GRANITEROCK CAPITOL SITE MODERNIZATION PLAN NOISE AND VIBRATION ASSESSMENT

San José, California

February 18, 2021

Prepared for:

Mike Lisenbee
Senior Project Manager
David J. Powers & Associates, Inc.
1871 The Alameda, Suite 200
San José, California 95126

Prepared by:

Steve Deines

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
429 East Cotati Avenue
Cotati, CA 94931
(707) 794-0400

Project: 20-018

INTRODUCTION

The Graniterock Capitol Site Modernization Plan proposes to expand, modernize, and streamline current operations at the approximately 22.18-acre site located at 120 Granite Rock Way in San José, California. Currently, aggregate is transported to the site via both rail and truck, with a majority of product transported by truck. Aggregate, concrete and asphalt products are then produced or recycled at the site and transported by truck to customers throughout the Bay Area and beyond. Elements of the proposed project would construct multiple new facilities on site and lengthen existing rail infrastructure.

This report evaluates the project's potential to result in significant noise or vibration impacts with respect to applicable California Environmental Quality Act (CEQA) guidelines. The report is divided into two sections: 1) the Setting Section provides a brief description of the fundamentals of environmental noise and groundborne vibration, summarizes applicable regulatory criteria, and discusses existing noise conditions in the project vicinity; and, 2) the Impacts and Mitigation Measures Section describes the significance criteria used to evaluate project impacts, provides a discussion of each project impact, and recommends mitigation measures to reduce project impacts to less-than-significant levels.

SETTING

Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (*frequency*) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA).* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the

variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level* (*CNEL*) is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level* (*DNL* or L_{dn}) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Effects of Noise

Sleep and Speech Interference

The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noises of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA DNL. Typically, the highest steady traffic noise level during the daytime is about equal to the DNL and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12-17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57-62 dBA DNL with open windows and 65-70 dBA DNL if the windows are closed. Levels of 55-60 dBA are common along collector streets and secondary arterials, while 65-70 dBA is a typical value for a primary/major arterial. Levels of 75-80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. In order to achieve an acceptable interior noise environment, bedrooms facing secondary roadways need to be able to have their windows closed, those facing major roadways and freeways typically need special glass windows.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes

for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The DNL as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 50 dBA DNL. At a DNL of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the DNL increases to 70 dBA, the percentage of the population highly annoyed increases to about 25-30 percent of the population. There is, therefore, an increase of about 2 percent per dBA between a DNL of 60-70 dBA. Between a DNL of 70-80 dBA, each decibel increase increases by about 3 percent the percentage of the population highly annoyed. People appear to respond more adversely to aircraft noise. When the DNL is 60 dBA, approximately 30-35 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about 3 percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a 4 percent increase in the percentage of the population highly annoyed.

TABLE 1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit 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. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e. g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

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

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table 3 displays the reactions of people and the effects on buildings that continuous or frequent intermittent vibration levels produce. The guidelines in Table 3 represent syntheses of vibration criteria for human response and potential damage to buildings resulting from construction vibration.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to cause damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as paint flaking or minimal extension of cracks in building surfaces; minor, including limited surface cracking; or major, that may threaten the structural integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher. The damage criteria presented in Table 3 include several categories for ancient, fragile, and historic structures, the types of structures most at risk to damage. Most buildings are included within the categories ranging from “Historic and some old buildings” to “Modern industrial/commercial buildings”. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

The annoyance levels shown in Table 3 should be interpreted with care since vibration may be found to be annoying at lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

TABLE 3 Reaction of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Virtually no risk of damage to normal buildings
0.25	Strongly perceptible to severe	Threshold at which there is a risk of damage to historic and some old buildings.
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential dwellings such as plastered walls or ceilings
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to newer residential structures

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, September 2013.

Regulatory Background - Noise

The State of California and the City of San José have established regulatory criteria that are applicable in this assessment. The State CEQA Guidelines, Appendix G, and the City of San José General Plan are used to assess the potential significance of impacts. A summary of the applicable regulatory criteria is provided below.

State CEQA Guidelines. CEQA contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. Under CEQA, noise impacts would be 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 groundborne vibration or groundborne noise levels; or

(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, if the project would expose people residing or working in the project area to excessive noise levels.

Checklist items (a) and (b) would be applicable to the project. The project does not propose any noise sensitive land uses; therefore, the project would not expose people residing or working in

the project area to excessive aircraft noise levels. Checklist item (c) is not carried further in this analysis.

City of San José General Plan. The Environmental Leadership Chapter in the Envision San José 2040 General Plan sets forth policies with the goal of minimizing the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies in the City of San José. The following policies are applicable to the proposed project:

EC-1.2 Minimize the noise impacts of new development on land uses sensitive to increased noise levels (Categories 1, 2, 3 and 6) by limiting noise generation and by requiring use of noise attenuation measures such as acoustical enclosures and sound barriers, where feasible. The City considers significant noise impacts to occur if a project would:

- Cause the DNL at noise sensitive receptors to increase by five dBA DNL or more where the noise levels would remain "Normally Acceptable;" or
- Cause the DNL at noise sensitive receptors to increase by three dBA DNL or more where noise levels would equal or exceed the "Normally Acceptable" level.

EC-1.3 Mitigate noise generation of new nonresidential land uses to 55 dBA DNL at the property line when located adjacent to existing or planned noise-sensitive residential and public/quasi-public land uses.

EC-1.6 Regulate the effects of operational noise from existing and new industrial and commercial development on adjacent uses through noise standards in the City's Municipal Code.

EC-1.7 Require construction operations within San José to use best available noise suppression devices and techniques and limit construction hours near residential uses per the City's Municipal Code. The City considers significant construction noise impacts to occur if a project located within 500 feet of residential uses or 200 feet of commercial or office uses would:

- Involve substantial noise generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) continuing for more than 12 months.

For such large or complex projects, a construction noise logistics plan that specifies hours of construction, noise and vibration minimization measures, posting or notification of construction schedules, and designation of a noise disturbance coordinator who would respond to neighborhood complaints will be required to be in place prior to the start of construction and implemented during construction to reduce noise impacts on neighboring residents and other uses.

EC-2.3 Require new development to minimize continuous vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, including ruins and ancient monuments or building that are documented to be structurally weakened, a continuous vibration limit of 0.08 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage to a building. A continuous vibration limit of 0.20 in/sec PPV will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction. Equipment or activities typical of generating continuous vibration include but are not limited to: excavation equipment; static compaction equipment; vibratory pile drivers; pile-extraction equipment; and vibratory compaction equipment. Avoid use of impact pile drivers within 125 feet of any buildings, and within 300 feet of historical buildings, or buildings in poor condition. On a project-specific basis, this distance of 300 feet may be reduced where warranted by a technical study by a qualified professional that verifies that there will be virtually no risk of cosmetic damage to sensitive buildings from the new development during demolition and construction.

Existing Noise Environment

The project site is located at 120 Granite Rock Way in the City of San José. The site is bordered to the northwest by industrial uses including West Coast Aggregate and Concrete Ready Mix, to the east by rail tracks serving Caltrain and the Union Pacific Railroad (UPRR) and Monterey Road, to the southeast by a former drive-in theater, and to the southwest by commercial and light industrial uses along Hillcap Avenue. Single- and multi-family residences are located to the north and east across Monterey Road, to the west (Communications Hill), and to the southwest along Snell Avenue. The topography of the site is essentially flat but Communications Hill located to the west reaches a height of approximately 200 feet above the elevation of the site at the nearest residences.

A noise monitoring survey was performed to quantify and characterize ambient noise levels at the site and in the project vicinity between Friday, October 30, 2020 and Wednesday, November 4, 2020. The monitoring survey included three long-term noise measurements (LT-1 through LT-3) to quantify the daily trend in noise levels at noise sensitive locations near the project site. Attended short-term measurements were made to characterize noise levels at noise sensitive uses in the site vicinity and to establish the noise levels generated by equipment at the existing Graniterock site and at the neighboring concrete batch plant to the northwest. The primary noise sources at noise sensitive areas in the vicinity of the project site are vehicular traffic along Monterey Road, UPRR operations, ongoing construction, and jet overflights. Noise from operations at the existing Graniterock facility is audible at the nearest noise sensitive uses during activities such as unloading of materials delivered via rail.

Figure 1 shows the locations of the long-term measurements and short-term, attended, noise measurements. The daily trend in noise levels at the long-term measurement locations are shown in Appendix Figures A1 through A18. A summary of the short-term measurement results is shown in Table 4.

TABLE 4 Summary of Short-Term Noise Measurements (dBA)

Noise Measurement Location, Date	Time	Measured Noise Level, dBA						Primary Noise Source
		L_{max}	$L_{(1)}$	$L_{(10)}$	$L_{(50)}$	$L_{(90)}$	L_{eq}	
ST-1: Northwestern corner of project site along property line, Friday, 10/30/2020	9:00 a.m. – 9:10 a.m.	80	80	75	70	69	72	Activities at the adjacent concrete batch plant to the west
ST-2: East side of Caltrain Capitol Station parking lot, Friday, 10/30/2020	10:12 a.m. – 10:20 a.m.	72	70	65	58	55	61	Vehicular traffic, aircraft, Graniterock train unloading operations audible at times
	10:20 a.m. – 10:30 a.m.	70	69	60	58	55	59	
ST-3: 331 Kenbrook Court at setback of residential units from Monterey Road, Friday, 10/30/2020	10:50 a.m. – 11:00 a.m.	75	75	71	65	55	67	Monterey Road traffic, aircraft, Graniterock train unloading operations negligible
ST-4: Communications Hill, 2932 Valley of Heart's Delight Plaza, Friday, 10/30/2020	11:22 a.m. – 11:30 a.m.	76	75	61	50	47	60	Local construction, aircraft, Graniterock train unloading operations inaudible
	11:30 a.m. – 11:40 a.m.	62	60	53	48	47	51	

Note: Noise levels measured at location ST-4 differed substantially due to the measurement taken during the 11:22 a.m. to 11:30 a.m. period being heavily influenced by noise from an aircraft flyover.

Long-term noise measurement LT-1 was made southwest of the site near residences along Snell Avenue. The primary noise source at this location was vehicular traffic along Snell Avenue. Hourly average noise levels at this location ranged from 63 to 74 dBA L_{eq} during the daytime and from 55 to 68 dBA L_{eq} during nighttime. Day-night average noise levels at LT-1 were 71 to 72 dBA DNL.

Long-term noise measurement LT-2 was made north of the site across Monterey Road. The primary noise source at this location was vehicular traffic along Monterey Road and UPRR railroad trains. Hourly average noise levels at this location ranged from 69 to 78 dBA L_{eq} during the daytime and from 61 to 74 dBA L_{eq} during nighttime. Day-night average noise levels at LT-2 were 75 dBA DNL on Sunday and 76 dBA DNL on Saturday, Monday, and Tuesday.

Long-term noise measurement LT-3 was made west of the site along Communications Hill Boulevard and adjacent to the Communications Hill residential development site. The primary noise source at this location was vehicular traffic associated with Communications Hill construction and aircraft. Hourly average noise levels at this location ranged from 50 to 68 dBA L_{eq} during the daytime and from 45 to 58 dBA L_{eq} during nighttime. Day-night average noise levels at LT-3 were 60 dBA DNL on weekends and 62 dBA DNL on weekdays.

Additional on-site measurements were made on Friday, October 30, 2020 and Wednesday, November 4, 2020 to establish the noise levels generated by existing equipment and processes at the Graniterock site. Noise levels were measured at various distances from each primary noise-generating activity and normalized to a distance of 100 feet. Results of these measurements are summarized in Table 5.

FIGURE 1 Project Site and Ambient Noise Measurement Locations

Source: Google Earth, 2020.

TABLE 5 Noise Levels Generated by Existing On-Site Graniterock Equipment and Processes

Existing Graniterock Equipment or Activity		Measured Noise Level at Distance from Source			Noise Level Normalized to 100 ft.
		Distance 1	Distance 2	Distance 3	
Crushing		76 to 77 dBA at 80 feet	70 to 74 dBA at 135 feet		73 to 75 dBA
Backhoe Scooping/Dumping Rock		78 to 81 dBA at 60 feet	77 dBA at 99 feet	72 to 74 dBA at 126 feet	74 to 77 dBA
Loader Scooping/Dumping Rock		80 to 87 dBA 35 feet	80 to 83 dBA at 60 feet	70 to 76 dBA at 120 feet	71 to 78 dBA
Loader Maneuvering		76 to 84 dBA at 30 feet	80 to 83 dBA at 60 feet	77 to 78 dBA at 98 feet	66 to 78 dBA
Rock Fall Pile		70 dBA at 50 feet			64 dBA
Rail Unloading	Dump	72 to 85 dBA at 35 feet			63 to 76 dBA
	Scraping Gravel	80 to 83 dBA at 35 feet			71 to 74 dBA
	Closing Hoppers	80 to 85 dBA at 35 feet			71 to 76 dBA
	Cable Pull	72 to 74 dBA at 35 feet			63 to 65 dBA
	Conveyor	69 to 71 dBA at 55 feet			64 to 66 dBA

NOISE IMPACTS AND MITIGATION MEASURES

This section describes the significance criteria used to evaluate project impacts under CEQA, provides a discussion of each project impact, and presents mitigation measures, where necessary, to provide a compatible project in relation to adjacent noise sources and land uses.

Significance Criteria

The following criteria were used to evaluate the significance of environmental noise resulting from the project:

1. **Temporary or Permanent Noise Increases in Excess of Established Standards.** A significant noise impact would be identified if the project would generate a substantial temporary or permanent noise level increase over ambient noise levels at existing noise-sensitive receptors surrounding the project site and that would exceed applicable noise standards presented in the General Plan at existing noise-sensitive receptors surrounding the project site.

    a) Temporary Noise Increase. A significant noise impact would be identified if construction-related noise would temporarily increase ambient noise levels at

sensitive receptors. The City of San José considers large or complex projects involving substantial noise-generating activities and lasting more than 12 months significant when within 500 feet of residential land uses or within 200 feet of commercial land uses or offices.

b) Permanent Noise Increase. A significant permanent noise level increase would occur if project-generated traffic would result in: a) a noise level increase of 5 dBA DNL or greater, with a future noise level of less than 60 dBA DNL, or b) a noise level increase of 3 dBA DNL or greater, with a future noise level of 60 dBA DNL or greater.

c) Operational Noise in Excess of Standards. A significant noise impact would be identified if the project would expose persons to or generate noise levels that would exceed applicable noise standards presented in the General Plan.

2. **Generation of Excessive Groundborne Vibration.** A significant impact would be identified if the construction of the project would generate excessive vibration levels surrounding receptors. For sensitive historic structures, including ruins and ancient monuments or buildings that are documented to be structurally weakened, a continuous vibration limit of 0.08 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage to a building. A continuous vibration limit of 0.20 in/sec PPV will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction.

Impact 1a: **Temporary Construction Noise.** Existing noise-sensitive land uses in the project vicinity would not be exposed to a substantial temporary increase in ambient noise levels due to project construction activities. **This is a less-than significant impact.**

Policy EC-1.7 of the City's General Plan requires that all construction operations within the City to use best available noise suppression devices and techniques and to limit construction hours near residential uses per the Municipal Code allowable hours, which are between the hours of 7:00 am and 7:00 pm Monday through Friday when construction occurs within 500 feet of a residential land use. Further, the City considers significant construction noise impacts to occur if a project located within 500 feet of residential uses or 200 feet of commercial or office uses would involve substantial noise-generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) continuing for more than 12 months.

Construction noise varies greatly depending on the construction activity performed, type and specific model of equipment, and the condition of equipment used. Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, the distance between construction noise sources and noise-sensitive receptors, any shielding provided by intervening structures or terrain, and ambient noise levels. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (early morning, evening, or nighttime hours), when construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction durations last over extended periods of time.

TABLE 6 Construction Equipment 50-foot Noise Emission Levels (dBA)

Equipment Category	$L_{eq}^{1,2}$	L_{max}^{1}	Equipment Category	$L_{eq}^{1,2}$	L_{max}^{1}
Air Hose	93	100	Horizontal Bore Drill	87	88
Air-Operated Post Driver	83	85	Impact Pile Driver	99	105
Asphalt Distributor Truck (Asphalt Sprayer)	-	70	Impact Wrench	68	72
Auger Drill	88	101	Jackhammer	91	95
Backhoe	76	84	Jig Saw	92	95
Bar Bender	66	75	Joint Sealer	-	74
Blasting (Abrasive)	100	103	Man Lift	72	73
Blasting (Explosive)	83	93	Movement Alarm	79	80
Chainsaw	79	83	Mud Recycler	73	74
Chip Spreader	-	77	Nail Gun	70	74
Chipping Gun	95	100	Pavement Scarifier (Milling Machine)	-	84
Circular Saw	73	76	Paving – Asphalt (Paver, Dump Truck)	-	82
Compactor (Plate)	-	75	Paving – Asphalt (Paver, MTV, Dump Truck)	-	83
Compactor (Roller)	82	83	Paving – Concrete (Placer, Slipform Paver)	87	91
Compressor	66	67	Paving – Concrete (Texturing/Curing Machine)	73	74
Concrete Batch Plant	87	90	Paving – Concrete (Triple Roller Tube Paver)	85	88
Concrete Grinder	-	97	Power Unit (Power Pack)	81	82
Concrete Mixer Truck	81	82	Pump	73	74
Concrete Pump Truck	84	88	Reciprocating Saw	64	66
Concrete Saw	85	88	Rivet Buster	100	107
Crane	74	76	Rock Drill	92	95
Directional Drill Rig	68	80	Rumble Strip Grinding	-	87
Dozer	90	96	Sander	65	68
Drum Mixer	66	71	Scraper	-	92
Dump Truck (Cyclical)	82	92	Shot Crete Pump/Spray	78	87
Dump Truck (Passby)	-	73	Street Sweeper	-	81
Excavator	76	87	Telescopic Handler (Forklift)	-	88
Flatbed Truck	-	74	Vacuum Excavator (Vac-Truck)	86	87
Front End Loader (Cyclical)	72	81	Ventilation Fan	62	63
Front End Loader (Passby)	-	71	Vibratory Concrete Consolidator	78	80
Generator	67	68	Vibratory Pile Driver	99	105
Grader (Passby)	-	79	Warning Horn (Air Horn)	94	99
Grinder	68	71	Water Spray Truck	-	72
Hammer Drill	72	75	Welding Machine	71	72
Hoe Ram	92	99			

Notes: 1 Noise levels apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.
2 Noise levels of mobile equipment vary as the proximity of the equipment changes. Therefore, only maximum instantaneous noise levels (L_{max}) are provided.
Source: Project 25-49 Data, National Cooperative Highway Research Program, October 2018.

Expected noise levels originating from project construction were calculated based on data used in the Federal Highway Administration's Roadway Construction Noise Model (RCNM) Version 2.0. Typical noise levels for different construction equipment at a distance of 50 feet are shown in Table 6. Table 7 shows project specific construction noise levels calculated based on construction equipment lists provided for each phase of construction at a distance of 250 feet. This distance represents the nearest noise sensitive receptor to the site. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor. Shielding by buildings or terrain can provide an additional 5 to 10 dBA noise reduction at distant receptors.

TABLE 7 Calculated Construction Noise Levels for Each Stage of Construction

Construction Phase		At Distance of 250 ft.	
		L_{eq}, dBA	L_{max}, dBA
Phase 1 (No Rail)	Demolition (20 days)	71	79
	Site Preparation (10 days)	71	77
	Grading & Excavation (30 days)	78	83
	Trenching & Foundation (30 days)	66	75
	Building – Exterior (300 days)	76	80
	Paving (20 days)	68	74
	Pile Driving for Storage Silos	85	91
Phase 1 Rail Spur	Demolition (20 days)	63	70
	Site Preparation (3 days)	69	75
	Grading & Excavation (6 days)	75	80
	Building – Exterior (220 days)	71	76
Phase 2 Concrete Plant	Demolition (20 days)	73	78
	Site Preparation (3 days)	68	75
	Grading & Excavation (6 days)	75	80
	Trenching & Foundation (10 days)	65	75
	Building – Exterior (220 days)	74	79
	Paving (10 days)	72	75
Phase 3 Asphalt Plant	Demolition (20 days)	73	78
	Site Preparation (3 days)	67	74
	Grading & Excavation (6 days)	69	77
	Trenching & Foundation (10 days)	65	75
	Building – Exterior (220 days)	74	79
	Paving (10 days)	70	74

As described in the Setting Section of the report, daytime noise levels range from 69 to 78 dBA L_{eq} at the closest noise sensitive residences, located about 250 feet north of the site across Monterey Road. These residences are as close as 550 feet from the location of the proposed aggregate terminal, 700 feet from the location of the proposed concrete plant, and 780 feet from the location of the proposed asphalt plant. Pile driving, which would be used to construct silo foundations, would generate noise levels as high as 78 dBA L_{eq} at these residences. Noise levels during construction of the rail line located adjacent to the northern property line would result in noise levels as high as 66 to 76 dBA L_{eq} at these residences, similar to existing ambient daytime levels generated by vehicular traffic. Construction noise levels are anticipated to range from 56 to 65 dBA L_{eq} during construction of the concrete plant and from 55 to 64 dBA L_{eq} during construction

of the asphalt plant. These noise levels would be below existing ambient daytime noise levels at these residences.

Daytime noise levels at residences to the south along Snell Avenue range from 63 to 74 dBA L_{eq}. These residences are as close as 1,500 feet from the center of the project site, 675 feet from the closest segment of the proposed rail spur, 1,750 feet from the location of the proposed aggregate terminal, 1,600 feet from the location of the proposed concrete plant, and 1,550 feet from the location of the proposed asphalt plant. Pile driving would result in noise levels of about 67 dBA L_{eq} at these residences, similar to existing ambient daytime levels. Rail spur construction would generate noise levels of 56 to 66 dBA L_{eq} when located closest to residences and 50 to 60 dBA L_{eq} when located in the northeastern portion of the spur line. Noise levels during other phases of construction would range from 48 to 61 dBA L_{eq}. Construction noise levels would be similar to or below levels generated by daytime ambient noise levels generated by vehicular traffic along Snell Avenue.

The Communications Hill development site is exposed to ambient daytime noise levels ranging from 50 to 68 dBA L_{eq}. These residences are as close as 1,300 feet from the property line of the site, 1,900 feet from the center of the project site, 1,650 feet from the location of the proposed aggregate terminal, 1,700 feet from the location of the proposed concrete plant, and 1,750 feet from the location of the proposed asphalt plant. Pile driving would result in noise levels of about 68 dBA L_{eq} at these residences, similar to existing loudest hour ambient daytime levels. Noise levels during other phases of construction would range from 48 to 61 dBA L_{eq}. Construction noise levels would be similar to or below levels generated by daytime ambient noise levels.

Construction noise levels would be similar in level or below ambient noise levels at surrounding noise sensitive locations. Although the overall construction period is anticipated to exceed 12 months, construction would not occur within 500 feet of a residential land use during the majority of this period.

The following standard noise control measures are assumed to be implemented with the project in accordance with General Plan Policy EC-1.7:

- Construction shall be limited to the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday for any on-site or off-site work within 500 feet of any residential unit. Construction outside of these hours may be approved through a development permit based on a site-specific "construction noise mitigation plan" and a finding by the Director of Planning, Building and Code Enforcement that the construction noise mitigation plan is adequate to prevent noise disturbance of affected residential uses.

- The contractor shall use "new technology" power construction equipment with state-of-the-art noise shielding and muffling devices. All internal combustion engines used on the project site shall be equipped with adequate mufflers and shall be in good mechanical condition to minimize noise created by faulty or poorly maintained engines or other components.

- The unnecessary idling of internal combustion engines shall be prohibited.

- Staging areas and stationary noise-generating equipment shall be located as far as possible from noise-sensitive receptors such as residential uses.

- The surrounding neighborhoods shall be notified early and frequently of the construction activities.

- A "noise disturbance coordinator" shall be designated to respond to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints (e.g., beginning work too early, bad muffler, etc.) and institute reasonable measures warranted to correct the problem. A telephone number for the disturbance coordinator would be conspicuously posted at the construction site.

With inclusion of GP Policy EC-1.7, the temporary construction noise impact would be **less-than-significant**.

Mitigation Measure 1a: None required.

Impact 1b: Permanent Noise Level Increase. The proposed project would not result in a permanent noise level increase at existing noise sensitive land uses in the project vicinity due to project-generated traffic. **This is a less-than-significant impact.**

A significant impact would result if traffic generated by the project would substantially increase noise levels at sensitive receptors in the vicinity. A substantial increase would occur if: a) the noise level increase is 5 dBA DNL or greater, with a future noise level of less than 60 dBA DNL, or b) the noise level increase is 3 dBA DNL or greater, with a future noise level of 60 dBA DNL or greater. The existing noise environment in the surrounding area would exceed 60 dBA DNL; therefore, a significant impact would occur if project-generated traffic would permanently increase noise levels by 3 dBA DNL. For reference, a 3 dBA DNL noise increase would be expected if the project would double existing traffic volumes along a roadway.

Operations of the expanded facility would occur 24 hours per day, seven days per week, but most activities will continue to be concentrated during Monday through Friday 6:00 a.m. to 8:00 p.m. (refer to Table 8, below). The existing site operations are completed by 28 full-time employees in four shifts, with the majority of the employees (23 employees) working a 12-hour shift staggered between 6:00 am and 8:00 pm. The number of employees is proposed to increase from the current 28 employees to 92 employees as part of the expanded and new site operations. The number of trucks associated with the expanded facility will increase from the current 323 daily trucks to 658 daily trucks. In addition, the existing rail spur will be extended from a 25 rail car spur track to accommodate up to 70 rail cars.

The proposed expansion is anticipated to result in an increase of 780 daily trips with 90 new trips (39 inbound and 51 outbound) occurring during the a.m. peak hour and a reduction of 3 trips (0 inbound and -3 outbound) occurring during the p.m. peak hour. All new peak-hour trips would be generated by trucks because employees would generally arrive before and leave after the peak-hours of the facility. Due to the reduction of trips in the p.m. hour, only the a.m. hour was analyzed for this assessment.

Peak hour turning movements were provided for eight study intersections[1]. Existing plus project and Background plus project traffic volumes were compared to existing and background volumes, respectively, to estimate the project's contribution to the traffic noise levels along roadways in the vicinity. Upon comparison of these traffic conditions, traffic noise increases of 3 dBA are anticipated along Granite Rock Way, east of Hillcap Avenue, and 2 dBA along Hillcap Avenue south of Granite Rock Way. Neither of these segments of roadway are adjacent to noise sensitive receptors and, in both cases, traffic noise levels are below noise levels generated by operations at the existing commercial and industrial uses in the area. Traffic noise increases at the remaining study segments are calculated to be less than 1 dBA.

To account for any potential underestimation in traffic noise increase due to project-generated traffic consisting almost entirely of trucks, which generate substantially higher levels of noise than typical automobiles, additional traffic noise modeling was conducted using Federal Highway Administration Traffic Noise Model 2.5 to verify the worst case peak hour traffic noise increase. Through comparison of existing project-generated peak hour volumes and the proposed peak hour volume consisting of 90 additional trucks, the peak hour traffic noise increase would reach up to 2 dBA. This is a **less-than-significant** impact.

Mitigation Measure 1b: None required.

Impact 1c: Noise Levels in Excess of Standards. The proposed would not generate noise in excess of standards established in the City's General Plan at the nearby sensitive receptors. This is a **less-than-significant** noise impact.

Under the City of San José's Noise Element, a substantial noise increase would occur if: a) the noise level increase is 5 dBA DNL or greater, with a future noise level of less than 60 dBA DNL, or b) the noise level increase is 3 dBA DNL or greater, with a future noise level of 60 dBA DNL or greater. The existing noise environment in the surrounding area exceeds 60 dBA DNL; therefore, a significant impact would occur if site operations would permanently increase noise levels by 3 dBA DNL. City of San José General Plan Policy EC-1.3 would not reasonably apply to noise resulting from project operations in the site vicinity, as the 55 dBA DNL criterion used in the Policy is already clearly exceeded under ambient conditions, as evident in the results of the noise measurement survey summarized in the Setting section. Additionally, this policy intends to mitigate new noise generation at the property line when located "adjacent to existing or planned noise-sensitive residential and public/quasi-public land uses." The project is not located adjacent to any residential or public/quasi-public land uses, with the nearest residential use located approximately 250 feet northwest of the site.

Modernization of the Graniterock Capitol Site would construct multiple new facilities on site and lengthen existing rail infrastructure. New noise generating equipment would be introduced to the site and existing operations would be expanded. The proposed asphalt plant, concrete plant, and aggregate terminal would introduce new noise-generating equipment including dust collectors, conveyors, elevators, mixers, and hoppers. The single railcar unloading operation will be expanded

[1] Granite Rock Facility Operations Expansion, Draft Transportation Analysis, Hexagon Transportation Consultants, Inc., December 1, 2020.

to a double railcar unloading system, increasing the unloading rate from 400 to 2,000 tons per hour. Rail spurs internal to the site will be extended to accommodate up to 70 railcars at any time. Railcars will continue to be delivered by UPRR between the hours of 12:00 a.m. and 5:00 a.m., then would be unloaded and moved throughout the site by Graniterock between the hours of 3:00 a.m. and 7:30 p.m. Operations at the site would occur Monday through Friday. Table 8 lists proposed new equipment and noise levels as they would be experienced by workers at the site adjacent to each individual noise source. Note that some equipment will be fully contained within the proposed structures and would generate substantially less exterior noise.

TABLE 8 Noise Levels for Proposed Equipment

Site	Equipment	Number of Units Proposed	Hours of Operation	Noise Level per Unit at Source (L_{eq})
Aggregate Terminal	Rail Unload Hopper	4	3:00 a.m. to 7:30 p.m.	68 dBA
	Truck Return Hopper	2	3:00 a.m. to 7:30 p.m.	52 dBA
	Bucket Elevator	2	3:00 a.m. to 7:30 p.m.	65 dBA
	DCL CFM 660 Dust Collector	2	3:00 a.m. to 7:30 p.m.	82 dBA
	DCL CFM 330 Dust Collector	9	3:00 a.m. to 7:30 p.m.	68 dBA
	Topside Transfer Conveyor	8	6:00 a.m. to 6:00 p.m.	55 dBA
	Transfer Conveyor to Batch Plant	1	6:00 a.m. to 6:00 p.m.	55 dBA
	Transfer Conveyor to Asphalt Plant	1	6:00 a.m. to 6:00 p.m.	55 dBA
	Diesel Locomotive	1	12:00 a.m. to 7:30 p.m.	100 dBA
Concrete Plant	Dust Collector	10	6:00 a.m. to 6:00 p.m.	65 dBA
	Twin Shaft Mixers	3	6:00 a.m. to 6:00 p.m.	107 dBA
	Fiber Dispenser	1	6:00 a.m. to 6:00 p.m.	70 dBA
	Bucket Elevator	2	6:00 a.m. to 6:00 p.m.	70 dBA
Asphalt Plant	Cold Feed Conveyor	1	6:00 a.m. to 6:00 p.m.	50 dBA
	Dryer	1	6:00 a.m. to 6:00 p.m.	95 dBA
	Baghouse and Stack	1	6:00 a.m. to 6:00 p.m.	70 dBA

	Mixer	1	6:00 a.m. to 6:00 p.m.	107 dBA
	Filler System	1	6:00 a.m. to 6:00 p.m.	50 dBA
	Discharge Bins	1	6:00 a.m. to 6:00 p.m.	50 dBA
	Rap System	1	6:00 a.m. to 6:00 p.m.	70 dBA
Cement Terminal	5” Fill Line / Blower	2	6:00 a.m. to 6:00 p.m.	84 dBA
	DCL CFM 660 Dust Collector	2	6:00 a.m. to 6:00 p.m.	82 dBA
	DCL CFM 330 Dust Collector	1	6:00 a.m. to 6:00 p.m.	68 dBA
	Airslide / Blower	3	6:00 a.m. to 6:00 p.m.	84 dBA
	Diesel Locomotive	1	12:00 a.m. to 7:30 p.m.	100 dBA

The nearest noise sensitive uses are residences and a motel located along Monterey Road approximately 250 feet northeast of the northern corner of the site, residences located along Pfeifle Avenue approximately 450 east of the site, residences located along Snell Avenue approximately 675 feet southwest of the site, and residences located on Communications Hill approximately 1,400 feet west of the site. SoundPLAN Version 8.2 was used to calculate noise levels at the nearest noise sensitive locations, considering the geometry and acoustical characteristics of the proposed noise generating equipment and the topography of the area. Calculations conservatively assume continuous operation of all equipment throughout hours of operation at each proposed facility (e.g., all equipment associated with the concrete plant would operate Monday through Friday between the hours of 6:00 a.m. and 6:00 p.m.).

Calculated day-night average noise levels resulting from project operations at the nearest receptors are shown in Table 9, along with existing noise levels either recorded during the measurement survey or calculated from measurement survey noise data. The increase in ambient noise at each sensitive receptor was calculated through comparison of existing noise levels and the project’s calculated contribution. An exposure map of project generated noise is shown in Figure 2.

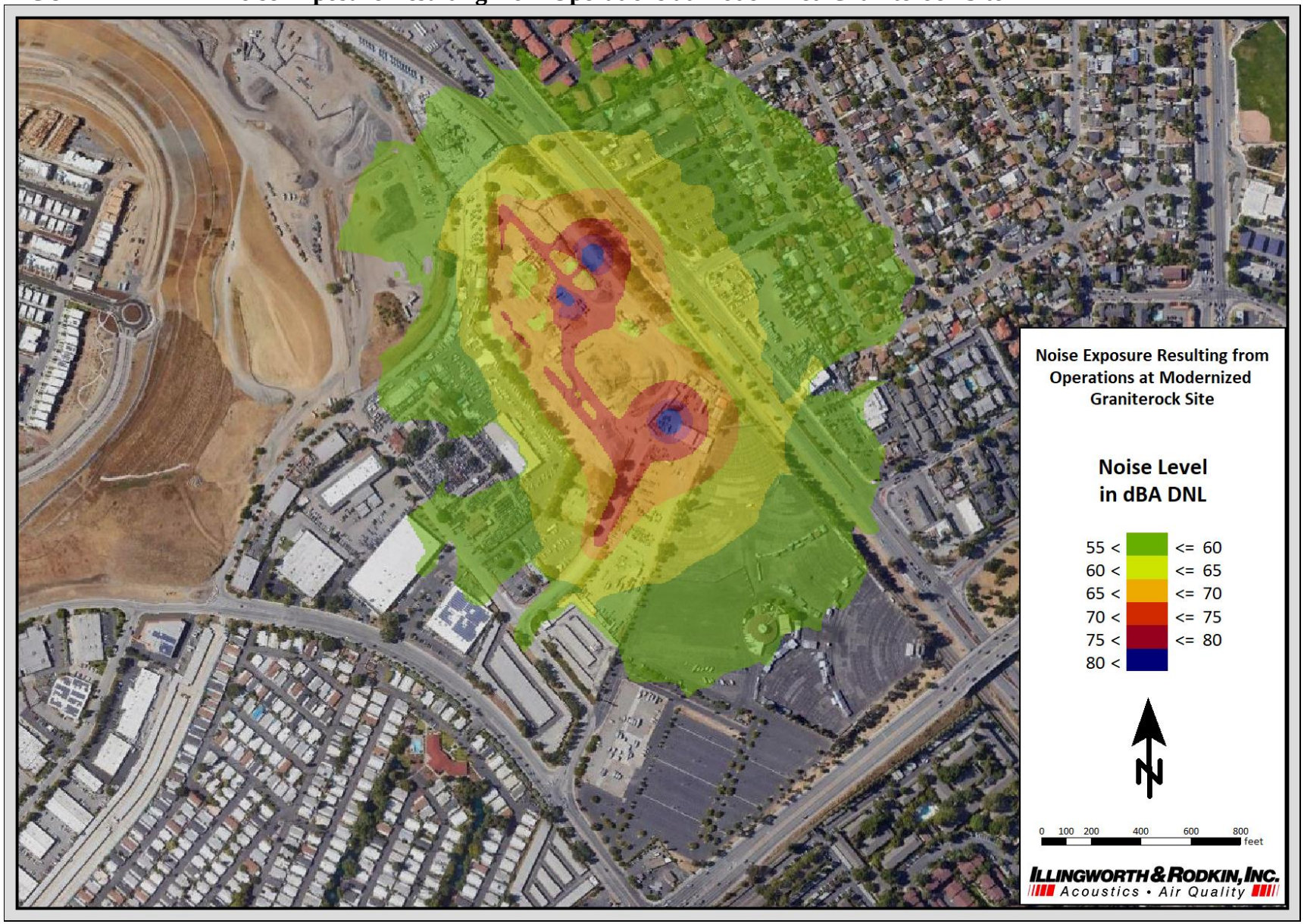
TABLE 9 Project Generated Noise Levels Compared to Existing Noise (dBA DNL)

Receiver	Existing Noise Level	Calculated Noise Resulting from Graniterock Operations	Noise Level Increase	Significance
Clarion Inn	70	60	0	None
Kenbrook Circle Residences	69	55	0	None
Pfeifle Avenue Residences	61	58 to 59	2	None
Snell Avenue Residences	71 to 72	48 to 50	0	None
Communications Hill Residences	60 to 62	45 to 46	0	None
10070 Sylvandale Avenue	63 to 64	55	1	None

As shown in Table 9, existing noise levels at noise sensitive uses in the site vicinity are above 60 dBA DNL. Calculations indicate that the project would result in an increase of 0 to 2 dBA DNL at nearby noise sensitive uses. Additionally, noise sensitive uses in the site vicinity would be subject to future noise increases resulting from increased traffic volumes along roadways in the site vicinity and the planned San José to Merced high speed rail line which would run adjacent to the project site along Monterey Road.[2] This would further diminish the total contribution to the ambient noise level resulting from the project operations.

[2] BuildHSR | California High-Speed Rail Authority, https://buildhsr.com/, Accessed 2/3/2021.

FIGURE 2 Noise Exposure Resulting from Operations at Modernized Graniterock Site



Project generated noise levels would be in compliance with the General Plan noise limits and noise increases at all receptors would be below the appropriate noise threshold used to assess the potential for significant permanent noise impacts. **This is a less-than-significant impact.**

Mitigation Measure 1c: None required.

Impact 2: Exposure to Excessive Groundborne Vibration due to Construction. Construction-related vibration levels are not anticipated to exceed 0.2 in/sec PPV at the nearest buildings of conventional construction. **This is a less than significant impact.**

According to Policy EC-2.3 of the City of San José General Plan, a vibration limit of 0.08 in/sec PPV shall be used to minimize the potential for cosmetic damage to sensitive historical structures, and a vibration limit of 0.2 in/sec PPV shall be used to minimize damage at buildings of normal conventional construction. A review of the City of San José Historic Resource Inventory[3] did not identify any properties of historical significance within 1,000 feet of the site. Therefore, the 0.2 in/sec PPV threshold would apply to all buildings in the site vicinity.

Cosmetic damage (also known as threshold damage) is defined as hairline cracking in plaster, the opening of old cracks, the loosening of paint or the dislodging of loose objects. Minor damage is defined as hairline cracking in masonry or the loosening of plaster. Major structural damage is defined as wide cracking or the shifting of foundation or bearing walls. The vibration limits contained in this policy are conservative and designed to provide the ultimate level of protection for existing buildings in San José.

Construction activities associated with the project would include lengthening the rail spur connection serving the site, constructing new silos and a rail car offloading system, replacing and modernizing the current concrete operation, constructing a new concrete truck washout and reclaiming system, and the construction and installation of additional support facilities. Pile driving, which can cause excessive vibration, will likely be used to construct the foundations of the storage silos.

Table 10 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet and summarizes the vibration levels at distances representative to buildings nearest the property line of the site. Most construction would occur in the central portions of the site, further from structures. Vibration levels are highest close to the source, and then attenuate with increasing distance at the rate of $(D_{ref}/D)^{1.1}$, where D is the distance from the source in feet, and D_{ref} is the reference distance of 25 feet. Vibration levels would vary depending on soil conditions, construction methods, and equipment used.

[3] https://www.sanjoseca.gov/your-government/departments/planning-building-code-enforcement/planning-division/historic-preservation/historic-resources-inventory

TABLE 7 Construction Vibration Levels at Nearby Buildings

Equipment		PPV at 25 ft. (in/sec)	PPV at 100 ft. (in/sec)	PPV at 300 ft. (in/sec)
Pile Driver (Impact)	upper range	1.158	0.252	0.075
	typical	0.644	0.140	0.042
Pile Driver (Sonic)	upper range	0.734	0.160	0.048
	typical	0.170	0.037	0.011
Clam shovel drop		0.202	0.044	0.013
Hydromill (slurry wall)	in soil	0.008	0.002	0.001
	in rock	0.017	0.004	0.001
Vibratory Roller		0.210	0.046	0.014
Hoe Ram		0.089	0.019	0.006
Large bulldozer		0.089	0.019	0.006
Caisson drilling		0.089	0.019	0.006
Loaded trucks		0.076	0.017	0.005
Jackhammer		0.035	0.008	0.002
Small bulldozer		0.003	0.001	0.000

Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006, as modified by Illingworth & Rodkin, Inc., December 2020.

As indicated in Table 10, construction vibration levels could potentially exceed the 0.2 in/sec PPV threshold within 125 feet of impact pile driving, within 80 feet of vibratory pile driving, and within 25 feet of other heavy construction activities. There are no off-site structures located within 125 feet of potential pile driving activities or within 25 feet of other heavy construction. This is a **less-than-significant** impact.

Mitigation Measure 2: None required.

APPENDIX

FIGURE A1

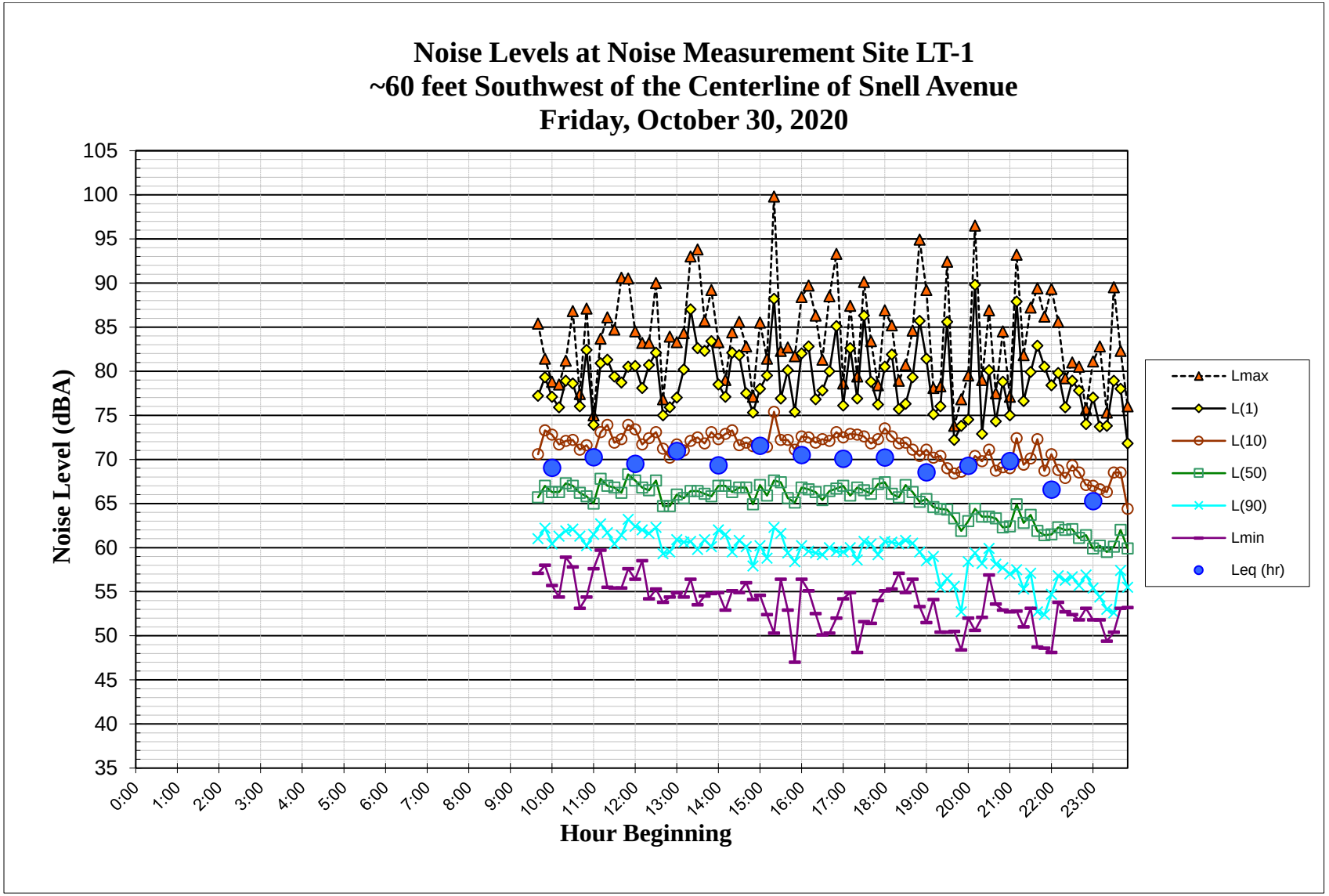


FIGURE A2

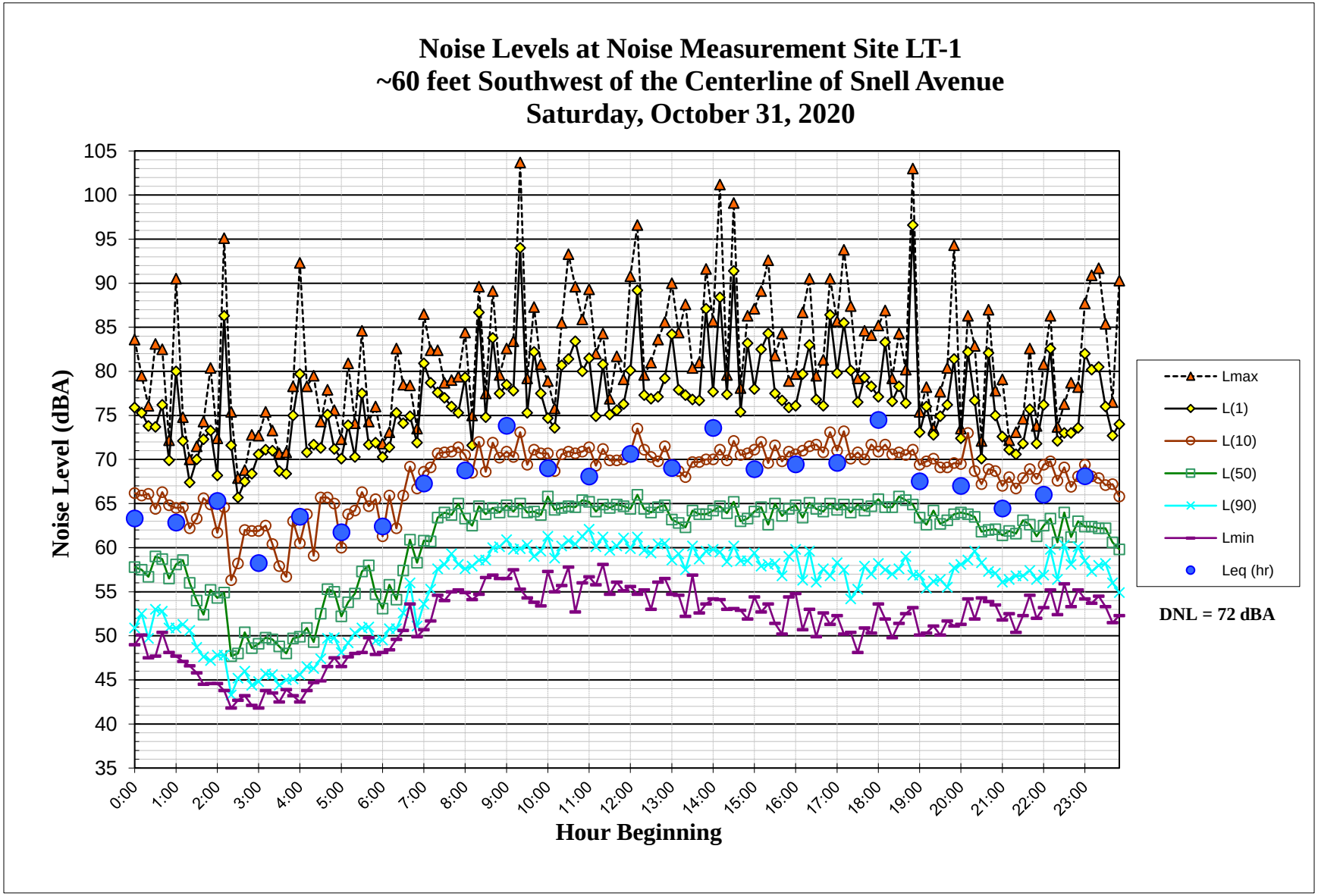

Noise Levels at Noise Measurement Site LT-1
~60 feet Southwest of the Centerline of Snell Avenue
Saturday, October 31, 2020
Noise Level (dBA)
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 72 dBA

FIGURE A3

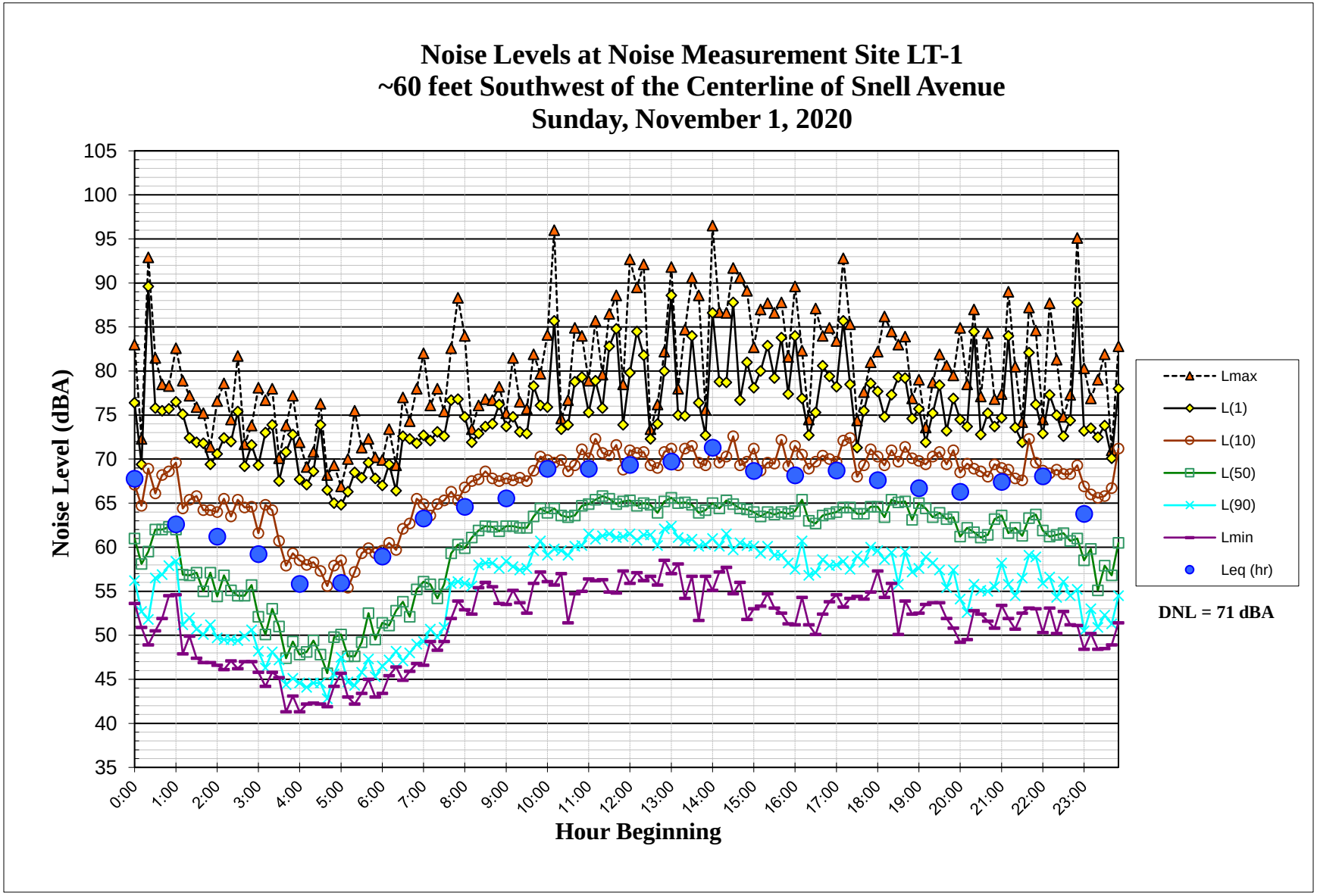

Noise Levels at Noise Measurement Site LT-1
~60 feet Southwest of the Centerline of Snell Avenue
Sunday, November 1, 2020
Noise Level (dBA)
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 71 dBA

FIGURE A4

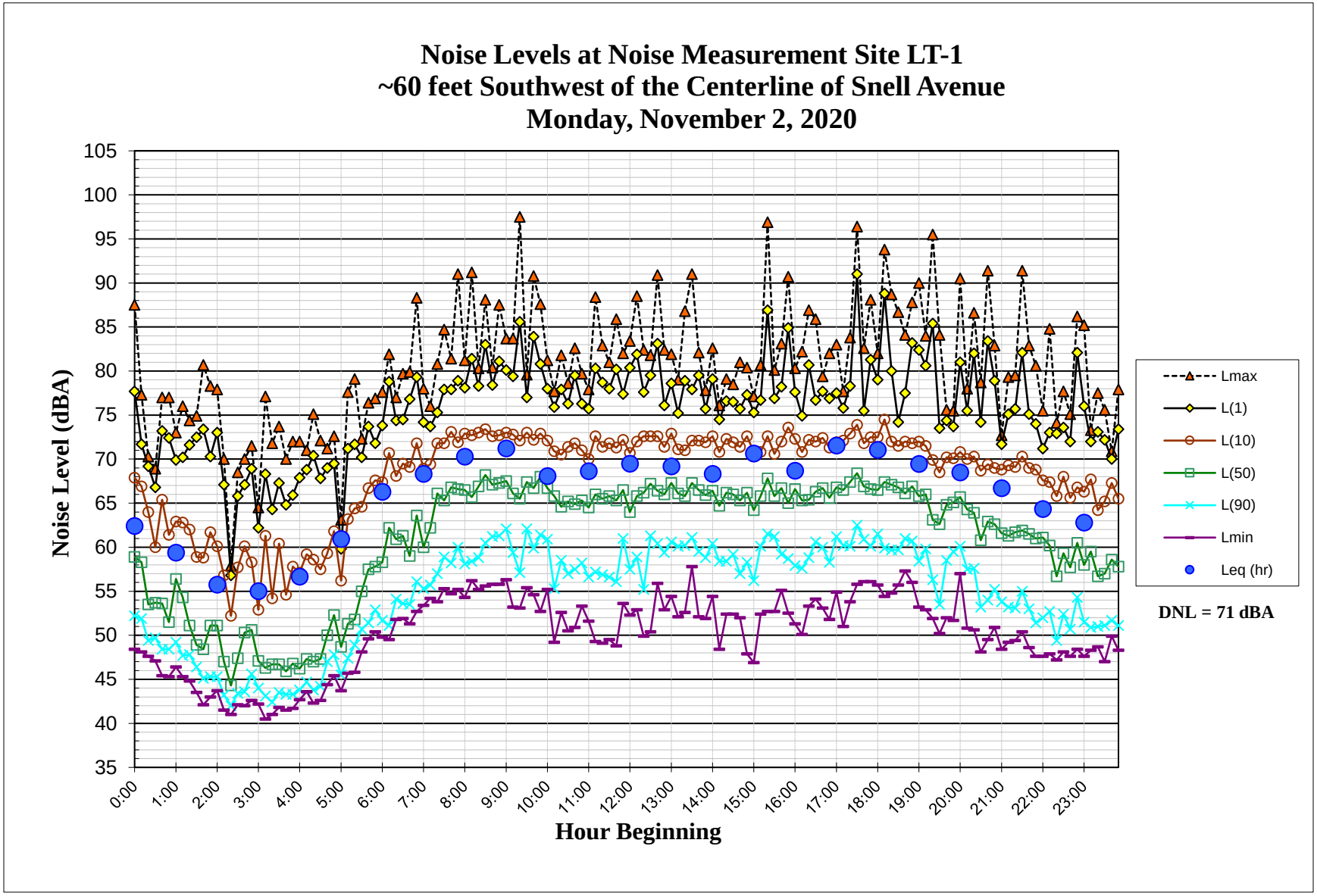

Noise Levels at Noise Measurement Site LT-1
~60 feet Southwest of the Centerline of Snell Avenue
Monday, November 2, 2020
Noise Level (dBA)
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 71 dBA

FIGURE A5

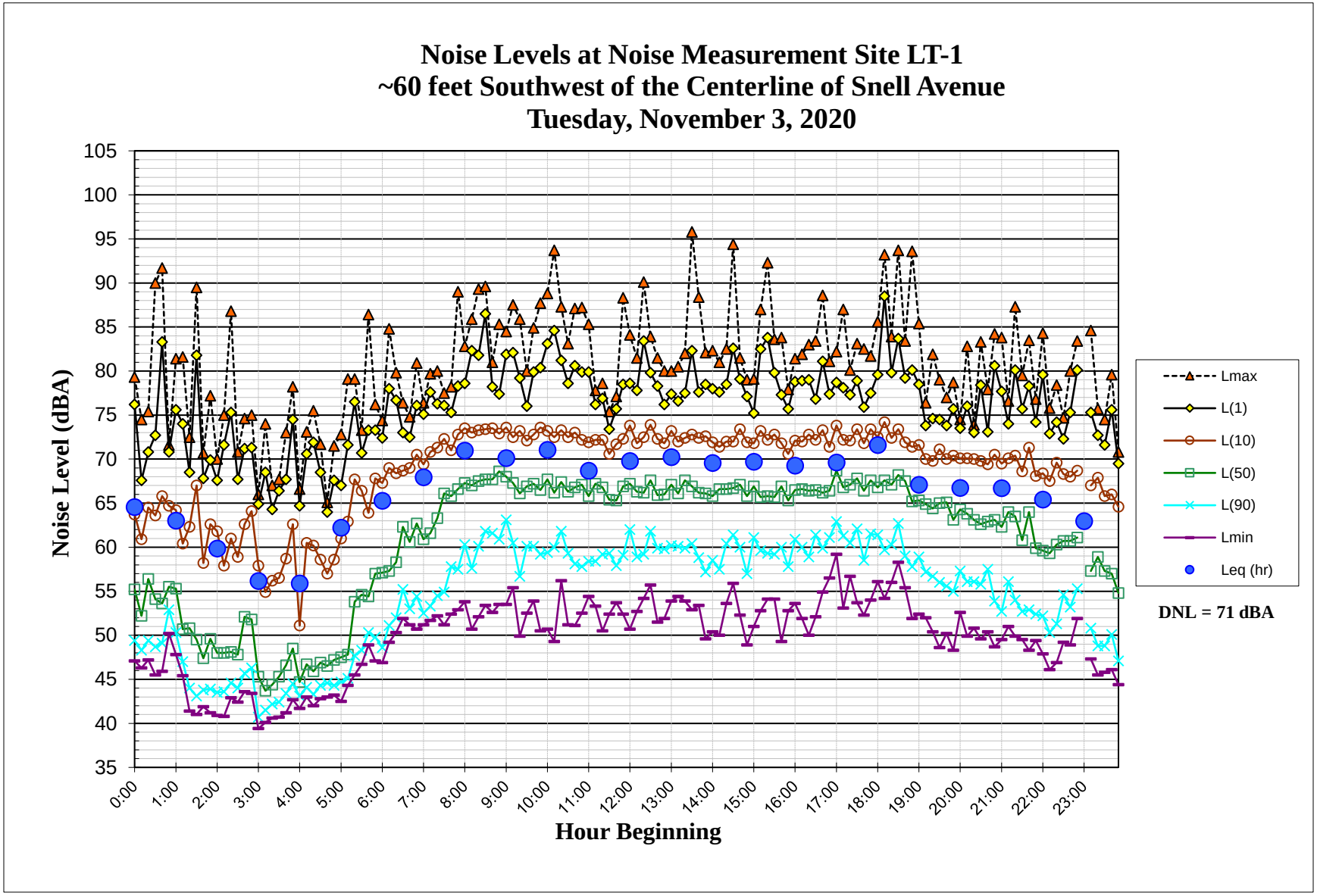

Noise Levels at Noise Measurement Site LT-1
~60 feet Southwest of the Centerline of Snell Avenue
Tuesday, November 3, 2020
Noise Level (dBA)
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 71 dBA

FIGURE A6

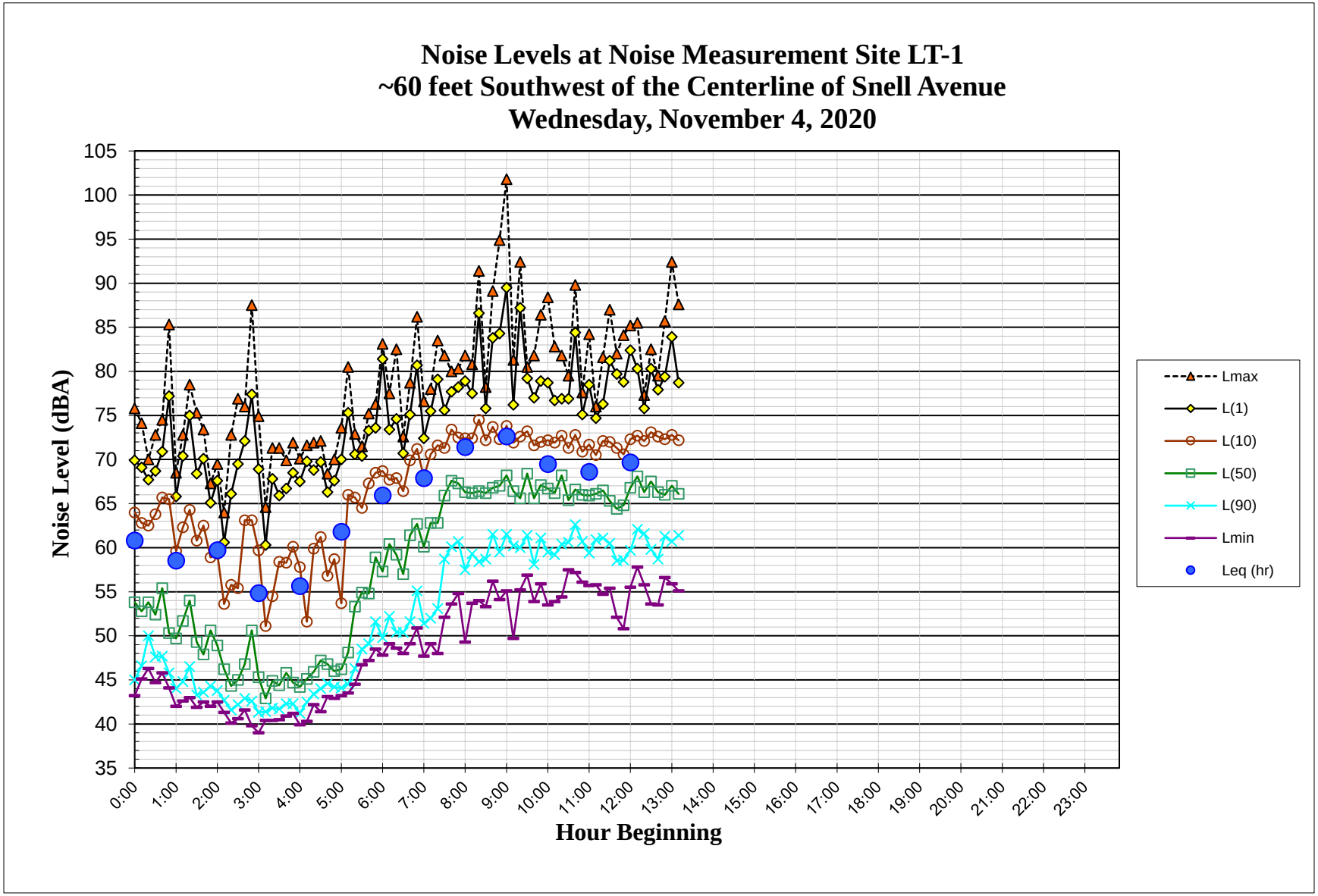

Noise Levels at Noise Measurement Site LT-1
~60 feet Southwest of the Centerline of Snell Avenue
Wednesday, November 4, 2020
Noise Level (dBA)
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)

FIGURE A7

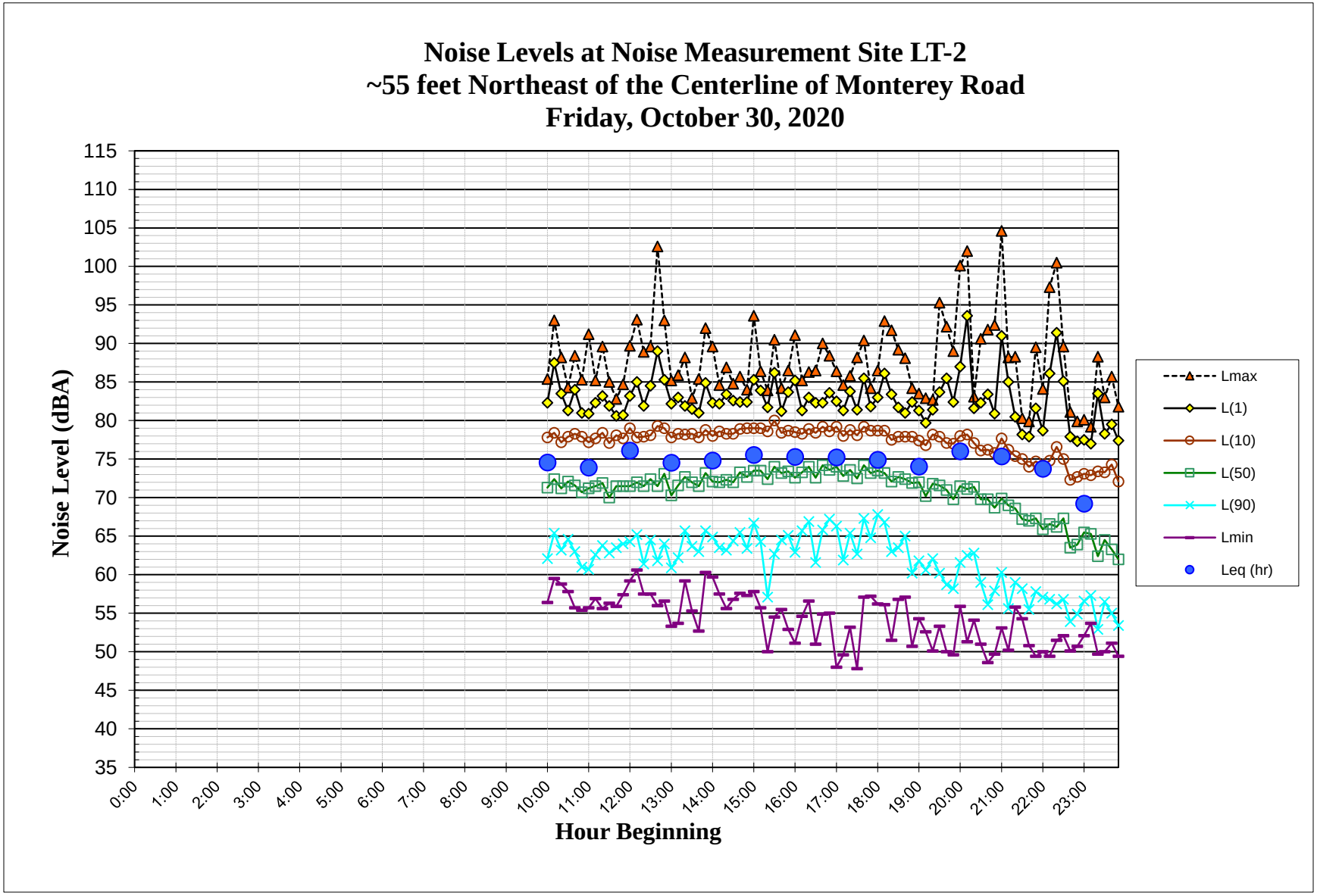

Noise Levels at Noise Measurement Site LT-2
~55 feet Northeast of the Centerline of Monterey Road
Friday, October 30, 2020
Noise Level (dBA)
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)

FIGURE A8

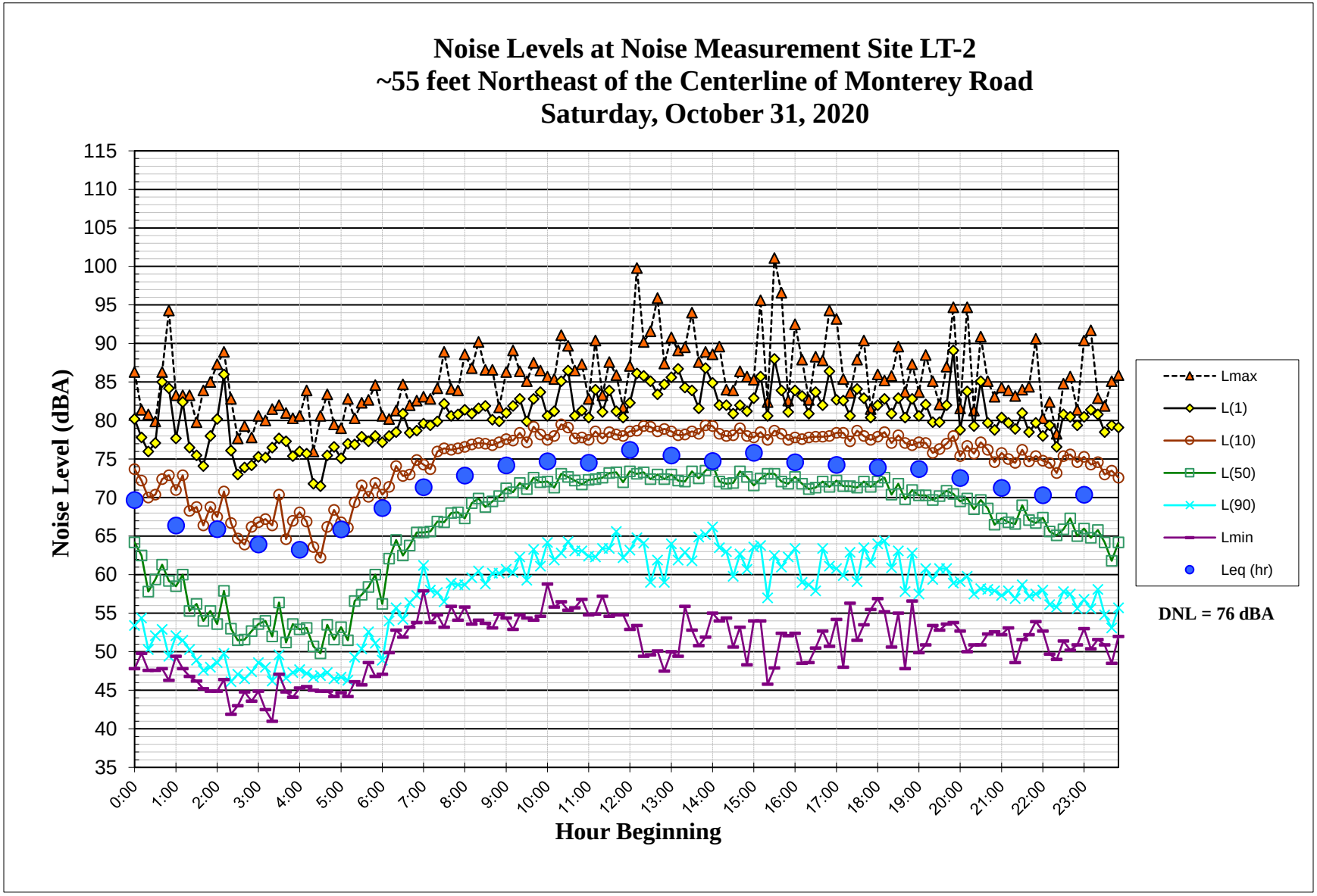

Noise Levels at Noise Measurement Site LT-2
~55 feet Northeast of the Centerline of Monterey Road
Saturday, October 31, 2020
Noise Level (dBA)
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 76 dBA

FIGURE A9

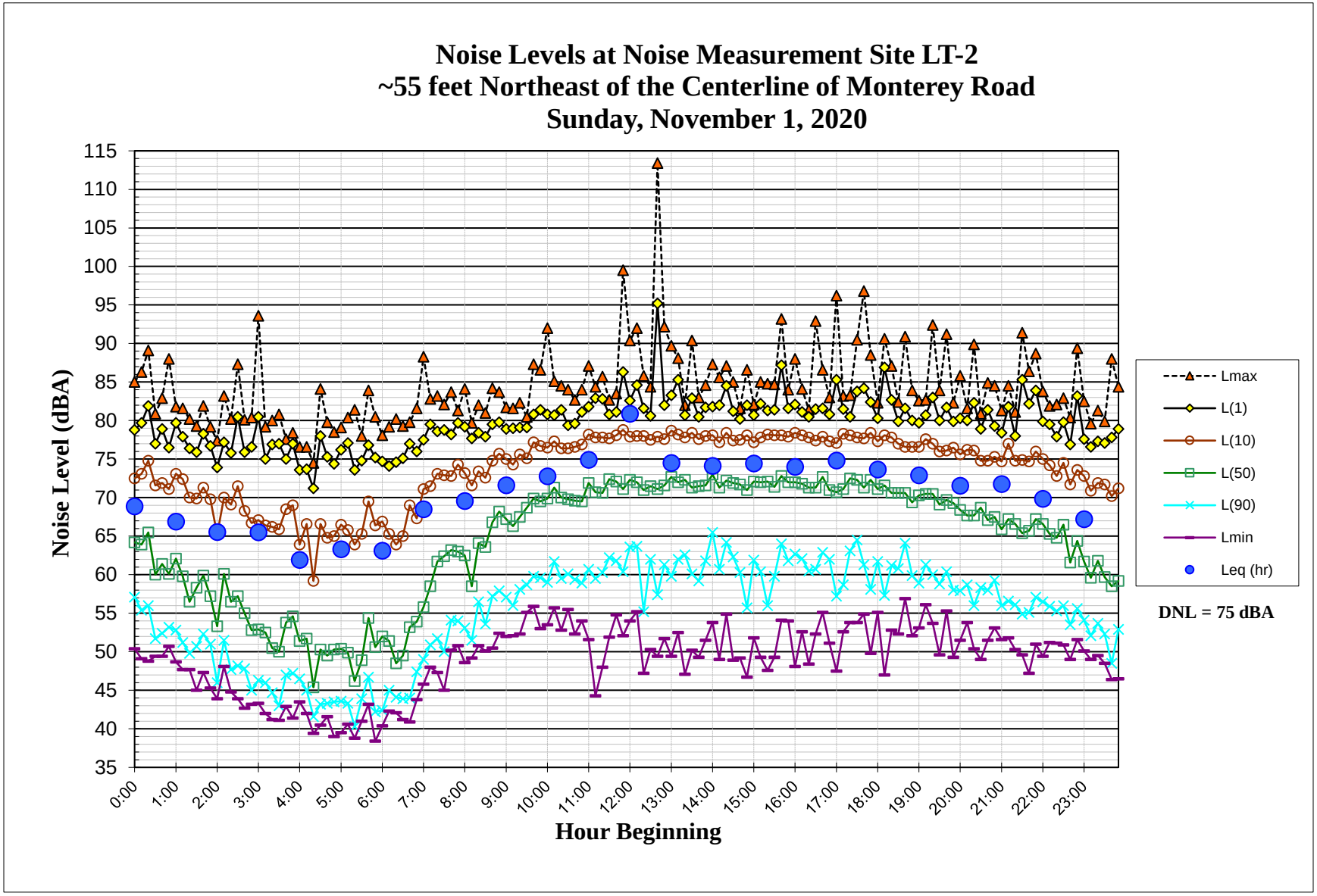

Noise Levels at Noise Measurement Site LT-2
~55 feet Northeast of the Centerline of Monterey Road
Sunday, November 1, 2020
Noise Level (dBA)
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 75 dBA

FIGURE A10

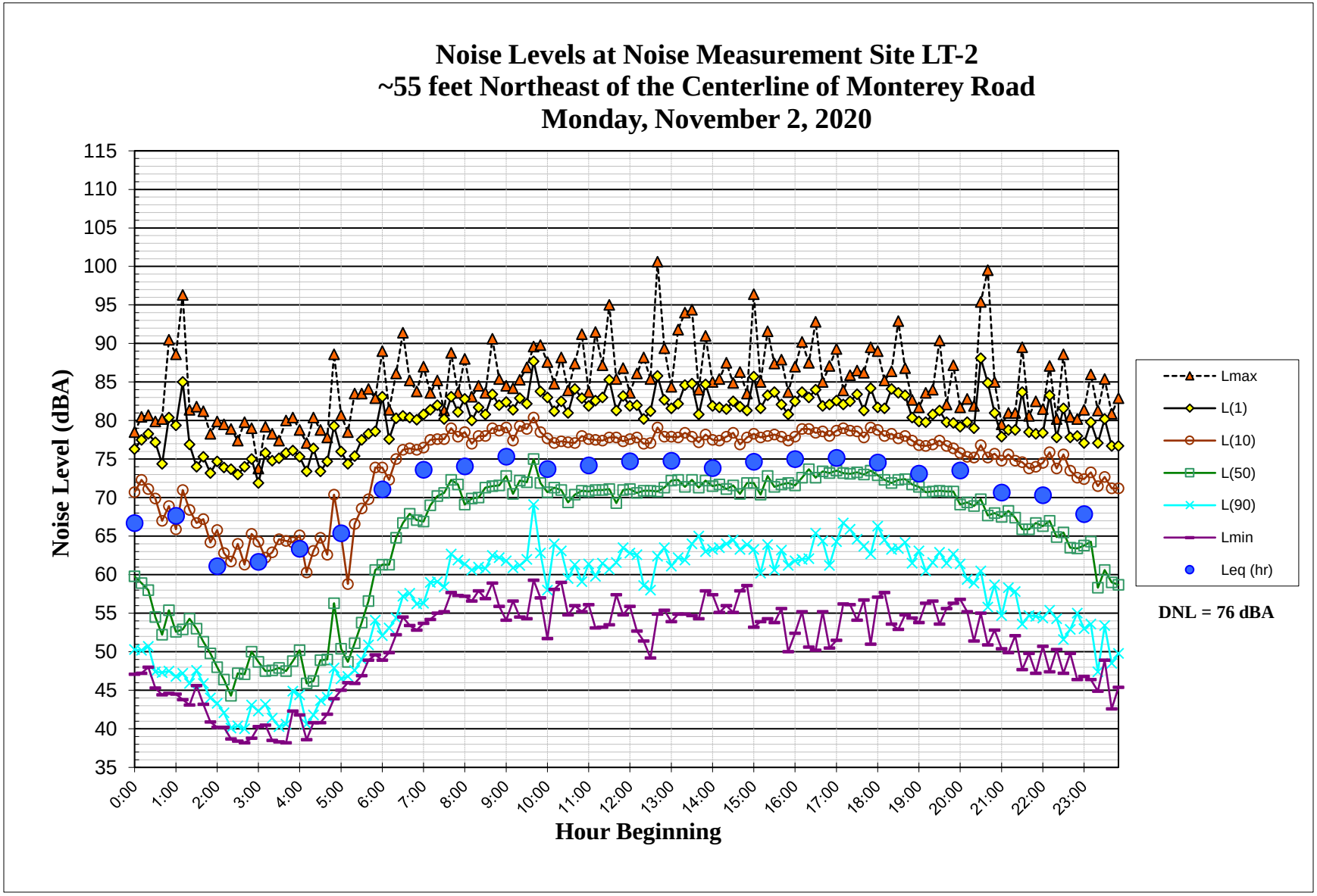

Noise Levels at Noise Measurement Site LT-2
~55 feet Northeast of the Centerline of Monterey Road
Monday, November 2, 2020
Noise Level (dBA)
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 76 dBA

FIGURE A11

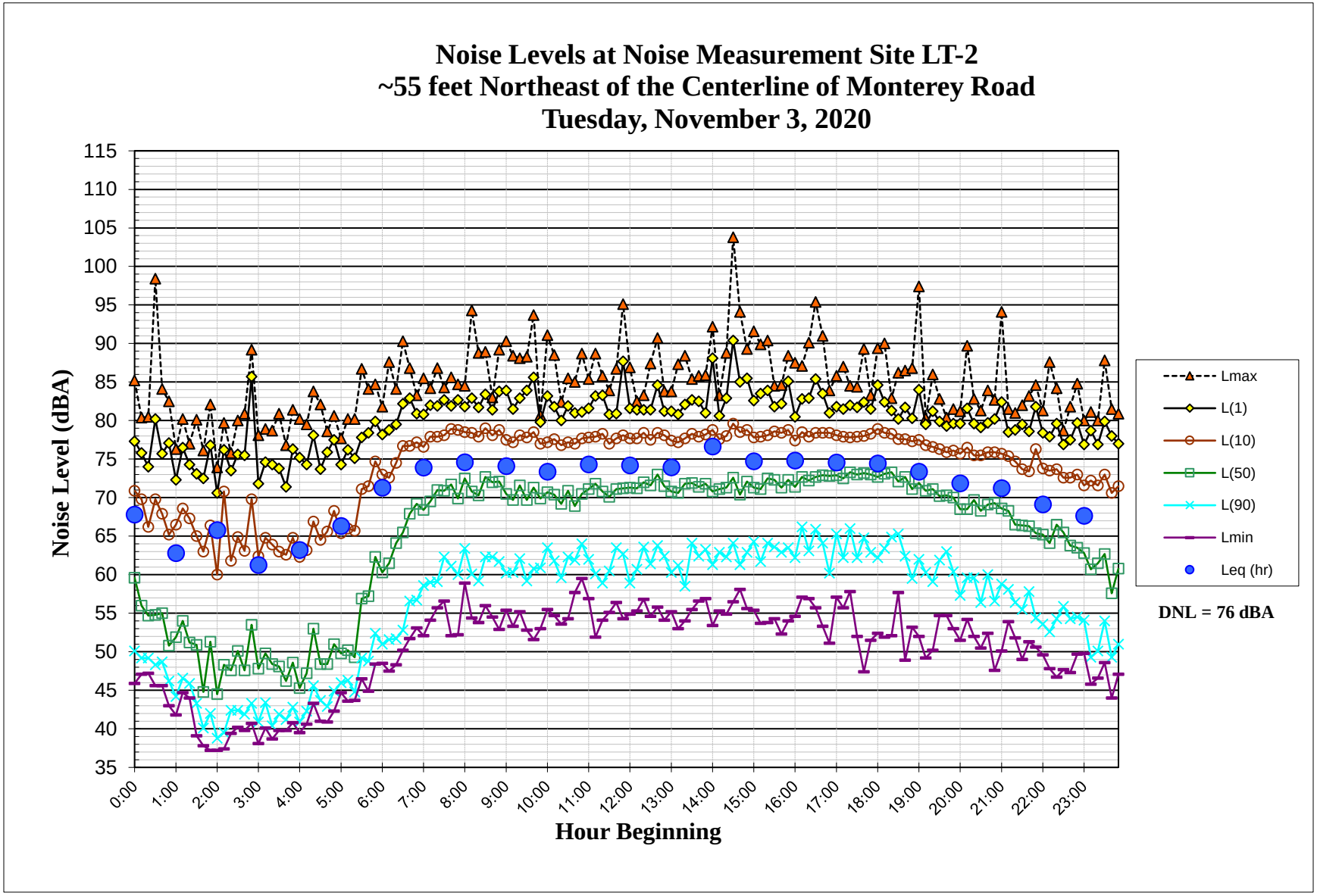

Noise Levels at Noise Measurement Site LT-2
~55 feet Northeast of the Centerline of Monterey Road
Tuesday, November 3, 2020
Noise Level (dBA)
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 76 dBA

FIGURE A12

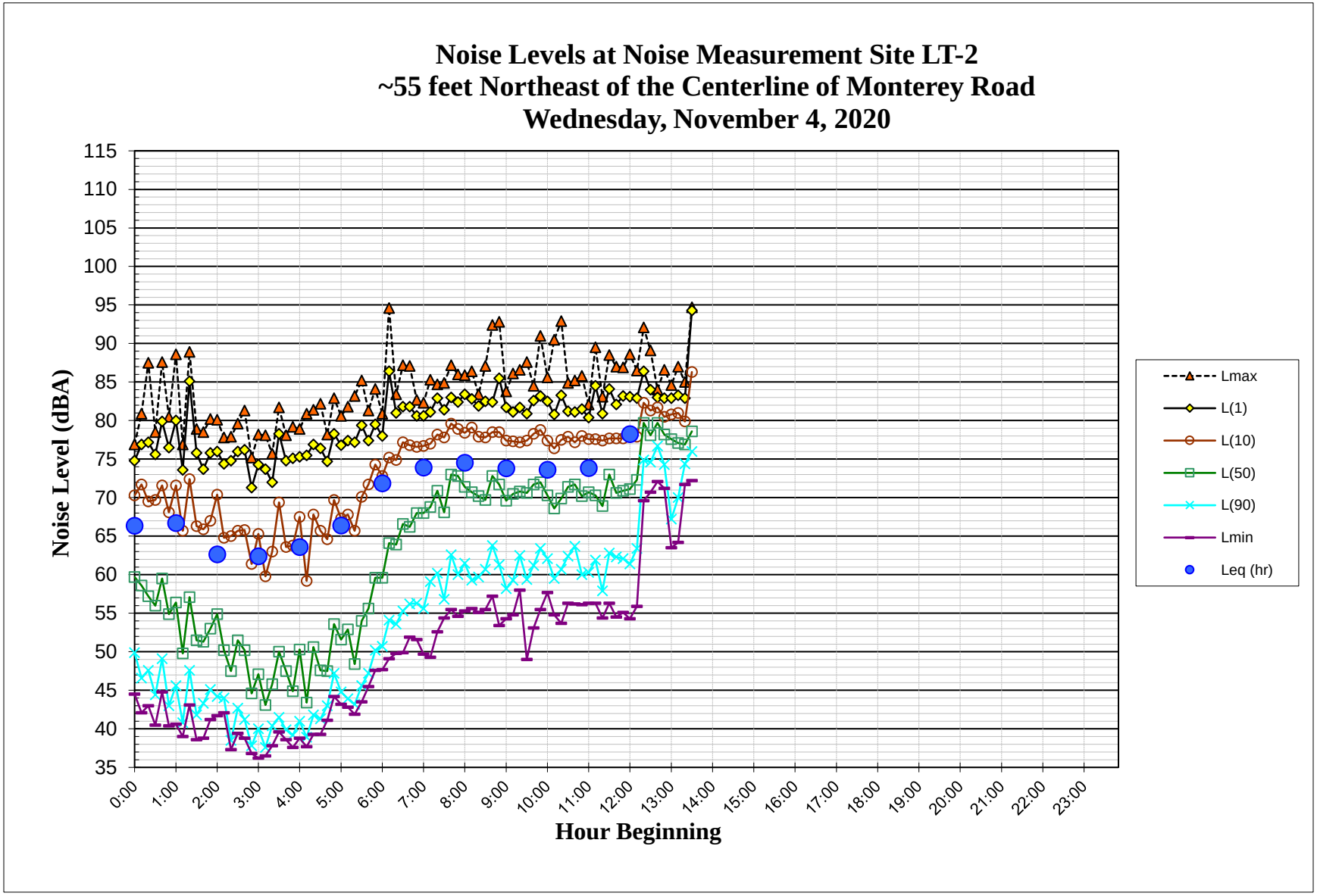

Noise Levels at Noise Measurement Site LT-2
~55 feet Northeast of the Centerline of Monterey Road
Wednesday, November 4, 2020
Noise Level (dBA)
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)

FIGURE A13

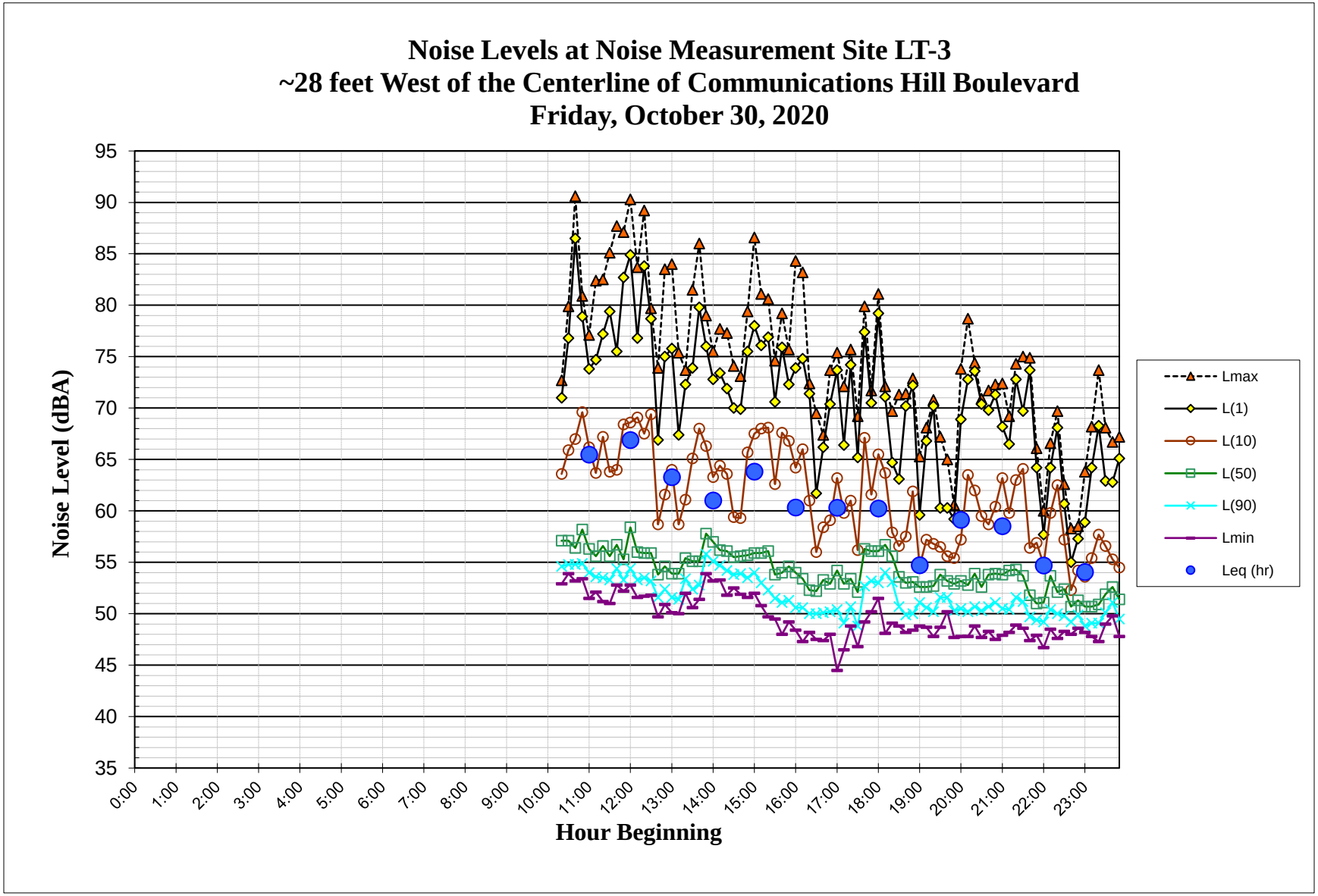

Noise Levels at Noise Measurement Site LT-3
~28 feet West of the Centerline of Communications Hill Boulevard
Friday, October 30, 2020
Noise Level (dBA)
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)

FIGURE A14

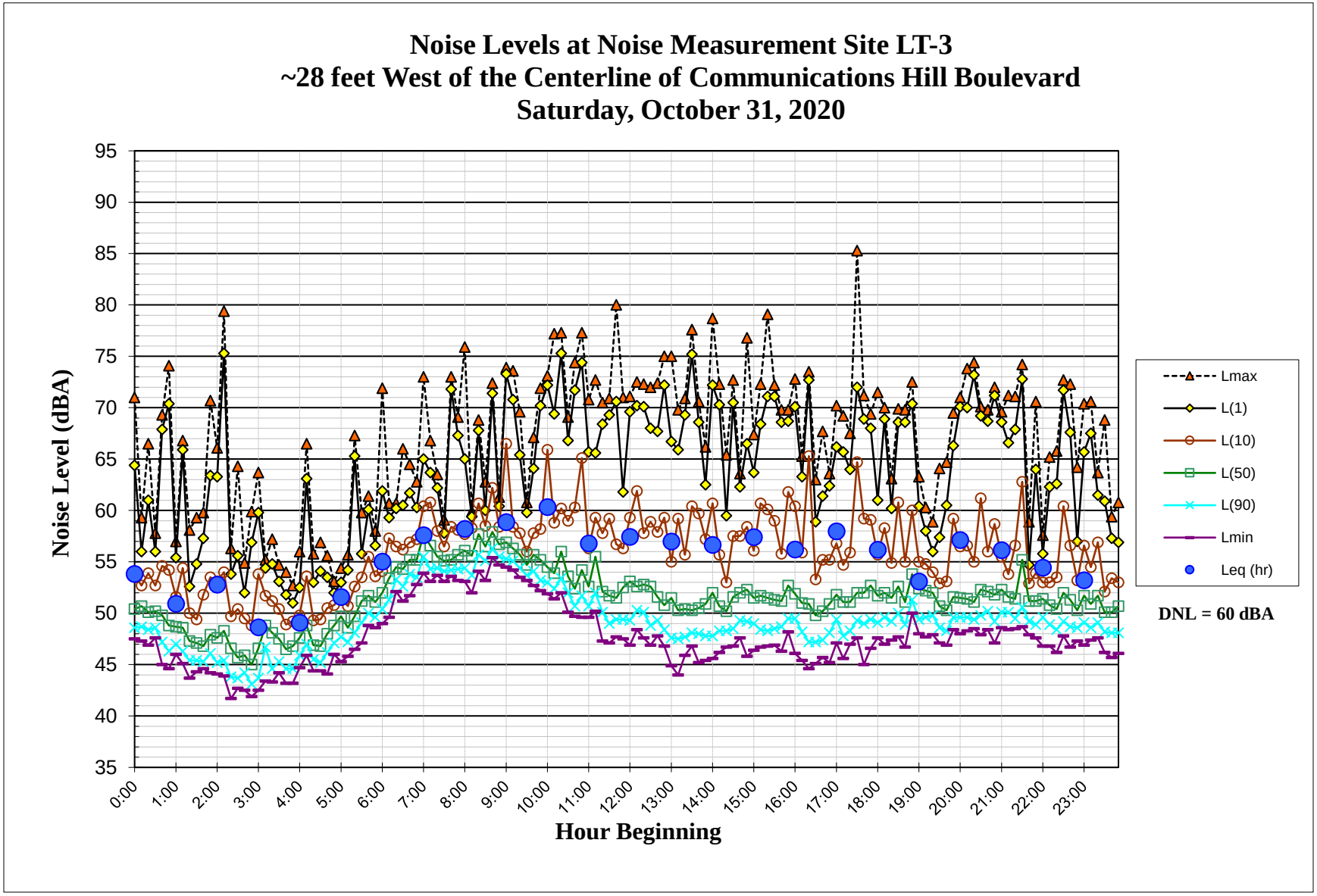

Noise Levels at Noise Measurement Site LT-3
~28 feet West of the Centerline of Communications Hill Boulevard
Saturday, October 31, 2020
Noise Level (dBA)
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 60 dBA

FIGURE A15

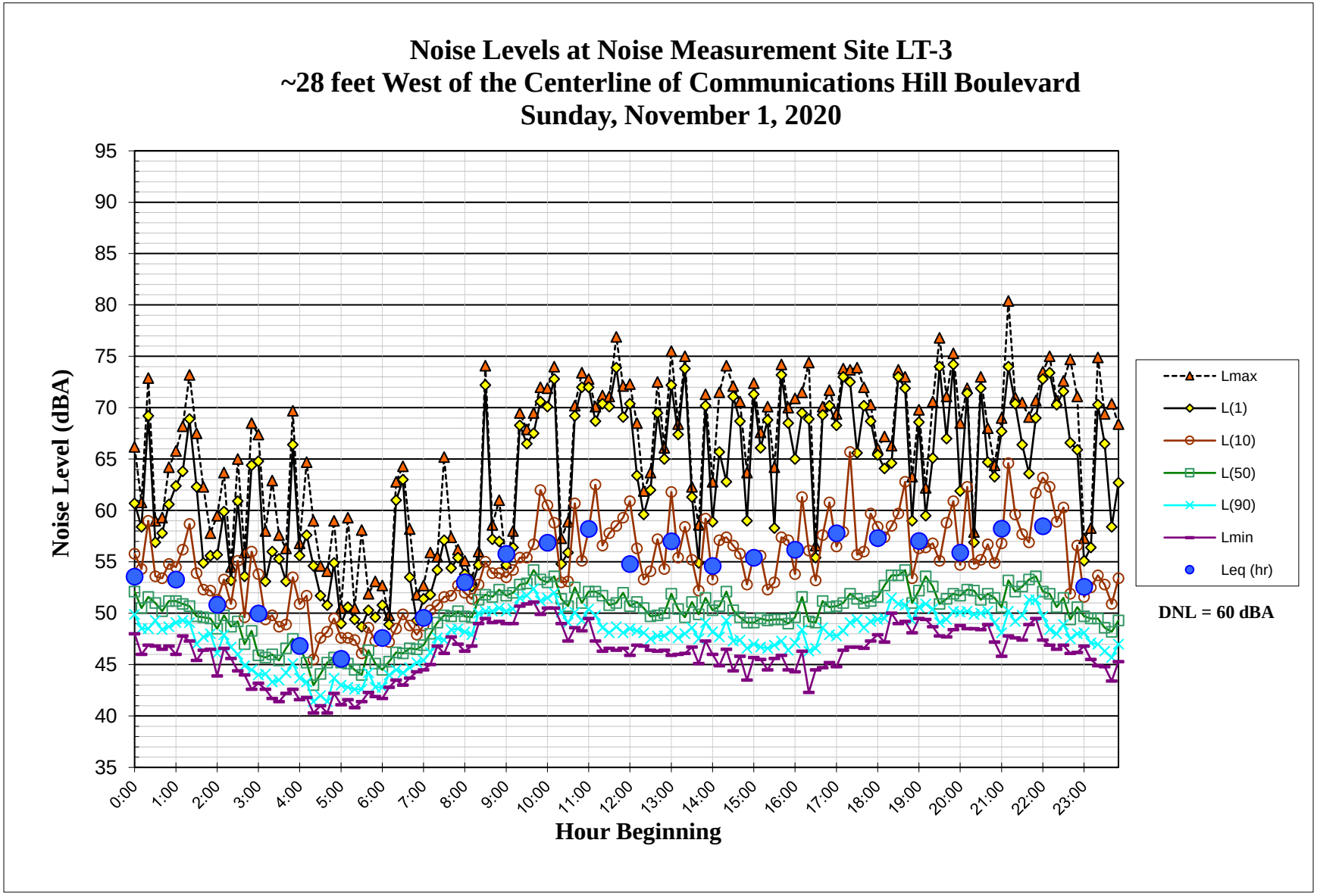

Noise Levels at Noise Measurement Site LT-3
~28 feet West of the Centerline of Communications Hill Boulevard
Sunday, November 1, 2020
Noise Level (dBA)
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 60 dBA

FIGURE A16

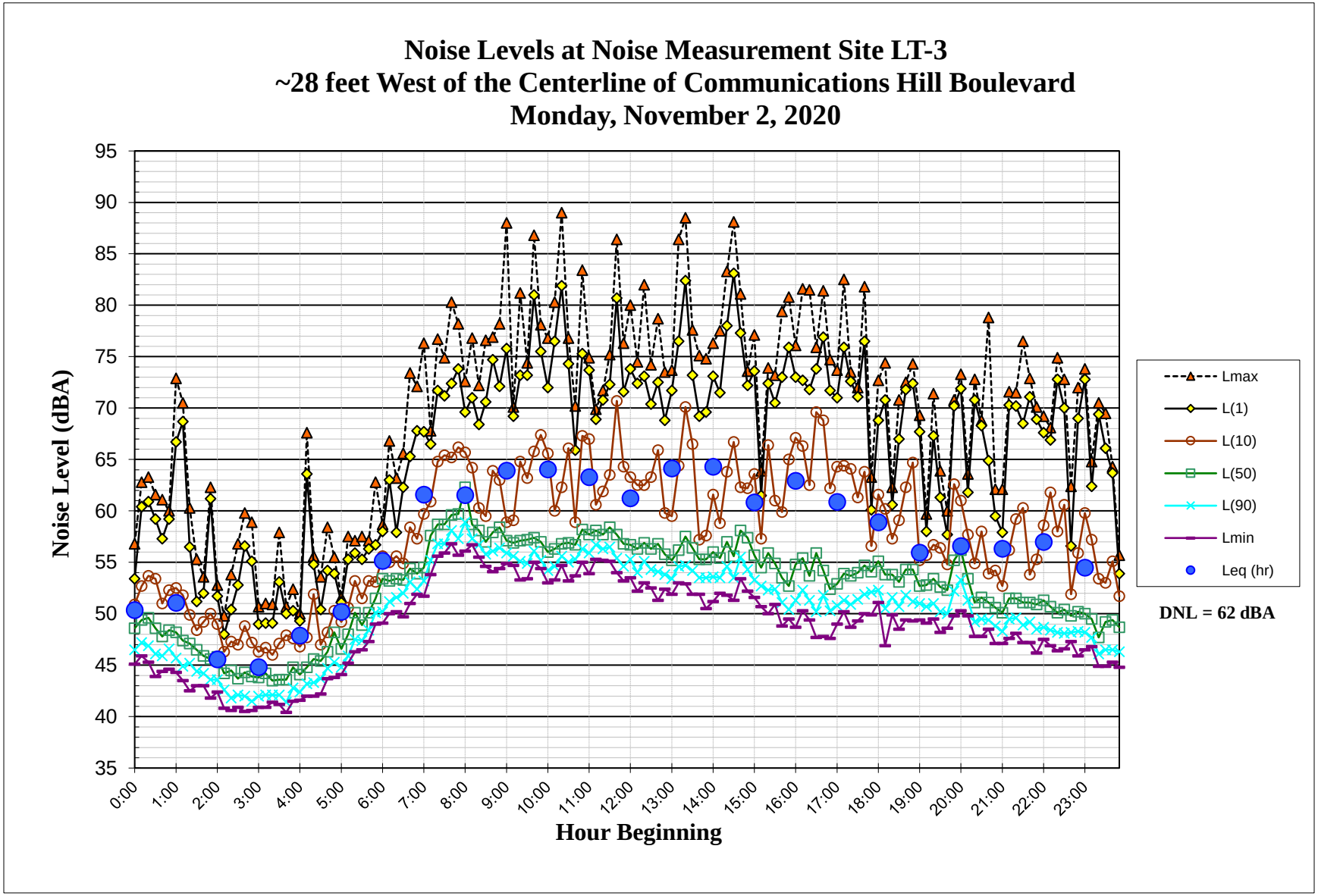

Noise Levels at Noise Measurement Site LT-3
~28 feet West of the Centerline of Communications Hill Boulevard
Monday, November 2, 2020
Noise Level (dBA)
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 62 dBA

FIGURE A17

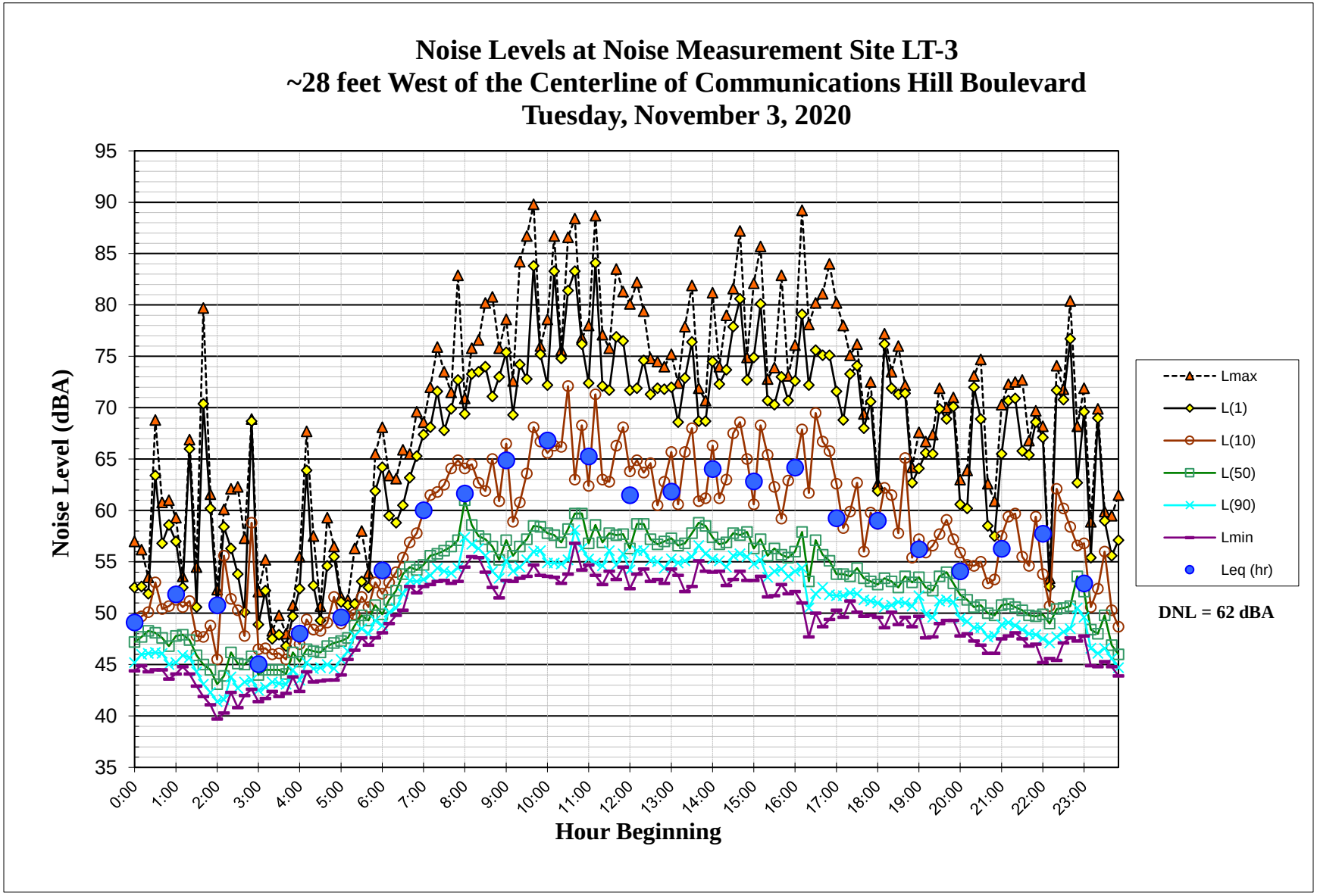
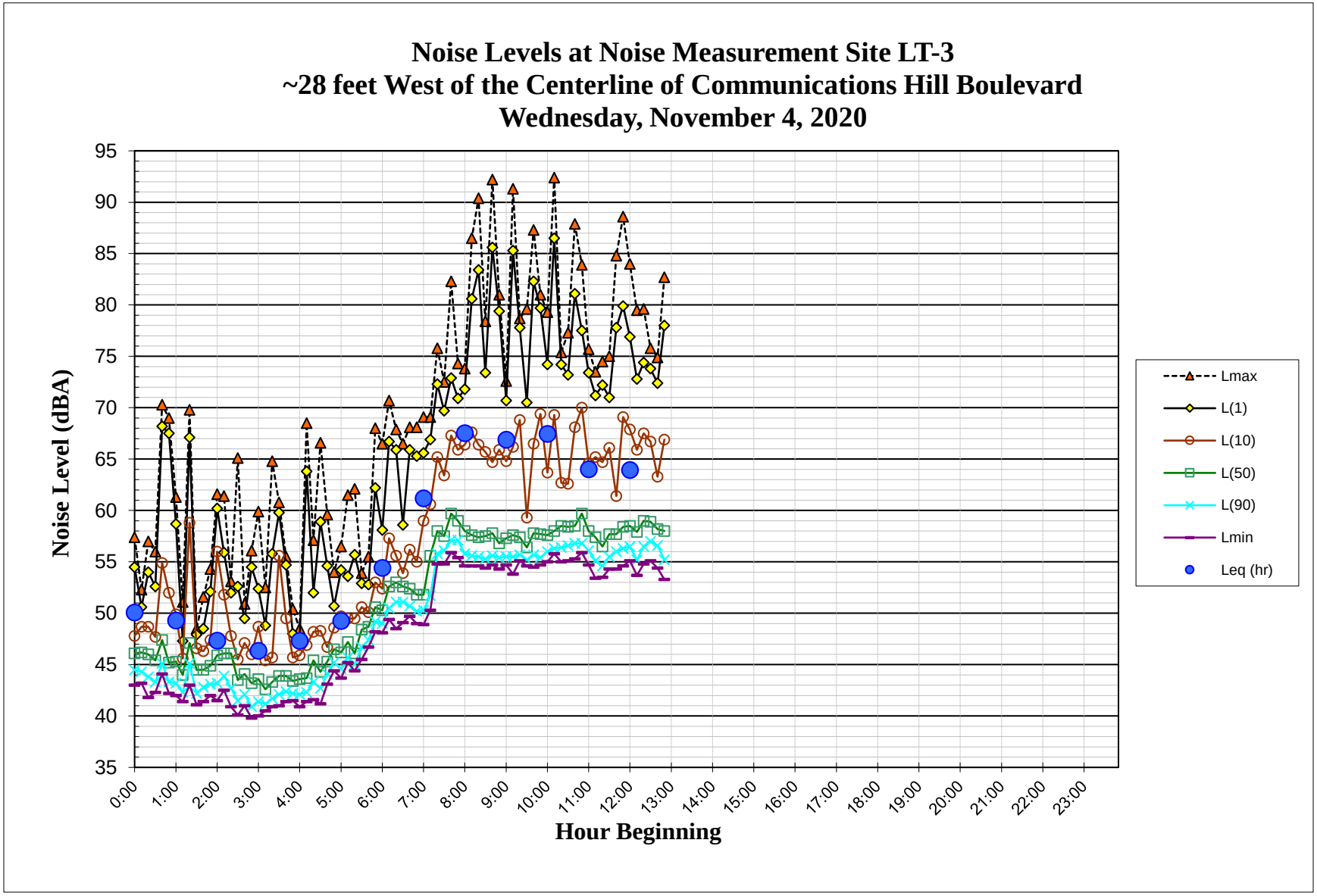

Noise Levels at Noise Measurement Site LT-3
~28 feet West of the Centerline of Communications Hill Boulevard
Tuesday, November 3, 2020
Noise Level (dBA)
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 62 dBA

FIGURE A18


Noise Levels at Noise Measurement Site LT-3
~28 feet West of the Centerline of Communications Hill Boulevard
Wednesday, November 4, 2020
Noise Level (dBA)
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)