4.7 NOISE

4.7.1 Introduction

This section of the EIR addresses the existing acoustical environment on and adjacent to the project site and evaluates off-site noise impacts related to project implementation. A noise analysis for the Proposed Project was prepared by Mestre Greve Associates, October 21, 2011, to specifically address potential impacts related to project construction as well as impacts on the existing land uses adjacent to the site. The Noise Analysis is included as Appendix G.

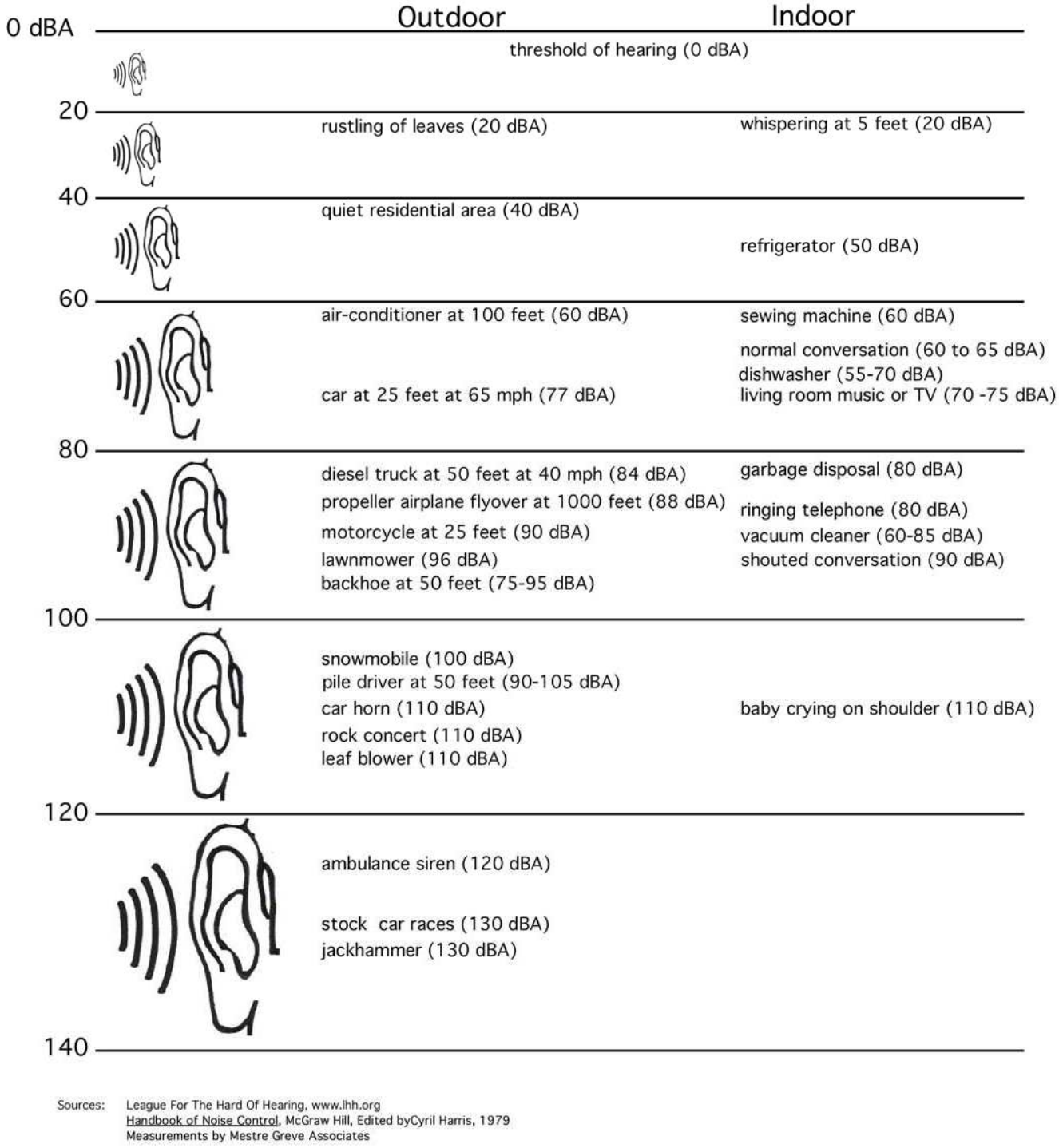
4.7.2 Environmental Setting

Sound is technically described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dB higher than another is judged to be twice as loud; and 20 dB higher four times as loud; and so forth. Everyday sounds normally range from 30 dB (very quiet) to 100 dB (very loud).

As the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. Community noise levels are measured in terms of the "A-weighted decibel," abbreviated dBA. Refer to Figure 4.7-1 for examples of various noises and their typical A-weighted noise level.

Sound levels decrease as a function of distance from the source as a result of wave divergence, atmospheric absorption and ground attenuation. As the sound wave form travels away from the source, the sound energy is dispersed over a greater area, hence dispersing the sound power of the wave. Atmospheric absorption also influences the levels that are received by the observer. The greater the distance traveled, the greater the influence and the resultant fluctuations. The degree of absorption is a function of the frequency of the sound as well as the humidity and temperature of the air. Turbulence and gradients of wind, temperature and humidity also play a significant role in determining the degree of attenuation. Intervening topography can also have a substantial effect on the effective perceived noise levels.

Noise has been defined as unwanted sound and it is known to have several adverse effects on people. From these known effects of noise, criteria have been established to help protect the public health and safety and prevent disruption of certain human activities. This criteria is based on known impacts of noise on people as hearing loss, speech interference, sleep interference, physiological responses and annoyance. A brief description of each of these potential noise impacts are as follows:



Source: Mestre Greve Associates, 10/2011.

TYPICAL NOISE LEVELS

Highland Marketplace EIR
City of San Bernardino, California

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FIGURE 4.7-1

- *Hearing loss* is not a concern in community noise situations of this type. The potential for noise induced hearing loss is more commonly associated with occupational noise exposures in heavy industry or very noisy work environments. Noise levels in neighborhoods are not sufficiently loud to cause hearing loss.

- *Speech Interference* is one of the primary concerns in environmental noise problems. Normal conversational speech is in the range of 60 to 65 dBA and any noise in this range or louder may interfere with speech. There are specific methods of describing speech interference as a function of distance between speaker and listener and voice level.

- *Sleep Interference* is a major noise concern form traffic noise. Sleep disturbance studies have identified interior noise levels that have the potential to cause sleep disturbance. Note that sleep disturbance does not necessarily mean awakening from sleep, but can refer to altering the pattern and stages of sleep.

- *Physiological Responses* are those measurable effects of noise on people that are realized as changes in pulse rate, blood pressure, etc. While such effects can be induced and observed, the extent is not known to which these physiological responses cause harm or are sign of harm.

- *Annoyance* is the most difficult of all noise responses to describe. Annoyance is a individual characteristic and can vary widely from person to person. What one person considers tolerable can be unbearable to another of equal hearing capability.

Noise Assessment Metrics

The description, analysis and reporting of community noise levels around communities is made difficult by the complexity of human response to noise and the myriad of noise metrics that have been developed for describing noise impacts. Each of these metrics attempts to quantify noise levels with respect to community response. Most of the metrics use the A-Weighted noise level to quantify noise impacts on humans. A-Weighting is a frequency weighting that accounts for human sensitivity to different frequencies.

Noise metrics are divided into two categories: single event and cumulative. Single-event metrics describe the noise levels from an individual event such as an aircraft fly over or a heavy equipment pass-by. Cumulative metrics average the total noise over a specific time period, typically 1 or 24-hours for community noise problems. A cumulative noise metrics were used for the proposed analysis.

Several rating scales have been developed for measurement of community noise. These include the following:

- The parameters of noise that have been shown to contribute to the effects of noise on man,
- The variety of noises found in the environment,

- The variations in noise levels that occur as a person moves through the environment, and
- The variations associated with the time of day.

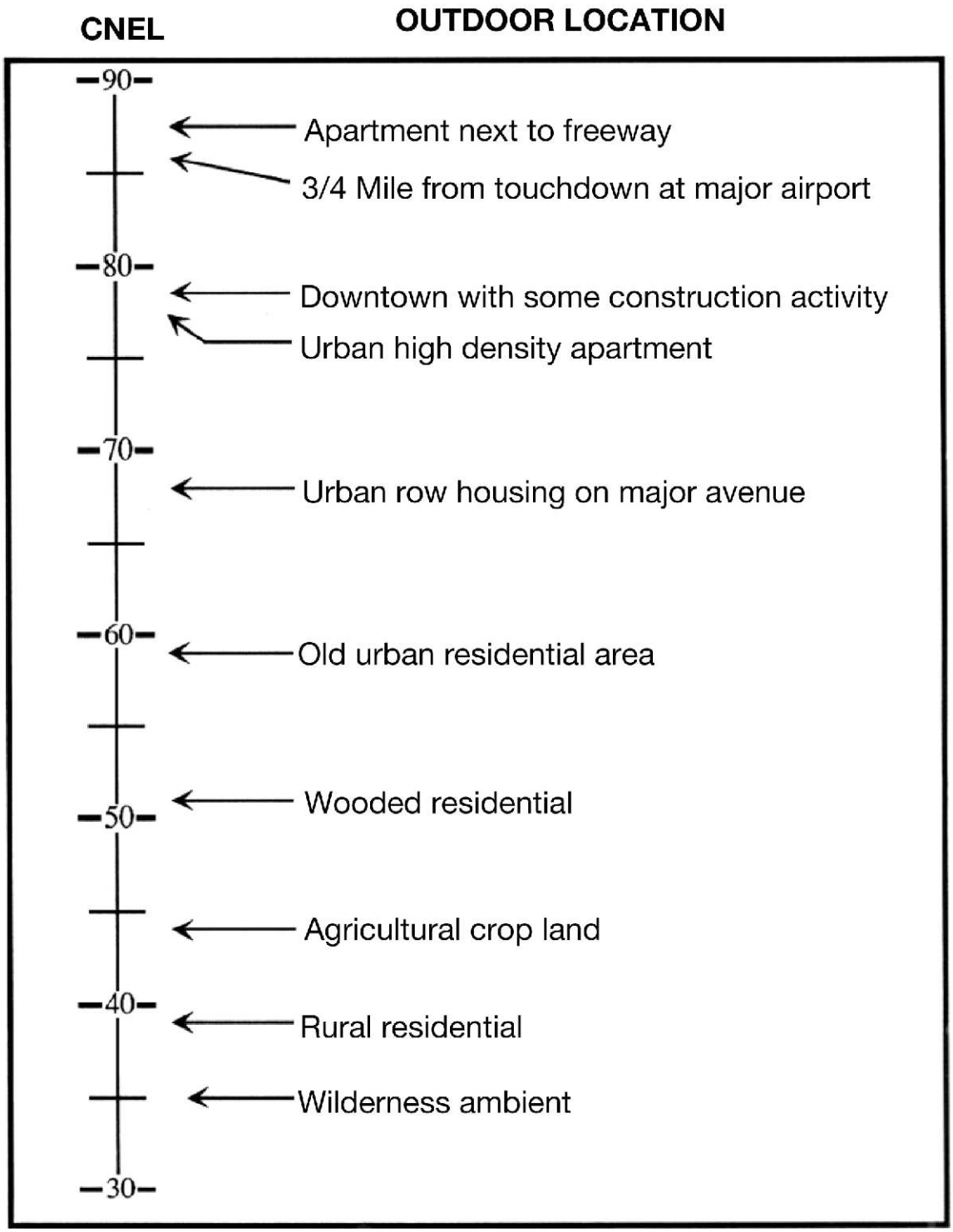
The scale was designed to account for the known health effects of noise on people. Based on these effects, the observation has been made that the potential for a noise to impact people is dependent on the total acoustical energy content of the noise. A number of noise scales have been developed to account for this observation. Two of the predominate noise scales are the: Equivalent Noise Level (LEQ) and the Community Noise Equivalent Level (CNEL). These scales are as follows:

LEQ is the sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. LEQ is the "energy" average noise level during the time period of the sample. LEQ can be measured for any time period, but is typically measured for 1 hour. This 1-hour noise level can also be referred to as the Hourly Noise Level (HNL). It is the energy sum of all the events and background noise levels that occur during that time period.

CNEL, Community Noise Equivalent Level, is the predominant rating scale now in use in California for land use compatibility assessment. The CNEL scale represents a time weighted 24-hour average noise level based on the A-weighted decibel. Time weighted refers to the fact that noise that occurs during certain sensitive time periods is penalized for occurring at these times. The evening time period (7 p.m. to 10 p.m.) penalizes noises by 5 dBA, and the nighttime (10 p.m. to 7 a.m.) noises are penalized by 10 dBA. These time periods and penalties were selected to reflect people's increased sensitivity to noise during these time periods. A CNEL noise level may be reported as a "CNEL of 60 dBA," "60 dBA CNEL," or "60 CNEL." Typical noise levels in terms of the CNEL scale for different types of communities are shown in Figure 4.7-2.

Ldn, the day-night is a measure of the overall noise experienced during an entire day. The time-weighted refers to noise that occurs during certain sensitive time periods and is penalized for occurring at these times. In the Ldn scale, those noise levels that occur during the night (10 pm to 7 am) are penalized by 10 dB. This penalty was selected to attempt to account for increased human sensitivity to noise during the quieter period of a day.

L(%) is a statistical method of describing noise which accounts for variance in noise levels throughout a given measurement period. L (%) is a way of expressing the noise level exceeded for a percentage of time in a given measurement period. Therefore, as five minutes is 25% of 20 minutes, L(25) is the noise level that is equal to or exceeded for five minutes in a 20 minute measurement period. It is L(%) that is used for most Noise Ordinance standards. Therefore, most daytime County, state and City Noise Ordinances use an ordinance standard of 55 dBA for 30 minutes per hour or an L(50) level of 55 dBA. Thus, the Noise Ordinance states that no noise level should exceed 55 dBA for more than 50% of a given period.



Source: Mestre Greve Associates, 10/2011.

TYPICAL CNEL NOISE LEVELS

Highland Marketplace EIR
City of San Bernardino, California

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FIGURE 4.7-2

4.7.3 Applicable Policies, Plans and Regulations

The City of San Bernardino General Plan Noise Element and Noise Ordinance contain the City's policies on noise. The noise ordinance applies to noise on one property impacting a neighboring property. Typically, it sets limits on noise levels that can be experienced at the neighboring property. The Noise Ordinance is part of the City's Municipal Code (Chapter 8.54 Noise Control) and is enforceable throughout the City. The Noise Element of the General Plan presents limits on noise levels from transportation noise sources, vehicles on public roadways, railroads and aircraft. These limits are imposed on new developments. New developments must incorporate the measures to ensure that the limits are not exceeded.

City of San Bernardino Noise Element

The City of San Bernardino General Plan Noise Element has not established any specific noise standards for land uses impacted by transportation noise sources. The project impacts would be contrasted with the State noise guidelines.

The City Noise Element states that an interior noise limit of 45 CNEL for dwelling units are considered acceptable for residential land uses. Residential outdoor uses (i.e., rear yard, patio and balcony) within a 65 CNEL exterior noise environment are required to have acoustical analyses prepared indicating that the proposed buildings are limited to the allowable 45 CNEL indoor noise level, and outside levels need to be mitigated to less than 65 CNEL. Commercial, retail, and industrial land uses are not as sensitive to noise as residential land uses, and no standards have been adopted by the City. As the City has not specified any noise standards for commercial uses, interior noise limits of 50 CNEL were applied for office or general commercial uses and 55 CNEL for retail and restaurant uses. These limits are used by other jurisdictions.

The Noise Element identifies three policies that are relevant to this project, policies 14.1.2, 14.1.3, and 14.1.4. These policies read as follows:

14.1.2 Require that automobile and truck access to commercial properties abutting residential parcels be located at the maximum practical distance from the residential parcel. (LU-1)

14.1.3 Require that all parking for commercial uses abutting residential areas be enclosed within a structure, buffered by walls, and/or limited hours of operation. (LU-1)

14.1.4 Prohibit the development of new or expansion of existing industrial, commercial, or other uses that generate noise impacts on housing, schools, health care facilities or other sensitive uses above a Ldn of 65 dB(A). (LU-1)

City of San Bernardino Noise Ordinance

A noise ordinance is designed to control unnecessary, excessive and annoying sounds from stationary (non-transportation) noise sources. Noise ordinance requirements cannot be applied to

mobile noise sources such as heavy trucks when traveling on public roadways. Federal and state laws preempt control of mobile noise sources on public roads. Noise ordinance standards typically apply to a noise source on one parcel of land impacting a nearby parcel of land (usually residential).

Chapter 8.54 – Noise Control of the municipal code is the noise ordinance document for the City (nuisance ordinance). It lists activities that cannot occur and provides general statements that any noise, which limits the use on another person's property, is a violation of the ordinance. Two items contained in the ordinance are of relevance to this project.

- Chapter 8.54.050(B) limits loading and unloading of vehicles to certain hours (this applies to the loading dock activities associated with the Proposed Project). The section lists activities that can only occur between 7:00 a.m. and 8:00 p.m. Included in the list is the following.

  B. Load or unload any vehicle, or operate or permit the use of dollies, carts, forklifts, or other wheeled equipment that causes any impulsive sound, raucous, or unnecessary noise within one thousand (1,000) feet of a residence.

- Chapter 8.54.070 limits construction activity. Construction is limited to the hours of 7:00 a.m. to 8:00 p.m. No restrictions for Sundays or holidays were cited.

4.7.4 Project Impact Analysis and Mitigation Measures

4.7.4.1 Thresholds of Significance

The Initial Study Checklist for the Proposed Project was completed and circulated with a Notice of Preparation (NOP) to identify potential environmental impacts that could occur as a result of the Proposed Project. The Checklist identifies the primary thresholds of significance. The Proposed Project would have a significant effect on Noise if it would:

- Exposure of persons to or generation of noise levels in excess of standards established in the City's General Plan or Development Code, or applicable standards of other agencies.
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- For a project located within an airport land use plan or airport influence area, would the project expose people residing or working in the project area to excessive noise levels.

4.7.4.2 Noise Issues Identified to have No Impact

The Initial Study Checklist that was circulated with the NOP identified the following threshold where no impact would occur. No additional information was received during the NOP review period to change the conclusions of the Initial Study.

For a project located within an airport land use plan or airport influence area, would the project expose people residing or working in the project area to excessive noise levels.

The Project Site does not occur within the San Bernardino International Airport (SBIA) Influence Area, as shown in Figure LU-4 of the City's General Plan, although it is adjacent to its boundary. The Airport is located approximately 1.5 miles northeast of the Project Site. Impacts from aircraft noise would have no effect on employees or customers. Therefore, no impact is anticipated.

4.7.4.3 Noise Issues Determined to have a Less Than Significant Impact

The Initial Study Checklist that was circulated with the NOP identified the following threshold area where impacts were determined to be less than significant. No additional information was received during the NOP review period to change the conclusions of the Initial Study.

Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

Perceptible ground borne vibrations are typically associated with blasting operations and the use of pile drivers, neither of which would be used during construction of the Proposed Project. Consequently, no excessive ground borne vibration would be generated during post-construction of the Project. On-site activity would include movement of vehicles on-site and delivery of goods. Therefore, no significant impacts due to Project-generated ground borne vibrations are anticipated.

4.7.4.4 Noise Issues Determined to Have Potentially Significant Impacts

Exposure of persons to or generation of noise levels in excess of standards established in the City's General Plan or Development Code, or applicable standards of other agencies.

A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Impact N-1:

Operational and temporary construction activities may expose residents in the immediate area to excessive noise levels exceeding the City's noise ordinance. This is a potentially significant impact.

Methodology

Off-site impacts from on-site activities, short-term and long-term, are measured against the City of San Bernardino Noise Ordinance criteria. Construction activities for the Proposed Project would be required to meet the noise ordinance standards along with any noise generating activities associated with the operation of the project.

Long-term off-site impacts from traffic noise are measured against two criteria. Both criteria must be met for a significant impact to be identified. The criteria are as follows:

- Project traffic must cause a substantial noise level increase (greater than 3 dB) on a roadway segment adjacent to a noise sensitive land use.

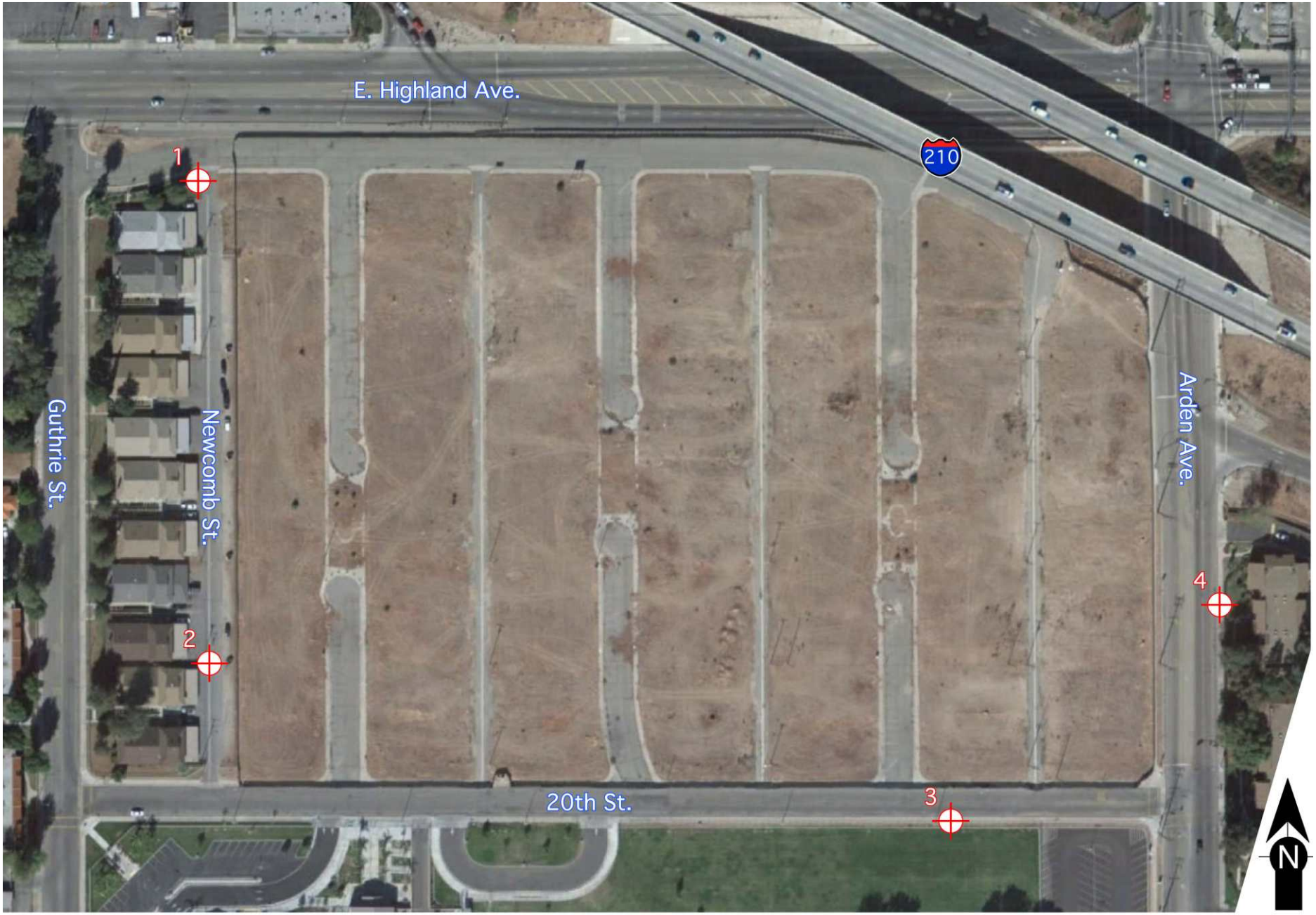
- The future noise level that would exist if the project is completed must exceed the criteria level for the noise sensitive land use. Therefore, the criteria level is 65 CNEL for residential land uses, schools, and other sensitive land uses. The project would have considerably contributed to this increase if it contributes more than 3 dB to the increase.

  The project would have a significant impact if it causes a 3 dB increase and the resulting noise level is 65 CNEL or higher for sensitive land uses.

In community noise assessment, changes in noise levels greater than 3 dB are identified as significant, while changes less than 1 dB would not be discernible to local residents. In the range of 1 to 3 dB, residents who are very sensitive to noise may perceive a slight change. However, there is no scientific evidence to support the use of 3 dB as the significance threshold. In laboratory testing situations, humans are able to detect noise level changes of slightly less than 1 dB. In a community noise situation, however, noise exposures are over a long time period, and changes in noise levels occur over years, rather than the immediate comparison made in a laboratory situation. Therefore, the level at which changes in community noise levels become discernible is likely to be some value greater than 1 dB, and 3 dB has become the appropriate benchmark for most people and agencies.

Existing Conditions

Existing noise levels in the vicinity of the Proposed Project and the surrounding were taken. The sites were selected to provide coverage of the project area. Refer to Figure 4.7-3 for the measurement sites.



Measurement Sites

Source: Mestre Greve Associates, 10/2011.

AMBIENT MEASUREMENT LOCATIONS

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City of San Bernardino, California

FIGURE 4.7-3

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Four short-term noise measurements were taken. All four of the short-term measurements were taken between 11:15 a.m. and 1:40 p.m. on August 25, 2011. Measurements at all sites were performed using a Brüel & Kjær Model 2236 automated digital noise data acquisition system and sound meter mounted on a tripod. During the measurements a large windscreen covered the microphone to dampen out the effect of unwanted wind-generated noise. For each measurement site, 30 minutes of data were collected. Before and after the measurements were taken, a Brüel & Kjær 4231 calibrator with certification traceable to the National Institute of Standards and Technology was used to calibrate the sound meter to ensure that the measured sound level readings were accurate. At the conclusion of each set of measurements, the Leq, L_{min}, L_{max}, L1.7, L8.3, L25 and L50 values for the full time period were documented, and then the buffer on the sound meter was reset to prepare it for measurements at the next site. Prevailing weather conditions were noted, along with any other factors that might adversely impact the noise measurements. Refer to Table 4.7-1 for the results of the data collected.

Table 4.7-1
Existing Noise Measurements (dBA)

Site	Date	Time	Leq	L_{max}	L1.7	L8.3	L25	L50	L_{min}
1	8-24-11	11:15 am	63.0	76.4	69.0	66.0	63.5	61.0	50.4
2	8-24-11	11:50 am	52.5	66.3	58.5	55.0	52.5	50.5	46.0
3	8-24-11	12:30 pm	58.7	77.9	68.5	61.5	54.0	51.0	45.4
4	8-24-11	1:10 pm	66.0	78.8	73.0	70.0	66.5	63.0	51.4

Information of the measurements sites are as follows:

- *Site 1: Northwest Corner of Project Site*

  Site 1 is located near the intersection of Highland Avenue and Newcomb Street and at the west edge of the project site. The monitoring location was near the northernmost residence that backs up to Newcomb Street. The primary noise sources were traffic on Interstate 210 (I-210) and traffic on Highland Avenue. The L_{max} was 76.4 dBA, which was caused by a truck on Highland Avenue. The Leq at this site measured 63.0 dBA, typical of a location near a freeway and a major highway.

- *Site 2: West Edge of Project Site*

  Site 2 is located at the west edge of the project site, north of 20th Street. Noise sources heard at this site were mostly from traffic on I-210 and traffic on Highland Avenue. However, also include car passes on Newcomb Street, and a distant gardener operating a trimmer. The L_{max} was 66.3 dBA. This was due to a car passing near the microphone. The Leq at this site measured 52.5 dBA, which is typical for a residential area near to a freeway. This site was the quietest site measured as it is farther from the freeway.

- *Site 3: South Edge of Site*

Site 3 is located near the south edge of the project site on 20th Street and west of Arden Avenue. The microphone was placed on the sidewalk on the south side of 20th Street, just outside the fence at the easterly school property (Emmerton Elementary School). The dominant noise source at the site was traffic on I-210. Traffic on Arden Avenue also contributed to the noise levels, as well as cars on 20th Street and children playing at a distant location at the school. The L_{max} was 77.9 dBA. This was caused by a bus passing near the microphone on 20th Street. The Leq at this site measured 58.7 dBA.

- *Site 4: East Edge of Project*

Site 4 is located at the center of the east side of the project site and across Arden Avenue, south of I-210. Traffic on the I-210 was the dominant noise source. Traffic on Arden Avenue also contributed significantly to the noise levels. The L_{max} of 78.8 dBA was due to a truck pass-by on I-210. The Leq at this site measured 66.0 dBA, which is typical of a location near a freeway and a major highway. This site was the loudest site measured.

Existing Roadway Noise Levels

The highway noise levels were analyzed using the Highway Noise Model published by the Federal Highway Administration ("FHWA Highway Traffic Noise Prediction Model," FHWA-RD-77-108, December, 1978). The FHWA Model uses traffic volume, vehicle mix, vehicle speed, and roadway geometry to compute the "equivalent noise level." A computer code has been written which computes equivalent noise levels for each of the time periods used in the calculation of CNEL. Weighting these noise levels and summing them results in the CNEL for the traffic projections used. CNEL contours are determined by iterating over many distances until the distances to the 60, 65, 70, and 75 CNEL contours are found.

Peak hour traffic volumes were analyzed in the traffic analysis prepared for the Proposed Project ("Draft Home Depot Traffic Impact Analysis," Fehr & Peers, August 12, 2011). The p.m. peak hour traffic levels were assumed to be 10% of the average daily traffic.

Traffic volumes and estimated speeds were used with the FHWA Model to estimate the noise levels in terms of CNEL. The distances to the CNEL contours for the roadways in the vicinity of the project site are shown in Table 4.7-2. These numbers represent the distance from the centerline of the road to the contour value shown. The values shown in Table 4.7-2 do not account for the effect of any noise barriers or topography that may impact ambient noise levels.

As shown in Table 4.7-2, substantial traffic noise occurs along Highland Avenue, Del Rosa Drive, and Sterling Avenue; traffic noise along these roadways is in excess of 65 CNEL.

Table 4.7-2
Existing Roadway Traffic Noise Levels

Roadway Segment		CNEL @ 100' †	Distance To CNEL Contour from Centerline of Roadway (feet)		
			70 CNEL	65 CNEL	60 CNEL
Highland Avenue	West of Del Rosa Dr.	62.4	31	67	145
	Del Rosa Dr. to Sterling Ave.	62.2	30	65	140
	Sterling Ave. to I-210 EB Off-Ramp	61.4	26	57	124
	I-210 EB Off-Ramp to Arden Ave.	64.6	43	93	202
	Arden Ave. to Victoria Ave.	64.6	43	94	203
	Victoria Ave. to Orange Ave.	62.2	30	64	139
	East of Orange Ave.	61.9	28	61	133
Del Rosa Drive	North of Highland	63.5	36	79	170
	South of Highland	62.8	33	71	153
Sterling Avenue	North of Highland	61.3	26	56	121
	South of Highland	61.1	25	54	118
Arden Avenue	North of Date St.	56.2	RW	25	55
	Date St. to Highland	57.5	RW	31	67
	Highland to I-210 EB Off-Ramp	59.2	RW	40	88
	I-210 EB Off-Ramp to 20th Street	57.5	RW	31	68
	20 Street to Pacific St.	57.3	RW	30	66
	South of Pacific St.	55.6	RW	23	50
Victoria Avenue	North of Highland	62.2	30	64	139
	South of Highland	59.4	RW	42	91
Orange Avenue	North of Highland	50.9	RW	RW	24
	South of Highland	49.8	RW	RW	20
Date Street	West of Arden Ave.	45.9	RW	RW	RW
	East of Arden Ave.	45.3	RW	RW	RW
Pacific Street	West of Arden Ave.	54.3	RW	RW	41
	East of Arden Ave.	55.2	RW	22	48

† From roadway centerline
RW – Noise contour falls within roadway right-of-way.

Potential Noise Impacts

Potential noise impacts are divided into temporary and long term. Temporary impacts are typically associated with noise generated by construction activities. Long-term impacts are divided into impacts on surrounding land uses generated by the Proposed Project and those impacts that occur at the Proposed Project site.

Temporary Construction Impacts

Construction noise represents a short-term impact on ambient noise levels. Noise generated by construction equipment, including trucks, graders, bulldozers, concrete mixers and portable generators may reach high levels.

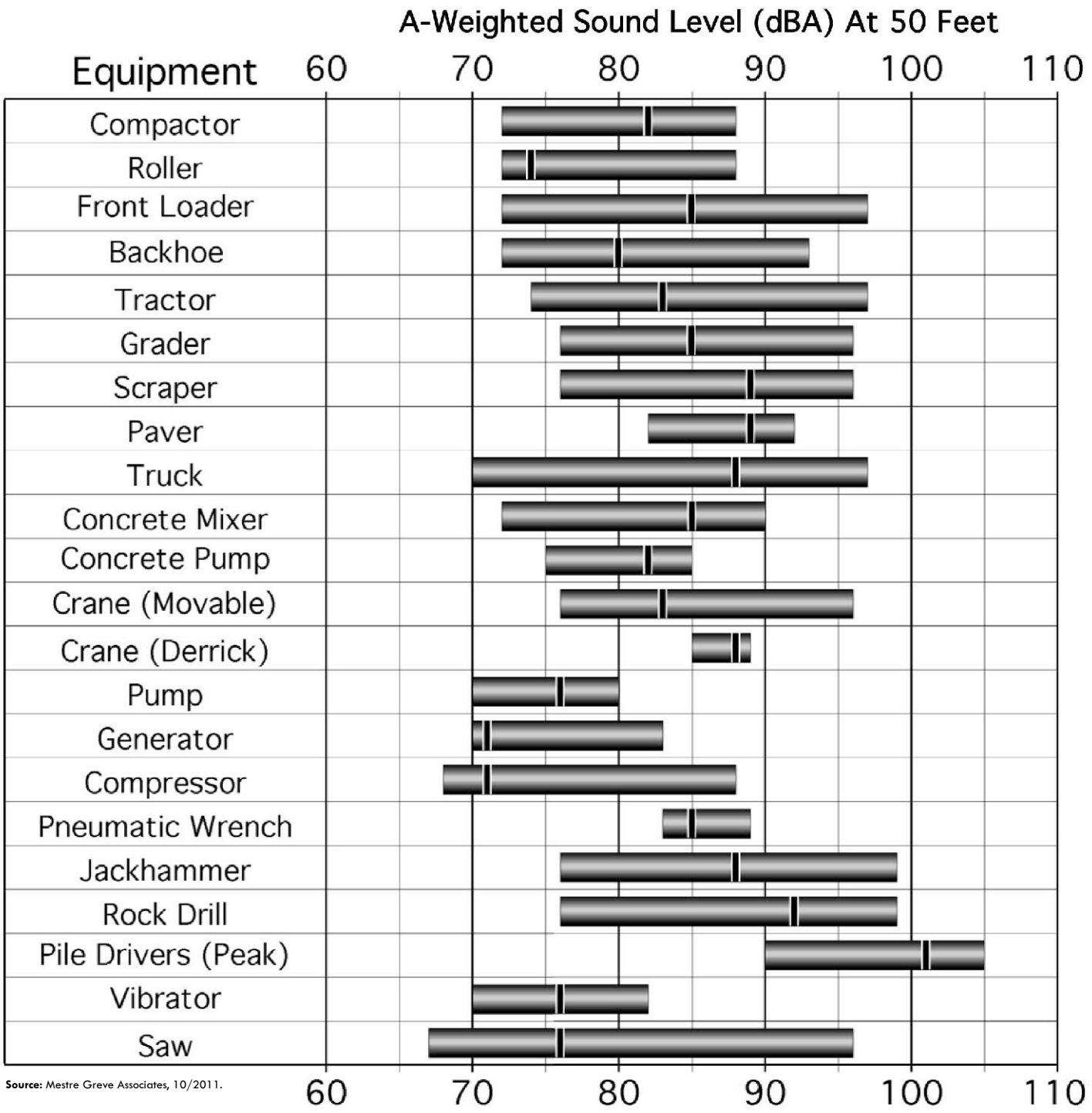
Worst-case examples of construction noise at 50 feet are shown in Figure 4.7-4. Typical equipment that may be used for this type of project includes graders, scrapers, front loaders, trucks, concrete mixers and concrete pumps. The peak noise level for most of the equipment that would be used during the construction is 70 to 95 dBA at a distance of 50 feet. Noise levels at further distances would be less than this. Therefore, at 200 feet, the peak construction noise levels range from 58 to 83 dBA.

The noise levels shown in Figure 4.7-4 are based on worst-case (i.e. loudest noise) conditions at the construction site. Therefore, these noise levels would be used as the basis for predicting the worst-case construction noise estimate.

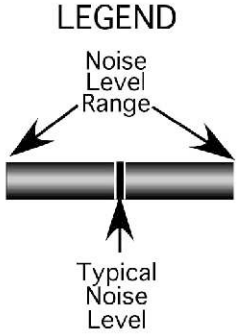
The nearest sensitive land use is the existing residential land uses immediately west of the project. Potential construction operations may occur as close as 50 feet from the nearest residential buildings with the center of the site being approximately 500 feet. Based on a distance of 50 feet, the worst-case unmitigated peak (L_{max}) construction noise levels may be 70 to 95 dBA at the nearest residence. However, as the construction move toward the center of the project site (i.e., 500 feet from homes), the L_{max} noise levels would be approximately 50 to 75 dBA. The average noise levels (L50) are typically 15 dB lower than the peak noise levels. Average noise levels (L50) at the nearest residence may be in the range of 55 to 80 dBA (L50).

Two schools are located to the south of the project site. The Emmerton Elementary School and the Rodriquez Prep Academy are located south of East 20th Street. Potential construction operations may occur as close as 50 feet from the nearest school property boundary with the center of the site being at approximately 450 feet. Based on a distance of 50 feet, the worst-case unmitigated peak (L_{max}) construction noise levels may be 70 to 95 dBA at the nearest school property boundary. However, as the construction is moved towards the center of the project site (i.e., 450 feet from schools), the L_{max} noise levels would be approximately 51 to 76 dBA. The average noise levels (L50) are typically 15 dB lower than the peak noise levels. Average noise levels (L50) at the nearest residence may be in the range of 55 to 80 dBA (L50).

The City's Noise Ordinance excludes control of construction at all locations throughout the City to between the hours of 7:00 a.m. and 8:00 p.m., 7 days of the week. In addition, all mobile construction equipment is required to be equipped with properly operating and maintained mufflers consistent with manufacturers' standards.



Source: Mestre Greve Associates, 10/2011.



Sources: "Handbook of Noise Control," by Cyril Harris, 1979
"Transit Noise and Vibration Impact Assessment" by Federal Transit Administration, 1995

CONSTRUCTION NOISE LEVELS

Highland Marketplace EIR
City of San Bernardino, California

FIGURE 4.7-4

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Long-Term Off-Site Impact

Increased traffic caused by the project would result in an increased traffic noise levels along the roadways in the vicinity of the project. Traffic data was provided from the traffic analysis prepared for the project (Draft Home Depot Traffic Impact Analysis," Fehr & Peers, August 12, 2011).

The FHWA noise model was used to determine traffic noise impacts. The FHWA noise model utilizes various traffic-flow parameters (e.g. traffic volume, speed, mix, etc.) to predict noise levels that result from the operation of motor vehicles on the roadways.

Table 4.7-3 shows traffic noise CNEL level changes on the roadways impacted by the project. As shown in Table 4.7-3, the first column shows the project's contribution to the increase (the noise increase is due solely to the Proposed Project). This represents a comparison of the existing condition with the opening year plus project condition. The second column shows the cumulative noise increase. This represents the change from the existing condition (no project) to the buildout case (2030) with project.

Table 4.7-3
Traffic Noise CNEL Increases (dB)

Roadway Segment		Column 1 Increase Due to Project	Column 2 Cumulative Increase Over Existing Conditions
Highland Avenue	West of Del Rosa Dr.	0.4	2.6
	Del Rosa Dr. to Sterling Ave.	0.6	2.7
	Sterling Ave. to I-210 EB Off-Ramp	0.8	2.8
	I-210 EB Off-Ramp to Arden Ave.	0.6	2.7
	Arden Ave. to Victoria Ave.	0.6	2.6
	Victoria Ave. to Orange Ave.	0.6	2.7
	East of Orange Ave.	0.6	2.8
Del Rosa Drive	North of Highland	0.1	2.8
	South of Highland	0.4	2.9
Sterling Avenue	North of Highland	0.3	2.5
	South of Highland	0.4	2.6
Arden Avenue	North of Date St.	0.5	2.6
	Date St. to Highland	0.5	2.6
	Highland to I-210 EB Off-Ramp	0.9	2.8
	I-210 EB Off-Ramp to 20th Street	0.6	2.6
	20 Street to Pacific St.	0.6	2.7
	South of Pacific St.	0.3	2.5
Victoria Avenue	North of Highland	0.3	2.5
	South of Highland	0.3	2.5
Orange Avenue	North of Highland	0.3	2.5
	South of Highland	0.3	2.8
Date Street	West of Arden Ave.	0.3	2.4
	East of Arden Ave.	0.2	2.4
Pacific Street	West of Arden Ave.	0.3	2.5
	East of Arden Ave.	0.4	2.5

Column 1 shows that the project itself would result in a very minor change in noise levels along all roadways in the area. The increases caused by the project range from 0.1 to 0.9 dB, which would not be discernable. Therefore, the traffic generated by the project would not result in a significant impact.

Column 2 shows that cumulative CNEL traffic noise levels are projected to increase up to 2.9 dB over existing conditions. The project contributes insignificantly to these levels. Therefore, is not adding to the cumulative impact. The increases in the cumulative noise levels are due to general development in the area, and not the Proposed Project.

The distances to the CNEL contours with future project traffic for the roadways in the vicinity of the Proposed Project site is shown in Table 4.7-4. The values shown under the 60, 65 and 70 CNEL columns represent the distance from the centerline of the roadway to the respective contour value. The CNEL at 100 feet from the roadway centerline is also shown. The contours do not account for the effect of any noise barriers or topography that may reduce traffic noise levels. Refer to Appendix F for the traffic volumes, speeds and traffic mixes used to calculate the noise levels.

The noise levels along Highland Avenue, Del Rosa Drive and Sterling Avenue would continue to be high and would increase over existing levels. However, the increase in traffic noise is due to general development in the area, and the project would not contribute significantly to this increase. The noise from the I-210 would continue to dominate the noise at the project site.

Parking Lot Noise

The proposed parking area would be a source of noise. Sensitive land uses near the project site include residential uses to the west (50 feet) and schools buildings located to the south (less than 150 feet from the parking area).

Traffic associated with parking lots does not typically exceed community noise standards. However, the instantaneous maximum sound levels generated by car door slamming, engine start-up, alarm activation and car pass-bys may generate impacts to residents. Tire squeal may also be a problem depending on the type of parking surface. Estimates of the maximum noise levels associated with some parking lot activities are shown in Table 4.7-5. The noise levels are for a distance of 50 feet from the source, and are the maximum noise level generated. A range is given to reflect the variability of noise generated by various automobile types and driving styles. Backup alarms would also be used on forklifts for loading building materials into customer vehicles. Backup alarms are regulated by California Division of Occupational Safety and Health (CAL OSHA). Chapter 4, Division of Industrial Safety, Subchapter 4, Construction Safety Orders, Article 10, Haulage and Earth Moving, Section 1592, Warning Methods, of the California Code of Regulations describe the requirements for back up beepers on construction equipment. The regulation requires that "The warning sound shall be of such magnitude that it would normally be audible from a distance of 200 feet and would sound immediately on backing." Backup alarms are typically rated to generate 87, 97, 102, and 112 dBA at a distance of four feet from the alarm. Due to the low ambient noise level in the area, an 87 or 97 rated alarm would be used for the forklift operations.

Table 4.7-4
Future Project Traffic Noise Levels

Roadway Segment		CNEL @ 100' †	Distance To CNEL Contour from Centerline of Roadway (feet)		
			70 CNEL	65 CNEL	60 CNEL
Highland Avenue	West of Del Rosa Dr.	65.1	46	100	217
	Del Rosa Dr. to Sterling Ave.	64.9	45	97	210
	Sterling Ave. to I-210 EB Off-Ramp	64.2	41	88	190
	I-210 EB Off-Ramp to Arden Ave.	67.2	65	141	304
	Arden Ave. to Victoria Ave.	67.2	65	141	304
	Victoria Ave. to Orange Ave.	64.9	45	98	212
	East of Orange Ave.	64.7	44	94	204
Del Rosa Drive	North of Highland	66.3	56	122	263
	South of Highland	65.6	51	110	237
Sterling Avenue	North of Highland	63.8	38	83	179
	South of Highland	63.6	37	81	175
Arden Avenue	North of Date St.	58.8	RW	38	82
	Date St. to Highland	60.0	21	46	100
	Highland to I-210 EB Off-Ramp	61.9	29	62	134
	I-210 EB Off-Ramp to 20th Street	60.1	21	47	101
	20 Street to Pacific St.	60.0	21	46	99
	South of Pacific St.	58.0	RW	34	74
Victoria Avenue	North of Highland	64.7	44	95	205
	South of Highland	61.9	28	62	134
Orange Avenue	North of Highland	53.3	RW	RW	35
	South of Highland	52.6	RW	RW	31
Date Street	West of Arden Ave.	48.3	RW	RW	RW
	East of Arden Ave.	47.7	RW	RW	RW
Pacific Street	West of Arden Ave.	56.8	RW	28	61
	East of Arden Ave.	57.8	RW	32	70
I-210 Adjacent to the Project		83.1	373	804	1,733

† From roadway centerline
RW – Noise contour falls within roadway right-of-way.

Table 4.7-5
Maximum Noise Levels Generated By
Parking Lots (dBA at 50 feet)

Event	L_{max}
Door Slam	60 to 70
Car Alarm Activation	65 to 70
Engine Start-up	60 to 70
Car pass-by	55 to 70
Back-up beepers	65 to 75

The nearest residences, west of project, 50 feet from the proposed parking spaces, may experience a maximum noise level of approximately 70 dBA for car activity and up to 75 dBA for backup beeper. The noise levels at the nearest school buildings would be approximately 10 dB less. Therefore, peak noise levels at the school would be less than 65 dBA. Therefore, no impact would occur.

The 70 to 75 dBA noise levels at the residences do not exceed any noise ordinance criteria. However, noise may be slightly annoying on occasion at some residences. Noise measurement Site 4 (refer to Figure 4.7-3) was measured with an L_{max} level of 76.4 dBA. This is above the noise level that would occur from parking lot activities, and the parking lot activities would generate noise levels well below the noise levels currently occurring at Site 1. Site 2 is further from I-210 and East Highland Avenue and currently experiences lower noise levels. The maximum sound level was measured at 66.3 dBA. A car door slam may result in a maximum noise level at this location of 70 dBA. This would increase the maximum noise levels experienced in this area. However, it would occur so infrequently that the noise level in terms of the CNEL noise scale as used by the City would change much less than 1 dB. Therefore, residents in the area around Site 2 would hear parking lot activity, but would not experience a significant change in the overall noise level based on the CNEL noise scale. Therefore, a significant noise impact is not anticipated as a result of the parking lot activities.

The Noise Element of the General Plan provides guidance on walls around commercial uses when they are adjacent to a residential zone. The Noise Element Policy 14.1.3 states "Require that all parking for commercial uses abutting residential areas be enclosed within a structure, buffered by walls, and/or limited hours of operation." An 8-foot retaining/screening wall is shown along the western perimeter of the site plan. This wall would satisfy the intention of the guidance in the Noise Element. The wall would reduce noise levels 5 to 8 dB at the nearby residences.

Truck Delivery Noise

Truck deliveries would travel along the west side of the project within approximately 50 feet of existing residences. Trucks would also travel along the south edge of the project site approximately 150 feet from the nearest school buildings. Truck deliveries to Home Depot and

Major 1 (Super Market) would use this route. Other business in the center would likely not use this route. Home Depot anticipates a maximum of 4.2 truck deliveries per day and these could occur between 6 a.m. and 7 p.m. Major 1 is project to have a maximum of 2.33 truck deliveries per day, and these could occur between 6 a.m. and 3 p.m. Noise Element Policy 14.1.4 states, "Prohibit the development of new or expansion of existing industrial, commercial, or other uses that generate noise impacts on housing, schools, health care facilities or other sensitive uses above a Ldn of 65 dB(A)." Therefore 65 Ldn is the critical noise level for truck deliveries.

If it was assumed that all truck deliveries (i.e., 6.53 per day) would occur before 7 a.m., which is during the nighttime period, then the Ldn noise levels at the residences would be 50.2 dBA. This is below the City criteria of 65 Ldn. Using the same assumptions would result in a projected noise level of 43 Ldn at the nearest school buildings. This is below the City criteria of 65 Ldn.

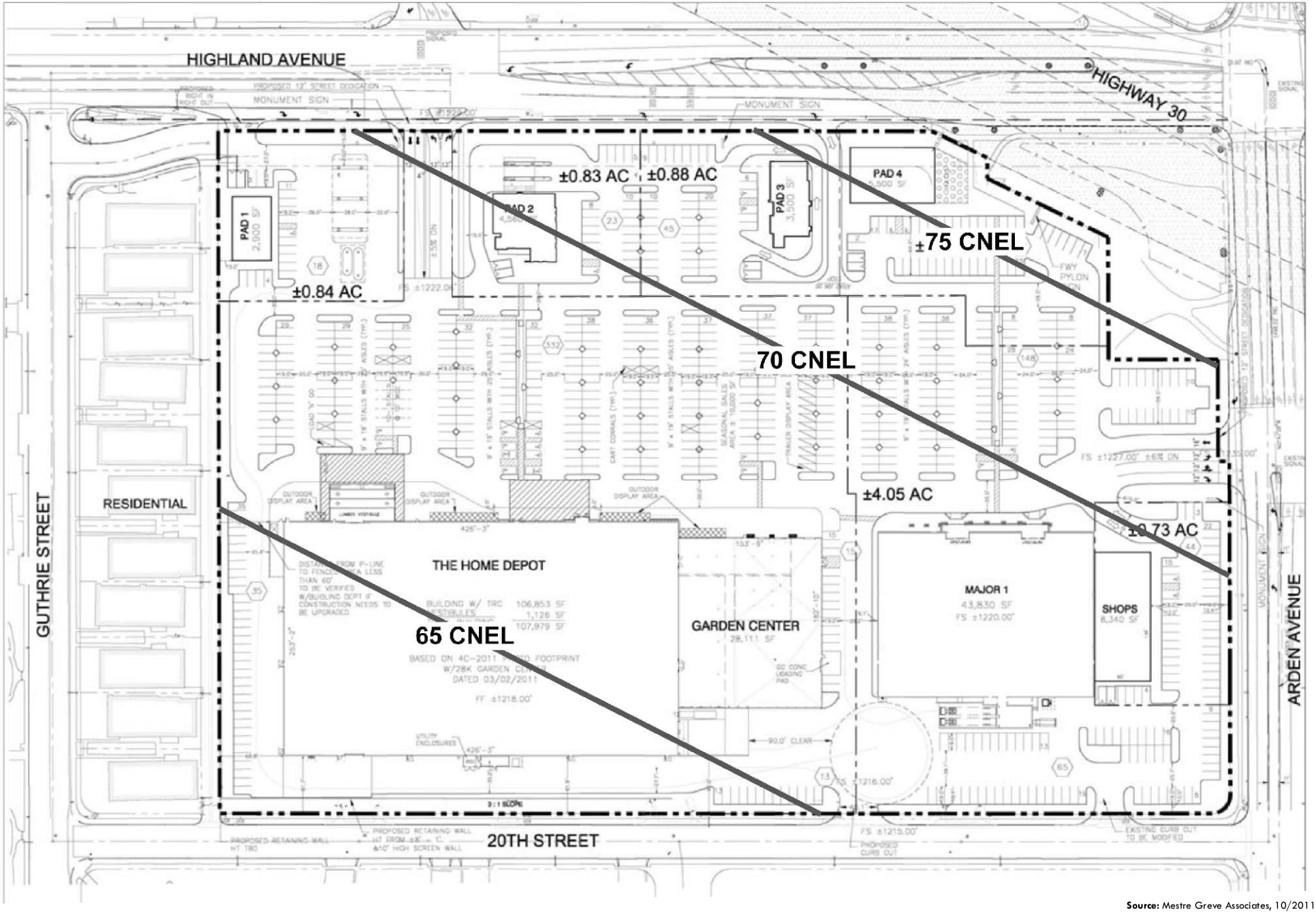
Chapter 8.54.050(B) of the Municipal Code limits loading and unloading of vehicles to certain hours. The section limits certain activities to the hours of 7 a.m. to 8 p.m. Included in the list of activities is "Load or unload any vehicle, or operate or permit the use of dollies, carts, forklifts, or other wheeled equipment that causes any impulsive sound, raucous, or unnecessary noise within one thousand (1,000) feet of a residence." Chapter 8.54 Noise Control is primarily a nuisance noise ordinance, not intended to guide land development projects. Section 8.54.060(B) exempts noises that are part of a lawful commercial or industrial business in an area zoned for such activity. Therefore, the loading time limitations would not apply if not needed to mitigate noise to acceptable levels. As the noise levels would be acceptable without mitigation, the time limitations are not needed.

Long-Term On-Site Impacts

The primary source of noise impacting the project site would be traffic on the I-210. The distances to the future 60, 65 and 70 CNEL contours for the roadways adjacent to the Proposed Project are shown in Table 4.7-4. The modeled on-site CNEL noise contours are shown in Figure 4.7-5.

As shown in Figure 4.7-5 the noise levels at the project site are projected to range from slightly above 75 CNEL to less than 65 CNEL. The highest noise level is at Pad 4 with a projected noise level of approximately 76 CNEL. For interior spaces to achieve 55 CNEL for commercial and retail uses, the outdoor-to-indoor noise attenuation provided by the building on Pad 4 needs to be at least 21 dB. Commercial buildings with standard construction typically achieve an outdoor to indoor noise reduction of between 20 to 25 dB. Therefore, the interior space for the building on Pad 4 would have an acceptable indoor noise environment without further building upgrades. All buildings for the project would achieve acceptable indoor noise levels without additional building upgrades.

Implementation of the following mitigation measure would reduce short term construction impacts to a less than significant level.



Source: Mestre Greve Associates, 10/2011.

ON-SITE NOISE LEVELS

Highland Marketplace EIR
City of San Bernardino, California

FIGURE 4.7-5

LILBURN CORPORATION

Mitigation Measure N-1:

Control of Construction Hours – All construction activities shall be limited to the allowable hours of 7:00 a.m. and 8:00 p.m.

Level of Significance After Mitigation:

The noise impact of the Proposed Project on the project vicinity is anticipated to be less than significant with the implementation of the recommended Mitigation Measure N-1