

LAGUNITAS COUNTRY CLUB NOISE ASSESSMENT OF INDOOR AMPLIFIED EVENTS

Ross, California

October 25, 2016

Prepared for:

**Sean Kennings
LAK Associates, LLC
PO Box 7043
Corte Madera, CA 94976**

Prepared by:

Michael S. Thill

ILLINGWORTH & RODKIN, INC.
/// Acoustics • Air Quality ///

**1 Willowbrook Court, Suite 120
Petaluma, CA 94954
(707) 794-0400**

Project: 16-193

INTRODUCTION

Lagunitas Country Club is requesting an increase in the number of indoor amplified music events from two events per year to 14 events per year. Currently, the use permit allows amplified indoor music at only two parties: the Christmas Party and the Pool Opening Party. The use permit further specifies that the windows shall be kept closed at the Christmas Party. Lagunitas Country Club is not proposing any changes to the type of events or additional events that are not currently on the Club calendar.

This report evaluates the project's potential to result in significant noise and 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, summarizes applicable regulatory criteria, and discusses the results of the ambient noise monitoring survey completed to document existing noise conditions; 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 presents mitigation measures, where necessary, to provide a compatible project in relation to adjacent land uses.

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 p.m. - 10:00 p.m.) and a 10 dB addition to nocturnal (10:00 p.m. - 7:00 a.m.) noise levels. The *Day/Night Average Sound Level (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.

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 p.m. and 7:00 a.m.
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 p.m. to 10:00 p.m. and after addition of 10 decibels to sound levels measured in the night between 10:00 p.m. and 7:00 a.m.
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	20 dBA	Bedroom at night, concert hall (background)
	10 dBA	Broadcast/recording studio
	0 dBA	

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

Regulatory Background - Noise

The State of California and the Town of Ross have established regulatory criteria that are applicable in this assessment. The State of California Environmental Quality Act (CEQA) Guidelines, Appendix G, are used to assess the potential significance of impacts pursuant to local General Plan policies, Municipal Code standards, or the applicable standards of other agencies. 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) Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies;
- (b) Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels;
- (c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- (d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- (e) For a project located within 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; or
- (f) For a project within the vicinity of a private airstrip, if the project would expose people residing or working in the project area to excessive noise levels.

Items (a), (c), and (d) would be applicable to the proposed project. Item (b) is not applicable as amplified music resulting from the proposed project would not expose persons to or generate excessive ground-borne vibration or ground-borne noise levels. Items (e) and (f) are not applicable as the project is not located within an airport land use plan, within two miles of a public airport or public use airport, or within the vicinity of a private airstrip where people residing or working in the project area would be exposed excessive aircraft noise levels.

CEQA does not define what noise level increase would be considered substantial. Typically, project-generated noise level increases of 3 dBA or greater would be considered significant where exterior noise levels would exceed the normally acceptable noise level standard. Where noise levels would remain at or below the normally acceptable noise level standard with the project, noise level increases of 5 dBA or greater would be considered significant.

Town of Ross General Plan. Policies related to noise as presented in the General Plan include:

Policy 5.6 Noise/Land Use Compatibility Standards. The Land Use/Noise Compatibility Standards (see Figure 8) apply to the siting and design of new structures and substantial remodels. Any project that is located in a “conditionally acceptable” or “normally unacceptable” noise exposure area will be required to prepare an acoustical analysis. Noise mitigation features may be required by the Town.

Policy 5.7 Noise Standards for Exterior Residential Use Areas. The noise standard for exterior use areas (such as backyards) in residential areas is 55 dB (decibels) L_{dn} (a day-night weighted 24-hour average noise level). All areas of Ross meet this standard except for those properties located along Sir Francis Drake Boulevard. General Plan policy requires that any new residential construction meet this standard.

Policy 5.8 Interior Noise Standards. Protect the community against the effects of intrusive and unhealthy exterior noise sources. Establish interior noise standards for new residential and residential health care projects of 40 dB (L_{dn}) for bedrooms and 45 dB (L_{dn}) for other rooms — decibel levels determined based on a day-night weighted 24-hour average noise level.

Policy 5.9 Noise Generated by Commercial Projects. Design of commercial projects should be sensitive to noise impacts on surrounding neighborhoods.

Policy 5.10 Traffic and Construction Noise. Require mitigation of construction and traffic noise impacts on the ambient noise level in the Town.

Town of Ross Municipal Code. Chapter 9.20 of the Town’s Municipal Code qualitatively addresses unnecessary noise in the community. Relevant sections of the code are as follows:

9.20.010 Unnecessary noises generally prohibited. No person shall make, cause, suffer or permit to be made or caused, upon any premises owned, occupied or controlled by such person, or upon any public roadway, sidewalk, path or public right-of-way, any unnecessary noises or sounds which are annoying to persons of ordinary sensitiveness, which are loud and raucous or which are so harsh or so prolonged, or unnatural, or unusual in their intensity, time or place of occurrence as to occasion discomfort to the inhabitants of this town or any number thereof. If any section, subsection, sentence, clause, phrase, or portion of this section for any reason is held invalid or unconstitutional, such decision shall not affect the validity of the remaining portions of this section. The town council further declares that it would have passed this and each section, subsection, sentence, clause, phrase, or portion thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses, phrases, or portions be declared unconstitutional on their face or as applied (Ord. 599, 2007: Ord. 267 §4(part), 1967: prior code §4350).

9.20.040 Musical instruments. (a) No person shall at any time use or operate any musical instrument, or any device, machine, apparatus, or instrument for the intensification or amplification of the human voice or any sound or noise, in such a manner that persons

owning, using, or occupying property in the neighborhood are reasonably disturbed or annoyed.

(b) In no case shall such musical instruments, devises, machines, apparatuses, or instruments used for the intensification or amplification of the human voice or any sound or noise, be operated such that they are audible beyond the owner's property line before nine a.m., or after ten p.m., except on Friday, Saturday, or the eve of a federally recognized holiday when the allowable hours of operation shall be between nine a.m. and eleven p.m. When determining whether a person has been reasonably annoyed or disturbed, factors for consideration shall include, but not be limited to the volume, nature, frequency, time of day, and planned duration of the offending instrument(s), as well as the number of complaints received. (Ord. 574, 2003: Ord. 267 §4(part), 1967: prior code §4351 (part)).

Existing Noise Environment

Lagunitas Country Club is located south of the intersection of Lagunitas Road and Glenwood Avenue in Ross, California. Residences and open space surround the project site. A noise monitoring survey was performed at the site beginning on Friday, September 16, 2016 and ending on Tuesday, September 20, 2016 in order to document ambient conditions. The noise monitoring survey included four long-term (LT) noise measurements, which are shown in Figure 1.

Long-term noise measurement LT-1 was made at a location approximately 325 feet west of the of the club house to represent the existing noise environment at residences west of Lagunitas Country Club. The daily trends in noise levels at LT-1 are shown in Figures 2-6. Hourly average noise levels at LT-1 typically ranged from 38 to 53 dBA L_{eq} between the hours of 7:00 a.m. and 10:00 p.m. The dropping of glass bottles during recycling collection produced a maximum instantaneous noise level of 80 dBA L_{max} (Figure 6). Day-night average noise levels ranged from 47 to 53 dBA L_{dn} .

The second long-term noise measurement, LT-2, was made to represent ambient noise levels at residential land uses north of the site bordering Lagunitas Road. Ambient noise levels measured at this location were generally higher than the three other noise measurement locations due to traffic along Lagunitas Road. Hourly average noise levels at LT-2 typically ranged from 49 to 60 dBA L_{eq} between the hours of 7:00 a.m. and 10:00 p.m. Day-night average noise levels were 56 dBA L_{dn} . The daily trends in noise levels at LT-2 are shown in Figures 7-11.

Long-term noise measurement LT-3 was made at a location approximately 375 feet east of the of the club house adjacent to Duff Lane residential land uses. The daily trends in noise levels at LT-3 are shown in Figures 12-16. Hourly average noise levels at LT-3 typically ranged from 37 to 50 dBA L_{eq} between the hours of 7:00 a.m. and 10:00 p.m. Yard maintenance activities yielded maximum instantaneous noise levels up to 75 dBA L_{max} and raised the hourly average noise level during the 9:00 a.m. hour on Monday, September 19, 2016 to 62 dBA L_{eq} . Day-night average noise levels ranged from 44 to 48 dBA L_{dn} .

The final long-term noise measurement location (LT-4) was approximately 190 feet south of the of the club house. The daily trends in noise levels at LT-4 are shown in Figures 17-21. Hourly

average noise levels at LT-4 typically ranged from 38 to 52 dBA L_{eq} between the hours of 7:00 a.m. and 10:00 p.m. Day-night average noise levels ranged from 48 to 49 dBA L_{dn} .

Based on a review of the ambient noise data collected at Sites LT-1 through LT-4, it was determined that the noise environment at the site and in the surrounding areas results primarily from vehicular traffic along Lagunitas Road and from existing club operations.

A series of noise measurements were also made on Friday, September 16, 2016 in order to determine the airborne sound isolation of the club house building. During the testing, amplified music was played indoors with the doors and windows of the building closed. The interior noise level during the test was approximately 94 to 95 dBA, approximately 10 dBA louder than what would be considered to be comfortable sound level for event attendees. The results of the measurements showed that the sound loss of the building ranged from 23 dBA to 26 dBA outside the front door and side door of the building, respectively. The sound loss provided by windows located on the west and south side of the club house ranged from 36 to 37 dBA. Figure 22 summarizes the airborne sound isolation at windows and doors of the club house building. Additional short-term measurements and observations made during the sound isolation testing showed that amplified music within the club house produced noise levels of 38 dBA or less at Site LT-1 and 41 dBA or less at Site LT-2.

NOISE IMPACTS AND MITIGATION MEASURES

Significance Criteria

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

- 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 or Municipal Code.
- A significant impact would be identified if the project would substantially increase noise levels over a temporary, periodic, or permanent basis at sensitive receivers in the vicinity.

Impact 1: Noise Levels in Excess of Standards. The proposed project would comply with applicable General Plan and Municipal Code standards established by the Town of Ross. **This is a less-than-significant impact.**

The Town of Ross General Plan establishes Land Use/Noise Compatibility Standards that apply to the siting and design of new structures and substantial remodels. These day-night average noise standards are not appropriate in regulating noise from amplified music that would only occur a few hours during any given event, and would not apply to the regulation of noise produced by commercial land uses as measured at noise-sensitive land uses.

Policy 5.9 of the Ross General Plan states that the design of commercial projects should be sensitive to noise impacts on surrounding neighborhoods. The proposed project would allow

amplified music to be played indoors with the doors and windows of the clubhouse closed, thereby reducing the level of noise on surrounding residences. Exterior noise levels produced by amplified music are calculated to be 41 dBA or less at the nearest residential properties. By maintaining doors and windows of the clubhouse closed, the design of the proposed project is sensitive to noise impacts on surrounding neighborhoods and would be considered to be consistent with Policy 5.9 of the General Plan.

Chapter 9.20 of the Town's Municipal Code qualitatively addresses unnecessary noise in the community. Section 9.20.010 states that, "No person shall make, cause, suffer or permit to be made or caused, upon any premises owned, occupied or controlled by such person, or upon any public roadway, sidewalk, path or public right-of-way, any unnecessary noises or sounds which are annoying to persons of ordinary sensitiveness, which are loud and raucous or which are so harsh or so prolonged, or unnatural, or unusual in their intensity, time or place of occurrence as to occasion discomfort to the inhabitants of this town or any number thereof." Similarly, Section 9.20.040 (a) states that, "No person shall at any time use or operate any musical instrument, or any device, machine, apparatus, or instrument for the intensification or amplification of the human voice or any sound or noise, in such a manner that persons owning, using, or occupying property in the neighborhood are reasonably disturbed or annoyed."

Noise levels produced by amplified music would be 41 dBA or less at the nearest residential property lines and 26 dBA or less indoors assuming windows are open for ventilation. Such noise levels would not be expected to interfere with speech communication outdoors as predicted exterior noise levels would be below 60 dBA, or result in sleep disturbance or activity interference indoors as predicted interior noise levels would be below 45 dBA. Amplified music would occur on an infrequent basis and would not be expected to annoy or disturb "persons of ordinary sensitiveness".

Section 9.20.040 (b) states that, "In no case shall such musical instruments, devices, machines, apparatuses, or instruments used for the intensification or amplification of the human voice or any sound or noise, be operated such that they are audible beyond the owner's property line before nine a.m., or after ten p.m., except on Friday, Saturday, or the eve of a federally recognized holiday when the allowable hours of operation shall be between nine a.m. and eleven p.m. When determining whether a person has been reasonably annoyed or disturbed, factors for consideration shall include, but not be limited to the volume, nature, frequency, time of day, and planned duration of the offending instrument(s), as well as the number of complaints received."

Events with amplified music would generally occur in the afternoon and evening, and in all cases, end prior to ten p.m. Therefore, the noise produced by indoor amplified music would comply with the Municipal Code requirements which prohibit amplified noise before nine a.m., or after ten p.m., Monday through Thursday, except on Friday, Saturday, or the eve of a federally recognized holiday when the allowable hours of operation shall be between nine a.m. and eleven p.m.

Proposed project operations would comply with applicable General Plan and Municipal Code standards resulting in a less-than-significant impact.

Mitigation Measures: None required.

Impact 2: Substantial Noise Level Increase. The proposed project would not result in a substantial temporary, periodic, or permanent noise level increase at the existing noise-sensitive land uses in the project vicinity. **This is a less-than-significant impact.**

During events with amplified music indoors, noise levels expected at the nearest residential land uses to the north of Lagunitas Road would be 41 dBA or less, and 35 to 38 dBA or less at the nearest residential land uses to the west and east.

Hourly average noise levels produced by amplified music would fall below the existing range of daytime hourly average noise levels at the nearest residential receptors to the north (LT-2 - 49 to 60 dBA L_{eq}). A credible worst-case scenario would assume that that amplified music would be played during an 8-hour period during the daytime. Under this scenario, the predicted day-night average noise level produced by amplified music would be 36 dBA L_{dn} at the nearest residential receptors to the north. Amplified music indoors would not measurably increase ambient day-night average noise levels at the nearest residential receptors north of the club house.

Noise levels resulting from amplified music indoors would be at or below the range of existing daytime hourly average noise levels at the nearest residential receptors to the west or east. Existing daytime hourly average noise levels at the nearest residential receptors to the west range from 38 to 53 dBA L_{eq} , and from 38 to 50 dBA L_{eq} at the nearest residential receptors to the east. Assuming that amplified music would be played during an 8-hour period during the daytime, the predicted day-night average noise level produced by amplified music would be 30 to 33 dBA L_{dn} at the nearest receptors to the west or east. As noted above, the amplified music would not be expected to measurably increase ambient day-night average noise levels at the nearest residential receptors west or east of the club house.

Although amplified music would at times be audible outdoors, the predicted noise levels fall at or below the range of ambient noise levels. Therefore, the proposed project would not result in a substantial temporary, periodic, or permanent noise level increase at the existing noise-sensitive land uses in the project vicinity. This is a less-than-significant impact.

Mitigation Measure 2: None required.

FIGURE 1 Noise Measurement Locations



Source: GoogleEarth.

**Noise Levels at Noise Measurement Site LT-1
Friday, September 16, 2016**

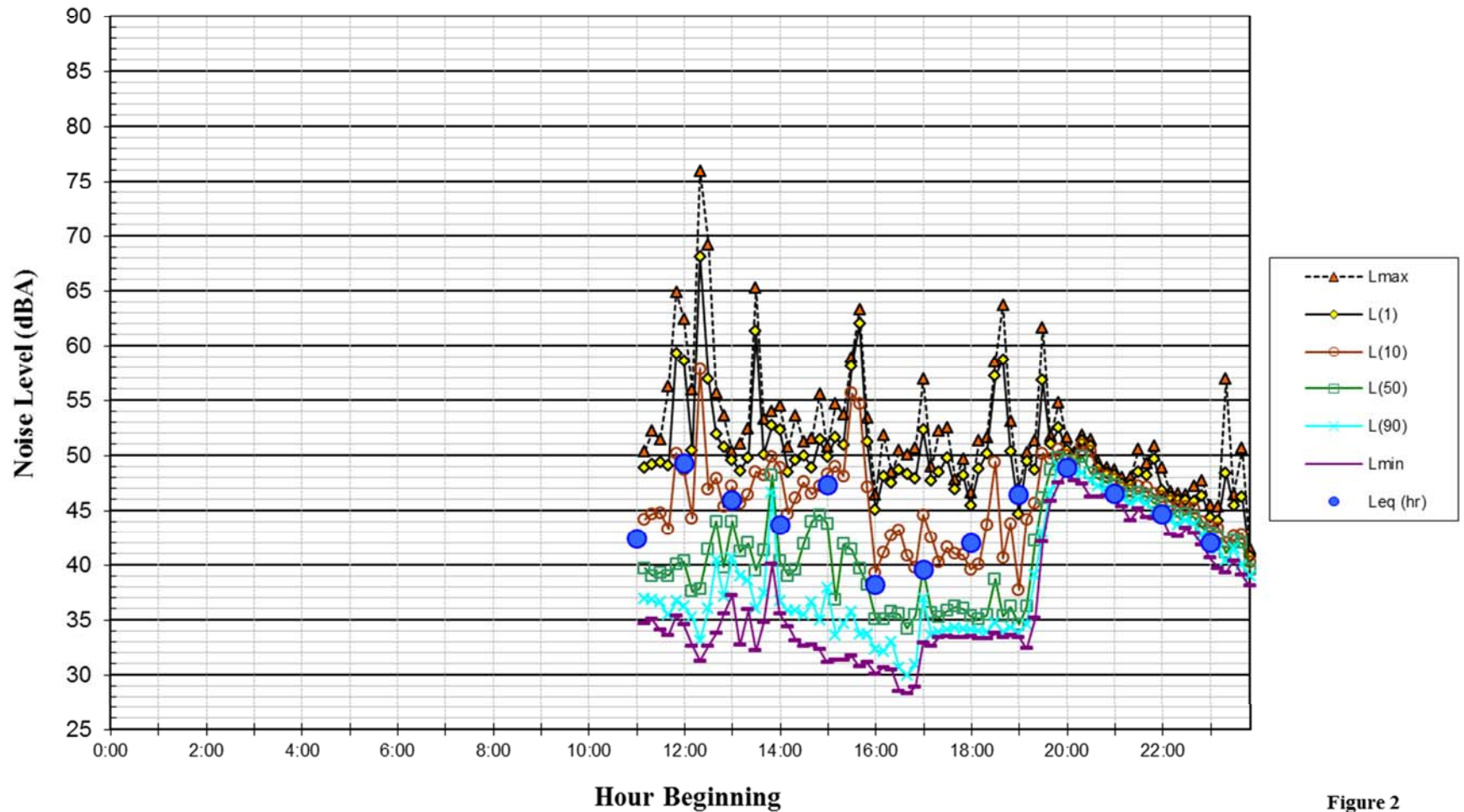


Figure 2

**Noise Levels at Noise Measurement Site LT-1
Saturday, September 17, 2016**

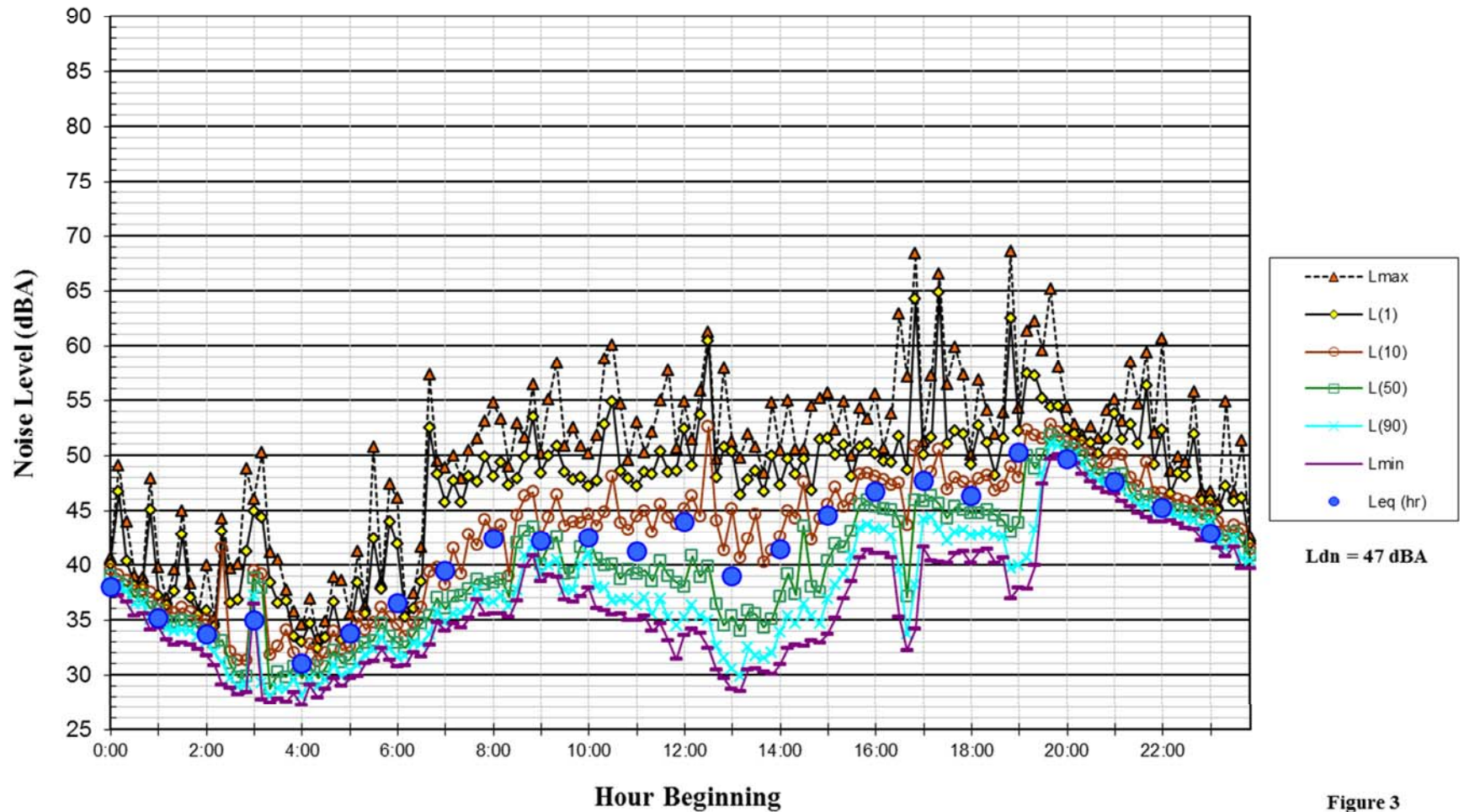


Figure 3

**Noise Levels at Noise Measurement Site LT-1
Sunday, September 18, 2016**

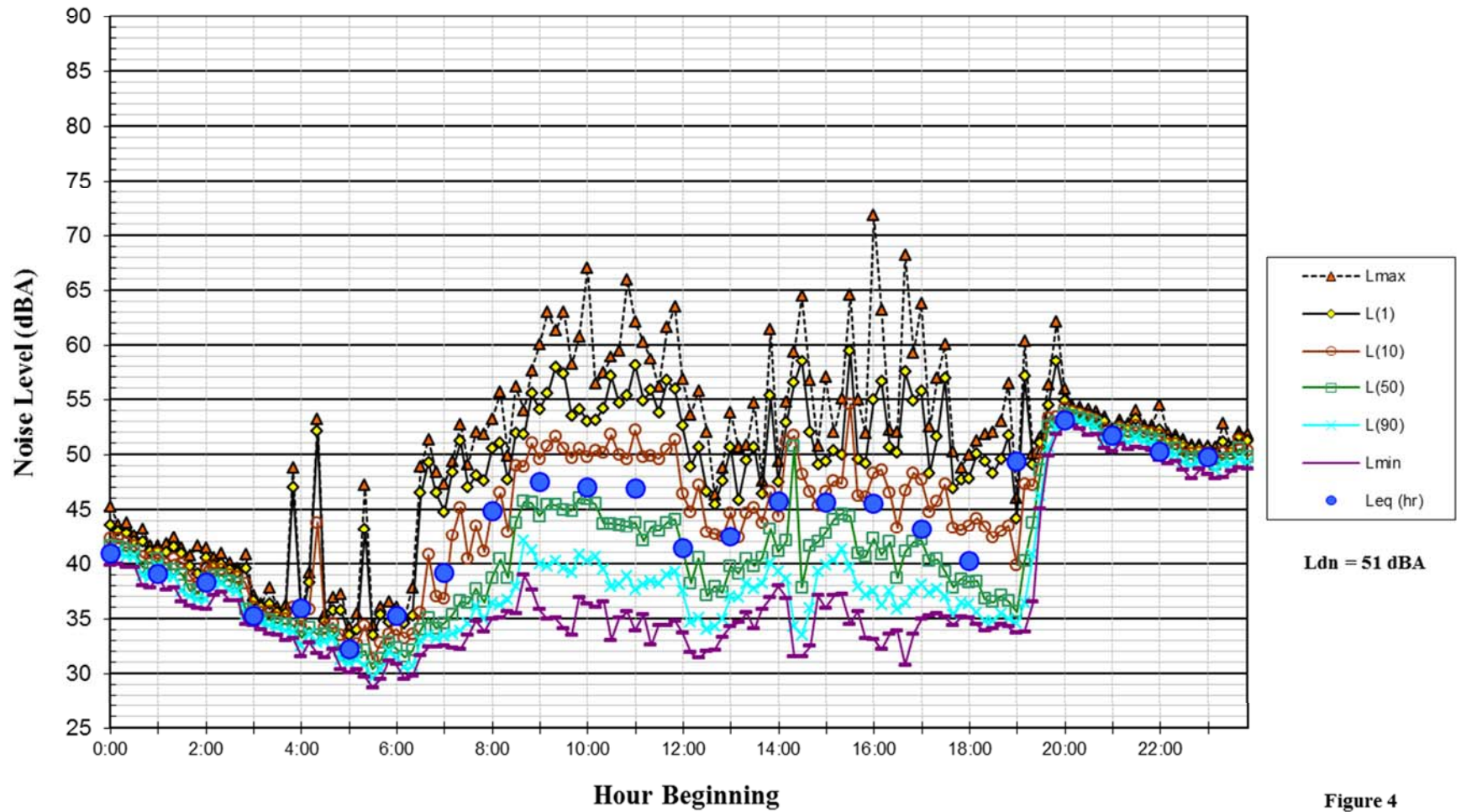


Figure 4

**Noise Levels at Noise Measurement Site LT-1
Monday, September 19, 2016**

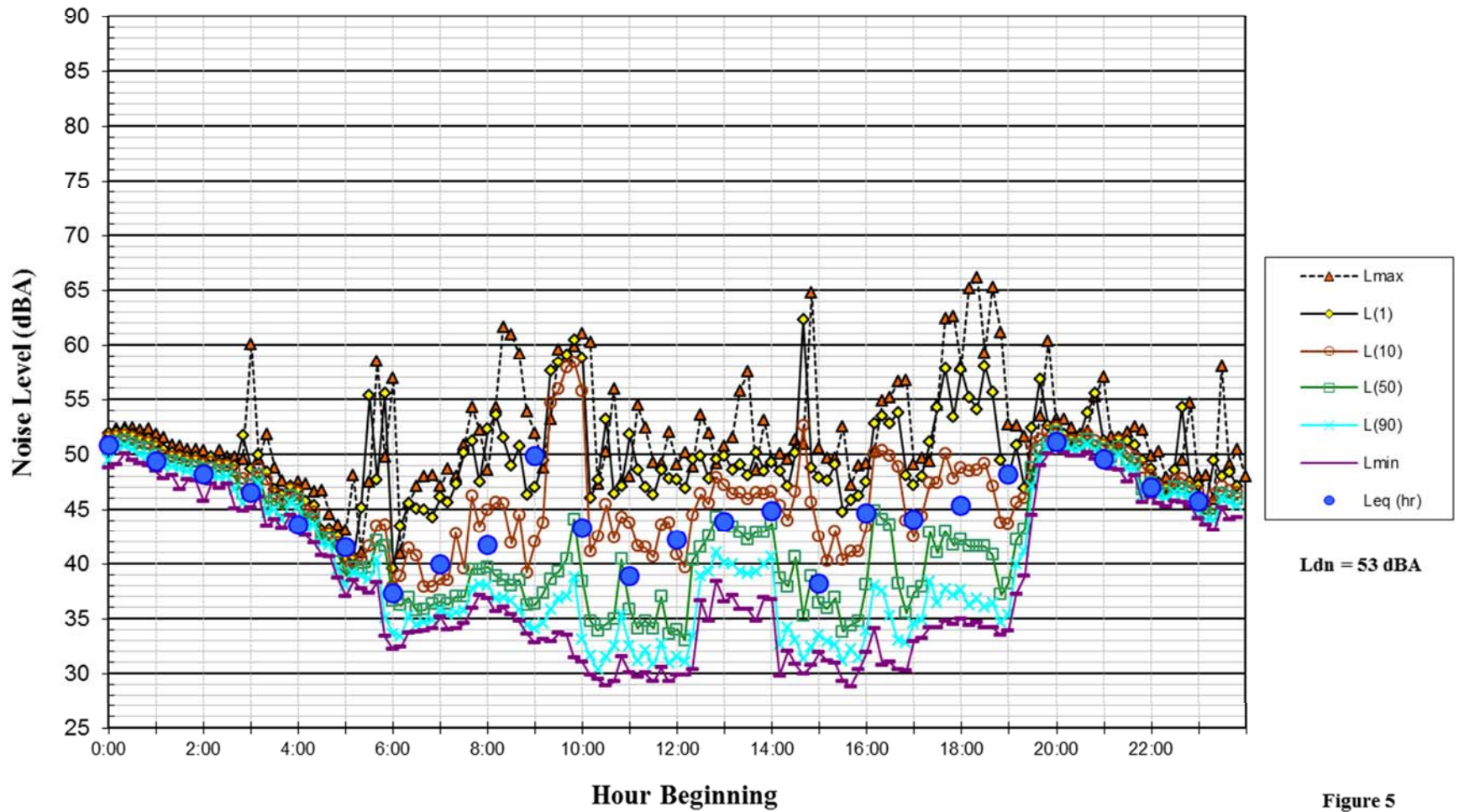


Figure 5

**Noise Levels at Noise Measurement Site LT-1
Tuesday, September 20, 2016**

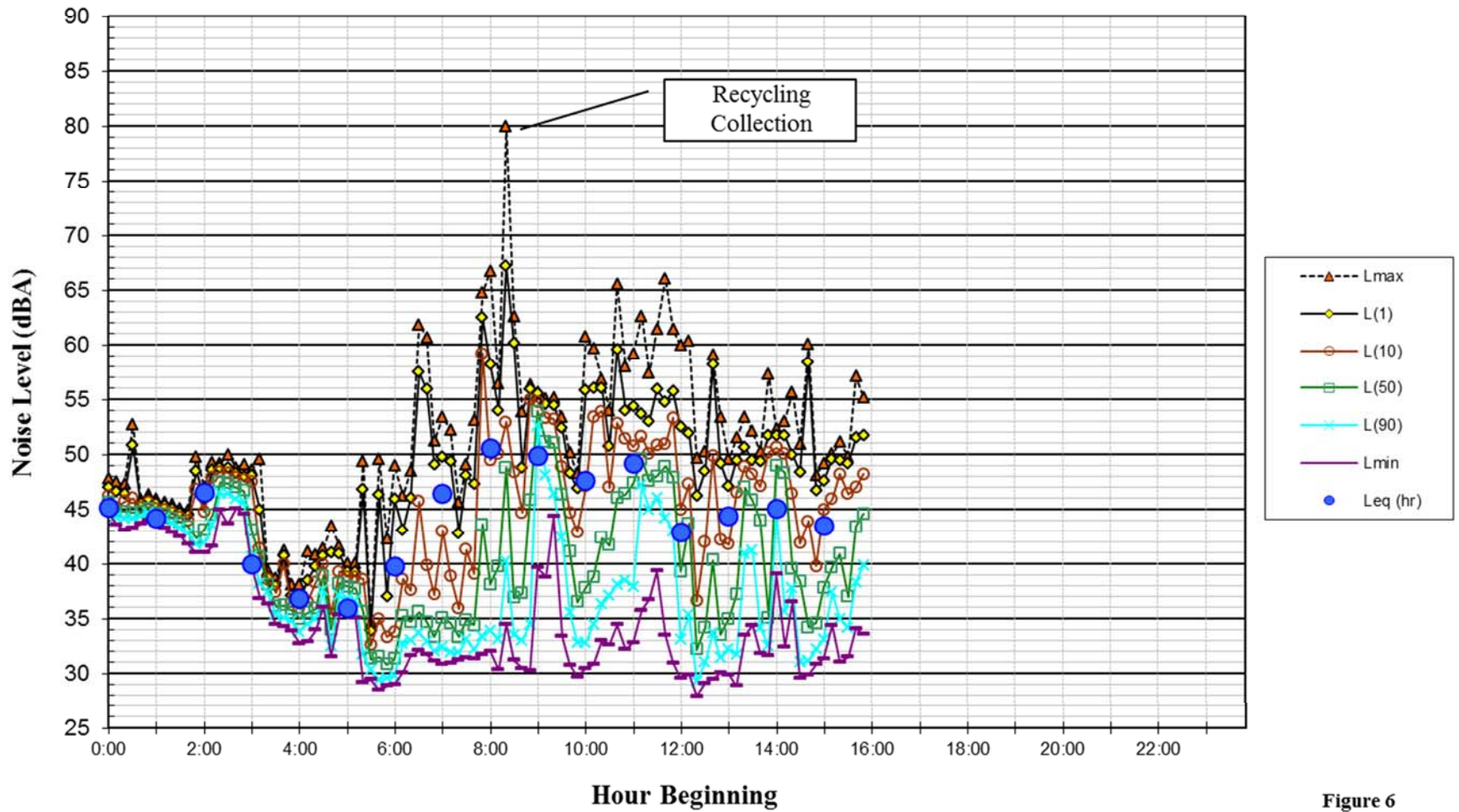
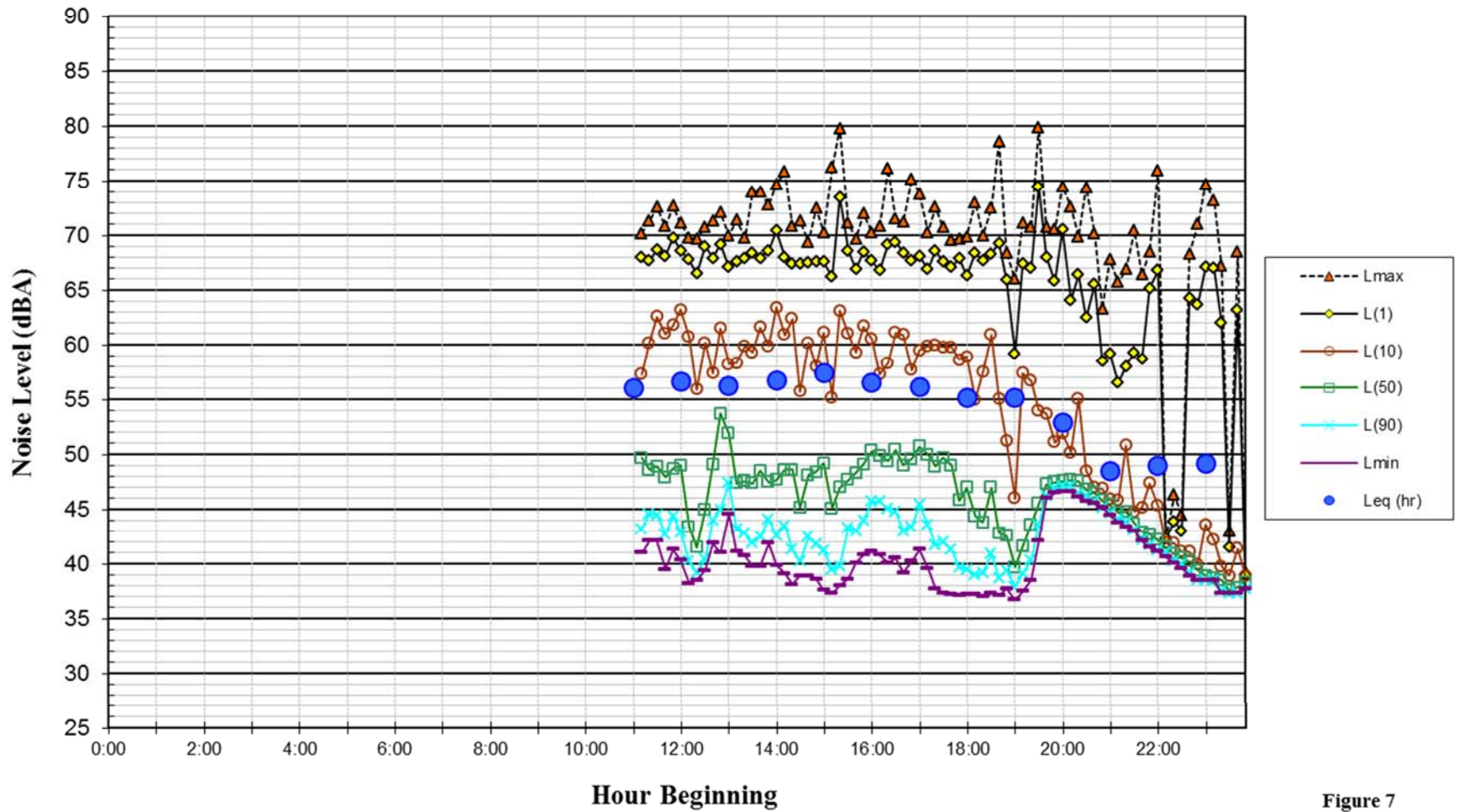


Figure 6

**Noise Levels at Noise Measurement Site LT-2
Friday, September 16, 2016**



**Noise Levels at Noise Measurement Site LT-2
Saturday, September 17, 2016**

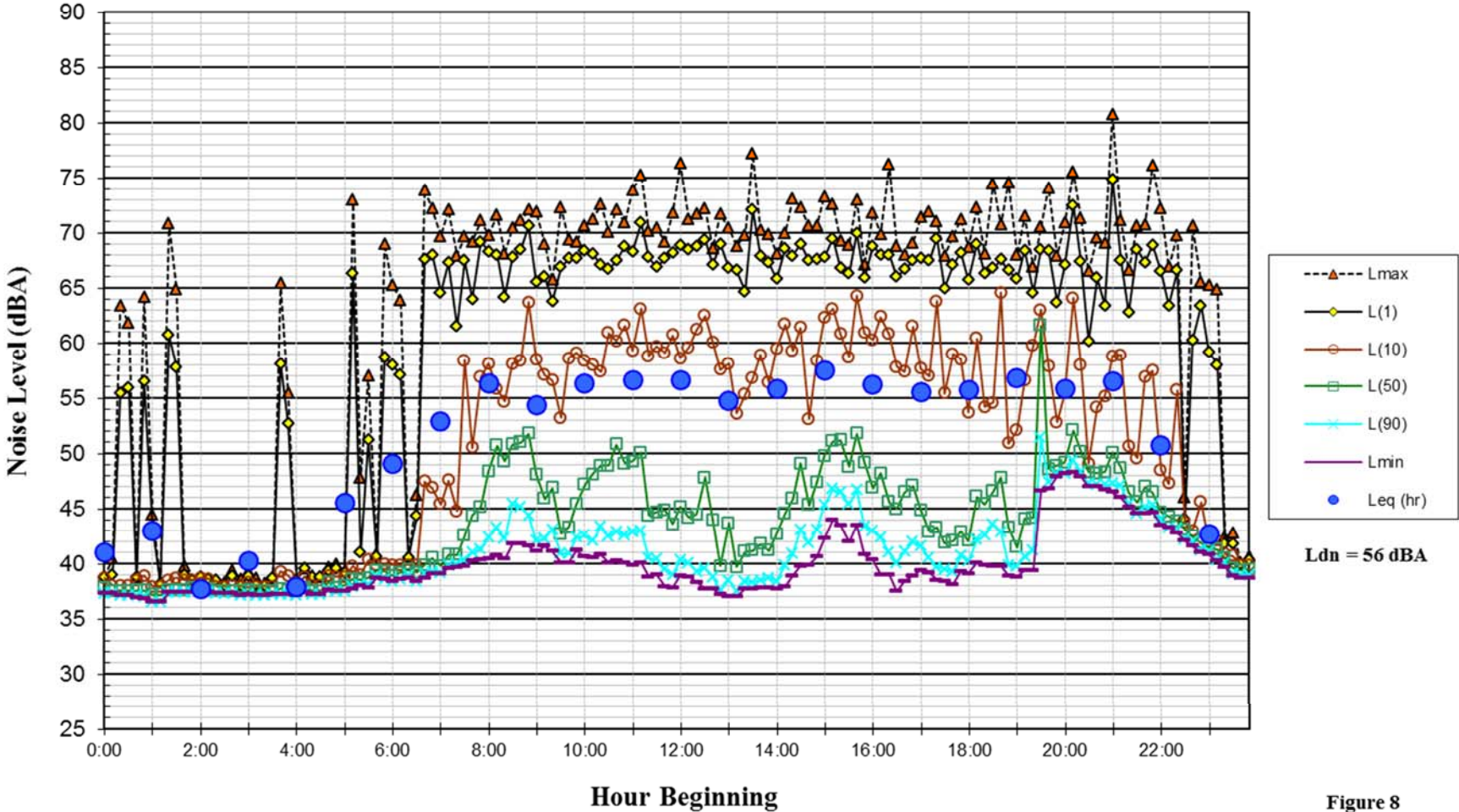


Figure 8

**Noise Levels at Noise Measurement Site LT-2
Sunday, September 18, 2016**

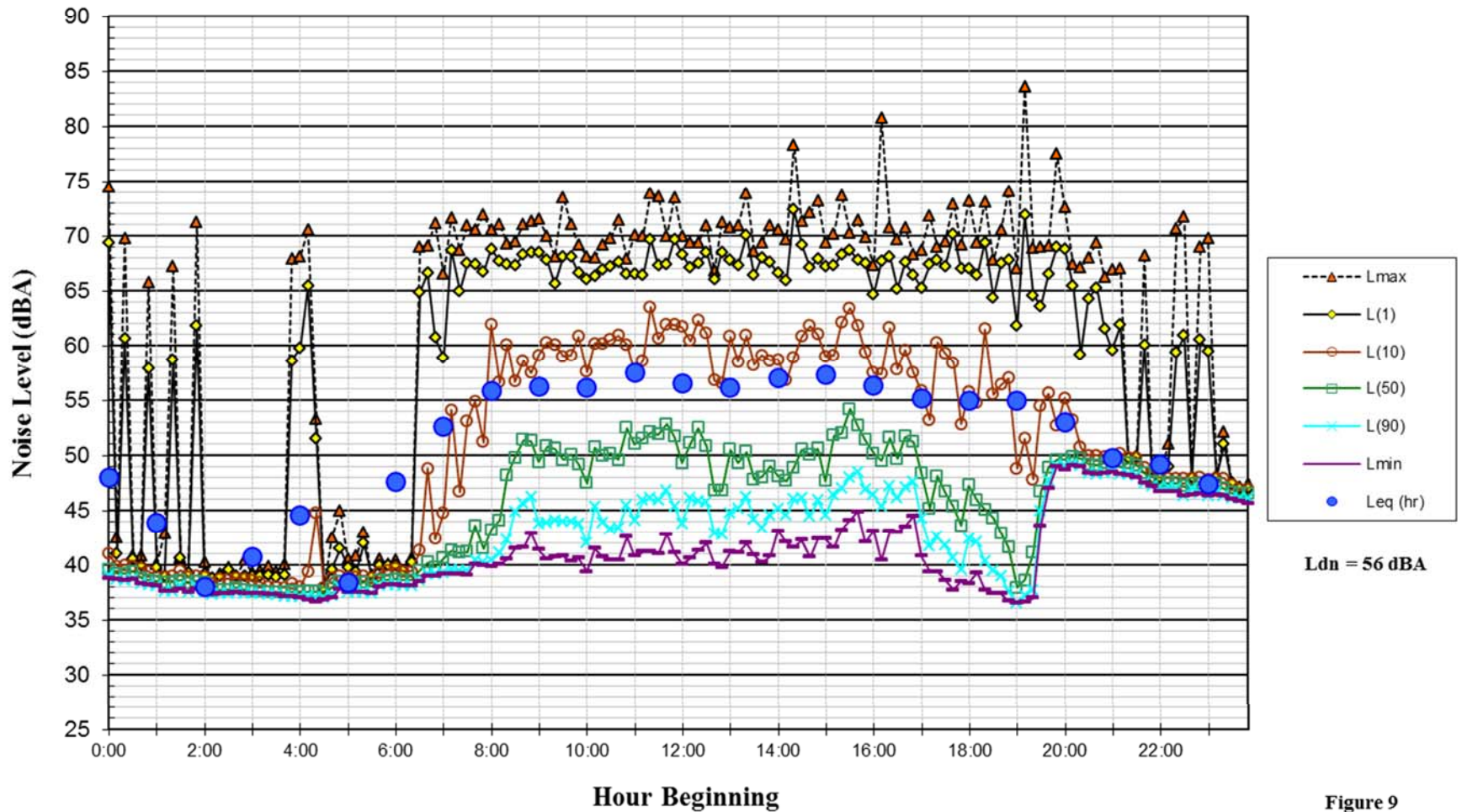


Figure 9

Noise Levels at Noise Measurement Site LT-2 Monday, September 19, 2016

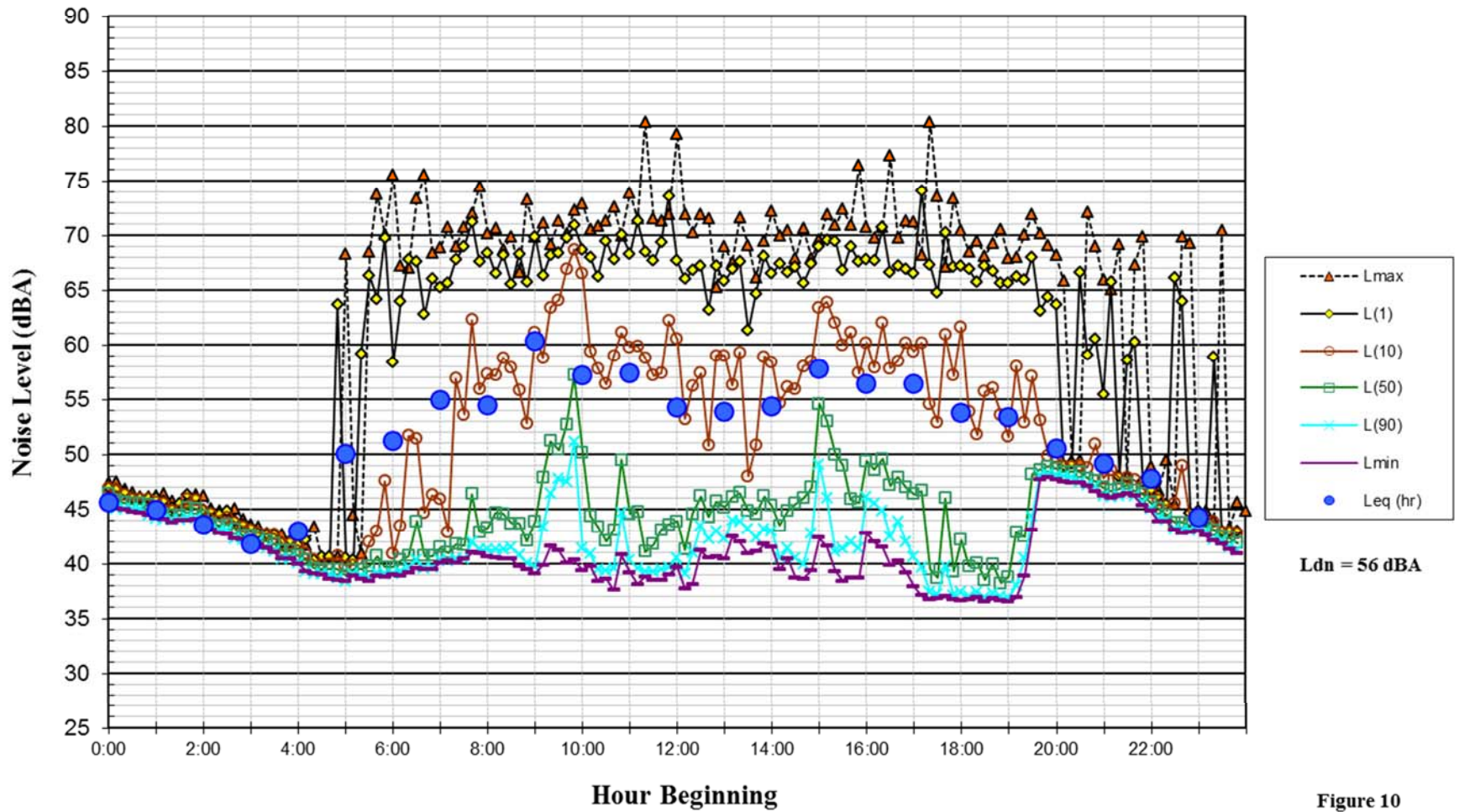


Figure 10

**Noise Levels at Noise Measurement Site LT-2
Tuesday, September 20, 2016**

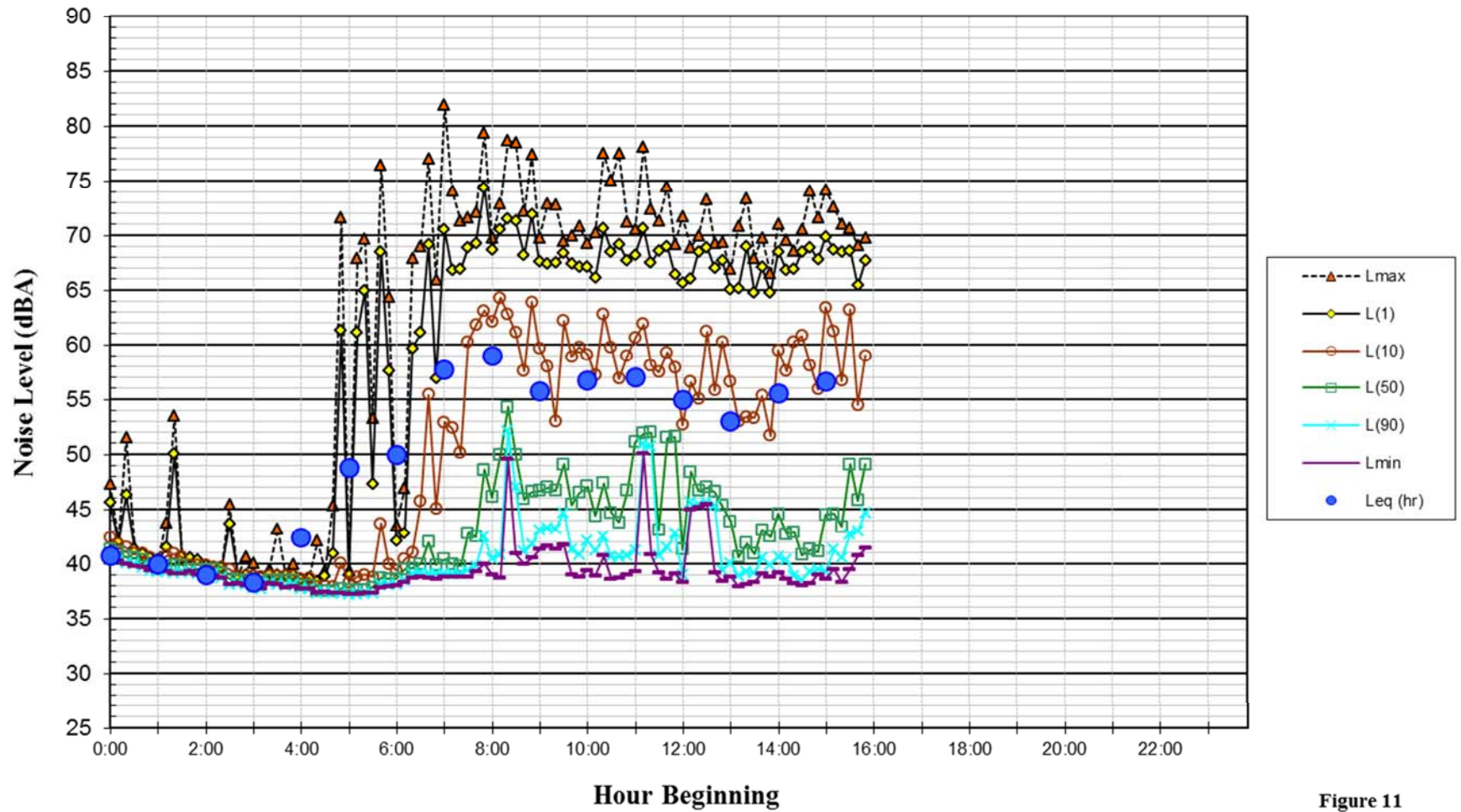


Figure 11

**Noise Levels at Noise Measurement Site LT-3
Friday, September 16, 2016**

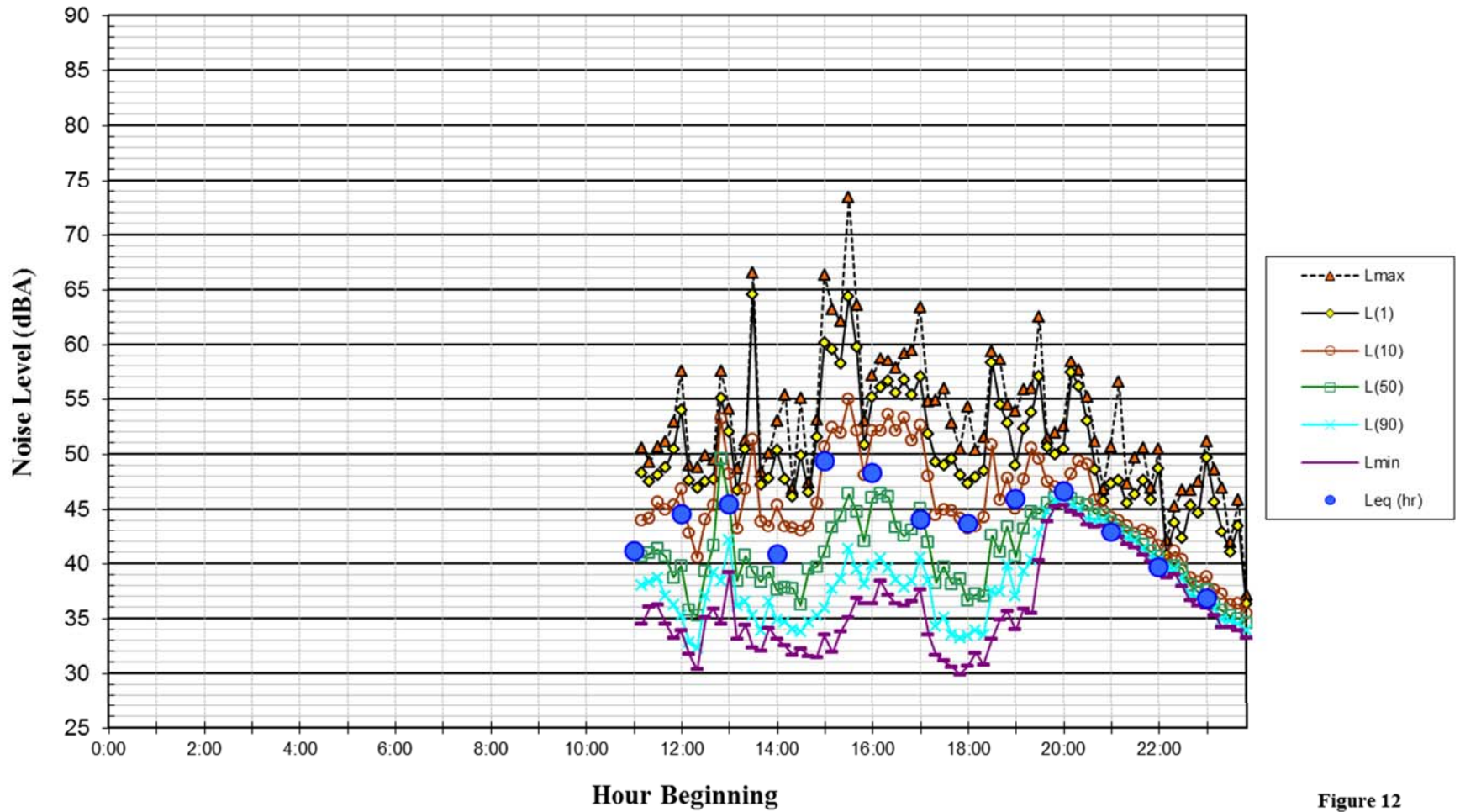


Figure 12

**Noise Levels at Noise Measurement Site LT-3
Saturday, September 17, 2016**

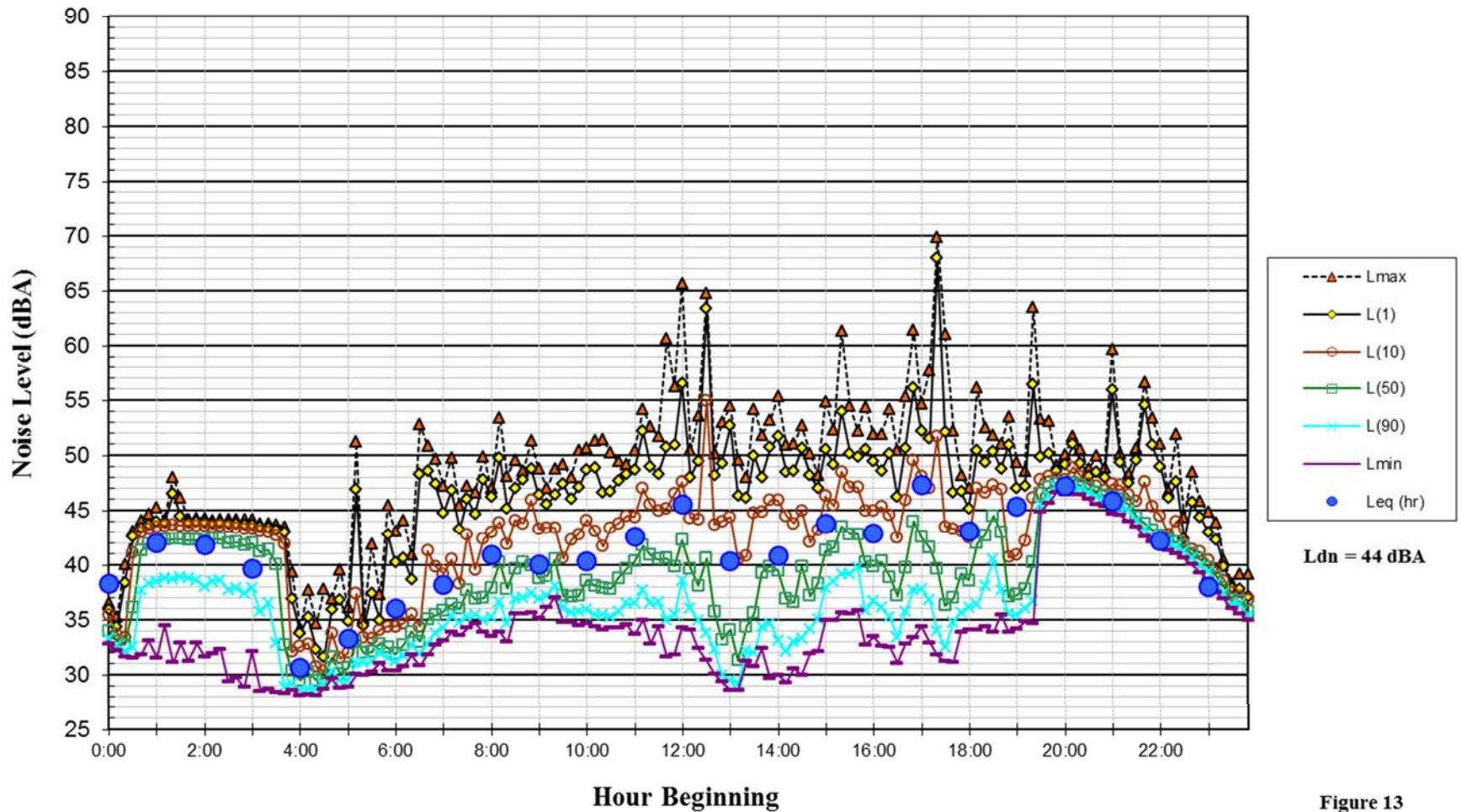


Figure 13

**Noise Levels at Noise Measurement Site LT-3
Sunday, September 18, 2016**

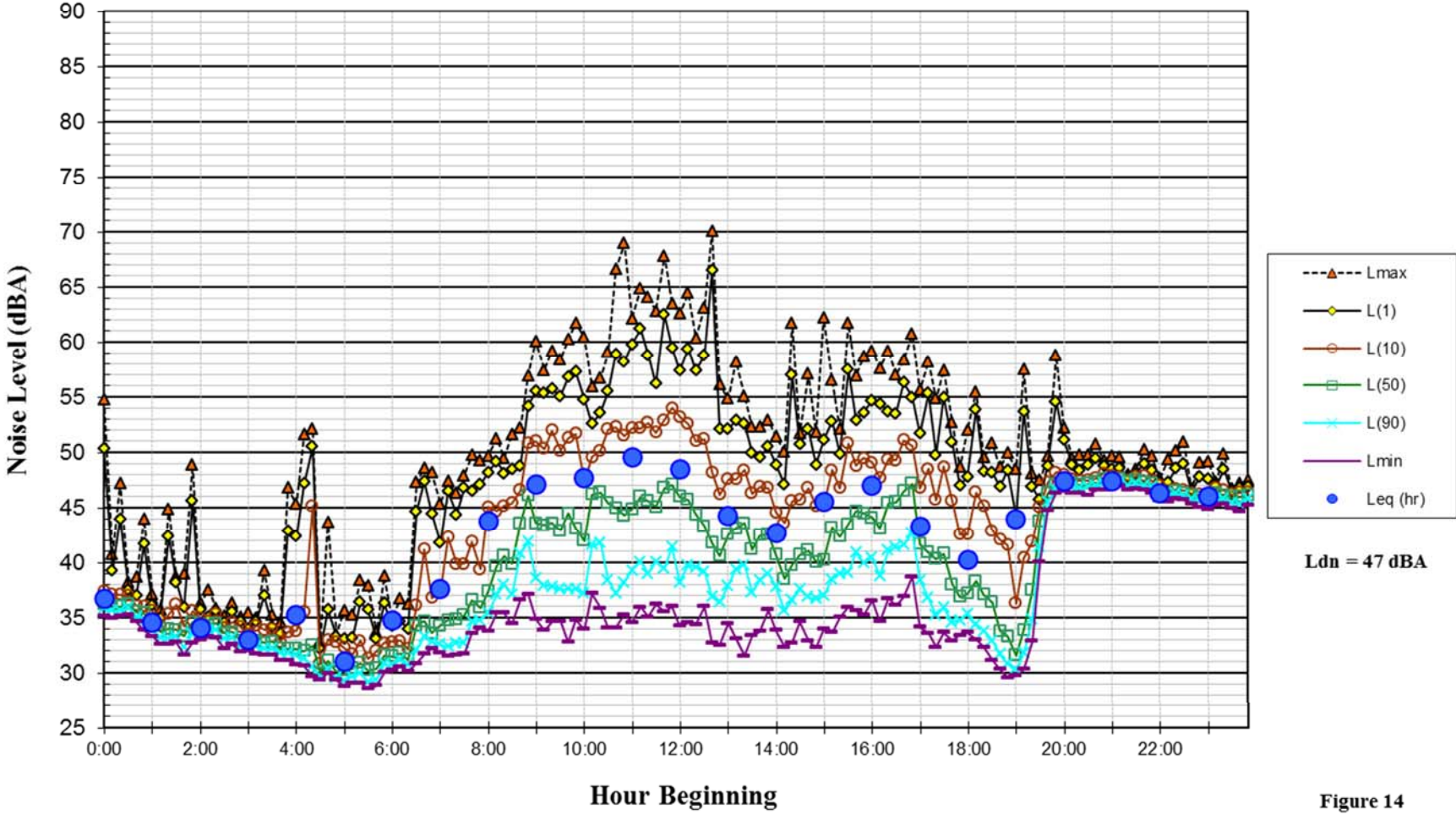


Figure 14

**Noise Levels at Noise Measurement Site LT-3
Monday, September 19, 2016**

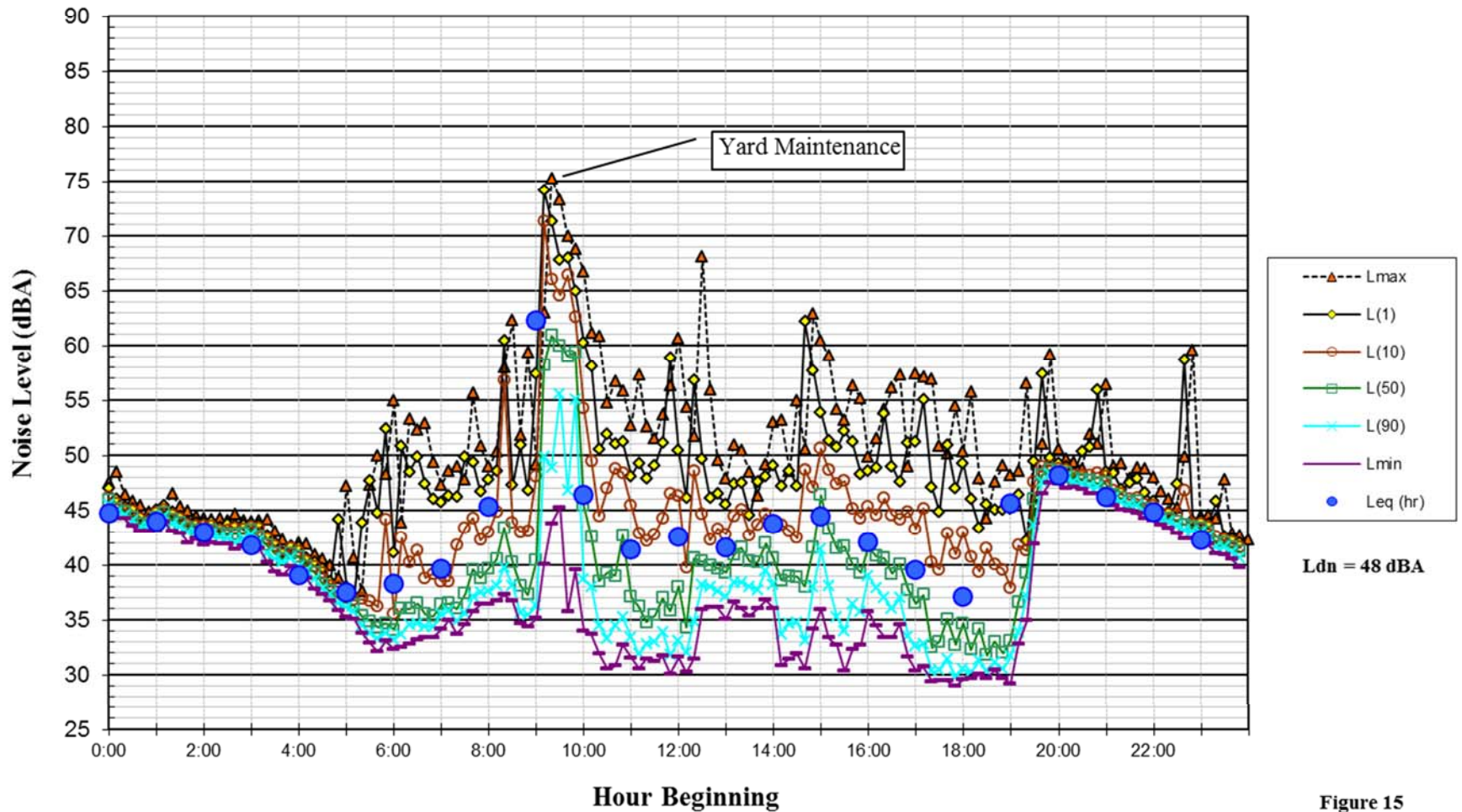


Figure 15

**Noise Levels at Noise Measurement Site LT-3
Tuesday, September 20, 2016**

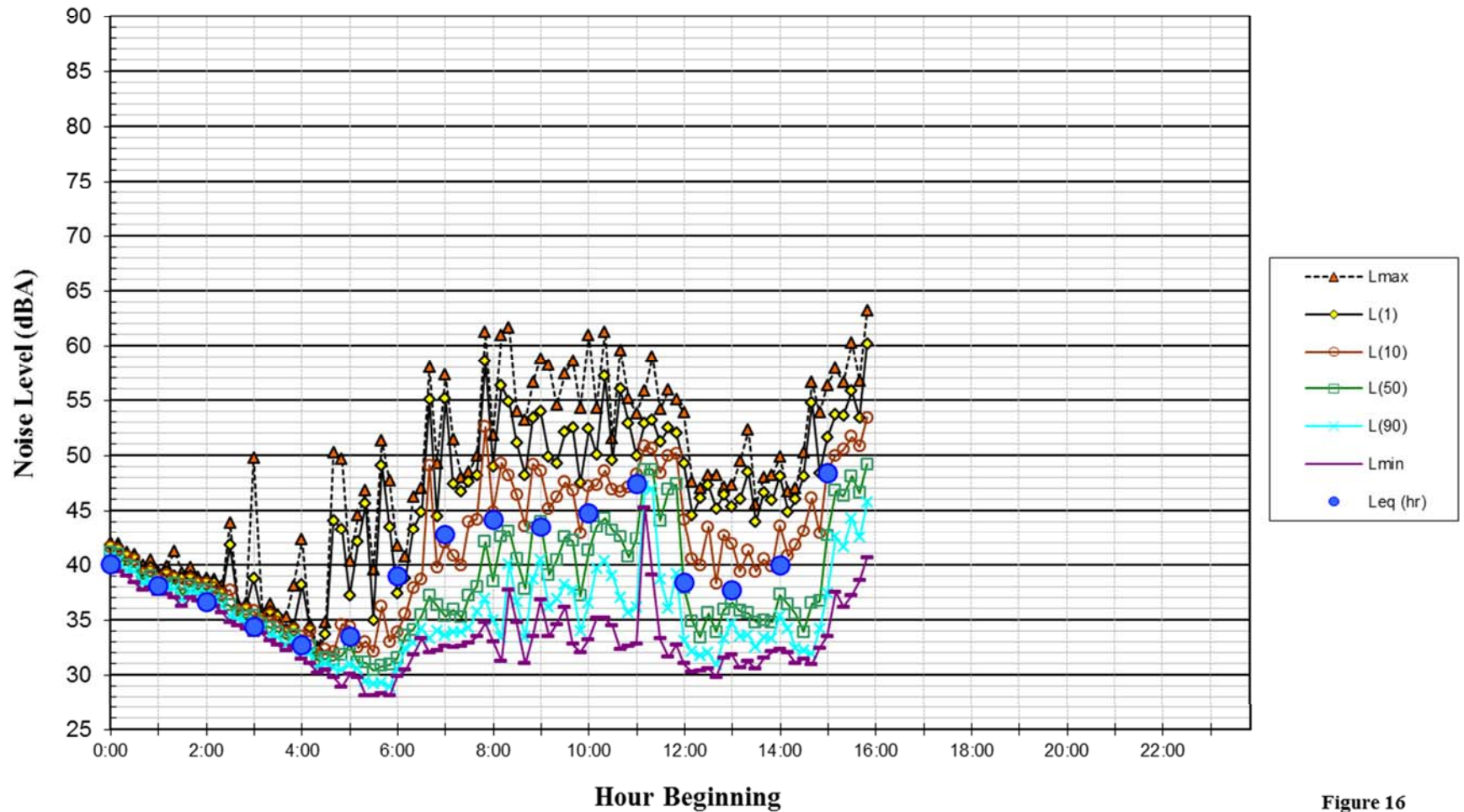


Figure 16

**Noise Levels at Noise Measurement Site LT-4
Friday, September 16, 2016**

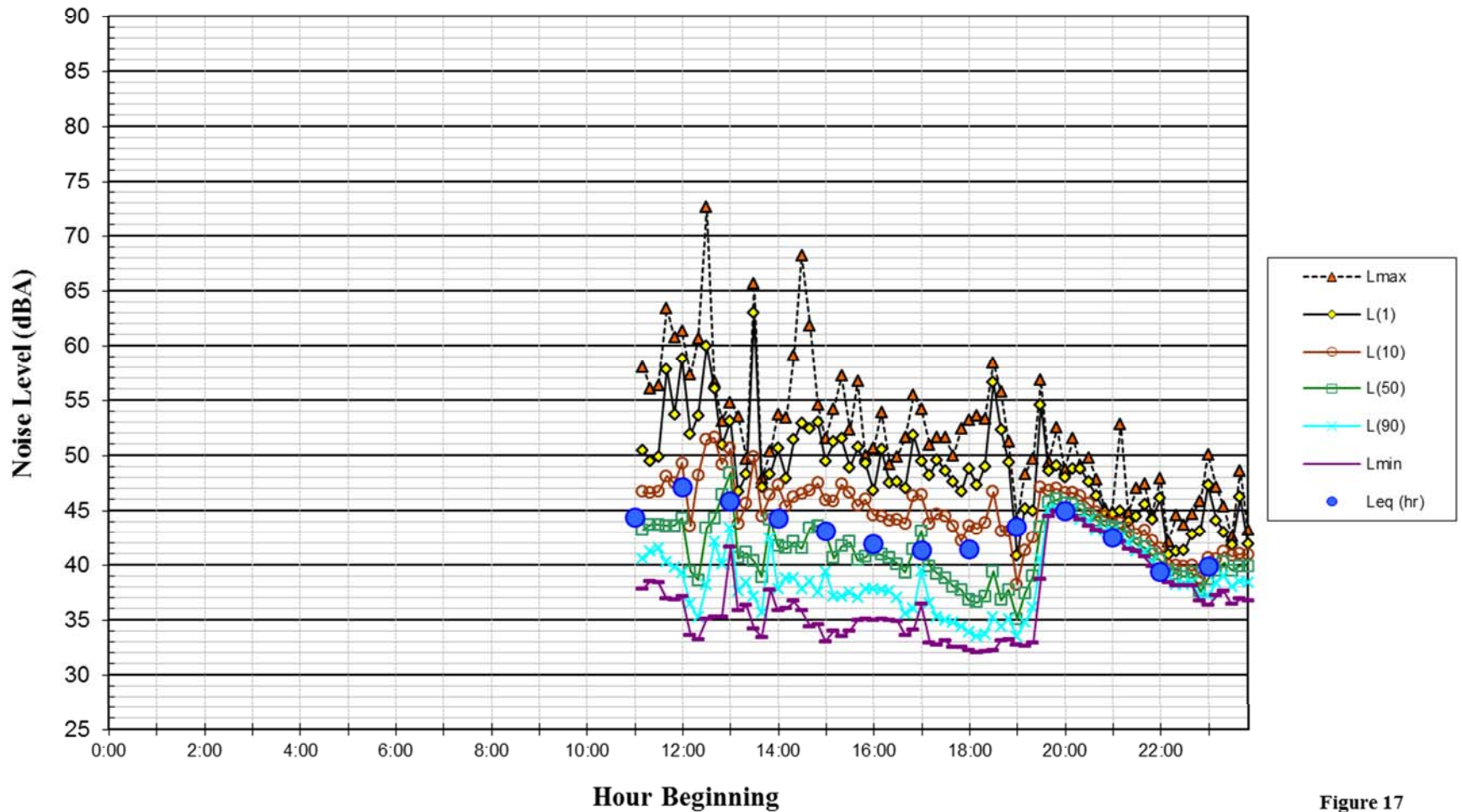


Figure 17

**Noise Levels at Noise Measurement Site LT-4
Saturday, September 17, 2016**

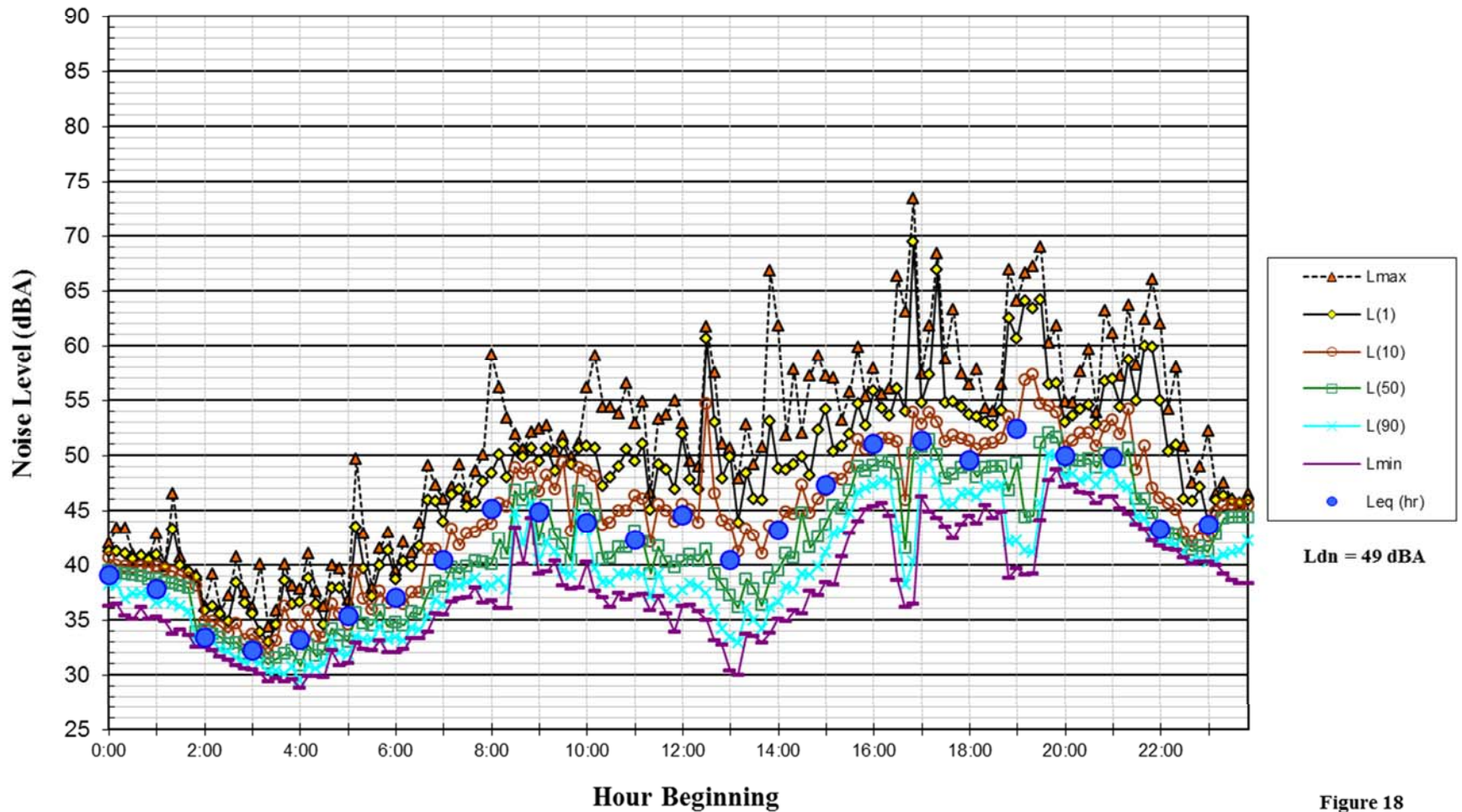


Figure 18

**Noise Levels at Noise Measurement Site LT-4
Sunday, September 18, 2016**

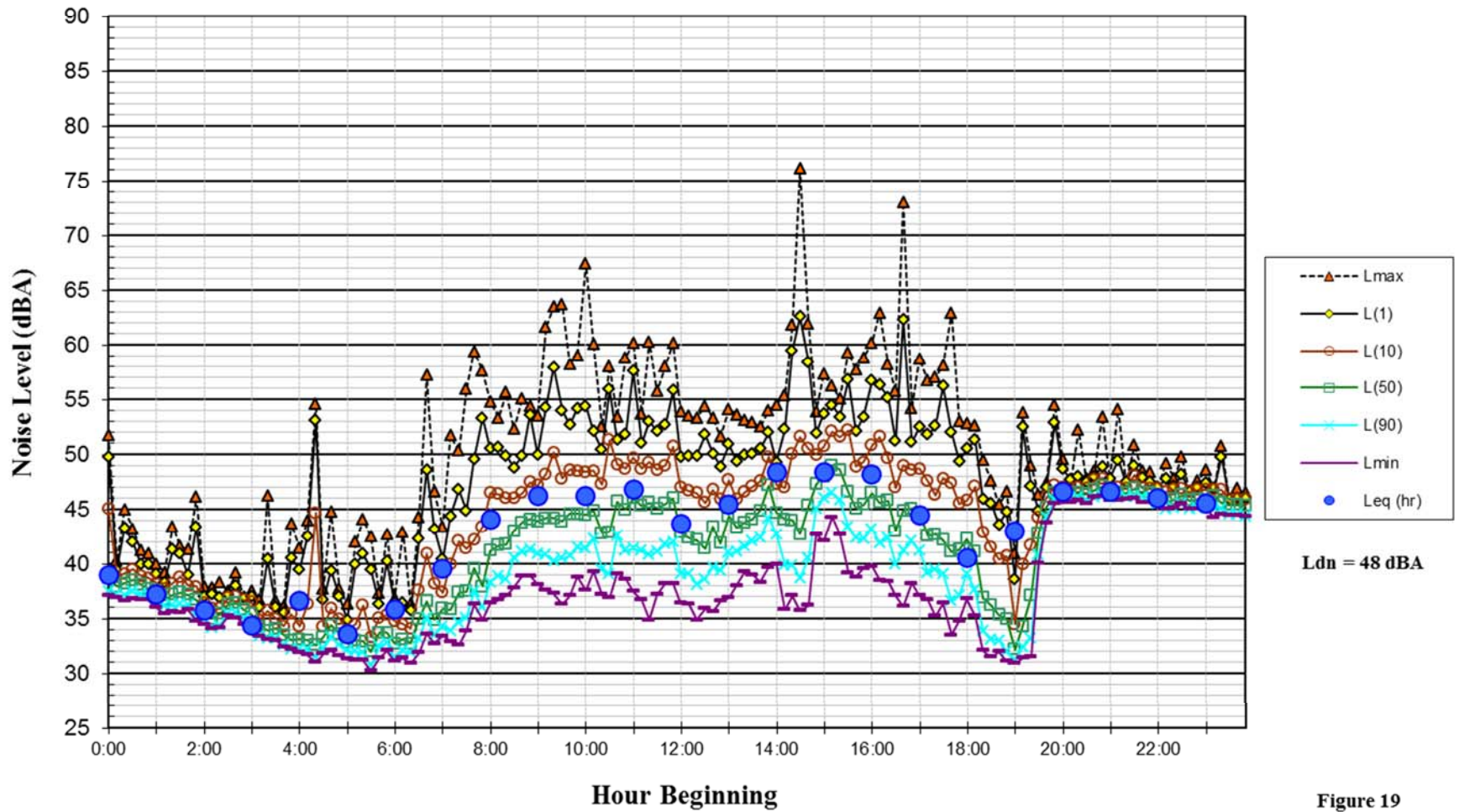


Figure 19

**Noise Levels at Noise Measurement Site LT-4
Monday, September 19, 2016**

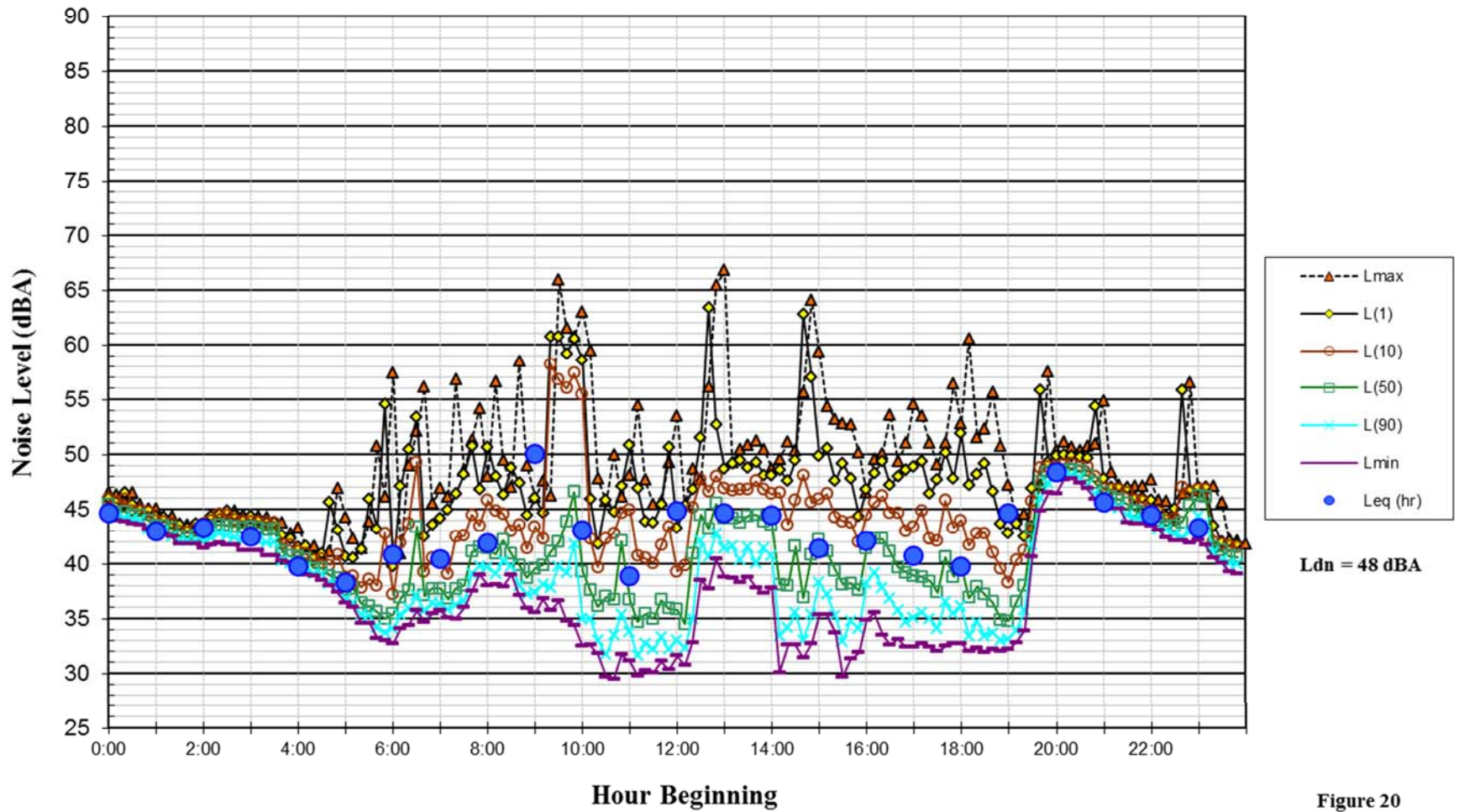


Figure 20

**Noise Levels at Noise Measurement Site LT-4
Tuesday, September 20, 2016**

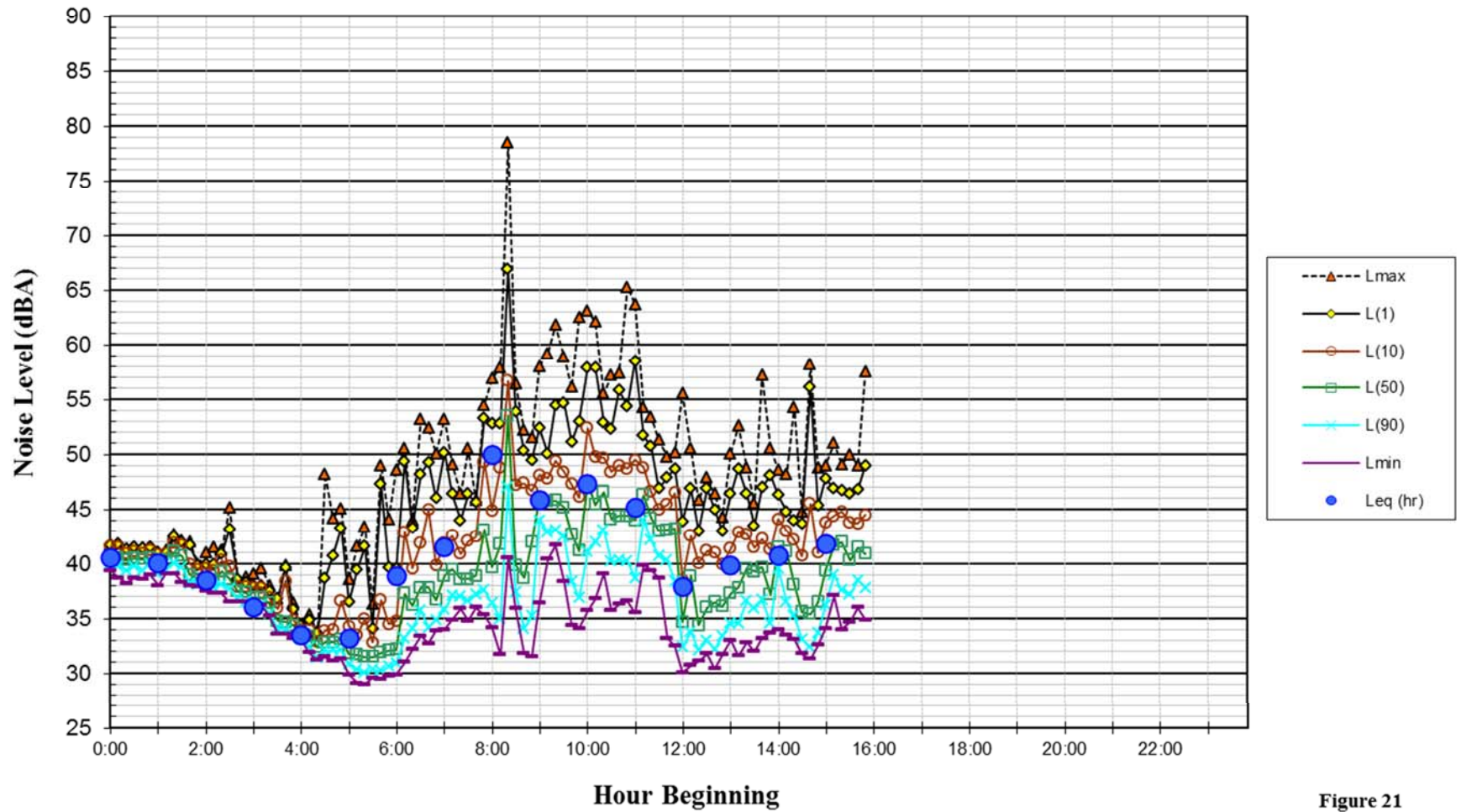


Figure 21

Figure 22: Airborne Sound Isolation at Windows and Doors

