−32	CNPV*6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465191	38HDR048−32	CNPV*6024A**	58PH*135−20	47,000	12.0	14.5
3465187	38HDR048−32	CNPV*6024A**+TDR		47,500	11.0	13.0
3465226	38HDR048−32	CSPH*4812A**	58CV(A,X)090−16	46,500	11.5	13.5
3465227	38HDR048−32	CSPH*4812A**	58CV(A,X)110−20	46,500	11.5	13.5
3465228	38HDR048−32	CSPH*4812A**	58CV(A,X)135−22	46,500	11.5	13.5
3465229	38HDR048−32	CSPH*4812A**	58CV(A,X)155−22	46,500	11.5	13.5
3465233	38HDR048−32	CSPH*4812A**	58MEB080−16	46,500	11.5	14.0
3465234	38HDR048−32	CSPH*4812A**	58MEB100−20	46,500	11.5	14.0
3465235	38HDR048−32	CSPH*4812A**	58MEB120−20	46,500	11.5	14.0
3465223	38HDR048−32	CSPH*4812A**	58MV(B,C)080−20	46,500	11.5	13.5
3465224	38HDR048−32	CSPH*4812A**	58MV(B,C)100−20	46,500	11.5	13.5
3465225	38HDR048−32	CSPH*4812A**	58MV(B,C)120−20	46,500	11.5	13.5
3465230	38HDR048−32	CSPH*4812A**	58PH*090−16	46,500	11.5	14.0
3465231	38HDR048−32	CSPH*4812A**	58PH*110−20	46,500	11.5	14.0
3465232	38HDR048−32	CSPH*4812A**	58PH*135−20	46,500	11.5	14.0
3465222	38HDR048−32	CSPH*4812A**+TDR		47,000	11.0	13.0
3465240	38HDR048−32	CSPH*6012A**	58CV(A,X)090−16	47,000	11.5	13.5
3465241	38HDR048−32	CSPH*6012A**	58CV(A,X)110−20	47,000	11.5	14.0
3465242	38HDR048−32	CSPH*6012A**	58CV(A,X)135−22	47,000	11.5	14.0
3465243	38HDR048−32	CSPH*6012A**	58CV(A,X)155−22	47,000	11.5	14.0
3465247	38HDR048−32	CSPH*6012A**	58MEB080−16	47,000	12.0	14.5
3465248	38HDR048−32	CSPH*6012A**	58MEB100−20	47,000	12.0	14.5
3465249	38HDR048−32	CSPH*6012A**	58MEB120−20	47,000	12.0	14.5
3465237	38HDR048−32	CSPH*6012A**	58MV(B,C)080−20	47,000	11.5	13.5
3465238	38HDR048−32	CSPH*6012A**	58MV(B,C)100−20	47,000	11.5	13.5
3465239	38HDR048−32	CSPH*6012A**	58MV(B,C)120−20	47,000	11.5	13.5
3465244	38HDR048−32	CSPH*6012A**	58PH*090−16	47,000	12.0	14.5
3465245	38HDR048−32	CSPH*6012A**	58PH*110−20	47,000	12.0	14.5
3465246	38HDR048−32	CSPH*6012A**	58PH*135−20	47,000	12.0	14.5
3465236	38HDR048−32	CSPH*6012A**+TDR		47,500	11.0	13.0
3465254	38HDR048−32	FE4AN(B,F)005+UI		47,000	11.5	13.5
3465255	38HDR048−32	FE4ANB006+UI		47,500	11.5	14.0
3465256	38HDR048−32	FV4BN(B,F)005		47,000	11.5	14.0
3465257	38HDR048−32	FV4BNB006		47,500	11.5	14.0
3465252	38HDR048−32	FX4CN(B,F)048		47,000	11.5	13.5
3465253	38HDR048−32	FX4CN(B,F)060		47,500	11.5	14.0
3465251	38HDR048−32	FY4ANB060		47,500	11.0	13.0
3465250	38HDR048−32	FY4ANF048		47,000	11.0	13.0
3465258	38HDR048−52	†CNPV*4821A**+TDR		47,000	11.0	13.0
3465808	38HDR048−52	40QAC048−3		45,500	11.5	13.0
3465260	38HDR048−52	CAP**4817A**	58CV(A,X)090−16	46,500	11.5	13.5
3465262	38HDR048−52	CAP**4817A**	58MEB080−16	46,500	11.5	14.0

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465261	38HDR048−52	CAP**4817A**	58PH*070−16	46,500	11.5	13.5
3465259	38HDR048−52	CAP**4817A**+TDR		46,500	11.0	13.0
3465266	38HDR048−52	CAP**4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465269	38HDR048−52	CAP**4821A**	58MEB100−20	46,500	11.5	14.0
3465264	38HDR048−52	CAP**4821A**	58MV(B,C)080−20	46,000	11.5	13.5
3465265	38HDR048−52	CAP**4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465267	38HDR048−52	CAP**4821A**	58PH*090−16	46,500	11.5	14.0
3465268	38HDR048−52	CAP**4821A**	58PH*110−20	46,500	11.5	14.0
3465263	38HDR048−52	CAP**4821A**+TDR		47,000	11.0	13.0
3465272	38HDR048−52	CAP**4824A**	58CV(A,X)135−22	46,500	11.5	13.5
3465273	38HDR048−52	CAP**4824A**	58CV(A,X)155−22	46,500	11.5	13.5
3465275	38HDR048−52	CAP**4824A**	58MEB120−20	46,500	11.5	14.0
3465271	38HDR048−52	CAP**4824A**	58MV(B,C)120−20	46,500	11.5	13.5
3465274	38HDR048−52	CAP**4824A**	58PH*135−20	46,500	11.5	14.0
3465270	38HDR048−52	CAP**4824A**+TDR		47,000	11.0	13.0
3465279	38HDR048−52	CAP**6021A**	58CV(A,X)110−20	47,000	11.5	13.5
3465282	38HDR048−52	CAP**6021A**	58MEB100−20	47,000	12.0	14.5
3465277	38HDR048−52	CAP**6021A**	58MV(B,C)080−20	47,000	11.5	13.5
3465278	38HDR048−52	CAP**6021A**	58MV(B,C)100−20	47,000	11.5	13.5
3465280	38HDR048−52	CAP**6021A**	58PH*090−16	47,000	12.0	14.5
3465281	38HDR048−52	CAP**6021A**	58PH*110−20	47,000	12.0	14.5
3465276	38HDR048−52	CAP**6021A**+TDR		47,500	11.0	13.0
3465285	38HDR048−52	CAP**6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465286	38HDR048−52	CAP**6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465288	38HDR048−52	CAP**6024A**	58MEB120−20	47,000	12.0	14.5
3465284	38HDR048−52	CAP**6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465287	38HDR048−52	CAP**6024A**	58PH*135−20	47,000	12.0	14.5
3465283	38HDR048−52	CAP**6024A**+TDR		47,500	11.0	13.0
3465335	38HDR048−52	CNPF*4818A**+TDR		46,000	11.0	13.0
3465311	38HDR048−52	CNPH*4821A**	58CV(A,X)090−16	46,500	11.5	13.5
3465312	38HDR048−52	CNPH*4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465313	38HDR048−52	CNPH*4821A**	58CV(A,X)135−22	46,500	11.5	13.5
3465314	38HDR048−52	CNPH*4821A**	58CV(A,X)155−22	46,500	11.5	13.5
3465318	38HDR048−52	CNPH*4821A**	58MEB080−16	46,500	11.5	14.0
3465319	38HDR048−52	CNPH*4821A**	58MEB100−20	46,500	11.5	14.0
3465320	38HDR048−52	CNPH*4821A**	58MEB120−20	46,500	11.5	14.0
3465308	38HDR048−52	CNPH*4821A**	58MV(B,C)080−20	46,500	11.5	13.5
3465309	38HDR048−52	CNPH*4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465310	38HDR048−52	CNPH*4821A**	58MV(B,C)120−20	46,500	11.5	13.5
3465315	38HDR048−52	CNPH*4821A**	58PH*090−16	46,500	11.5	13.5
3465316	38HDR048−52	CNPH*4821A**	58PH*110−20	46,500	11.5	13.5
3465317	38HDR048−52	CNPH*4821A**	58PH*135−20	46,500	11.5	13.5
3465307	38HDR048−52	CNPH*4821A**+TDR		47,000	11.0	13.0
3465325	38HDR048−52	CNPH*6024A**	58CV(A,X)090−16	47,000	11.5	13.5
3465326	38HDR048−52	CNPH*6024A**	58CV(A,X)110−20	47,000	11.5	13.5
3465327	38HDR048−52	CNPH*6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465328	38HDR048−52	CNPH*6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465332	38HDR048−52	CNPH*6024A**	58MEB080−16	47,000	11.5	14.0
3465333	38HDR048−52	CNPH*6024A**	58MEB100−20	47,000	12.0	14.5
3465334	38HDR048−52	CNPH*6024A**	58MEB120−20	47,000	12.0	14.5
3465322	38HDR048−52	CNPH*6024A**	58MV(B,C)080−20	47,000	11.5	13.5
3465323	38HDR048−52	CNPH*6024A**	58MV(B,C)100−20	47,000	11.5	13.5
3465324	38HDR048−52	CNPH*6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465329	38HDR048−52	CNPH*6024A**	58PH*090−16	47,000	12.0	14.5
3465330	38HDR048−52	CNPH*6024A**	58PH*110−20	47,000	12.0	14.5
3465331	38HDR048−52	CNPH*6024A**	58PH*135−20	47,000	12.0	14.5
3465321	38HDR048−52	CNPH*6024A**+TDR		47,500	11.0	13.0
3465291	38HDR048−52	CNPV*4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465294	38HDR048−52	CNPV*4821A**	58MEB100−20	46,500	11.5	13.5
3465289	38HDR048−52	CNPV*4821A**	58MV(B,C)080−20	46,500	11.5	13.5
3465290	38HDR048−52	CNPV*4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465292	38HDR048−52	CNPV*4821A**	58PH*090−16	46,500	11.5	14.0
3465293	38HDR048−52	CNPV*4821A**	58PH*110−20	46,500	11.5	14.0
3465297	38HDR048−52	CNPV*4824A**	58CV(A,X)135−22	46,500	11.5	13.5
3465298	38HDR048−52	CNPV*4824A**	58CV(A,X)155−22	46,500	11.5	13.5
3465300	38HDR048−52	CNPV*4824A**	58MEB120−20	46,500	11.5	14.0
3465296	38HDR048−52	CNPV*4824A**	58MV(B,C)120−20	46,500	11.5	13.5
3465299	38HDR048−52	CNPV*4824A**	58PH*135−20	46,500	11.5	14.0
3465295	38HDR048−52	CNPV*4824A**+TDR		47,000	11.0	13.0
3465303	38HDR048−52	CNPV*6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465304	38HDR048−52	CNPV*6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465306	38HDR048−52	CNPV*6024A**	58MEB120−20	47,000	12.0	14.5
3465302	38HDR048−52	CNPV*6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465305	38HDR048−52	CNPV*6024A**	58PH*135−20	47,000	12.0	14.5
3465301	38HDR048−52	CNPV*6024A**+TDR		47,500	11.0	13.0
3465340	38HDR048−52	CSPH*4812A**	58CV(A,X)090−16	46,500	11.5	13.5
3465341	38HDR048−52	CSPH*4812A**	58CV(A,X)110−20	46,500	11.5	13.5
3465342	38HDR048−52	CSPH*4812A**	58CV(A,X)135−22	46,500	11.5	13.5
3465343	38HDR048−52	CSPH*4812A**	58CV(A,X)155−22	46,500	11.5	13.5

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465347	38HDR048−52	CSPH*4812A**	58MEB080−16	46,500	11.5	14.0
3465348	38HDR048−52	CSPH*4812A**	58MEB100−20	46,500	11.5	14.0
3465349	38HDR048−52	CSPH*4812A**	58MEB120−20	46,500	11.5	14.0
3465337	38HDR048−52	CSPH*4812A**	58MV(B,C)080−20	46,500	11.5	13.5
3465338	38HDR048−52	CSPH*4812A**	58MV(B,C)100−20	46,500	11.5	13.5
3465339	38HDR048−52	CSPH*4812A**	58MV(B,C)120−20	46,500	11.5	13.5
3465344	38HDR048−52	CSPH*4812A**	58PH*090−16	46,500	11.5	14.0
3465345	38HDR048−52	CSPH*4812A**	58PH*110−20	46,500	11.5	14.0
3465346	38HDR048−52	CSPH*4812A**	58PH*135−20	46,500	11.5	14.0
3465336	38HDR048−52	CSPH*4812A**+TDR		47,000	11.0	13.0
3465354	38HDR048−52	CSPH*6012A**	58CV(A,X)090−16	47,000	11.5	13.5
3465355	38HDR048−52	CSPH*6012A**	58CV(A,X)110−20	47,000	11.5	14.0
3465356	38HDR048−52	CSPH*6012A**	58CV(A,X)135−22	47,000	11.5	14.0
3465357	38HDR048−52	CSPH*6012A**	58CV(A,X)155−22	47,000	11.5	14.0
3465361	38HDR048−52	CSPH*6012A**	58MEB080−16	47,000	12.0	14.5
3465362	38HDR048−52	CSPH*6012A**	58MEB100−20	47,000	12.0	14.5
3465363	38HDR048−52	CSPH*6012A**	58MEB120−20	47,000	12.0	14.5
3465351	38HDR048−52	CSPH*6012A**	58MV(B,C)080−20	47,000	11.5	13.5
3465352	38HDR048−52	CSPH*6012A**	58MV(B,C)100−20	47,000	11.5	13.5
3465353	38HDR048−52	CSPH*6012A**	58MV(B,C)120−20	47,000	11.5	13.5
3465358	38HDR048−52	CSPH*6012A**	58PH*090−16	47,000	12.0	14.5
3465359	38HDR048−52	CSPH*6012A**	58PH*110−20	47,000	12.0	14.5
3465360	38HDR048−52	CSPH*6012A**	58PH*135−20	47,000	12.0	14.5
3465350	38HDR048−52	CSPH*6012A**+TDR		47,500	11.0	13.0
3465368	38HDR048−52	FE4AN(B,F)005+UI		47,000	11.5	13.5
3465369	38HDR048−52	FE4ANB006+UI		47,500	11.5	14.0
3465370	38HDR048−52	FV4BN(B,F)005		47,000	11.5	14.0
3465371	38HDR048−52	FV4BNB006		47,500	11.5	14.0
3465366	38HDR048−52	FX4CN(B,F)048		47,000	11.5	13.5
3465367	38HDR048−52	FX4CN(B,F)060		47,500	11.5	14.0
3465365	38HDR048−52	FY4ANB060		47,500	11.0	13.0
3465364	38HDR048−52	FY4ANF048		47,000	11.0	13.0
3465372	38HDR048−62	†CNPV*4821A**+TDR		47,000	11.0	13.0
3465809	38HDR048−62	40QAC048−3		45,500	11.5	13.0
3465374	38HDR048−62	CAP**4817A**	58CV(A,X)090−16	46,500	11.5	13.5
3465376	38HDR048−62	CAP**4817A**	58MEB080−16	46,500	11.5	14.0
3465375	38HDR048−62	CAP**4817A**	58PH*070−16	46,500	11.5	13.5
3465373	38HDR048−62	CAP**4817A**+TDR		46,500	11.0	13.0
3465380	38HDR048−62	CAP**4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465383	38HDR048−62	CAP**4821A**	58MEB100−20	46,500	11.5	14.0
3465378	38HDR048−62	CAP**4821A**	58MV(B,C)080−20	46,000	11.5	13.5
3465379	38HDR048−62	CAP**4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465381	38HDR048−62	CAP**4821A**	58PH*090−16	46,500	11.5	14.0
3465382	38HDR048−62	CAP**4821A**	58PH*110−20	46,500	11.5	14.0
3465377	38HDR048−62	CAP**4821A**+TDR		47,000	11.0	13.0
3465386	38HDR048−62	CAP**4824A**	58CV(A,X)135−22	46,500	11.5	13.5
3465387	38HDR048−62	CAP**4824A**	58CV(A,X)155−22	46,500	11.5	13.5
3465389	38HDR048−62	CAP**4824A**	58MEB120−20	46,500	11.5	14.0
3465385	38HDR048−62	CAP**4824A**	58MV(B,C)120−20	46,500	11.5	13.5
3465388	38HDR048−62	CAP**4824A**	58PH*135−20	46,500	11.5	14.0
3465384	38HDR048−62	CAP**4824A**+TDR		47,000	11.0	13.0
3465393	38HDR048−62	CAP**6021A**	58CV(A,X)110−20	47,000	11.5	13.5
3465396	38HDR048−62	CAP**6021A**	58MEB100−20	47,000	12.0	14.5
3465391	38HDR048−62	CAP**6021A**	58MV(B,C)080−20	47,000	11.5	13.5
3465392	38HDR048−62	CAP**6021A**	58MV(B,C)100−20	47,000	11.5	13.5
3465394	38HDR048−62	CAP**6021A**	58PH*090−16	47,000	12.0	14.5
3465395	38HDR048−62	CAP**6021A**	58PH*110−20	47,000	12.0	14.5
3465390	38HDR048−62	CAP**6021A**+TDR		47,500	11.0	13.0
3465399	38HDR048−62	CAP**6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465400	38HDR048−62	CAP**6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465402	38HDR048−62	CAP**6024A**	58MEB120−20	47,000	12.0	14.5
3465398	38HDR048−62	CAP**6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465401	38HDR048−62	CAP**6024A**	58PH*135−20	47,000	12.0	14.5
3465397	38HDR048−62	CAP**6024A**+TDR		47,500	11.0	13.0
3465449	38HDR048−62	CNPF*4818A**+TDR		46,000	11.0	13.0
3465425	38HDR048−62	CNPH*4821A**	58CV(A,X)090−16	46,500	11.5	13.5
3465426	38HDR048−62	CNPH*4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465427	38HDR048−62	CNPH*4821A**	58CV(A,X)135−22	46,500	11.5	13.5
3465428	38HDR048−62	CNPH*4821A**	58CV(A,X)155−22	46,500	11.5	13.5
3465432	38HDR048−62	CNPH*4821A**	58MEB080−16	46,500	11.5	14.0
3465433	38HDR048−62	CNPH*4821A**	58MEB100−20	46,500	11.5	14.0
3465434	38HDR048−62	CNPH*4821A**	58MEB120−20	46,500	11.5	14.0
3465422	38HDR048−62	CNPH*4821A**	58MV(B,C)080−20	46,500	11.5	13.5
3465423	38HDR048−62	CNPH*4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465424	38HDR048−62	CNPH*4821A**	58MV(B,C)120−20	46,500	11.5	13.5
3465429	38HDR048−62	CNPH*4821A**	58PH*090−16	46,500	11.5	13.5
3465430	38HDR048−62	CNPH*4821A**	58PH*110−20	46,500	11.5	13.5
3465431	38HDR048−62	CNPH*4821A**	58PH*135−20	46,500	11.5	13.5

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ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465421	38HDR048−62	CNPH*4821A**+TDR		47,000	11.0	13.0
3465439	38HDR048−62	CNPH*6024A**	58CV(A,X)090−16	47,000	11.5	13.5
3465440	38HDR048−62	CNPH*6024A**	58CV(A,X)110−20	47,000	11.5	13.5
3465441	38HDR048−62	CNPH*6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465442	38HDR048−62	CNPH*6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465446	38HDR048−62	CNPH*6024A**	58MEB080−16	47,000	11.5	14.0
3465447	38HDR048−62	CNPH*6024A**	58MEB100−20	47,000	12.0	14.5
3465448	38HDR048−62	CNPH*6024A**	58MEB120−20	47,000	12.0	14.5
3465436	38HDR048−62	CNPH*6024A**	58MV(B,C)080−20	47,000	11.5	13.5
3465437	38HDR048−62	CNPH*6024A**	58MV(B,C)100−20	47,000	11.5	13.5
3465438	38HDR048−62	CNPH*6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465443	38HDR048−62	CNPH*6024A**	58PH*090−16	47,000	12.0	14.5
3465444	38HDR048−62	CNPH*6024A**	58PH*110−20	47,000	12.0	14.5
3465445	38HDR048−62	CNPH*6024A**	58PH*135−20	47,000	12.0	14.5
3465435	38HDR048−62	CNPH*6024A**+TDR		47,500	11.0	13.0
3465405	38HDR048−62	CNPV*4821A**	58CV(A,X)110−20	46,500	11.5	13.5
3465408	38HDR048−62	CNPV*4821A**	58MEB100−20	46,500	11.5	13.5
3465403	38HDR048−62	CNPV*4821A**	58MV(B,C)080−20	46,500	11.5	13.5
3465404	38HDR048−62	CNPV*4821A**	58MV(B,C)100−20	46,500	11.5	13.5
3465406	38HDR048−62	CNPV*4821A**	58PH*090−16	46,500	11.5	14.0
3465407	38HDR048−62	CNPV*4821A**	58PH*110−20	46,500	11.5	14.0
3465411	38HDR048−62	CNPV*4824A**	58CV(A,X)135−22	46,500	11.5	13.5
3465412	38HDR048−62	CNPV*4824A**	58CV(A,X)155−22	46,500	11.5	13.5
3465414	38HDR048−62	CNPV*4824A**	58MEB120−20	46,500	11.5	14.0
3465410	38HDR048−62	CNPV*4824A**	58MV(B,C)120−20	46,500	11.5	13.5
3465413	38HDR048−62	CNPV*4824A**	58PH*135−20	46,500	11.5	14.0
3465409	38HDR048−62	CNPV*4824A**+TDR		47,000	11.0	13.0
3465417	38HDR048−62	CNPV*6024A**	58CV(A,X)135−22	47,000	11.5	13.5
3465418	38HDR048−62	CNPV*6024A**	58CV(A,X)155−22	47,000	11.5	14.0
3465420	38HDR048−62	CNPV*6024A**	58MEB120−20	47,000	12.0	14.5
3465416	38HDR048−62	CNPV*6024A**	58MV(B,C)120−20	47,000	11.5	13.5
3465419	38HDR048−62	CNPV*6024A**	58PH*135−20	47,000	12.0	14.5
3465415	38HDR048−62	CNPV*6024A**+TDR		47,500	11.0	13.0
3465454	38HDR048−62	CSPH*4812A**	58CV(A,X)090−16	46,500	11.5	13.5
3465455	38HDR048−62	CSPH*4812A**	58CV(A,X)110−20	46,500	11.5	13.5
3465456	38HDR048−62	CSPH*4812A**	58CV(A,X)135−22	46,500	11.5	13.5
3465457	38HDR048−62	CSPH*4812A**	58CV(A,X)155−22	46,500	11.5	13.5
3465461	38HDR048−62	CSPH*4812A**	58MEB080−16	46,500	11.5	14.0
3465462	38HDR048−62	CSPH*4812A**	58MEB100−20	46,500	11.5	14.0
3465463	38HDR048−62	CSPH*4812A**	58MEB120−20	46,500	11.5	14.0
3465451	38HDR048−62	CSPH*4812A**	58MV(B,C)080−20	46,500	11.5	13.5
3465452	38HDR048−62	CSPH*4812A**	58MV(B,C)100−20	46,500	11.5	13.5
3465453	38HDR048−62	CSPH*4812A**	58MV(B,C)120−20	46,500	11.5	13.5
3465458	38HDR048−62	CSPH*4812A**	58PH*090−16	46,500	11.5	14.0
3465459	38HDR048−62	CSPH*4812A**	58PH*110−20	46,500	11.5	14.0
3465460	38HDR048−62	CSPH*4812A**	58PH*135−20	46,500	11.5	14.0
3465450	38HDR048−62	CSPH*4812A**+TDR		47,000	11.0	13.0
3465468	38HDR048−62	CSPH*6012A**	58CV(A,X)090−16	47,000	11.5	13.5
3465469	38HDR048−62	CSPH*6012A**	58CV(A,X)110−20	47,000	11.5	14.0
3465470	38HDR048−62	CSPH*6012A**	58CV(A,X)135−22	47,000	11.5	14.0
3465471	38HDR048−62	CSPH*6012A**	58CV(A,X)155−22	47,000	11.5	14.0
3465475	38HDR048−62	CSPH*6012A**	58MEB080−16	47,000	12.0	14.5
3465476	38HDR048−62	CSPH*6012A**	58MEB100−20	47,000	12.0	14.5
3465477	38HDR048−62	CSPH*6012A**	58MEB120−20	47,000	12.0	14.5
3465465	38HDR048−62	CSPH*6012A**	58MV(B,C)080−20	47,000	11.5	13.5
3465466	38HDR048−62	CSPH*6012A**	58MV(B,C)100−20	47,000	11.5	13.5
3465467	38HDR048−62	CSPH*6012A**	58MV(B,C)120−20	47,000	11.5	13.5
3465472	38HDR048−62	CSPH*6012A**	58PH*090−16	47,000	12.0	14.5
3465473	38HDR048−62	CSPH*6012A**	58PH*110−20	47,000	12.0	14.5
3465474	38HDR048−62	CSPH*6012A**	58PH*135−20	47,000	12.0	14.5
3465464	38HDR048−62	CSPH*6012A**+TDR		47,500	11.0	13.0
3465482	38HDR048−62	FE4AN(B,F)005+UI		47,000	11.5	13.5
3465483	38HDR048−62	FE4ANB006+UI		47,500	11.5	14.0
3465484	38HDR048−62	FV4BN(B,F)005		47,000	11.5	14.0
3465485	38HDR048−62	FV4BNB006		47,500	11.5	14.0
3465480	38HDR048−62	FX4CN(B,F)048		47,000	11.5	13.5
3465481	38HDR048−62	FX4CN(B,F)060		47,500	11.5	14.0
3465479	38HDR048−62	FY4ANB060		47,500	11.0	13.0
3465478	38HDR048−62	FY4ANF048		47,000	11.0	13.0
3465024	38HDR060−32	†CNPV*6024A**+TDR		57,000	11.0	13.0
3465810	38HDR060−32	40QAC060−3		56,000	11.0	13.0
3465026	38HDR060−32	CAP**6021A**	58CV(A,X)110−20	56,000	11.0	13.2
3465029	38HDR060−32	CAP**6021A**	58MEB100−20	56,000	11.0	13.5
3465027	38HDR060−32	CAP**6021A**	58PH*090−16	56,000	11.0	13.2
3465028	38HDR060−32	CAP**6021A**	58PH*110−20	56,000	11.0	13.5
3465025	38HDR060−32	CAP**6021A**+TDR		57,000	11.0	13.0
3465031	38HDR060−32	CAP**6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465032	38HDR060−32	CAP**6024A**	58CV(A,X)155−22	56,000	11.0	13.5

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465034	38HDR060−32	CAP**6024A**	58MEB120−20	56,000	11.0	13.5
3465033	38HDR060−32	CAP**6024A**	58PH*135−20	56,000	11.0	13.5
3465030	38HDR060−32	CAP**6024A**+TDR		57,000	11.0	13.0
3465040	38HDR060−32	CNPH*6024A**	58CV(A,X)110−20	56,000	11.0	13.2
3465041	38HDR060−32	CNPH*6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465042	38HDR060−32	CNPH*6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465046	38HDR060−32	CNPH*6024A**	58MEB080−16	56,000	11.0	13.2
3465047	38HDR060−32	CNPH*6024A**	58MEB100−20	56,000	11.0	13.5
3465048	38HDR060−32	CNPH*6024A**	58MEB120−20	56,000	11.0	13.5
3465043	38HDR060−32	CNPH*6024A**	58PH*090−16	56,000	11.0	13.2
3465044	38HDR060−32	CNPH*6024A**	58PH*110−20	56,000	11.0	13.5
3465045	38HDR060−32	CNPH*6024A**	58PH*135−20	56,000	11.0	13.5
3465039	38HDR060−32	CNPH*6024A**+TDR		57,000	11.0	13.0
3465035	38HDR060−32	CNPV*6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465036	38HDR060−32	CNPV*6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465038	38HDR060−32	CNPV*6024A**	58MEB120−20	56,000	11.0	13.5
3465037	38HDR060−32	CNPV*6024A**	58PH*135−20	56,000	11.0	13.5
3465051	38HDR060−32	CSPH*6012A**	58CV(A,X)110−20	56,000	11.0	13.5
3465052	38HDR060−32	CSPH*6012A**	58CV(A,X)135−22	56,000	11.0	13.5
3465053	38HDR060−32	CSPH*6012A**	58CV(A,X)155−22	56,000	11.0	13.5
3465057	38HDR060−32	CSPH*6012A**	58MEB080−16	56,000	11.0	13.2
3465058	38HDR060−32	CSPH*6012A**	58MEB100−20	56,000	11.0	13.5
3465059	38HDR060−32	CSPH*6012A**	58MEB120−20	56,000	11.0	13.5
3465050	38HDR060−32	CSPH*6012A**	58MV(B,C)120−20	56,000	11.0	13.2
3465054	38HDR060−32	CSPH*6012A**	58PH*090−16	56,000	11.0	13.5
3465055	38HDR060−32	CSPH*6012A**	58PH*110−20	56,000	11.0	13.5
3465056	38HDR060−32	CSPH*6012A**	58PH*135−20	56,000	11.0	13.5
3465049	38HDR060−32	CSPH*6012A**+TDR		57,000	11.0	13.0
3465062	38HDR060−32	FE4ANB006+UI		57,500	11.0	13.5
3465063	38HDR060−32	FV4BNB006		57,500	11.0	13.5
3465061	38HDR060−32	FX4CN(B,F)060		57,500	11.0	13.5
3465060	38HDR060−32	FY4ANB060		57,000	11.0	13.0
3465064	38HDR060−52	†CNPV*6024A**+TDR		57,000	11.0	13.0
3465811	38HDR060−52	40QAC060−3		56,000	11.0	13.0
3465066	38HDR060−52	CAP**6021A**	58CV(A,X)110−20	56,000	11.0	13.2
3465069	38HDR060−52	CAP**6021A**	58MEB100−20	56,000	11.0	13.5
3465067	38HDR060−52	CAP**6021A**	58PH*090−16	56,000	11.0	13.2
3465068	38HDR060−52	CAP**6021A**	58PH*110−20	56,000	11.0	13.5
3465065	38HDR060−52	CAP**6021A**+TDR		57,000	11.0	13.0
3465071	38HDR060−52	CAP**6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465072	38HDR060−52	CAP**6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465074	38HDR060−52	CAP**6024A**	58MEB120−20	56,000	11.0	13.5
3465073	38HDR060−52	CAP**6024A**	58PH*135−20	56,000	11.0	13.5
3465070	38HDR060−52	CAP**6024A**+TDR		57,000	11.0	13.0
3465080	38HDR060−52	CNPH*6024A**	58CV(A,X)110−20	56,000	11.0	13.2
3465081	38HDR060−52	CNPH*6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465082	38HDR060−52	CNPH*6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465086	38HDR060−52	CNPH*6024A**	58MEB080−16	56,000	11.0	13.2
3465087	38HDR060−52	CNPH*6024A**	58MEB100−20	56,000	11.0	13.5
3465088	38HDR060−52	CNPH*6024A**	58MEB120−20	56,000	11.0	13.5
3465083	38HDR060−52	CNPH*6024A**	58PH*090−16	56,000	11.0	13.2
3465084	38HDR060−52	CNPH*6024A**	58PH*110−20	56,000	11.0	13.5
3465085	38HDR060−52	CNPH*6024A**	58PH*135−20	56,000	11.0	13.5
3465079	38HDR060−52	CNPH*6024A**+TDR		57,000	11.0	13.0
3465075	38HDR060−52	CNPV*6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465076	38HDR060−52	CNPV*6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465078	38HDR060−52	CNPV*6024A**	58MEB120−20	56,000	11.0	13.5
3465077	38HDR060−52	CNPV*6024A**	58PH*135−20	56,000	11.0	13.5
3465091	38HDR060−52	CSPH*6012A**	58CV(A,X)110−20	56,000	11.0	13.5
3465092	38HDR060−52	CSPH*6012A**	58CV(A,X)135−22	56,000	11.0	13.5
3465093	38HDR060−52	CSPH*6012A**	58CV(A,X)155−22	56,000	11.0	13.5
3465097	38HDR060−52	CSPH*6012A**	58MEB080−16	56,000	11.0	13.2
3465098	38HDR060−52	CSPH*6012A**	58MEB100−20	56,000	11.0	13.5
3465099	38HDR060−52	CSPH*6012A**	58MEB120−20	56,000	11.0	13.5
3465090	38HDR060−52	CSPH*6012A**	58MV(B,C)120−20	56,000	11.0	13.2
3465094	38HDR060−52	CSPH*6012A**	58PH*090−16	56,000	11.0	13.5
3465095	38HDR060−52	CSPH*6012A**	58PH*110−20	56,000	11.0	13.5
3465096	38HDR060−52	CSPH*6012A**	58PH*135−20	56,000	11.0	13.5
3465089	38HDR060−52	CSPH*6012A**+TDR		57,000	11.0	13.0
3465102	38HDR060−52	FE4ANB006+UI		57,500	11.0	13.5
3465103	38HDR060−52	FV4BNB006		57,500	11.0	13.5
3465101	38HDR060−52	FX4CN(B,F)060		57,500	11.0	13.5
3465100	38HDR060−52	FY4ANB060		57,000	11.0	13.0
3465104	38HDR060−62	†CNPV*6024A**+TDR		57,000	11.0	13.0
3465812	38HDR060−62	40QAC060−3		56,000	11.0	13.0
3465106	38HDR060−62	CAP**6021A**	58CV(A,X)110−20	56,000	11.0	13.2
3465109	38HDR060−62	CAP**6021A**	58MEB100−20	56,000	11.0	13.5

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COMBINATION RATINGS (CONT.)

ARI Ref. No.	Model Number	Indoor Model	Furnace Model	Capacity	EER	SEER
3465107	38HDR060−62	CAP**6021A**	58PH*090−16	56,000	11.0	13.2
3465108	38HDR060−62	CAP**6021A**	58PH*110−20	56,000	11.0	13.5
3465105	38HDR060−62	CAP**6021A**+TDR		57,000	11.0	13.0
3465111	38HDR060−62	CAP**6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465112	38HDR060−62	CAP**6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465114	38HDR060−62	CAP**6024A**	58MEB120−20	56,000	11.0	13.5
3465113	38HDR060−62	CAP**6024A**	58PH*135−20	56,000	11.0	13.5
3465110	38HDR060−62	CAP**6024A**+TDR		57,000	11.0	13.0
3465120	38HDR060−62	CNPH*6024A**	58CV(A,X)110−20	56,000	11.0	13.2
3465121	38HDR060−62	CNPH*6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465122	38HDR060−62	CNPH*6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465126	38HDR060−62	CNPH*6024A**	58MEB080−16	56,000	11.0	13.2
3465127	38HDR060−62	CNPH*6024A**	58MEB100−20	56,000	11.0	13.5
3465128	38HDR060−62	CNPH*6024A**	58MEB120−20	56,000	11.0	13.5
3465123	38HDR060−62	CNPH*6024A**	58PH*090−16	56,000	11.0	13.2
3465124	38HDR060−62	CNPH*6024A**	58PH*110−20	56,000	11.0	13.5
3465125	38HDR060−62	CNPH*6024A**	58PH*135−20	56,000	11.0	13.5
3465119	38HDR060−62	CNPH*6024A**+TDR		57,000	11.0	13.0
3465115	38HDR060−62	CNPV*6024A**	58CV(A,X)135−22	56,000	11.0	13.5
3465116	38HDR060−62	CNPV*6024A**	58CV(A,X)155−22	56,000	11.0	13.5
3465118	38HDR060−62	CNPV*6024A**	58MEB120−20	56,000	11.0	13.5
3465117	38HDR060−62	CNPV*6024A**	58PH*135−20	56,000	11.0	13.5
3465131	38HDR060−62	CSPH*6012A**	58CV(A,X)110−20	56,000	11.0	13.5
3465132	38HDR060−62	CSPH*6012A**	58CV(A,X)135−22	56,000	11.0	13.5
3465133	38HDR060−62	CSPH*6012A**	58CV(A,X)155−22	56,000	11.0	13.5
3465137	38HDR060−62	CSPH*6012A**	58MEB080−16	56,000	11.0	13.2
3465138	38HDR060−62	CSPH*6012A**	58MEB100−20	56,000	11.0	13.5
3465139	38HDR060−62	CSPH*6012A**	58MEB120−20	56,000	11.0	13.5
3465130	38HDR060−62	CSPH*6012A**	58MV(B,C)120−20	56,000	11.0	13.2
3465134	38HDR060−62	CSPH*6012A**	58PH*090−16	56,000	11.0	13.5
3465135	38HDR060−62	CSPH*6012A**	58PH*110−20	56,000	11.0	13.5
3465136	38HDR060−62	CSPH*6012A**	58PH*135−20	56,000	11.0	13.5
3465129	38HDR060−62	CSPH*6012A**+TDR		57,000	11.0	13.0
3465142	38HDR060−62	FE4ANB006+UI		57,500	11.0	13.5
3465143	38HDR060−62	FV4BNB006		57,500	11.0	13.5
3465141	38HDR060−62	FX4CN(B,F)060		57,500	11.0	13.5
3465140	38HDR060−62	FY4ANB060		57,000	11.0	13.0

† Tested combination

EER — Energy Efficiency Ratio

SEER — Seasonal Energy Efficiency Ratio

TDR — Time−Delay Relay. In most cases, only 1 method should be used to achieve TDR function. Using more than 1 method in a system may cause degradation in performance. Use either the accessory Time−Delay Relay KAATD0101TDR or a furnace equipped with TDR. Most Carrier furnaces are equipped with TDR.

TXV — Thermostatic Expansion Valve

NOTES:

1. Ratings are net values reflecting the effects of circulating fan motor heat. Supplemental electric heat is not included.
2. Tested outdoor/indoor combinations have been tested in accordance with DOE test procedures for central air conditioners. Ratings for other combinations are determined under DOE computer simulation procedures.
3. Determine actual CFM values obtainable for your system by referring to fan performance data in fan coil or furnace coil literature.
4. Do not apply with capillary tube coils as performance and reliability are significantly affected.

DETAILED COOLING CAPACITIES*

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR018 Outdoor Section With CNPV*1814A** Indoor Section																			
525	72 (22.2)	20.28	9.40	1.22	19.31	9.07	1.36	18.30	8.73	1.52	17.26	8.38	1.69	16.14	8.01	1.87	14.90	7.61	2.07
	67(19.4)	18.53	11.50	1.22	17.65	11.17	1.36	16.72	10.82	1.52	15.76	10.47	1.69	14.72	10.09	1.87	13.59	9.69	2.07
	62 (16.7)	16.93	13.58	1.23	16.13	13.24	1.37	15.29	12.89	1.52	14.43	12.52	1.69	13.57	13.57	1.87	12.71	12.71	2.07
	57 (13.9)	16.35	16.35	1.23	15.72	15.72	1.37	15.05	15.05	1.52	14.34	14.34	1.69	13.57	13.57	1.87	12.71	12.71	2.07
600	72(22.2)	20.65	9.87	1.25	19.63	9.53	1.39	18.59	9.18	1.54	17.50	8.83	1.71	16.34	8.46	1.90	15.05	8.05	2.10
	67(19.4)	18.90	12.25	1.25	17.97	11.91	1.39	17.00	11.56	1.55	16.00	11.20	1.72	14.93	10.82	1.90	13.75	10.41	2.10
	62 (16.7)	17.33	14.61	1.25	16.51	14.26	1.39	15.67	15.61	1.55	14.91	14.91	1.72	14.08	14.08	1.90	13.16	13.16	2.10
	57 (13.9)	17.07	17.07	1.25	16.39	16.39	1.39	15.67	15.67	1.55	14.91	14.91	1.72	14.08	14.08	1.90	13.16	13.16	2.10
675	72 (22.2)	20.91	10.30	1.27	19.86	9.96	1.41	18.78	9.61	1.57	17.67	9.26	1.74	16.47	8.88	1.93	15.15	8.46	2.13
	67 (19.4)	19.16	12.97	1.27	18.20	12.62	1.42	17.20	12.27	1.57	16.18	11.90	1.74	15.07	11.52	1.93	13.87	11.09	2.13
	62 (16.7)	17.70	17.52	1.28	16.94	16.94	1.42	16.17	16.17	1.57	15.37	15.37	1.74	14.49	14.49	1.93	13.52	13.52	2.13
	57(13.9)	17.67	17.67	1.28	16.94	16.94	1.42	16.17	16.17	1.57	15.37	15.37	1.74	14.49	14.49	1.93	13.52	13.52	2.13

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
*CNPV*1814A**	1.00	1.00	
40QAC(Q)024−3	1.06	1.01	
CAP**1814A**	1.00	1.01	
CAP**2414A**	1.02	1.02	
CAP**2417A**	1.02	1.02	
CNPF*2418A**	1.02	1.02	
CNPH*2417A**	1.02	1.02	
CNPV*2414A**	1.02	1.02	
CNPV*2417A**	1.02	1.02	
CSPH*2412A**	1.02	1.02	
FE4ANF002	1.02	0.98	
FF1ENP018	1.00	1.05	
FF1ENP024	1.02	1.07	
FV4BNF002	1.02	0.99	
FX4CNF018	1.00	0.96	
FX4CNF024	1.02	0.98	
FY4ANF018	1.00	1.05	
FY4ANF024	1.02	1.07	
CAP**1814A**	1.00	0.96	58CV(A,X)070−12
CAP**2414A**	1.02	0.98	58CV(A,X)070−12
CNPH*2417A**	1.02	0.98	58CV(A,X)070−12
CNPV*1814A**	0.10	0.10	58CV(A,X)070−12
CNPV*2414A**	1.02	0.98	58CV(A,X)070−12
CSPH*2412A**	1.02	0.98	58CV(A,X)070−12
CAP**2417A**	1.02	0.98	58CV(A,X)090−16
CNPH*2417A**	1.02	0.98	58CV(A,X)090−16
CNPV*2417A**	1.02	0.98	58CV(A,X)090−16
CSPH*2412A**	1.02	0.98	58CV(A,X)090−16
CAP**2417A**	1.02	0.94	58MEB040−12
CNPH*2417A**	1.02	0.94	58MEB040−12
CNPV*2417A**	1.02	0.94	58MEB040−12
CSPH*2412A**	1.02	0.94	58MEB040−12
CAP**2417A**	1.02	0.94	58MEB060−12
CNPH*2417A**	1.02	0.94	58MEB060−12
CNPV*2417A**	1.02	0.94	58MEB060−12
CSPH*2412A**	1.02	0.94	58MEB060−12
CAP**2417A**	1.02	0.98	58MV(B,C)060−14
CNPH*2417A**	1.02	0.98	58MV(B,C)060−14
CNPV*2417A**	1.02	0.98	58MV(B,C)060−14
CSPH*2412A**	1.02	0.98	58MV(B,C)060−14
CNPH*2417A**	1.02	0.98	58MV(B,C)080−14

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CSPH*2412A**	1.02	0.98	58MV(B,C)080−14
CNPH*2417A**	1.02	0.98	58MVB040−14
CSPH*2412A**	1.02	0.98	58MVB040−14
CAP**1814A**	0.10	0.10	58PH*045−08
CAP**2414A**	1.02	0.94	58PH*045−08
CNPH*2417A**	1.02	0.94	58PH*045−08
CNPV*1814A**	1.00	0.96	58PH*045−08
CNPV*2414A**	1.02	0.94	58PH*045−08
CSPH*2412A**	1.02	0.94	58PH*045−08

See notes on pg. 34

DETAILED COOLING CAPACITIES* (CONT.)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR024 Outdoor Section With CNPV*2414A** Indoor Section																			
700	72 (22.2)	28.11	13.59	1.69	26.70	13.09	1.89	25.17	12.55	2.10	23.54	11.98	2.33	21.76	11.38	2.58	19.78	10.71	2.84
	67(19.4)	25.68	16.61	1.68	24.41	16.11	1.87	23.04	15.58	2.09	21.58	15.02	2.32	19.98	14.42	2.57	18.21	13.77	2.83
	62 (16.7)	23.47	19.61	1.67	22.34	19.11	1.86	21.13	18.58	2.08	19.86	18.01	2.31	18.57	18.57	2.55	17.23	17.23	2.82
	57 (13.9)	22.67	22.67	1.67	21.77	21.77	1.86	20.81	20.81	2.07	19.75	19.75	2.31	18.57	18.57	2.55	17.23	17.23	2.82
800	72(22.2)	28.62	14.25	1.73	27.14	13.73	1.93	25.53	13.18	2.14	23.83	12.61	2.37	21.98	11.99	2.62	19.92	11.32	2.88
	67(19.4)	26.18	17.67	1.72	24.84	17.16	1.91	23.40	16.61	2.13	21.88	16.05	2.36	20.22	15.43	2.61	18.38	14.76	2.87
	62 (16.7)	24.02	21.07	1.71	22.85	20.54	1.90	21.63	21.51	2.12	20.48	20.48	2.35	19.20	19.20	2.60	17.75	17.75	2.86
	57 (13.9)	23.64	23.64	1.71	22.68	22.68	1.90	21.62	21.62	2.12	20.48	20.48	2.35	19.20	19.20	2.60	17.75	17.75	2.86
900	72 (22.2)	28.99	14.87	1.77	27.45	14.34	1.96	25.78	13.78	2.18	24.03	13.20	2.41	22.12	12.57	2.66	20.00	11.89	2.92
	67 (19.4)	26.54	18.68	1.76	25.15	18.16	1.95	23.66	17.61	2.17	22.09	17.03	2.40	20.38	16.40	2.65	18.50	15.71	2.91
	62 (16.7)	24.51	22.41	1.75	23.41	23.41	1.94	22.28	22.28	2.16	21.06	21.06	2.39	19.70	19.70	2.64	18.15	18.15	2.91
	57(13.9)	24.45	24.45	1.75	23.41	23.41	1.94	22.28	22.28	2.16	21.06	21.06	2.39	19.70	19.70	2.64	18.15	18.15	2.91

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
*CNPV*2414A**	1.00	1.00	
40QAC024–3	0.97	0.93	
CAP**2414A**	1.00	1.00	
CAP**2417A**	1.00	1.00	
CAP**3014A**	1.01	1.01	
CAP**3017A**	1.01	1.01	
CNPF*2418A**	1.00	1.00	
CNPH*2417A**	1.00	1.00	
CNPH*3017A**	1.01	1.01	
CNPV*2417A**	1.00	1.00	
CNPV*3014A**	1.01	1.01	
CNPV*3017A**	1.01	1.01	
CSPH*2412A**	1.00	1.00	
CSPH*3012A**	1.01	1.01	
FE4AN(B,F)003	1.02	0.93	
FE4ANF002	1.01	0.92	
FE5ANB004	1.03	0.94	
FF1ENP024	0.97	0.97	
FF1ENP025	1.00	0.96	
FF1ENP030	0.98	0.98	
FF1ENP031	1.01	0.96	
FF1ENP037	1.02	0.97	
FV4BN(B,F)003	1.02	0.93	
FV4BNF002	1.01	0.92	
FV4CN(B,F)003	1.02	0.93	
FV4CNF002	1.01	0.92	
FX4CNF024	1.00	0.96	
FX4CNF030	1.02	0.97	
FY4ANF024	0.99	0.99	
FY4ANF030	1.01	1.01	
CAP**2414A**	1.00	0.96	58CV(A,X)070–12
CAP**3014A**	1.00	0.96	58CV(A,X)070–12
CNPH*2417A**	1.00	0.96	58CV(A,X)070–12
CNPH*3017A**	1.00	0.96	58CV(A,X)070–12
CNPV*2414A**	1.00	0.96	58CV(A,X)070–12
CNPV*3014A**	1.00	0.96	58CV(A,X)070–12
CSPH*2412A**	1.00	0.96	58CV(A,X)070–12
CSPH*3012A**	1.01	0.96	58CV(A,X)070–12
CAP**2417A**	1.00	0.96	58CV(A,X)090–16
CAP**3017A**	1.01	0.96	58CV(A,X)090–16
CNPH*2417A**	1.00	0.96	58CV(A,X)090–16
CNPH*3017A**	1.01	0.96	58CV(A,X)090–16

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CNPV*2417A**	1.00	0.96	58CV(A,X)090–16
CNPV*3017A**	1.01	0.96	58CV(A,X)090–16
CSPH*2412A**	1.00	0.96	58CV(A,X)090–16
CSPH*3012A**	1.01	0.96	58CV(A,X)090–16
CNPH*2417A**	1.00	0.96	58CV(A,X)110–20
CNPH*3017A**	1.01	0.96	58CV(A,X)110–20
CSPH*2412A**	1.00	0.96	58CV(A,X)110–20
CSPH*3012A**	1.01	0.96	58CV(A,X)110–20
CNPH*2417A**	1.00	0.96	58CV(A,X)135–22
CNPH*3017A**	1.01	0.96	58CV(A,X)135–22
CSPH*2412A**	1.00	0.96	58CV(A,X)135–22
CSPH*3012A**	1.01	0.96	58CV(A,X)135–22
CNPH*2417A**	1.00	0.96	58CV(A,X)155–22
CNPH*3017A**	1.01	0.96	58CV(A,X)155–22
CSPH*2412A**	1.00	0.96	58CV(A,X)155–22
CSPH*3012A**	1.01	0.96	58CV(A,X)155–22
CAP**2417A**	1.00	0.92	58MEB040–12
CAP**3017A**	1.01	0.92	58MEB040–12
CNPH*2417A**	1.00	0.92	58MEB040–12
CNPH*3017A**	1.01	0.92	58MEB040–12
CNPV*2417A**	1.00	0.92	58MEB040–12
CNPV*3017A**	1.01	0.92	58MEB040–12
CSPH*2412A**	1.00	0.92	58MEB040–12
CSPH*3012A**	1.01	0.92	58MEB040–12
CAP**2417A**	1.00	0.92	58MEB060–12
CAP**3017A**	1.01	0.92	58MEB060–12
CNPH*2417A**	1.00	0.92	58MEB060–12
CNPH*3017A**	1.01	0.92	58MEB060–12
CNPV*2417A**	1.00	0.92	58MEB060–12
CNPV*3017A**	1.01	0.92	58MEB060–12
CSPH*2412A**	1.00	0.92	58MEB060–12
CSPH*3012A**	1.01	0.92	58MEB060–12
CAP**2417A**	1.00	0.92	58MEB080–12
CAP**3017A**	1.01	0.92	58MEB080–12
CNPH*2417A**	1.00	0.92	58MEB080–12
CNPH*3017A**	1.01	0.92	58MEB080–12
CNPV*2417A**	1.00	0.92	58MEB080–12
CNPV*3017A**	1.01	0.92	58MEB080–12
CSPH*2412A**	1.00	0.92	58MEB080–12
CSPH*3012A**	1.01	0.92	58MEB080–12
CAP**2417A**	1.00	0.96	58MV(B,C)060–14
CAP**3017A**	1.01	0.96	58MV(B,C)060–14

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CNPH*2417A**	1.00	0.96	58MV(B,C)060–14
CNPH*3017A**	1.01	0.96	58MV(B,C)060–14
CNPV*2417A**	1.00	0.96	58MV(B,C)060–14
CNPV*3017A**	1.01	0.96	58MV(B,C)060–14
CSPH*2412A**	1.00	0.96	58MV(B,C)060–14
CSPH*3012A**	1.01	0.96	58MV(B,C)060–14
CNPH*2417A**	1.00	0.96	58MV(B,C)080–14
CNPH*3017A**	1.00	0.96	58MV(B,C)080–14
CSPH*2412A**	1.00	0.96	58MV(B,C)080–14
CSPH*3012A**	1.01	0.96	58MV(B,C)080–14
CNPH*2417A**	0.99	0.95	58MV(B,C)080–20
CNPH*3017A**	1.00	0.96	58MV(B,C)080–20
CSPH*2412A**	1.00	0.96	58MV(B,C)080–20
CSPH*3012A**	1.00	0.96	58MV(B,C)080–20
CNPH*2417A**	1.00	0.96	58MV(B,C)100–20
CNPH*3017A**	1.01	0.96	58MV(B,C)100–20
CSPH*2412A**	1.00	0.96	58MV(B,C)100–20
CSPH*3012A**	1.01	0.96	58MV(B,C)100–20
CNPH*2417A**	1.00	0.96	58MV(B,C)120–20
CNPH*3017A**	1.01	0.96	58MV(B,C)120–20
CSPH*2412A**	1.00	0.96	58MV(B,C)120–20
CSPH*3012A**	1.01	0.96	58MV(B,C)120–20
CNPH*2417A**	1.00	0.96	58MVB040–14
CNPH*3017A**	1.01	0.96	58MVB040–14
CSPH*2412A**	1.00	0.96	58MVB040–14
CSPH*3012A**	1.01	0.96	58MVB040–14
CAP**2414A**	1.00	0.96	58PH*045–08
CAP**3014A**	1.01	0.92	58PH*045–08
CNPH*2417A**	1.00	0.96	58PH*045–08
CNPH*3017A**	1.01	0.92	58PH*045–08
CNPV*2414A**	1.00	0.96	58PH*045–08
CNPV*3014A**	1.01	0.96	58PH*045–08
CSPH*2412A**	1.00	0.96	58PH*045–08
CSPH*3012A**	1.01	0.92	58PH*045–08

See notes on pg. 34

DETAILED COOLING CAPACITIES* (CONT.)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR030 Outdoor Section With CNPV*3014A** Indoor Section																			
875	72 (22.2)	33.74	16.03	2.06	32.29	15.52	2.29	30.76	14.99	2.54	29.12	14.43	2.81	27.36	13.84	3.11	25.42	13.19	3.44
	67(19.4)	30.65	19.58	2.06	29.32	19.06	2.29	27.90	18.51	2.54	26.39	17.94	2.81	24.76	17.34	3.11	22.97	16.69	3.43
	62 (16.7)	28.07	23.01	2.07	26.73	22.59	2.29	25.47	22.03	2.54	24.10	21.45	2.81	22.76	22.72	3.11	21.45	21.45	3.43
	57 (13.9)	27.14	27.14	2.07	26.16	26.16	2.29	25.11	25.11	2.53	24.01	24.01	2.80	22.78	22.78	3.11	21.43	21.43	3.43
1000	72(22.2)	34.29	16.79	2.11	32.87	16.29	2.34	31.28	15.69	2.58	29.58	15.18	2.86	27.57	14.54	3.17	25.64	13.91	3.49
	67(19.4)	31.27	20.81	2.11	29.84	20.29	2.34	28.40	19.75	2.58	26.82	19.17	2.86	24.99	18.52	3.16	23.21	17.87	3.49
	62 (16.7)	28.72	24.92	2.11	27.38	24.26	2.34	26.11	26.11	2.58	24.94	24.94	2.85	23.54	23.54	3.16	22.22	22.22	3.48
	57 (13.9)	28.28	28.28	2.11	27.23	27.23	2.34	26.13	26.13	2.58	24.94	24.94	2.85	23.54	23.54	3.16	22.22	22.22	3.48
1125	72 (22.2)	34.76	17.52	2.16	33.30	17.00	2.39	31.65	16.46	2.63	29.90	15.89	2.91	28.03	15.27	3.21	25.95	14.60	3.53
	67 (19.4)	31.86	21.48	2.16	30.25	21.46	2.38	28.76	20.92	2.63	27.14	20.32	2.90	25.39	19.69	3.21	23.44	18.98	3.54
	62 (16.7)	29.27	29.04	2.16	28.12	28.12	2.38	26.98	26.98	2.63	25.71	25.71	2.90	24.35	24.35	3.20	22.84	22.84	3.53
	57(13.9)	29.23	29.23	2.16	28.13	28.13	2.38	26.99	26.99	2.63	25.71	25.71	2.90	24.23	24.23	3.21	22.85	22.85	3.53

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
*CNPV*3014A**	1.00	1.00	
CAP**3014A**	1.00	1.00	
CAP**3017A**	1.00	1.00	
CAP**3614A**	1.02	1.02	
CAP**3617A**	1.02	1.02	
CAP**3621A**	1.02	1.02	
CNPF*3618A**	1.02	1.02	
CNPH*3017A**	1.00	1.00	
CNPH*3617A**	1.02	1.02	
CNPV*3017A**	1.00	1.00	
CNPV*3617A**	1.02	1.02	
CNPV*3621A**	1.02	1.02	
CSPH*3012A**	1.00	1.00	
CSPH*3612A**	1.02	1.02	
40QAC(Q)036−3	1.04	1.06	
FE4AN(B,F)003	1.02	0.98	
FE4AN(B,F)005	1.04	0.91	
FE4ANF002	1.02	0.98	
FE5ANB004	1.00	0.88	
FF1ENP030	1.00	1.00	
FF1ENP036	1.02	1.02	
FV4BN(B,F)003	1.03	0.98	
FV4BN(B,F)005	1.04	0.99	
FV4BNF002	1.02	0.98	
FX4CN(B,F)036	1.02	0.98	
FX4CNF030	1.00	0.96	
FY4ANF030	1.00	1.00	
FY4ANF036	1.02	1.02	
CAP**3014A**	1.00	0.96	58CV(A,X)070−12
CAP**3614A**	1.02	0.98	58CV(A,X)070−12
CNPH*3017A**	1.00	0.96	58CV(A,X)070−12
CNPH*3617A**	1.02	0.98	58CV(A,X)070−12
CNPV*3014A**	1.02	0.98	58CV(A,X)070−12
CSPH*3012A**	1.00	0.96	58CV(A,X)070−12
CSPH*3612A**	1.02	0.98	58CV(A,X)070−12
CAP**3017A**	1.00	0.96	58CV(A,X)090−16
CAP**3617A**	1.02	0.98	58CV(A,X)090−16
CNPH*3017A**	1.00	0.96	58CV(A,X)090−16
CNPH*3617A**	1.02	0.98	58CV(A,X)090−16
CNPV*3017A**	1.00	0.96	58CV(A,X)090−16
CNPV*3617A**	1.02	0.98	58CV(A,X)090−16
CSPH*3012A**	1.00	0.96	58CV(A,X)090−16

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CSPH*3612A**	1.02	0.98	58CV(A,X)090−16
CAP**3621A**	1.02	0.98	58CV(A,X)110−20
CNPH*3017A**	1.00	0.96	58CV(A,X)110−20
CNPH*3617A**	1.02	0.98	58CV(A,X)110−20
CNPV*3621A**	1.02	0.98	58CV(A,X)110−20
CSPH*3012A**	1.00	0.96	58CV(A,X)110−20
CSPH*3612A**	1.02	0.98	58CV(A,X)110−20
CNPH*3017A**	1.00	0.96	58CV(A,X)135−22
CNPH*3617A**	1.02	0.98	58CV(A,X)135−22
CSPH*3012A**	1.00	0.96	58CV(A,X)135−22
CSPH*3612A**	1.02	0.98	58CV(A,X)135−22
CNPH*3017A**	1.00	0.96	58CV(A,X)155−22
CNPH*3617A**	1.02	0.98	58CV(A,X)155−22
CSPH*3012A**	1.00	0.96	58CV(A,X)155−22
CSPH*3612A**	1.02	0.98	58CV(A,X)155−22
CAP**3017A**	1.00	0.92	58MEB040−12
CAP**3617A**	1.02	0.94	58MEB040−12
CNPH*3017A**	1.00	0.92	58MEB040−12
CNPH*3617A**	1.02	0.94	58MEB040−12
CNPV*3017A**	1.00	0.92	58MEB040−12
CNPV*3617A**	1.02	0.94	58MEB040−12
CSPH*3012A**	1.00	0.92	58MEB040−12
CSPH*3612A**	1.02	0.94	58MEB040−12
CAP**3017A**	1.00	0.92	58MEB060−12
CAP**3617A**	1.02	0.94	58MEB060−12
CNPH*3017A**	1.00	0.92	58MEB060−12
CNPH*3617A**	1.02	0.94	58MEB060−12
CNPV*3017A**	1.00	0.92	58MEB060−12
CNPV*3617A**	1.02	0.94	58MEB060−12
CSPH*3012A**	1.00	0.92	58MEB060−12
CSPH*3612A**	1.02	0.94	58MEB060−12
CAP**3017A**	1.00	0.92	58MEB080−12
CAP**3617A**	1.02	0.94	58MEB080−12
CNPH*3017A**	1.00	0.92	58MEB080−12
CNPH*3617A**	1.02	0.94	58MEB080−12
CNPV*3017A**	1.00	0.92	58MEB080−12
CNPV*3617A**	1.02	0.94	58MEB080−12
CSPH*3012A**	1.00	0.92	58MEB080−12
CSPH*3612A**	1.02	0.94	58MEB080−12
CAP**3017A**	1.00	0.92	58MEB080−16
CAP**3617A**	1.02	0.94	58MEB080−16
CNPH*3017A**	1.00	0.92	58MEB080−16

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CNPH*3617A**	1.02	0.94	58MEB080−16
CNPV*3017A**	1.00	0.92	58MEB080−16
CNPV*3617A**	1.02	0.94	58MEB080−16
CSPH*3012A**	1.00	0.92	58MEB080−16
CSPH*3612A**	1.02	0.94	58MEB080−16
CAP**3017A**	1.00	0.96	58MV(B,C)060−14
CAP**3617A**	1.02	0.98	58MV(B,C)060−14
CNPH*3017A**	1.00	0.96	58MV(B,C)060−14
CNPH*3617A**	1.02	0.98	58MV(B,C)060−14
CNPV*3017A**	1.00	0.96	58MV(B,C)060−14
CNPV*3617A**	1.02	0.98	58MV(B,C)060−14
CSPH*3012A**	1.00	0.96	58MV(B,C)060−14
CSPH*3612A**	1.02	0.98	58MV(B,C)060−14
CAP**3621A**	1.02	0.98	58MV(B,C)080−14
CNPH*3017A**	1.00	0.96	58MV(B,C)080−14
CNPH*3617A**	1.02	0.98	58MV(B,C)080−14
CNPV*3621A**	1.02	0.98	58MV(B,C)080−14
CSPH*3012A**	1.00	0.96	58MV(B,C)080−14
CSPH*3612A**	1.02	0.98	58MV(B,C)080−14
CAP**3621A**	1.02	0.98	58MV(B,C)080−20
CNPH*3017A**	1.00	0.96	58MV(B,C)080−20
CNPH*3617A**	1.02	0.98	58MV(B,C)080−20
CNPV*3621A**	1.02	0.98	58MV(B,C)080−20
CSPH*3012A**	1.00	0.96	58MV(B,C)080−20
CSPH*3612A**	1.02	0.98	58MV(B,C)080−20
CAP**3621A**	1.02	0.98	58MV(B,C)100−20
CNPH*3017A**	1.00	0.96	58MV(B,C)100−20
CNPH*3617A**	1.02	0.98	58MV(B,C)100−20
CNPV*3621A**	1.02	0.98	58MV(B,C)100−20
CSPH*3012A**	1.00	0.96	58MV(B,C)100−20
CSPH*3612A**	1.02	0.98	58MV(B,C)100−20
CNPH*3017A**	1.00	0.96	58MV(B,C)120−20
CNPH*3617A**	1.02	0.98	58MV(B,C)120−20
CSPH*3012A**	1.00	0.96	58MV(B,C)120−20
CSPH*3612A**	1.02	0.98	58MV(B,C)120−20
CNPH*3617A**	1.02	0.98	58MVB040−14
CSPH*3012A**	1.00	0.96	58MVB040−14
CSPH*3612A**	1.02	0.98	58MVB040−14
CAP**3017A**	1.00	0.96	58PH*070−16
CAP**3617A**	1.02	0.94	58PH*070−16
CNPH*3017A**	1.00	0.96	58PH*070−16
CNPH*3617A**	1.02	0.94	58PH*070−16

DETAILED COOLING CAPACITIES* (CONT.)

38HDR030 Outdoor Section With CNPV*3014A Indoor Section**

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CNPV*3017A**	1.00	0.96	58PH*070−16
CNPV*3617A**	1.02	0.94	58PH*070−16
CSPH*3012A**	1.00	0.96	58PH*070−16
CSPH*3612A**	1.02	0.94	58PH*070−16
CAP**3621A**	1.02	0.94	58PH*090−16
CNPH*3017A**	1.00	0.96	58PH*090−16
CNPH*3617A**	1.02	0.94	58PH*090−16
CNPV*3621A**	1.02	0.94	58PH*090−16
CSPH*3012A**	1.00	0.96	58PH*090−16
CSPH*3612A**	1.02	0.94	58PH*090−16

See notes on pg. 34

DETAILED COOLING CAPACITIES* (CONT.)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR036 Outdoor Section With CNPV*4221A** Indoor Section																			
1050	72 (22.2)	39.85	18.85	2.42	38.03	18.23	2.68	36.08	17.58	2.98	33.99	16.89	3.30	31.72	16.14	3.65	29.20	15.33	4.03
	67(19.4)	36.33	23.19	2.42	34.67	22.57	2.68	32.91	21.91	2.98	31.02	21.23	3.30	28.99	20.49	3.65	26.73	19.69	4.04
	62 (16.7)	33.23	27.51	2.42	31.75	26.88	2.68	30.20	26.20	2.98	28.60	28.45	3.30	27.06	27.06	3.65	25.34	25.34	4.03
	57 (13.9)	32.46	32.46	2.42	31.26	31.26	2.68	29.98	29.98	2.98	28.59	28.59	3.30	27.06	27.06	3.65	25.34	25.34	4.03
1200	72(22.2)	40.51	19.77	2.48	38.61	19.14	2.74	36.57	18.47	3.04	34.40	17.77	3.36	32.04	17.01	3.71	29.42	16.18	4.09
	67(19.4)	36.97	24.67	2.48	35.23	24.04	2.74	33.40	23.38	3.04	31.45	22.68	3.36	29.33	21.93	3.71	27.00	21.10	4.09
	62 (16.7)	34.01	29.52	2.48	32.53	32.23	2.74	31.11	31.11	3.04	29.61	29.61	3.36	27.97	27.97	3.71	26.12	26.12	4.09
	57 (13.9)	33.78	33.78	2.48	32.49	32.49	2.74	31.11	31.11	3.04	29.62	29.62	3.36	27.97	27.97	3.71	26.12	26.12	4.09
1350	72 (22.2)	40.99	20.64	2.54	39.02	19.99	2.80	36.91	19.31	3.09	34.67	18.60	3.42	32.24	17.83	3.77	29.54	16.99	4.15
	67 (19.4)	37.43	26.09	2.54	35.65	25.45	2.80	33.76	24.78	3.10	31.75	24.06	3.42	29.58	23.29	3.77	27.20	22.42	4.15
	62 (16.7)	34.86	34.86	2.54	33.49	33.49	2.80	32.02	32.02	3.10	30.44	30.44	3.42	28.70	28.70	3.77	26.73	26.73	4.15
	57(13.9)	34.86	34.86	2.54	33.49	33.49	2.80	32.03	32.03	3.10	30.44	30.44	3.42	28.70	28.70	3.77	26.73	26.73	4.15

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
*CNPV*4221A**	1.00	1.00	
40QAC(Q)036–3	0.96	0.92	
CAP**3614A**	0.98	0.98	
CAP**3617A**	0.99	0.99	
CAP**3621A**	0.99	0.99	
CAP**4221A**	1.00	1.00	
CAP**4224A**	1.00	1.00	
CNPF*3618A**	0.99	0.99	
CNPH*3617A**	0.99	0.99	
CNPH*4221A**	1.00	1.00	
CNPV*3617A**	0.99	0.99	
CNPV*3621A**	0.99	0.99	
CNPV*4217A**	0.99	0.99	
CSPH*3612A**	0.99	0.99	
CSPH*4212A**	1.00	1.00	
FE4AN(B,F)003	0.99	0.95	
FE4AN(B,F)005	1.00	0.88	
FE4ANB006	1.00	0.88	
FE4ANF002	0.99	0.95	
FE5ANB004	1.04	0.91	
FF1ENP036	0.99	0.99	
FV4BN(B,F)003	0.99	0.91	
FV4BN(B,F)005	1.02	0.93	
FV4BNB006	1.00	0.88	
FV4BNF002	0.99	0.95	
FX4CN(B,F)036	0.99	0.95	
FX4CN(B,F)042	1.00	0.96	
FY4ANF036	0.99	0.99	
FY4ANF042	1.00	1.00	
CAP**3614A**	0.98	0.93	58CV(A,X)070–12
CNPH*3617A**	0.99	0.95	58CV(A,X)070–12
CNPH*4221A**	1.00	0.96	58CV(A,X)070–12
CSPH*3612A**	0.99	0.95	58CV(A,X)070–12
CSPH*4212A**	1.00	0.96	58CV(A,X)070–12
CAP**3617A**	0.99	0.95	58CV(A,X)090–16
CNPH*3617A**	0.99	0.95	58CV(A,X)090–16
CNPH*4221A**	1.00	0.96	58CV(A,X)090–16
CNPV*3617A**	0.99	0.95	58CV(A,X)090–16
CNPV*4217A**	1.00	0.92	58CV(A,X)090–16
CSPH*3612A**	0.99	0.95	58CV(A,X)090–16
CSPH*4212A**	1.00	0.96	58CV(A,X)090–16
CAP**3621A**	0.99	0.95	58CV(A,X)110–20

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CAP**4221A**	1.00	0.96	58CV(A,X)110–20
CNPH*3617A**	0.99	0.95	58CV(A,X)110–20
CNPH*4221A**	1.00	0.96	58CV(A,X)110–20
CNPV*3621A**	0.99	0.95	58CV(A,X)110–20
CNPV*4221A**	1.00	0.96	58CV(A,X)110–20
CSPH*3612A**	0.99	0.95	58CV(A,X)110–20
CSPH*4212A**	1.00	0.96	58CV(A,X)110–20
CAP**4224A**	1.00	0.96	58CV(A,X)135–22
CNPH*3617A**	0.99	0.95	58CV(A,X)135–22
CNPH*4221A**	1.00	0.96	58CV(A,X)135–22
CSPH*3612A**	0.99	0.95	58CV(A,X)135–22
CSPH*4212A**	1.00	0.96	58CV(A,X)135–22
CAP**4224A**	1.00	0.96	58CV(A,X)155–22
CNPH*3617A**	0.99	0.95	58CV(A,X)155–22
CNPH*4221A**	1.00	0.96	58CV(A,X)155–22
CSPH*3612A**	0.99	0.95	58CV(A,X)155–22
CSPH*4212A**	1.00	0.96	58CV(A,X)155–22
CAP**3617A**	0.99	0.91	58MEB040–12
CNPH*3617A**	0.99	0.91	58MEB040–12
CNPH*4221A**	1.00	0.92	58MEB040–12
CNPV*3617A**	0.10	0.09	58MEB040–12
CNPV*4217A**	1.00	0.92	58MEB040–12
CSPH*3612A**	0.99	0.91	58MEB040–12
CSPH*4212A**	1.00	0.92	58MEB040–12
CAP**3617A**	0.99	0.91	58MEB060–12
CNPH*3617A**	0.99	0.91	58MEB060–12
CNPH*4221A**	1.02	0.93	58MEB060–12
CNPV*3617A**	0.99	0.91	58MEB060–12
CNPV*4217A**	1.00	0.92	58MEB060–12
CSPH*3612A**	0.99	0.91	58MEB060–12
CSPH*4212A**	1.00	0.92	58MEB060–12
CAP**3617A**	0.99	0.91	58MEB080–12
CNPH*3617A**	0.99	0.91	58MEB080–12
CNPH*4221A**	1.00	0.92	58MEB080–12
CNPV*3617A**	0.99	0.91	58MEB080–12
CNPV*4217A**	1.00	0.92	58MEB080–12
CSPH*3612A**	0.99	0.91	58MEB080–12
CSPH*4212A**	1.00	0.92	58MEB080–12
CAP**3617A**	0.99	0.91	58MEB080–16
CNPH*3617A**	0.99	0.91	58MEB080–16
CNPH*4221A**	1.00	0.92	58MEB080–16
CNPV*3617A**	0.99	0.91	58MEB080–16

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CNPV*4217A**	1.00	0.92	58MEB080–16
CSPH*3612A**	0.99	0.91	58MEB080–16
CSPH*4212A**	1.00	0.92	58MEB080–16
CAP**3621A**	0.99	0.91	58MEB100–20
CAP**4221A**	1.00	0.92	58MEB100–20
CNPH*3617A**	0.99	0.91	58MEB100–20
CNPH*4221A**	1.00	0.92	58MEB100–20
CNPV*3621A**	0.99	0.91	58MEB100–20
CNPV*4221A**	1.00	0.92	58MEB100–20
CSPH*3612A**	0.99	0.91	58MEB100–20
CSPH*4212A**	1.00	0.92	58MEB100–20
CAP**3617A**	0.99	0.95	58MV(B,C)060–14
CNPH*3617A**	0.99	0.95	58MV(B,C)060–14
CNPH*4221A**	1.00	0.96	58MV(B,C)060–14
CNPV*3617A**	0.99	0.95	58MV(B,C)060–14
CNPV*4217A**	1.00	0.92	58MV(B,C)060–14
CSPH*3612A**	0.99	0.95	58MV(B,C)060–14
CSPH*4212A**	1.00	0.96	58MV(B,C)060–14
CAP**3621A**	0.99	0.95	58MV(B,C)080–14
CAP**4221A**	1.00	0.96	58MV(B,C)080–14
CNPH*3617A**	0.99	0.95	58MV(B,C)080–14
CNPH*4221A**	1.00	0.96	58MV(B,C)080–14
CNPV*3621A**	0.99	0.95	58MV(B,C)080–14
CNPV*4221A**	1.00	0.96	58MV(B,C)080–14
CSPH*3612A**	0.99	0.95	58MV(B,C)080–14
CSPH*4212A**	1.00	0.96	58MV(B,C)080–14
CAP**3621A**	0.99	0.95	58MV(B,C)080–20
CAP**4221A**	1.00	0.96	58MV(B,C)080–20
CNPH*3617A**	0.99	0.95	58MV(B,C)080–20
CNPH*4221A**	1.00	0.96	58MV(B,C)080–20
CNPV*3621A**	0.99	0.95	58MV(B,C)080–20
CNPV*4221A**	1.00	0.96	58MV(B,C)080–20
CSPH*3612A**	0.99	0.95	58MV(B,C)080–20
CSPH*4212A**	1.00	0.96	58MV(B,C)080–20
CAP**3621A**	0.99	0.95	58MV(B,C)100–20
CAP**4221A**	1.00	0.96	58MV(B,C)100–20
CNPH*3617A**	0.99	0.95	58MV(B,C)100–20
CNPH*4221A**	1.00	0.96	58MV(B,C)100–20
CNPV*3621A**	0.99	0.95	58MV(B,C)100–20
CNPV*4221A**	1.00	0.96	58MV(B,C)100–20
CSPH*3612A**	0.99	0.95	58MV(B,C)100–20
CSPH*4212A**	1.00	0.96	58MV(B,C)100–20

DETAILED COOLING CAPACITIES* (CONT.)

38HDR036 Outdoor Section With CNPV*4221A Indoor Section**

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CAP**4224A**	1.00	0.96	58MV(B,C)120−20
CNPH*3617A**	0.99	0.95	58MV(B,C)120−20
CNPH*4221A**	1.00	0.96	58MV(B,C)120−20
CSPH*3612A**	0.99	0.95	58MV(B,C)120−20
CSPH*4212A**	1.00	0.96	58MV(B,C)120−20
CAP**4224A**	1.00	0.96	58MVB040−14
CNPH*3617A**	0.99	0.95	58MVB040−14
CNPH*4221A**	1.00	0.96	58MVB040−14
CSPH*3612A**	0.99	0.95	58MVB040−14
CSPH*4212A**	1.00	0.96	58MVB040−14
CAP**3614A**	0.99	0.95	58PH*045−08
CNPH*3617A**	0.99	0.95	58PH*045−08
CNPH*4221A**	1.00	0.96	58PH*045−08
CSPH*3612A**	0.99	0.95	58PH*045−08
CSPH*4212A**	1.00	0.96	58PH*045−08
CAP**3617A**	0.99	0.95	58PH*070−16
CNPH*3617A**	0.99	0.95	58PH*070−16
CNPH*4221A**	1.00	0.96	58PH*070−16
CNPV*3617A**	0.99	0.95	58PH*070−16
CNPV*4217A**	1.00	0.92	58PH*070−16
CSPH*3612A**	0.99	0.95	58PH*070−16
CSPH*4212A**	1.00	0.96	58PH*070−16
CAP**3621A**	0.99	0.91	58PH*090−16
CAP**4221A**	1.00	0.92	58PH*090−16
CNPH*3617A**	0.99	0.91	58PH*090−16
CNPH*4221A**	1.00	0.92	58PH*090−16
CNPV*3621A**	0.99	0.91	58PH*090−16
CNPV*4221A**	1.00	0.92	58PH*090−16
CSPH*3612A**	0.99	0.91	58PH*090−16
CSPH*4212A**	1.00	0.92	58PH*090−16
CAP**3621A**	0.99	0.91	58PH*110−20
CAP**4221A**	1.02	0.93	58PH*110−20
CNPH*3617A**	0.99	0.91	58PH*110−20
CNPH*4221A**	1.02	0.93	58PH*110−20
CNPV*3621A**	0.99	0.91	58PH*110−20
CNPV*4221A**	1.00	0.92	58PH*110−20
CSPH*3612A**	0.99	0.91	58PH*110−20
CSPH*4212A**	1.00	0.92	58PH*110−20

See notes on pg. 34

DETAILED COOLING CAPACITIES* (CONT.)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR048 Outdoor Section With CNPV*4821A** Indoor Section																			
1460	72 (22.2)	57.22	27.09	3.31	54.16	26.03	3.74	50.83	24.90	4.20	47.23	23.69	4.69	43.24	22.38	5.21	38.87	20.99	5.76
	67(19.4)	52.21	33.21	3.33	49.49	32.17	3.76	46.57	31.08	4.22	43.40	29.91	4.71	39.95	28.66	5.23	36.03	27.26	5.77
	62 (16.7)	47.74	39.31	3.35	45.37	38.29	3.78	42.88	37.19	4.23	40.25	39.91	4.72	37.64	37.64	5.23	34.63	34.63	5.78
	57 (13.9)	46.44	46.44	3.36	44.53	44.53	3.78	42.48	42.48	4.23	40.21	40.21	4.72	37.65	37.65	5.23	34.63	34.63	5.78
1650	72(22.2)	58.13	28.26	3.37	54.91	27.17	3.81	51.42	26.01	4.27	47.67	24.78	4.76	43.52	23.45	5.28	39.26	22.10	5.84
	67(19.4)	53.07	35.09	3.40	50.21	34.03	3.83	47.16	32.91	4.29	43.87	31.73	4.78	40.28	30.44	5.30	36.23	28.99	5.85
	62 (16.7)	48.75	41.89	3.42	46.32	40.79	3.85	43.85	43.85	4.30	41.42	41.42	4.79	38.64	38.64	5.31	35.37	35.37	5.85
	57 (13.9)	48.17	48.17	3.43	46.11	46.11	3.85	43.88	43.88	4.30	41.42	41.42	4.79	38.64	38.64	5.31	35.37	35.37	5.85
1850	72 (22.2)	58.83	29.41	3.45	55.48	28.31	3.88	51.86	27.12	4.35	47.97	25.87	4.84	43.73	24.52	5.36	39.89	23.26	5.92
	67 (19.4)	53.74	36.97	3.48	50.78	35.90	3.91	47.62	34.76	4.37	44.22	33.55	4.86	40.51	32.22	5.38	36.39	30.70	5.93
	62 (16.7)	49.74	44.35	3.50	47.48	47.48	3.92	45.09	45.09	4.38	42.44	42.44	4.87	39.46	39.46	5.38	35.96	35.96	5.93
	57(13.9)	49.69	49.69	3.50	47.49	47.49	3.92	45.09	45.09	4.38	42.45	42.45	4.87	39.46	39.46	5.38	35.97	35.97	5.93

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
*CNPV*4821A**	1.00	1.00	
40QAC048−3	0.97	0.93	
CAP**4817A**	0.99	0.99	
CAP**4821A**	1.00	1.00	
CAP**4824A**	1.00	1.00	
CAP**6021A**	1.01	1.01	
CAP**6024A**	1.01	1.01	
CNPF*4818A**	0.98	0.98	
CNPH*4821A**	1.00	1.00	
CNPH*6024A**	1.01	1.01	
CNPV*4824A**	1.00	1.00	
CNPV*6024A**	1.01	1.01	
CSPH*4812A**	1.00	1.00	
CSPH*6012A**	1.01	1.01	
FE4AN(B,F)005	1.00	0.96	
FE4ANB006	1.01	0.97	
FV4BN(B,F)005	1.00	0.96	
FV4BNB006	1.01	0.97	
FX4CN(B,F)048	1.00	0.96	
FX4CN(B,F)060	1.01	0.97	
FY4ANB060	1.01	1.01	
FY4ANF048	1.00	1.00	
CAP**4817A**	0.99	0.95	58CV(A,X)090−16
CNPH*4821A**	0.99	0.95	58CV(A,X)090−16
CNPH*6024A**	1.00	0.96	58CV(A,X)090−16
CSPH*4812A**	0.99	0.95	58CV(A,X)090−16
CSPH*6012A**	1.00	0.96	58CV(A,X)090−16
CAP**4821A**	0.99	0.95	58CV(A,X)110−20
CAP**6021A**	1.00	0.96	58CV(A,X)110−20
CNPH*4821A**	0.99	0.95	58CV(A,X)110−20
CNPH*6024A**	1.00	0.96	58CV(A,X)110−20
CNPV*4821A**	0.99	0.95	58CV(A,X)110−20
CSPH*4812A**	0.99	0.95	58CV(A,X)110−20
CSPH*6012A**	1.00	0.96	58CV(A,X)110−20
CAP**4824A**	0.99	0.95	58CV(A,X)135−22
CAP**6024A**	1.00	0.96	58CV(A,X)135−22
CNPH*4821A**	0.99	0.95	58CV(A,X)135−22
CNPH*6024A**	1.00	0.96	58CV(A,X)135−22
CNPV*4824A**	0.99	0.95	58CV(A,X)135−22
CNPV*6024A**	1.00	0.96	58CV(A,X)135−22
CSPH*4812A**	0.99	0.95	58CV(A,X)135−22
CSPH*6012A**	1.00	0.96	58CV(A,X)135−22

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CAP**4824A**	0.99	0.95	58CV(A,X)155−22
CAP**6024A**	1.00	0.96	58CV(A,X)155−22
CNPH*4821A**	0.99	0.95	58CV(A,X)155−22
CNPH*6024A**	1.00	0.96	58CV(A,X)155−22
CNPV*4824A**	0.99	0.95	58CV(A,X)155−22
CNPV*6024A**	1.00	0.96	58CV(A,X)155−22
CSPH*4812A**	0.99	0.95	58CV(A,X)155−22
CSPH*6012A**	1.00	0.96	58CV(A,X)155−22
CAP**4817A**	0.99	0.95	58MEB080−16
CNPH*4821A**	0.99	0.95	58MEB080−16
CNPH*6024A**	1.00	0.96	58MEB080−16
CSPH*4812A**	0.99	0.95	58MEB080−16
CSPH*6012A**	1.00	0.92	58MEB080−16
CAP**4821A**	0.99	0.95	58MEB100−20
CAP**6021A**	1.00	0.92	58MEB100−20
CNPH*4821A**	0.99	0.95	58MEB100−20
CNPH*6024A**	1.00	0.92	58MEB100−20
CNPV*4821A**	0.99	0.95	58MEB100−20
CSPH*4812A**	0.99	0.95	58MEB100−20
CSPH*6012A**	1.00	0.92	58MEB100−20
CAP**4824A**	0.99	0.95	58MEB120−20
CAP**6024A**	1.00	0.92	58MEB120−20
CNPH*4821A**	0.99	0.95	58MEB120−20
CNPH*6024A**	1.00	0.92	58MEB120−20
CNPV*4824A**	0.99	0.95	58MEB120−20
CNPV*6024A**	1.00	0.92	58MEB120−20
CSPH*4812A**	0.99	0.95	58MEB120−20
CSPH*6012A**	1.00	0.92	58MEB120−20
CAP**4821A**	0.98	0.94	58MV(B,C)080−20
CAP**6021A**	1.00	0.96	58MV(B,C)080−20
CNPH*4821A**	0.99	0.95	58MV(B,C)080−20
CNPH*6024A**	1.00	0.96	58MV(B,C)080−20
CNPV*4821A**	0.99	0.95	58MV(B,C)080−20
CSPH*4812A**	0.99	0.95	58MV(B,C)080−20
CSPH*6012A**	1.00	0.96	58MV(B,C)080−20
CAP**4821A**	0.99	0.95	58MV(B,C)100−20
CAP**6021A**	1.00	0.96	58MV(B,C)100−20
CNPH*4821A**	0.99	0.95	58MV(B,C)100−20
CNPH*6024A**	1.00	0.96	58MV(B,C)100−20
CNPV*4821A**	0.99	0.95	58MV(B,C)100−20
CSPH*4812A**	0.99	0.95	58MV(B,C)100−20
CSPH*6012A**	1.00	0.96	58MV(B,C)100−20

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CAP**4824A**	0.99	0.95	58MV(B,C)120−20
CAP**6024A**	1.00	0.96	58MV(B,C)120−20
CNPH*4821A**	0.99	0.95	58MV(B,C)120−20
CNPH*6024A**	1.00	0.96	58MV(B,C)120−20
CNPV*4824A**	0.99	0.95	58MV(B,C)120−20
CNPV*6024A**	1.00	0.96	58MV(B,C)120−20
CSPH*4812A**	0.99	0.95	58MV(B,C)120−20
CSPH*6012A**	1.00	0.96	58MV(B,C)120−20
CAP**4817A**	0.99	0.95	58PH*070−16
CAP**4821A**	0.99	0.95	58PH*090−16
CAP**6021A**	1.00	0.92	58PH*090−16
CNPH*4821A**	0.99	0.95	58PH*090−16
CNPH*6024A**	1.00	0.92	58PH*090−16
CNPV*4821A**	0.99	0.95	58PH*090−16
CSPH*4812A**	0.99	0.95	58PH*090−16
CSPH*6012A**	1.00	0.92	58PH*090−16
CAP**4821A**	0.99	0.95	58PH*110−20
CAP**6021A**	1.00	0.92	58PH*110−20
CNPH*4821A**	0.99	0.95	58PH*110−20
CNPH*6024A**	1.00	0.92	58PH*110−20
CNPV*4821A**	0.99	0.95	58PH*110−20
CSPH*4812A**	0.99	0.95	58PH*110−20
CSPH*6012A**	1.00	0.92	58PH*110−20
CAP**4824A**	0.99	0.95	58PH*135−20
CAP**6024A**	1.00	0.92	58PH*135−20
CNPH*4821A**	0.99	0.95	58PH*135−20
CNPH*6024A**	1.00	0.92	58PH*135−20
CNPV*4824A**	0.99	0.95	58PH*135−20
CNPV*6024A**	1.00	0.92	58PH*135−20
CSPH*4812A**	0.99	0.95	58PH*135−20
CSPH*6012A**	1.00	0.92	58PH*135−20

See notes on pg. 34

DETAILED COOLING CAPACITIES** (CONT.)

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERATURES °F (°C)																	
		75 (23.9)			85 (29.4)			95 (35)			105 (40.6)			115 (46.1)			125 (51.7)		
CFM	EWB °F (°C)	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**	Capacity MBtuh†		Total System KW**
		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡		Total	Sens‡	
38HDR060 Outdoor Section With CNPV*6024A** Indoor Section																			
1750	72 (22.2)	68.88	33.36	4.20	65.13	32.05	4.64	60.97	30.62	5.12	56.47	29.10	5.64	51.66	27.52	6.20	46.31	25.80	6.80
	67(19.4)	63.28	41.18	4.15	59.98	39.91	4.59	56.34	38.52	5.08	52.38	37.05	5.60	48.00	35.44	6.17	43.23	33.69	6.77
	62 (16.7)	58.24	48.95	4.11	55.37	47.69	4.55	52.27	46.30	5.04	48.91	48.85	5.57	45.63	45.63	6.15	41.69	41.69	6.76
	57 (13.9)	56.77	56.77	4.09	54.45	54.45	4.54	51.86	51.86	5.03	48.95	48.95	5.57	45.63	45.63	6.15	41.69	41.69	6.76
2000	72(22.2)	69.89	34.93	4.31	65.94	33.59	4.75	61.58	32.12	5.23	56.96	30.59	5.74	52.01	29.02	6.31	47.30	27.45	6.92
	67(19.4)	64.28	43.75	4.26	60.81	42.45	4.70	57.00	41.04	5.18	52.88	39.53	5.71	48.32	37.86	6.27	43.82	36.17	6.88
	62 (16.7)	59.48	52.47	4.22	56.55	51.08	4.66	53.58	53.58	5.15	50.40	50.40	5.68	46.78	46.78	6.26	42.62	42.62	6.87
	57 (13.9)	58.96	58.96	4.21	56.42	56.42	4.66	53.58	53.58	5.15	50.40	50.40	5.68	46.78	46.78	6.26	42.60	42.60	6.87
2250	72 (22.2)	70.60	36.41	4.42	66.50	35.04	4.86	61.97	33.55	5.33	57.25	32.02	5.85	52.14	30.44	6.41	48.41	29.01	7.04
	67 (19.4)	65.01	46.21	4.37	61.41	44.89	4.81	57.46	43.44	5.29	53.20	41.88	5.81	48.56	40.17	6.37	44.28	38.42	6.99
	62 (16.7)	60.67	60.67	4.33	58.00	58.00	4.78	54.94	54.94	5.26	51.52	51.52	5.79	47.63	47.63	6.36	43.18	43.18	6.98
	57(13.9)	60.73	60.73	4.33	58.00	58.00	4.78	54.94	54.94	5.26	51.52	51.52	5.79	47.63	47.63	6.36	43.14	43.14	6.98

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
*CNPV*6024A**	1.00	1.00	
40QAC060−3	0.98	0.98	
CAP**6021A**	1.00	1.00	
CAP**6024A**	1.00	1.00	
CNPH*6024A**	1.00	1.00	
CSPH*6012A**	1.00	1.00	
FE4ANB006	1.01	1.01	
FV4BNB006	1.01	1.01	
FX4CN(B,F)060	1.01	1.01	
FY4ANB060	1.00	1.00	
CAP**6021A**	0.98	0.98	58CV(A,X)110−20
CNPH*6024A**	0.98	0.98	58CV(A,X)110−20
CSPH*6012A**	0.98	0.98	58CV(A,X)110−20
CAP**6024A**	0.98	0.98	58CV(A,X)135−22

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CNPH*6024A**	0.98	0.98	58CV(A,X)135−22
CNPV*6024A**	0.98	0.98	58CV(A,X)135−22
CSPH*6012A**	0.98	0.98	58CV(A,X)135−22
CAP**6024A**	0.98	0.98	58CV(A,X)155−22
CNPH*6024A**	0.98	0.98	58CV(A,X)155−22
CNPV*6024A**	0.98	0.98	58CV(A,X)155−22
CSPH*6012A**	0.98	0.98	58CV(A,X)155−22
CNPH*6024A**	0.98	0.98	58MEB080−16
CSPH*6012A**	0.98	0.98	58MEB080−16
CAP**6021A**	0.98	0.98	58MEB100−20
CNPH*6024A**	0.98	0.98	58MEB100−20
CSPH*6012A**	0.98	0.98	58MEB100−20
CAP**6024A**	0.98	0.98	58MEB120−20
CNPH*6024A**	0.98	0.98	58MEB120−20

COOLING INDOOR MODEL	CAPACITY	POWER	FURNACE MODEL
CNPV*6024A**	0.98	0.98	58MEB120−20
CSPH*6012A**	0.98	0.98	58MEB120−20
CSPH*6012A**	0.98	0.98	58MV(B,C)120−20
CAP**6021A**	0.98	0.98	58PH*090−16
CNPH*6024A**	0.98	0.98	58PH*090−16
CSPH*6012A**	0.98	0.98	58PH*090−16
CAP**6021A**	0.98	0.98	58PH*110−20
CNPH*6024A**	0.98	0.98	58PH*110−20
CSPH*6012A**	0.98	0.98	58PH*110−20
CAP**6024A**	0.98	0.98	58PH*135−20
CNPH*6024A**	0.98	0.98	58PH*135−20
CNPV*6024A**	0.98	0.98	58PH*135−20
CSPH*6012A**	0.98	0.98	58PH*135−20

NOTE: When the required data fall between the published data, interpolation may be performed. Extrapolation is not an acceptable practice.

* Detailed cooling capacities are based on indoor and outdoor unit at the same elevation per the latest edition of AHRI standard 210/240. If additional tubing length and/or indoor unit is located above outdoor unit, a slight variation in capacity may occur.

† Total and sensible capacities are net capacities. Blower motor heat has been subtracted.

‡ Sensible capacities shown are based on 80° F (27° C) entering air at the indoor coil. For sensible capacities at other than 80° F (27° C), deduct 835 Btuh (245 kW) per 1000 CFM (480 L/S) of indoor coil air for each degree below 80° F (27° C), or add 835 Btuh (245 kW) per 1000 CFM (480 L/S) of indoor coil air per degree above 80° F (27° C).
When the required data fall between the published data, interpolation may be performed.

** Total system kW is total of indoor and outdoor unit kilowatts.

CONDENSER ONLY RATINGS*

SST °F (°C)		CONDENSER ENTERING AIR TEMPERATURES °F (°C)							
		55 (12.8)	65 (18.3)	75 (23.9)	85 (29.4)	95 (35)	105 (40.6)	115 (46.1)	125 (51.7)
					38HDR018–31				
30 (–1.6)	TCG	16.20	15.30	14.30	13.40	12.40	11.40	10.30	9.20
	SDT	67.40	77.00	86.50	96.00	105.50	114.90	124.40	133.70
	KW	0.86	0.98	1.11	1.26	1.42	1.59	1.77	1.96
35 (1.7)	TCG	17.90	16.90	15.90	14.80	13.80	12.70	11.60	10.40
	SDT	68.50	78.00	87.50	97.00	106.40	115.80	125.20	134.50
	KW	0.86	0.98	1.11	1.26	1.42	1.59	1.78	1.98
40 (4.4)	TCG	19.70	18.60	17.50	16.40	15.20	14.10	12.90	11.60
	SDT	69.70	79.10	88.60	98.00	107.40	116.80	126.10	135.30
	KW	0.85	0.97	1.11	1.26	1.42	1.60	1.79	1.99
45 (7.2)	TCG	21.60	20.40	19.20	18.00	16.80	15.50	14.20	12.80
	SDT	70.90	80.30	89.70	99.00	108.40	117.70	127.00	136.10
	KW	0.85	0.97	1.11	1.26	1.42	1.60	1.79	2.00
50 (10)	TCG	23.60	22.30	21.10	19.70	18.40	17.00	15.60	14.10
	SDT	72.20	81.50	90.80	100.10	109.40	118.60	127.80	136.90
	KW	0.85	0.97	1.11	1.26	1.42	1.60	1.79	2.00
55 (12.8)	TCG	25.70	24.30	22.90	21.50	20.00	18.60	17.00	15.40
	SDT	73.50	82.70	92.00	101.20	110.40	119.60	128.70	137.70
	KW	0.85	0.97	1.10	1.25	1.42	1.60	1.79	2.00
					38HDR024–32				
30 (–1.6)	TCG	22.10	20.90	19.60	18.30	16.90	15.50	14.00	12.40
	SDT	69.00	78.50	88.00	97.40	106.80	116.10	125.30	134.50
	KW	1.08	1.24	1.41	1.60	1.80	2.02	2.25	2.48
35 (1.7)	TCG	24.30	23.00	21.70	20.30	18.80	17.20	15.60	13.80
	SDT	70.30	79.80	89.20	98.60	107.90	117.10	126.30	135.40
	KW	1.09	1.24	1.42	1.61	1.82	2.04	2.28	2.52
40 (4.4)	TCG	26.80	25.30	23.90	22.30	20.70	19.00	17.20	15.30
	SDT	71.70	81.10	90.50	99.80	109.10	118.20	127.30	136.30
	KW	1.10	1.26	1.43	1.62	1.83	2.06	2.30	2.55
45 (7.2)	TCG	29.40	27.80	26.20	24.50	22.70	20.90	18.90	16.70
	SDT	73.20	82.60	91.90	101.10	110.20	119.30	128.30	137.10
	KW	1.11	1.27	1.44	1.64	1.85	2.08	2.32	2.57
50 (10)	TCG	32.10	30.40	28.60	26.80	24.80	22.70	20.50	18.10
	SDT	74.80	84.10	93.30	102.40	111.50	120.40	129.20	137.90
	KW	1.12	1.28	1.46	1.65	1.86	2.09	2.33	2.59
55 (12.8)	TCG	35.00	33.10	31.20	29.10	26.90	24.60	22.20	19.50
	SDT	76.40	85.60	94.70	103.80	112.70	121.50	130.20	138.60
	KW	1.13	1.29	1.47	1.66	1.88	2.10	2.35	2.60
					38HDR030–31				
30 (–1.6)	TCG	26.20	24.70	23.20	21.70	20.10	18.40	16.80	15.30
	SDT	72.00	82.30	92.90	103.80	115.00	126.90	139.00	148.90
	KW	1.30	1.48	1.69	1.92	2.19	2.50	2.84	3.12
35 (1.7)	TCG	28.80	27.30	25.70	24.10	22.40	20.60	18.90	17.40
	SDT	73.10	83.50	94.00	104.80	116.10	127.70	139.50	149.30
	KW	1.30	1.49	1.69	1.93	2.21	2.52	2.86	3.15
40 (4.4)	TCG	31.70	30.10	28.40	26.60	24.80	23.00	21.20	19.60
	SDT	74.30	84.70	95.20	105.90	117.10	128.60	140.00	149.70
	KW	1.31	1.49	1.70	1.94	2.22	2.53	2.87	3.18
45 (7.2)	TCG	34.80	33.10	31.20	29.40	27.40	25.50	23.60	21.90
	SDT	75.60	85.90	96.40	107.10	118.10	129.40	140.60	150.10
	KW	1.31	1.50	1.71	1.95	2.22	2.54	2.88	3.19
50 (10)	TCG	38.20	36.20	34.30	32.30	30.30	28.20	26.20	24.40
	SDT	76.90	87.20	97.60	108.20	119.20	130.30	141.10	150.50
	KW	1.32	1.50	1.71	1.95	2.23	2.55	2.89	3.20
55 (12.8)	TCG	41.70	39.70	37.60	35.50	33.30	31.10	29.00	27.10
	SDT	78.30	88.50	98.90	109.40	120.20	131.20	141.80	150.90
	KW	1.32	1.51	1.72	1.96	2.24	2.55	2.89	3.20
					38HDR036–31				
30 (–1.6)	TCG	30.10	28.50	26.80	25.10	23.30	21.50	19.60	17.60
	SDT	70.90	80.80	90.90	101.00	111.20	121.60	132.30	143.30
	KW	1.50	1.71	1.94	2.20	2.50	2.83	3.19	3.58
35 (1.7)	TCG	33.20	31.50	29.70	27.80	25.90	24.00	21.90	19.90
	SDT	72.00	82.00	92.00	102.10	112.30	122.80	133.30	143.80
	KW	1.50	1.71	1.95	2.21	2.52	2.85	3.21	3.60
40 (4.4)	TCG	36.50	34.60	32.70	30.70	28.70	26.60	24.40	22.30
	SDT	73.30	83.20	93.20	103.20	113.40	123.60	134.10	144.50
	KW	1.51	1.72	1.95	2.22	2.52	2.85	3.23	3.63
45 (7.2)	TCG	40.10	38.10	36.00	33.80	31.70	29.40	27.10	24.80
	SDT	74.60	84.40	94.40	104.50	113.80	124.50	135.20	145.30
	KW	1.51	1.72	1.96	2.23	2.51	2.86	3.26	3.65
50 (10)	TCG	43.90	41.70	39.50	37.10	34.90	32.40	30.00	27.60
	SDT	75.90	85.80	95.70	105.90	115.50	125.90	136.20	146.00
	KW	1.52	1.73	1.97	2.24	2.54	2.89	3.27	3.66
55 (12.8)	TCG	48.00	45.70	43.30	40.70	38.30	35.70	33.10	30.50
	SDT	77.40	87.10	97.00	107.10	116.70	126.80	137.00	146.70
	KW	1.53	1.74	1.98	2.25	2.55	2.89	3.28	3.66

See notes on page 38

CONDENSER ONLY RATINGS* CONTINUED

SST °F (°C)		CONDENSER ENTERING AIR TEMPERATURES °F (°C)							
		55 (12.8)	65 (18.3)	75 (23.9)	85 (29.4)	95 (35)	105 (40.6)	115 (46.1)	125 (51.7)
38HDR048–32									
30 (–1.6)	TCG	48.40	45.50	42.50	39.50	36.20	32.90	30.60	28.10
	SDT	67.90	77.30	86.70	96.00	105.40	114.70	124.30	133.80
	KW	2.05	2.39	2.75	3.15	3.56	4.01	4.49	5.00
35 (1.7)	TCG	53.40	50.20	46.90	43.40	39.60	35.70	34.00	25.50
	SDT	69.10	78.40	87.80	97.00	106.20	115.40	125.10	133.00
	KW	2.02	2.37	2.74	3.14	3.56	4.01	4.51	4.99
40 (4.4)	TCG	58.70	55.10	51.40	47.50	43.10	38.30	33.00	27.10
	SDT	70.40	79.60	88.90	98.00	107.10	116.10	124.80	133.40
	KW	1.99	2.35	2.72	3.13	3.55	4.01	4.49	4.99
45 (7.2)	TCG	64.30	60.30	56.20	51.60	46.90	41.20	35.20	28.90
	SDT	71.80	80.90	90.00	99.10	108.10	116.80	125.40	133.80
	KW	1.96	2.32	2.70	3.11	3.54	4.00	4.48	4.99
50 (10)	TCG	70.30	65.80	61.10	55.80	50.40	44.20	37.30	34.60
	SDT	73.30	82.30	91.20	100.10	108.90	117.50	125.90	135.30
	KW	1.92	2.29	2.68	3.09	3.52	3.98	4.46	5.01
55 (12.8)	TCG	76.50	71.40	66.00	60.30	54.00	47.00	50.70	41.10
	SDT	74.80	83.60	92.50	101.20	109.80	118.20	129.40	137.00
	KW	1.88	2.25	2.64	3.06	3.49	3.95	4.57	5.05
38HDR060–32									
30 (–1.6)	TCG	59.30	55.30	50.90	46.20	40.40	37.90	33.80	30.30
	SDT	70.10	79.30	88.40	97.40	106.20	115.80	124.90	134.20
	KW	2.59	2.93	3.31	3.73	4.19	4.72	5.31	5.90
35 (1.7)	TCG	64.70	60.20	55.50	50.00	43.30	42.40	31.50	33.10
	SDT	71.40	80.50	89.50	98.40	106.90	116.90	124.20	134.90
	KW	2.62	2.97	3.34	3.76	4.21	4.76	5.25	5.93
40 (4.4)	TCG	69.90	65.30	60.10	53.80	55.90	47.40	31.70	35.60
	SDT	72.70	81.70	90.60	99.30	110.10	118.10	124.20	135.50
	KW	2.66	3.00	3.38	3.78	4.34	4.81	5.24	5.96
45 (7.2)	TCG	76.00	70.80	64.80	57.40	56.00	54.60	48.50	47.70
	SDT	74.10	83.00	91.80	100.20	110.00	119.90	128.60	138.80
	KW	2.71	3.04	3.40	3.80	4.32	4.89	5.43	6.08
50 (10)	TCG	82.20	76.70	69.30	70.90	61.80	58.60	30.50	52.10
	SDT	75.60	84.40	92.80	103.40	111.40	120.90	123.80	139.80
	KW	2.75	3.09	3.42	3.99	4.38	4.93	5.16	6.13
55 (12.8)	TCG	95.20	87.70	88.40	74.60	75.40	53.90	46.10	60.30
	SDT	78.80	87.10	97.50	104.30	114.70	119.50	127.70	141.70
	KW	2.85	3.13	3.74	3.95	4.56	4.78	5.33	6.25

* AHRI listing applies only to systems shown in Combination Ratings table.

KW – Outdoor Unit Kilowatts Only.
SDT – Saturated Temperature Leaving Compressor (°F)
SST – Saturated Temperature Entering Compressor (°F/°C)
TCG – Gross Cooling Capacity (1000 Btuh)

GUIDE SPECIFICATIONS

GENERAL

System Description

Outdoor-mounted, air-cooled, split-system air conditioner unit suitable for ground or rooftop installation. Unit consists of a hermetic compressor, an air-cooled coil, propeller-type condenser fan, and a control box. Unit will discharge supply air horizontally as shown on contract drawings. Unit will be used in a refrigeration circuit to match up to a packaged fan coil or coil unit.

Quality Assurance

— Unit will be rated in accordance with the latest edition of ARI Standard 210.

— Unit will be certified for capacity and efficiency, and listed in the latest ARI directory.

— Unit construction will comply with latest edition of ANSI/ ASHRAE and with NEC.

— Unit will be constructed in accordance with UL standards and will carry the UL label of approval. Unit will have c-UL approval.

— Unit cabinet will be capable of withstanding Federal Test
Method Standard No. 141 (Method 6061) 500-hr salt spray test.

— Air-cooled condenser coils will be leak tested and pressure tested

— Unit constructed in ISO9001 approved facility.

Delivery, Storage, and Handling

— Unit will be shipped as single package only and is stored and handled per unit manufacturer's recommendations.

Warranty (for inclusion by specifying engineer)

— U.S. and Canada only.

PRODUCTS

Equipment

— Factory assembled, single piece, air-cooled air conditioner unit. Contained within the unit enclosure is all factory wiring, piping, controls, compressor, refrigerant charge Puron® (R-410A), and special features required prior to field start-up.

Unit Cabinet

— Unit cabinet will be constructed of galvanized steel, bonderized, and coated with a powder coat paint.

Fans

— Condenser fan will be direct-drive propeller type, discharging air horizontally.

— Condenser fan motors will be totally enclosed, 1-phase type with class B insulation and permanently lubricated bearings. Shafts will be corrosion resistant.

— Fan blades will be statically and dynamically balanced.

— Condenser fan openings will be equipped with coated steel wire safety guards.

Compressor

— Compressor will be hermetically sealed.

— Compressor will be mounted on rubber vibration isolators.

Condenser Coil

— Condenser coil will be air cooled.

— Coil will be constructed of aluminum fins mechanically bonded to copper tubes which are then cleaned, dehydrated, and sealed.

Refrigeration Components

— Refrigeration circuit components will include liquid-line front-seating shutoff valve with sweat connections, vapor-line front-seating shutoff valve with sweat connections, system charge of Puron® (R-410A) refrigerant, and compressor oil.

— Unit will be equipped with high-pressure switch, low pressure switch and filter drier for Puron refrigerant.

Operating Characteristics

— The capacity of the unit will meet or exceed _____ Btuh at a suction temperature of _____ °F/°C. The power consumption at full load will not exceed _____ kW.

— Combination of the unit and the evaporator or fan coil unit will have a total net cooling capacity of _____ Btuh or greater at conditions of _____ CFM entering air temperature at the evaporator at _____ °F/°C wet bulb and _____ °F/°C dry bulb, and air entering the unit at _____ °F/°C.

— The system will have a SEER of _____ Btuh/watt or greater at DOE conditions.

Electrical Requirements

— Nominal unit electrical characteristics will be _____ v, single phase, 60 hz. The unit will be capable of satisfactory operation within voltage limits of _____ v to _____ v.

— Nominal unit electrical characteristics will be _____ v, three phase, 60 hz. The unit will be capable of satisfactory operation within voltage limits of _____ v to _____ v.

— Unit electrical power will be single point connection.

— Control circuit will be 24v.

Special Features

— Refer to section of this literature identifying accessories and descriptions for specific features and available enhancements.

SYSTEM DESIGN SUMMARY

1. Intended for outdoor installation with free air inlet and outlet. Outdoor fan external static pressure available is less than 0.01-in. wc.
2. Minimum outdoor operating air temperature without low-ambient operation accessory is 55°F (12.8°C).
3. Maximum outdoor operating air temperature is 125°F (51.7°C).
4. For reliable operation, unit should be level in all horizontal planes.
5. For interconnecting refrigerant tube lengths greater than 80 ft (23.4 m) and/or 35 ft (10.7 m) vertical differential, consult Residential Piping and Longline Guideline and Service Manual available from equipment distributor.
6. If any refrigerant tubing is buried, provide a 6 in. (152.4 mm) vertical rise to the valve connections at the unit. Refrigerant tubing lengths up to 36 in. (914.4 mm) may be buried without further consideration. Do not bury refrigerant lines longer than 36 in. (914.4 mm).
7. Use only copper wire for electric connection at unit. Aluminum and clad aluminum are not acceptable for the type of connector provided.
8. Do not apply capillary tube indoor coils to these units.
9. Factory-supplied filter drier must be installed.

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