ROSEMARY STREET HOUSING PROJECT ENVIRONMENTAL NOISE ASSESSMENT SAN JOSE, CALIFORNIA

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INTRODUCTION

This report evaluates potential noise impacts resulting from the construction and operation of the Rosemary Street Housing project. The project site is located north of Interstate 880 (I-880) in San Jose, California, and is currently developed with commercial and light industrial land uses. The majority of the existing buildings on site are vacant. The project will remove the existing buildings and develop up to 106 senior and 184 family affordable housing units.

This report includes a Setting Section outlining the fundamentals of environmental acoustics, applicable noise regulations and guidelines, and a description of the existing conditions at the project site. The Impacts and Mitigation Measures Section identifies the potential noise impacts resulting from the construction and operation of the project and necessary mitigation.

SETTING

Fundamentals of Environmental Noise

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB) with 0 dB corresponding roughly to the threshold of hearing. Decibels and other technical terms are defined in Table 1.

Most of the sounds that we hear in the environment do not consist of a single frequency, but rather a broad band of frequencies, with each frequency differing in sound level. The intensities of each frequency add together to generate a sound. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound in accordance with a weighting that reflects the facts that human hearing is less sensitive at low frequencies and extreme high frequencies than in the frequency mid-range. This is called "A" weighting, and the decibel level so measured is called the A-weighted sound level (dBA). In practice, the level of a sound source is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting curve. Typical A-weighted levels measured in the environment and in industry are shown in Table 2 for different types of noise.

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources which create a relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of environmental noise, the statistical noise descriptors, L_{01}, L_{10}, L_{50}, and L_{90}, are commonly used. They are the A-weighted noise levels equaled or exceeded during 1%, 10%, 50%, and 90% of a stated time period. A single number descriptor called the L_{eq} is also widely used. The L_{eq} is the average A-weighted noise level during a stated period of time.

In determining the daily level of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes very noticeable. Further, most people sleep at

night and are very sensitive to noise intrusion. To account for human sensitivity to nighttime noise levels, a descriptor, DNL (day/night average sound level), was developed. The DNL divides the 24-hour day into the daytime of 7:00 AM to 10:00 PM and the nighttime of 10:00 PM to 7:00 AM. The nighttime noise level is weighted 10 dB higher than the daytime noise level. The Community Noise Equivalent Level (CNEL) is another 24-hour average which includes both an evening and nighttime weighting.

Fundamentals of Groundborne Vibration

Light rail trains can be a potential source of ground vibration depending on the distance between the track and receiver, the type and the speed of trains, and the type of track. Human response to ground vibration has been correlated best with the velocity of the ground. The velocity of the ground is expressed on the decibel scale. The reference velocity is 1×10^{-6} in./sec. RMS, which equals 0 VdB, and 1 in./sec. equals 120 VdB. Although not a universally accepted notation, the abbreviation "VdB" is used in this document for vibration levels to reduce the potential for confusion with sound levels.

Typical background vibration levels in residential areas are usually 50 VdB or lower, well below the threshold of perception for most humans. Perceptible vibration levels inside residences are attributed to the operation of heating and air conditioning systems, door slams and foot traffic. Construction activities, train operations, and street traffic are some of the most common external sources of vibration that can be perceptible inside residences. Table 3 illustrates some common sources of vibration and the association to human perception or the potential for structural damage.

One of the problems with developing suitable criteria for groundborne vibration is the limited research into human response to vibration and more importantly human annoyance inside buildings. The U.S. Department of Transportation, Federal Transit Administration has developed rational vibration limits that can be used to evaluate human annoyance to groundborne vibration. These criteria are primarily based on experience with passenger train operations, such as rapid transit and commuter rail systems. The FTA vibration limits are used in this assessment to evaluate the potential of vibration-induced annoyance on the site due to light rail trains.

Table 1 Definitions of Acoustical Terms Used in this Report

Term	Definitions
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.
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, Leq	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.

Table 2 Typical Noise Levels in the Environment

Common Outdoor Noise Source	Noise Level (dBA)	Common Indoor Noise Source
	120 dBA	
Jet fly-over at 300 meters		Rock concert
	110 dBA	
Pile driver at 20 meters	100 dBA	
		Night club with live music
	90 dBA	
Large truck pass by at 15 meters		
	80 dBA	Noisy restaurant
		Garbage disposal at 1 meter
Gas lawn mower at 30 meters	70 dBA	Vacuum cleaner at 3 meters
Commercial/Urban area daytime		Normal speech at 1 meter
Suburban expressway at 90 meters	60 dBA	
Suburban daytime		Active office environment
	50 dBA	
Urban area nighttime		Quiet office environment
	40 dBA	
Suburban nighttime		
Quiet rural areas	30 dBA	Library
		Quiet bedroom at night
Wilderness area	20 dBA	
Most quiet remote areas	10 dBA	Quiet recording studio
Threshold of human hearing	0 dBA	Threshold of human hearing

Table 3 Typical Levels of Groundborne Vibration

Human/Structural Response	Velocity Level, VdB (re 1µinch/sec, RMS)	Typical Events (50 –foot setback)
Threshold, minor cosmetic damage	100	Blasting, pile driving, vibratory compaction equipment
		Heavy tracked vehicles (Bulldozers, cranes, drill rigs)
Difficulty with tasks such as reading a video or computer screen	90	
		Commuter rail, upper range
Residential annoyance, infrequent events	80	Rapid transit, upper range
Residential annoyance, frequent events		Commuter rail, typical Bus or truck over bump or on rough roads
	70	Rapid transit, typical
Approximate human threshold of perception to vibration		Buses, trucks and heavy street traffic
	60	
		Background vibration in residential settings in the absence of activity
Lower limit for equipment ultra-sensitive to vibration	50	

Source: Illingworth & Rodkin, Inc. and U.S. Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006,FTA-VA-90-1003-0

Regulatory Background - Noise

The State of California, the Santa Clara County Airport Land Use Commision, and the City of San Jose establish regulatory criteria that are designed to limit noise exposure at noise sensitive land uses. These guidelines, regulations, and policies are used as significance criteria in this impact assessment. Applicable criteria presented in Appendix G of the State CEQA Guidelines, in the State Building Code, and in the City of San Jose Noise Element of the General Plan are as follows:

State CEQA Guidelines. The significance of environmental noise impacts resulting from a proposed project are evaluated based on the California Environmental Quality Act (CEQA) guidelines. CEQA asks the following applicable questions. Would the project result in:

- 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?
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

CEQA does not define what noise level increase would be considered substantial. Typically, project-generated noise level increases of 3 dBA DNL or greater would be considered significant where exterior noise levels would exceed the normally acceptable noise level standard (60 dBA DNL for residential land uses). Where noise levels would remain at or below the normally acceptable noise level standard with the project, noise level increases of 5 dBA DNL or greater would be considered significant.

Santa Clara County Airport Land Use Commission Land Use Plan. The Santa Clara County Airport Land Use Commission has adopted a Land Use Compatibility Chart (not shown) for projects within the vicinity of Mineta San Jose International Airport. The chart indicates that residential land uses are compatible in noise environments resulting from aircraft that are 65 dBA CNEL or less.

City of San Jose General Plan. The Noise Element of the City of San Jose's 2020 Plan identifies noise and land use compatibility standards for various land uses. The City's goal is to,

"...minimize the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies."

Residential land uses are considered "satisfactory" up to 60 dBA DNL as the short-range exterior noise quality level, and 55 dBA DNL as the long-range exterior noise quality level. The guidelines state that where the exterior DNL is above the "satisfactory" limit (between 60 and 70 dBA DNL), and the project requires a full EIR, an acoustical analysis should be made indicating the amount of attenuation necessary to maintain an indoor level less than or equal to 45 dBA DNL. Exterior noise levels exceeding 70 dBA DNL require that new development would only be permitted if uses are entirely indoors and building design limits interior levels to less than or equal to 45 dBA DNL. Outside activity areas should be permitted if site planning and noise barriers result in levels of 60 dBA DNL or less.

Policies presented in the Noise Element applicable to this project are as follows:

> **Policy 1.** The City's acceptable noise level objectives are 55 dBA DNL as the long-range exterior noise quality level, 60 dBA DNL as the short-range exterior noise quality level, 45 dBA DNL as the interior noise quality level, and 76 dBA DNL as the maximum exterior noise level necessary to avoid significant adverse health effects. These objectives are established for the City, recognizing that the attainment of exterior noise quality levels in the environs of the San Jose International Airport, the Downtown Core Area, and along major roadways may not be achieved in the time frame of this Plan. To achieve the noise objectives, the City should require appropriate site and building design, building construction and noise attenuation techniques in new residential development.
>
> **Policy 9.** Construction operations should use available noise suppression devices and technology.

Regulatory Background - Vibration

The City of San Jose has not established vibration limits that can be used to evaluate the compatibility of sensitive land uses with respect to groundborne vibration. Although there are no local standards, the U.S. Department of Transportation's Federal Transit Administration (FTA) has developed vibration impact assessment criteria for evaluating vibration impacts associated with transit projects.[1] FTA has proposed vibration impact criteria based on maximum overall levels for a single event. The impact criteria for groundborne vibration are shown in Table 4. Note that there are criteria for frequent events (more than 70 events of the same source per day), occasional events (30 to 70 vibration events of the same source per day), and infrequent events (less than 30 vibration events of the same source per day).

[1]U.S. Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006, FTA-VA-90-1003-06.

Table 4 Groundborne Vibration Impact Criteria

Land Use Category	Groundborne Vibration Impact Levels (VdB re 1 µinch/sec, RMS)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1 Buildings where vibration would interfere with interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]
Category 2 Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Category 3 Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB

Notes:

1. "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
2. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
3. "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.
4. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research should always require detailed evaluation to define the acceptable vibration levels. Ensuring low vibration levels in a building requires special design of HVAC systems and stiffened floors.

Source: U.S. Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006, FTA-VA-90-1003-06.

Existing Noise Environment

The project site is located southeast of the intersection of North 1st Street and Rosemary Street, as shown on Figure 1. Surrounding lands are primarily commercial in nature, including two hotels north of Rosemary Street and restaurants and a gas station to the west. Senior housing is located just east of the project site. The project would remove the buildings located on site and develop up to 97 senior and 207 family affordable housing units.

The ambient noise environment was quantified through a series of noise measurements made at the project site beginning Thursday, September 27, 2007 and ending Tuesday, October 2, 2007. The noise monitoring survey included two long-term noise measurements (LT-1 and LT-2) and three short-term noise measurements (ST-1, ST-2, and ST-3). The noise environment at the project site results primarily from vehicles along I-880 and North 1st Street, VTA light rail trains, and aircraft.

Long-term noise measurement location LT-1 was along the site's southernmost boundary near the southbound I-880 off-ramp to North 1st Street. This position was approximately 325 feet from the center of I-880. Ambient noise levels measured at Site LT-1 were primarily the result of traffic along I-880. These data are summarized on Figures 2-7. Typical weekday, daytime hourly average noise levels ranged from 59 to 68 dBA L_{eq}. Nighttime hourly average noise levels generally ranged from 55 to 67 dBA L_{eq}. Day-night average noise levels ranged from 68 to 69 dBA DNL on weekdays and from 67 to 68 dBA DNL over the weekend.

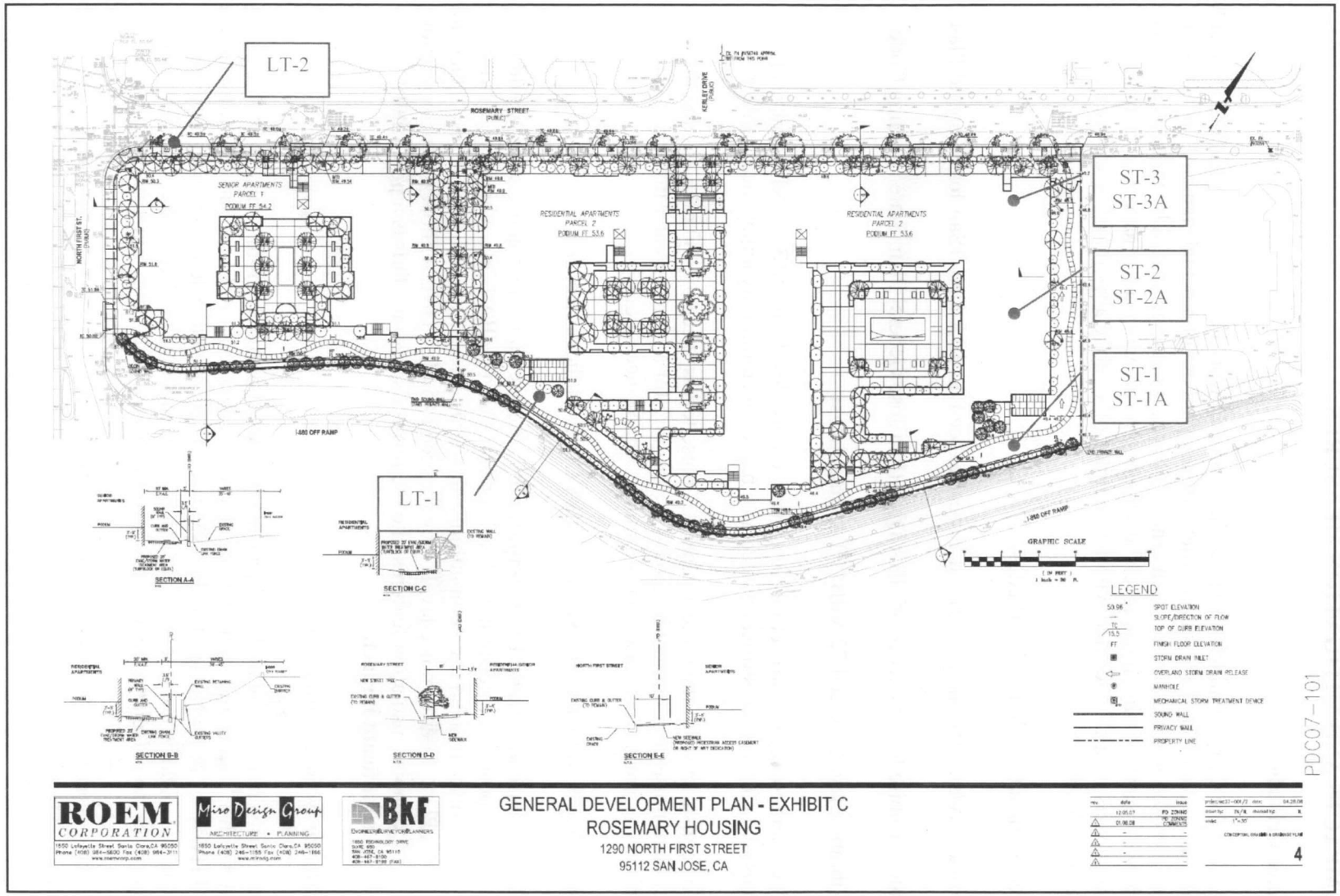
The daily trend in noise levels along North 1st Street was measured approximately 105 feet from the center of the North 1st Street/VTA right-of-way at Site LT-2. Ambient noise levels measured at this site were primarily the result of traffic along North 1st Street, VTA light-rail train passages, distant highway traffic, and jet aircraft. Typical weekday, daytime hourly average noise levels ranged from 63 to 70 dBA L_{eq}. Nighttime hourly average noise levels generally ranged from 55 to 68 dBA L_{eq}. Day-night average noise levels ranged from 70 to 71 dBA DNL on weekdays and from 68 to 69 dBA DNL over the weekend. Noise levels measured at Site LT-2 are summarized on Figures 8-13.

Short-term noise measurements were made on Tuesday, October 2, 2007 during the 11:00 a.m. and noon hours. The short-term noise measurements were made at three locations as shown in Figure 1 at elevations of five-feet and fifteen-feet above the ground. Noise data collected at these sites are summarized in Table 5.

Table 5 Short-Term Measurement Noise Data (dBA)

Location	L_{eq}	L_{01}	L_{10}	L_{50}	L_{90}	Est. DNL
ST-1 – South Property Line 5 feet above ground.	63	66	64	62	61	68
ST-1A – South Property Line 15 feet above ground.	67	70	69	67	65	72
ST-2 – Mid-Point of Site 5 feet above ground.	66	77	66	64	63	69
ST-2A – Mid-Point of Site 15 feet above ground.	67	77	68	66	64	71
ST-3 – North End of Site 5 feet above ground.	64	68	66	64	61	69
ST-3A – North End of Site 15 feet above ground.	65	69	66	65	63	70

Figure 1 Site Plan Showing Measurement Locations



NOISE IMPACTS AND MITIGATION MEASURES

Significance Criteria

Appendix G of the CEQA Guidelines states that a project would normally be considered to result in a significant impact if noise levels conflict with adopted environmental standards or plans, if persons are exposed to excessive groundborne vibration, if noise generated by the project would substantially increase existing noise levels at sensitive receivers on a permanent or temporary basis, or if persons would be located within two miles of a public airport and be exposed to excessive noise levels.

A significant impact would be identified if:

- Noise levels at common exterior use areas exceed 60 dBA DNL (San Jose General Plan)
- Interior noise levels exceed 45 dBA DNL (San Jose General Plan, State Building Code)
- Vibration levels exceed 72 VdB (FTA Guidelines)
- The operation of the project increases traffic noise levels by 3 dBA DNL or more at sensitive receivers (historical precedence based on community annoyance studies)
- The construction of the project generates noise levels exceeding 60 dBA L_{eq} and the ambient noise environment by 5 dBA L_{eq} or more for a period greater than one year (historical precedence based on community annoyance studies)
- Noise levels from aircraft exceed 65 dBA CNEL at the project site

Impact 1: **Noise and Land Use Compatibility.** Residential common use areas would be exposed to exterior noise levels greater than 60 dBA DNL, which exceeds the noise and land use compatibility standards presented in the City of Jose's General Plan. Interior noise levels would exceed 45 dBA DNL without the incorporation of noise insulation features into the project's design. **This is a potentially significant impact.**

Future Exterior Noise Environment

The future noise environment at the project site will result primarily from vehicular traffic along I-880 and North 1st Street and aircraft associated with operations at Mineta San Jose International Airport. FHWA's Traffic Noise Model (TNM v. 2.5) was used to calculate future traffic noise levels at the site. Traffic noise levels calculated by the model were then added to aircraft noise level projections[2] to calculate overall noise levels expected at the site. Exterior noise levels

2 65 dB CNEL Contour for 2010 Master Plan with Amendment, Norman Y. Mineta San Jose International Airport, http://www.sjc.org/community/maps/2010_SEIRJET_65.pdf.

throughout the project site would exceed 60 dBA DNL and would vary depending upon the proximity of receivers to area roadways and the presence of shielding features.

Traffic noise modeling indicates that unshielded facades nearest I-880 would be exposed to exterior noise levels ranging from 76 to 79 dBA DNL. Facades located below the elevation of I-880 would be partially shielded by the edge of the fill section and "k-rail" barrier at the edge of the southbound travel way. Future noise levels at first floor and second floor elevations would range from 69 to 73 dBA DNL. Exterior noise levels would exceed 72 dBA DNL at facades nearest North 1st Street.

Shared common use areas would be located in courtyards that open toward I-880. The courtyards will include outdoor amenities such as swimming pools, BBQ areas, a Tot Lot, outdoor patio seating, etc. TNM does not account for the potential noise reflections in courtyards that open onto a noise source, so an image noise source was included in the model to conservatively calculate noise levels assuming reflections off of the proposed buildings. Exterior noise levels at the courtyard proposed on Parcel 1 (senior apartments) are calculated to be 66 dBA DNL. Well- shielded portions of the courtyards proposed for residential apartments (Parcels 2 and 3) would experience future exterior noise levels ranging from 61 to 64 dBA DNL assuming the shielding and reflections resulting from the proposed residential buildings that surround these courtyard areas. Common use areas located outside of the shielded courtyards will experience future exterior noise levels ranging from 66 to 67 dBA DNL. Exterior noise levels would generally exceed the City of San Jose's short-term noise goal of 60 dBA DNL, however, the City recognizes that it may not be possible to reduce exterior noise levels to meet the goal adjacent to major roadways, in the downtown core, or near the airport. The noise environment in shielded common use areas would generally range from 61 to 66 dBA DNL, which is generally accepted as a satisfactory noise level for multi-family residences in similar urban settings.

Future Interior Noise Environment

Interior noise levels within new residential units are required to be maintained at or below 45 dBA DNL. Residential buildings throughout the project site will be exposed to future noise levels greater than 60 dBA DNL with the highest future noise exposures occurring nearest I-880. Interior noise levels will vary depending on the design of the buildings (relative window area to wall area) and construction materials and methods. Standard residential construction provides approximately 15 dBA of exterior to interior noise reduction assuming the windows are partially open for ventilation. Standard construction with the windows closed provides approximately 20 to 25 dBA of noise reduction in interior spaces.

In exterior noise environments ranging from 60 dBA DNL to 65 dBA DNL, interior noise levels can typically be maintained below City and State standards with the incorporation of an adequate forced air mechanical ventilation system in each residential unit. In noise environments of 65 dBA DNL or greater, a combination of forced-air mechanical ventilation and sound-rated construction methods is often required to meet the interior noise level limit.

Attaining the necessary noise reduction from exterior to interior spaces is readily achievable in noise environments less than 75 dBA DNL with proper wall construction techniques, the

selections of proper windows and doors, and the incorporation of forced-air mechanical ventilation systems. In noise environments exceeding 75 dBA DNL, specialized construction materials and techniques are necessary to reduce interior noise levels to acceptable levels.

Mitigation Measures:

- The following mitigation measures shall be included in the project:
- Project-specific acoustical analyses are required by Appendix Chapter 1208A.8.4 of the California Building Code to confirm that interior noise levels will be reduced to 45 dBA DNL or lower. The specific determination of what noise insulation treatments are necessary will be conducted on a unit-by-unit basis. Results of the analysis, including the description of the necessary noise control treatments, will be submitted to the City along with the building plans and approved prior to issuance of a building permit.
- Building sound insulation requirements would need to include the provision of forced-air mechanical ventilation for units proposed in noise environments exceeding 60 dBA DNL, so that windows could be kept closed at the occupant's discretion to control noise.
- Special building techniques (e.g., sound-rated windows and building facade treatments) may be required to maintain interior noise levels at or below acceptable levels. These treatments would include, but are not limited to, sound rated windows and doors, sound rated wall constructions, acoustical caulking, protected ventilation openings, etc. Preliminary calculations indicate that residential units nearest I-880 and with direct line of sight to the roadway would require sound rated windows and doors with ratings ranging from STC 35-40 to assure that the 45 dBA DNL indoor standard is met.

Impact 2: **Groundborne Vibration.** The project will develop residential land uses within approximately 55 feet of VTA light rail tracks. This distance is sufficient to attenuate groundborne vibration levels below FTA acceptability thresholds for residential uses exposed to "frequent" events. **This is a less-than-significant impact.**

The U.S. Department of Transportation's Federal Transit Administration (FTA) criterion for groundborne vibration impacts is 72 VdB for frequent events (more than 70 events per day). The nearest residential units will be located approximately 55 feet from the center of the northbound track and 70 feet from the center of the southbound track. Data collected at a similar site[3] along the North 1st Street corridor indicates that vibration generated by light-rail train passages will range from 60 to 64 VdB at the nearest proposed receivers. Light-rail train vibration levels will be less than the FTA's criterion for groundborne vibration impacts (72 VdB), and the impact is a less than significant.

Mitigation Measures: None Required

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3 Wyse Property Project Environmental Noise Assessment, prepared for David J. Powers and Associates Inc. by Illingworth and Rodkin, Inc., October 11, 2007.

Impact 3: **Project-Generated Noise - Traffic.** Project-generated traffic would not substantially increase traffic noise levels at nearby receivers. **This is a less-than-significant impact.**

The cumulative development of the North San Jose Area will increase traffic noise levels along North 1st Street by approximately 1 dBA DNL[4]. The project's contribution to the overall noise increase would be less. Noise levels along the major roadways serving the project site would not substantially increase as a result of the project. This is a less than significant impact.

Mitigation Measures: **None Required**

Impact 4: **Construction Noise.** Noise generated by construction activities at the site would not be expected to adversely affect adjacent land uses provided standard construction noise controls are implemented at the site. **This is a less-than-significant impact with the incorporation of mitigation.**

The project would be constructed in phases over an approximate 18 to 20-month period. The construction of each podium would be phased one after the other. Proposed activities would include the demolition of existing commercial and industrial buildings, site preparation, construction of project infrastructure, construction of building cores and shells, building finishing, and landscaping.

Construction-related noise levels are normally highest during the demolition phase and during the construction of project infrastructure. These phases of construction require heavy equipment that normally generates the highest noise levels over extended periods of time. Typical hourly average construction generated noise levels are about 81 to 88 dBA L_{eq} measured at a distance of 50 feet from the center of the site during busy construction periods (e.g., earth moving equipment, impact tools, etc.). Construction-related noise levels are normally less during building framing, finishing, and landscaping phases when less heavy equipment is present on site. There would be variations in construction noise levels on a day-to-day basis depending on the actual activities occurring at the site.

Construction generated noise levels drop off at a rate of about 6 dBA per doubling of distance between the noise source and receptor. Barriers or buildings that interrupt the sound path between the source and receivers would provide an additional 5 to 10 decibels of attenuation. The nearest existing residential receivers are located approximately 50 feet east of the site. Two hotels are located to the north at distances of approximately 100 and 250 feet, respectively.

Construction noise levels would be highest at existing residential receivers in the site vicinity when construction occurs on the northernmost or easternmost portions of the site. Hourly average noise levels generated by project construction activities would range from about 81 to 88

4 North San Jose Area EIR Environmental Noise Assessment, prepared for David J. Powers and Associates Inc. by Illingworth and Rodkin, Inc., February 9, 2005.

dBA L_{eq} at receivers to the east during intense periods of construction near the easternmost portion of the site. As construction activities move away from the easternmost portion of the site (beyond about 200 feet), construction noise levels would be at or below ambient noise levels resulting from traffic along I-880. Construction noise levels would range from about 75 to 82 dBA L_{eq} at the hotel east of North 1st Street and from about 67 to 74 dBA L_{eq} at the hotel east of Kerley Drive. Construction noise levels would similarly decrease as activities move to the south.

Significant noise impacts do not normally occur when standard construction noise control measures are enforced at the project site and when the duration of the noise generating construction period at a particular receiver or group of receivers is limited to one construction season (typically one year) or less. Construction noises associated with projects of this type are disturbances that are necessary for the construction or repair of buildings and structures in urban areas. Reasonable regulation of the hours of construction, as well as regulation of the arrival and operation of heavy equipment and the delivery of construction materials, are necessary to protect the health and safety of persons, promote the general welfare of the community, and maintain the quality of life.

The following standard controls are assumed to be included in the project:

- Noise-generating activities at the construction site or in areas adjacent to the construction site associated with the project in any way should be restricted to the hours of 7:00 a.m. to 6:00 p.m., Monday through Friday, and 8:00 a.m. to 5:00 p.m. on Saturdays. No construction activities should occur Sundays or holidays.

- Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.

- Locate stationary noise generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area.

- Utilize "quiet" air compressors and other stationery noise sources where technology exists.

- The contractor shall prepare a detailed construction plan identifying the schedule for major noise-generating construction activities. The construction plan shall identify a procedure for coordination with the adjacent noise sensitive facilities so that construction activities can be scheduled to minimize noise disturbance.

- Designate a "disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction schedule.

Mitigation Measures: **No additional measures are required.**

Impact 5: **Noise and Land Use Compatibility (Aircraft).** Residential uses developed at the site would be located in a compatible noise environment with respect to noise generated by Mineta San Jose International Airport. **This is a less-than-significant impact.**

A review of the 65 dBA CNEL noise contour map for Mineta San Jose International Airport indicates that the project site is located outside of the future 65 dBA CNEL noise contour[5]. Residential land uses are considered compatible in noise environments of 65 dBA CNEL or less.

Mitigation Measures: **None Required.**

5 65 dB CNEL Contour for 2010 Master Plan with Amendment, Norman Y. Mineta San Jose International Airport, http://www.sjc.org/community/maps/2010_SEIRJET_65.pdf.

Noise Levels at LT-1
~325 feet from the Center of I-880
Thursday, September 27, 2007

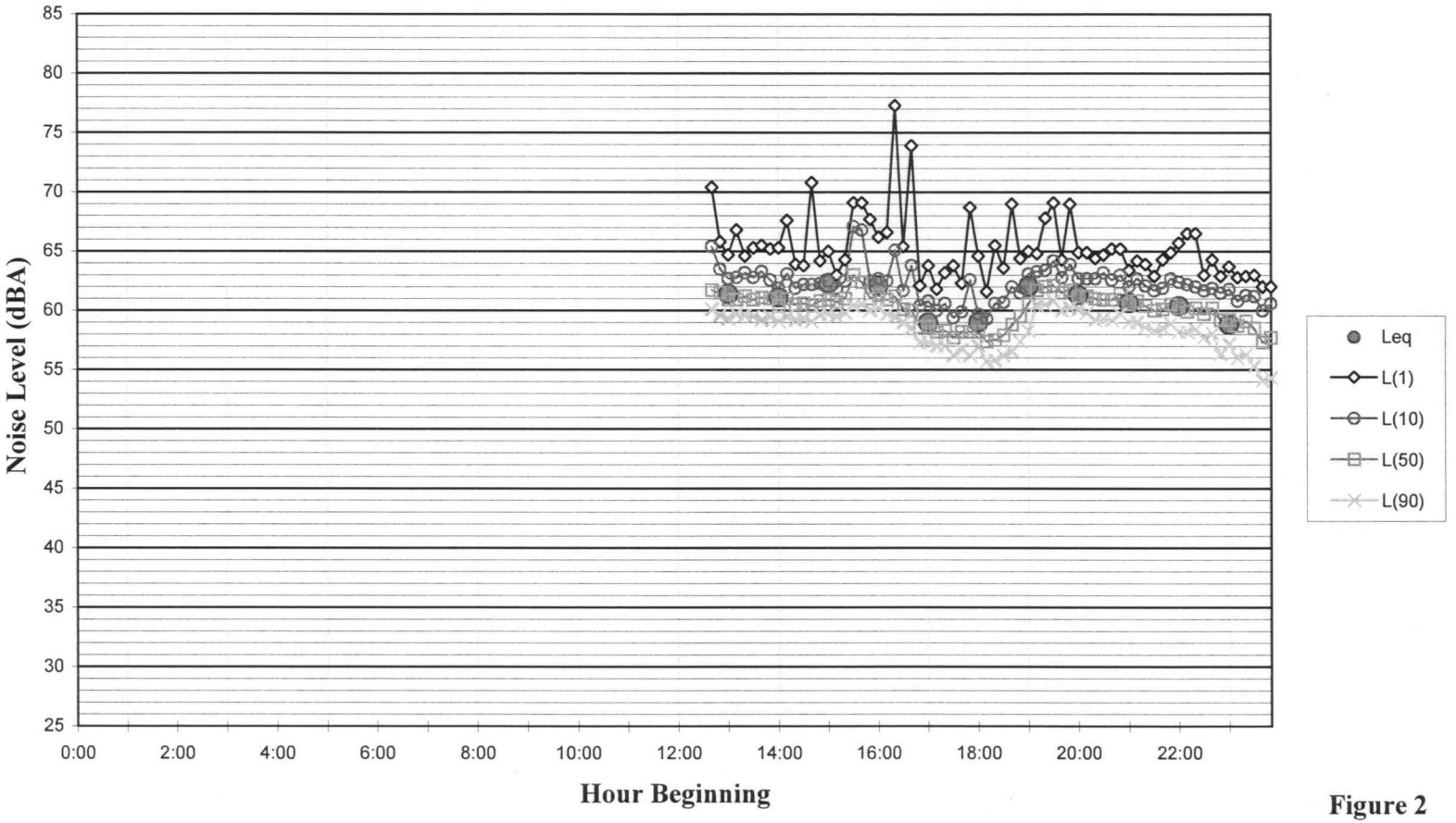

Figure 2

Noise Levels at LT-1
~325 feet from the Center of I-880
Friday, September 28, 2007

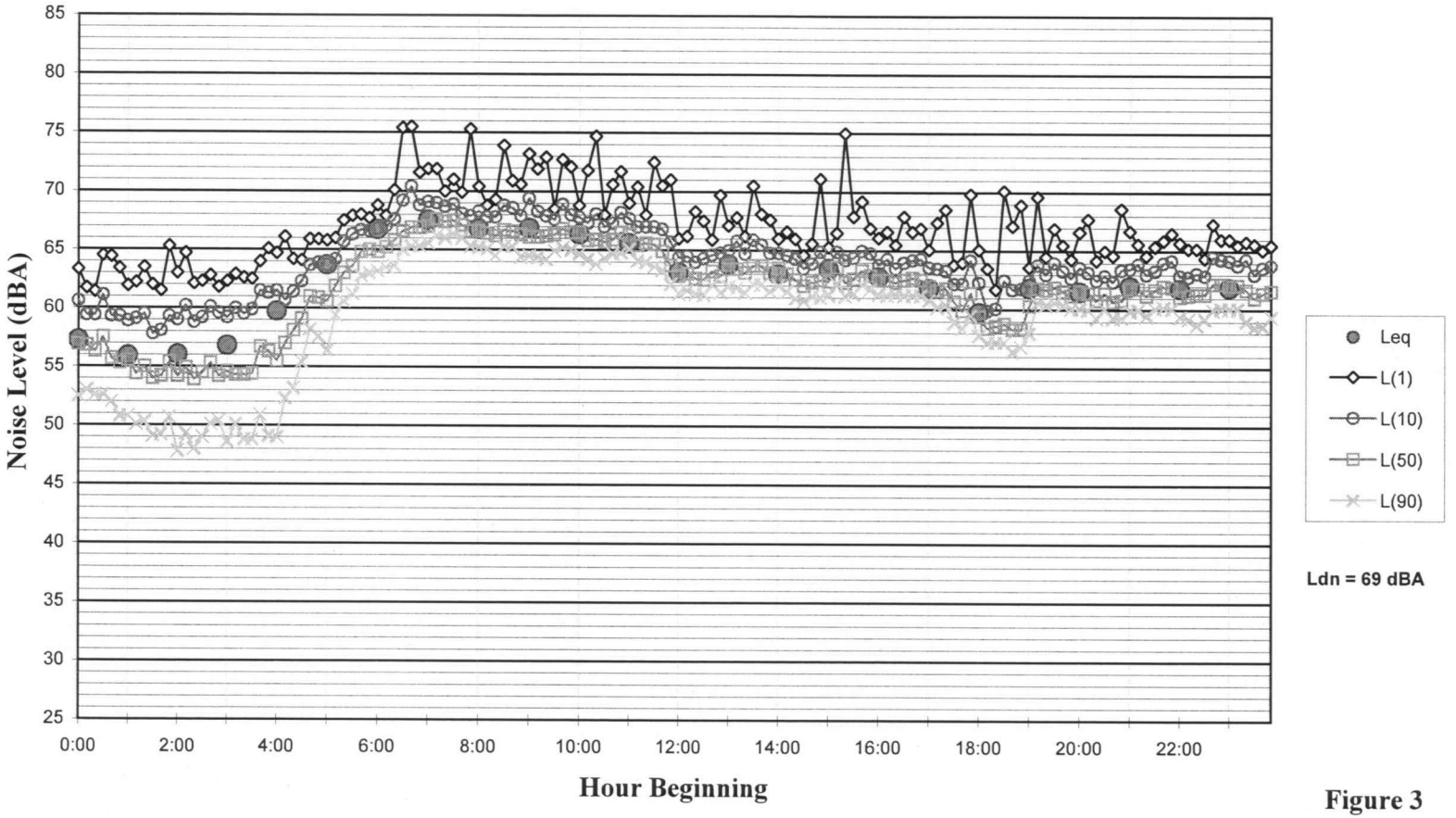

Figure 3

Noise Levels at LT-1
~325 feet from the Center of I-880
Saturday, September 29, 2007

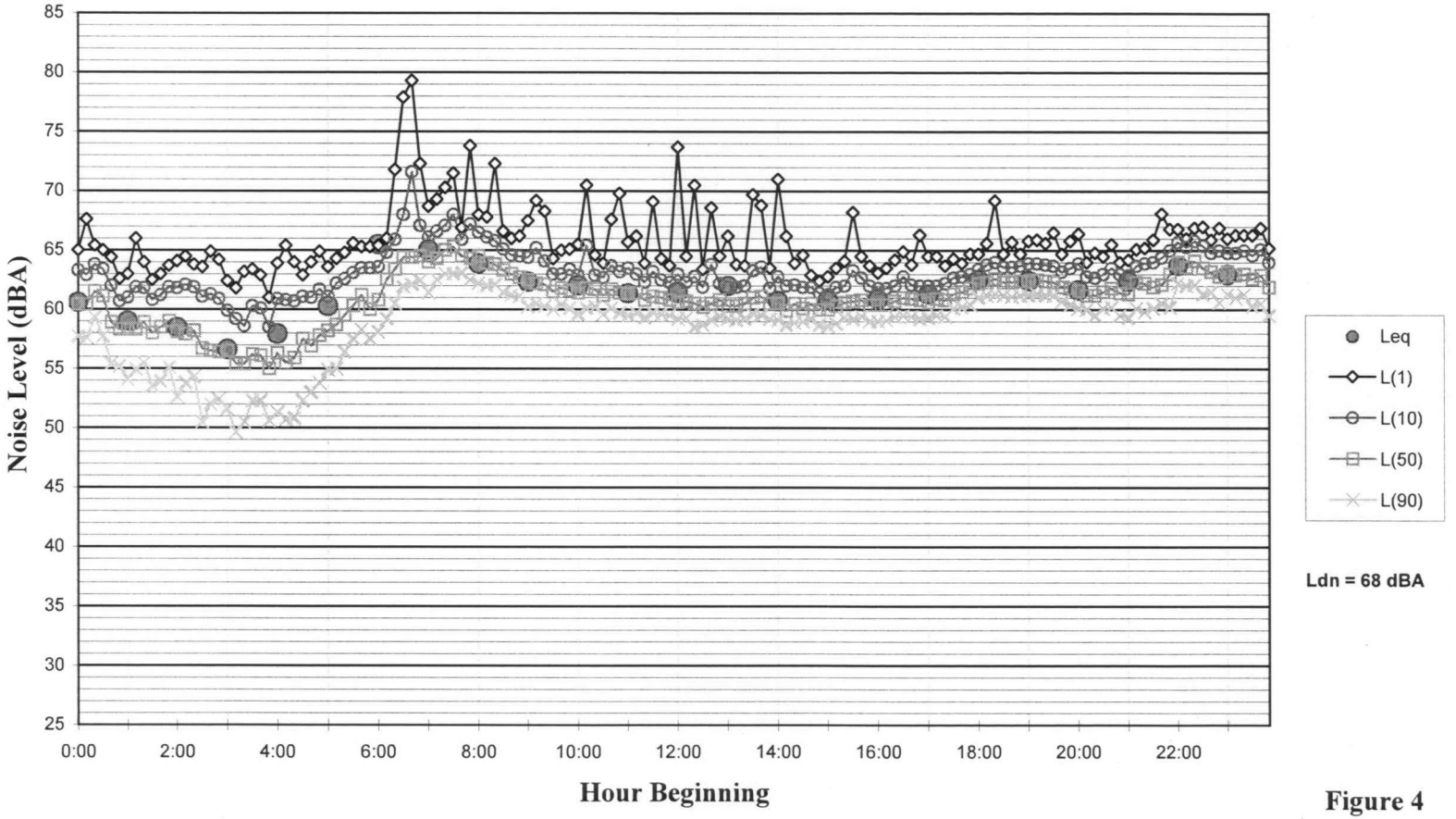

Figure 4

Noise Levels at LT-1
~325 feet from the Center of I-880
Sunday, September 30, 2007

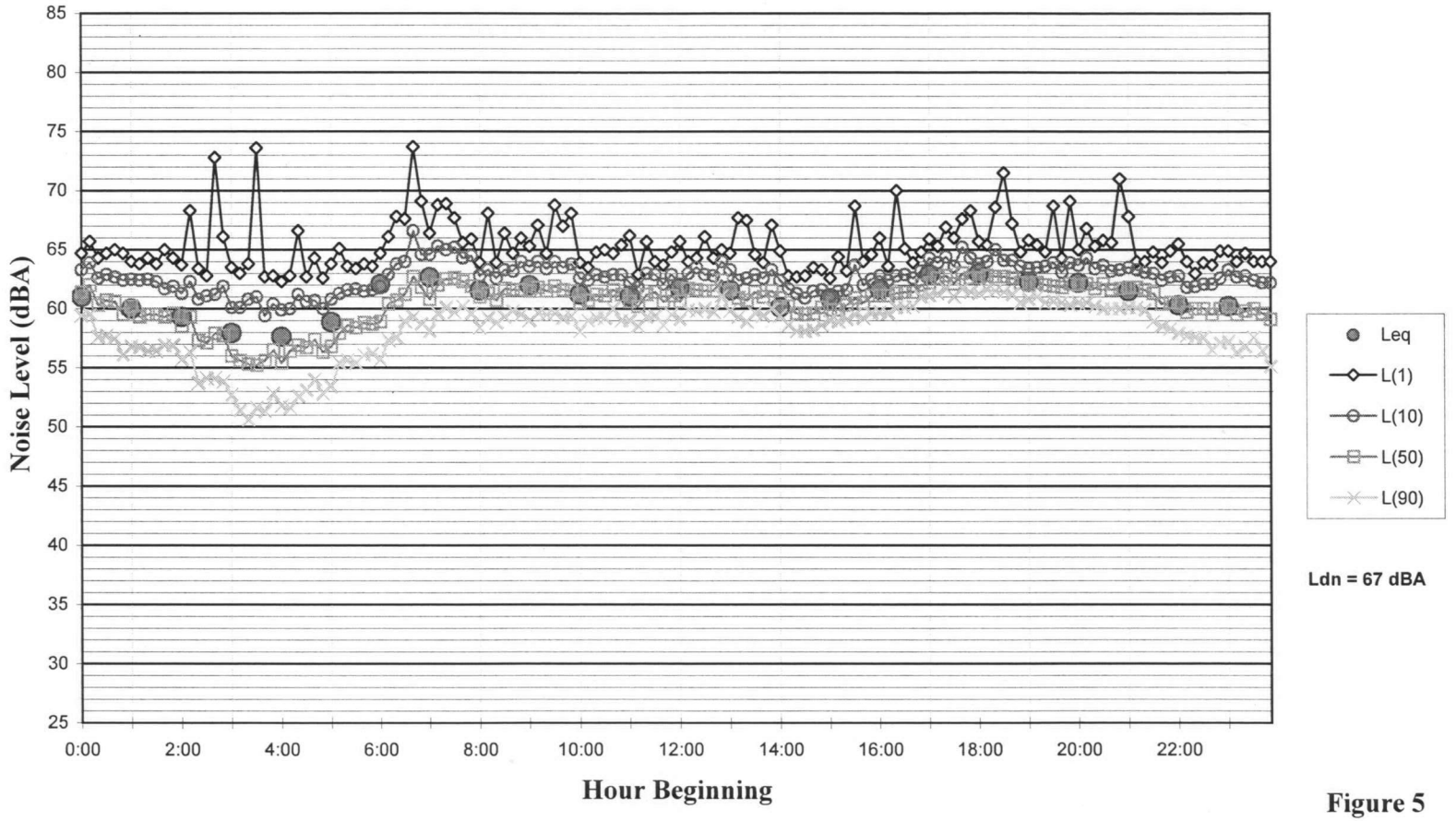

Figure 5

Noise Levels at LT-1
~325 feet from the Center of I-880
Monday, October 1, 2007

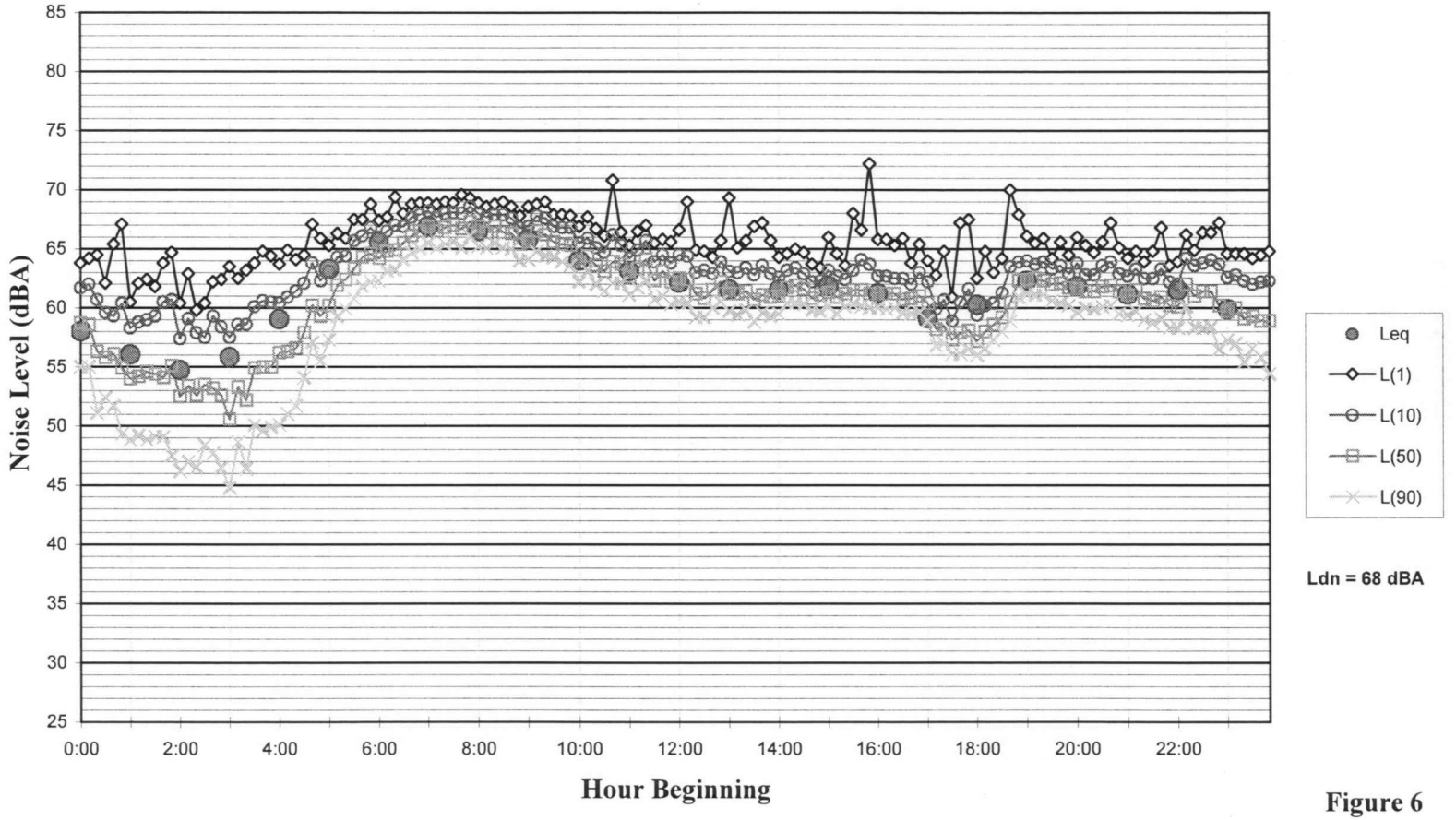

Figure 6

Noise Levels at LT-1
~325 feet from the Center of I-880
Tuesday, October 2, 2007

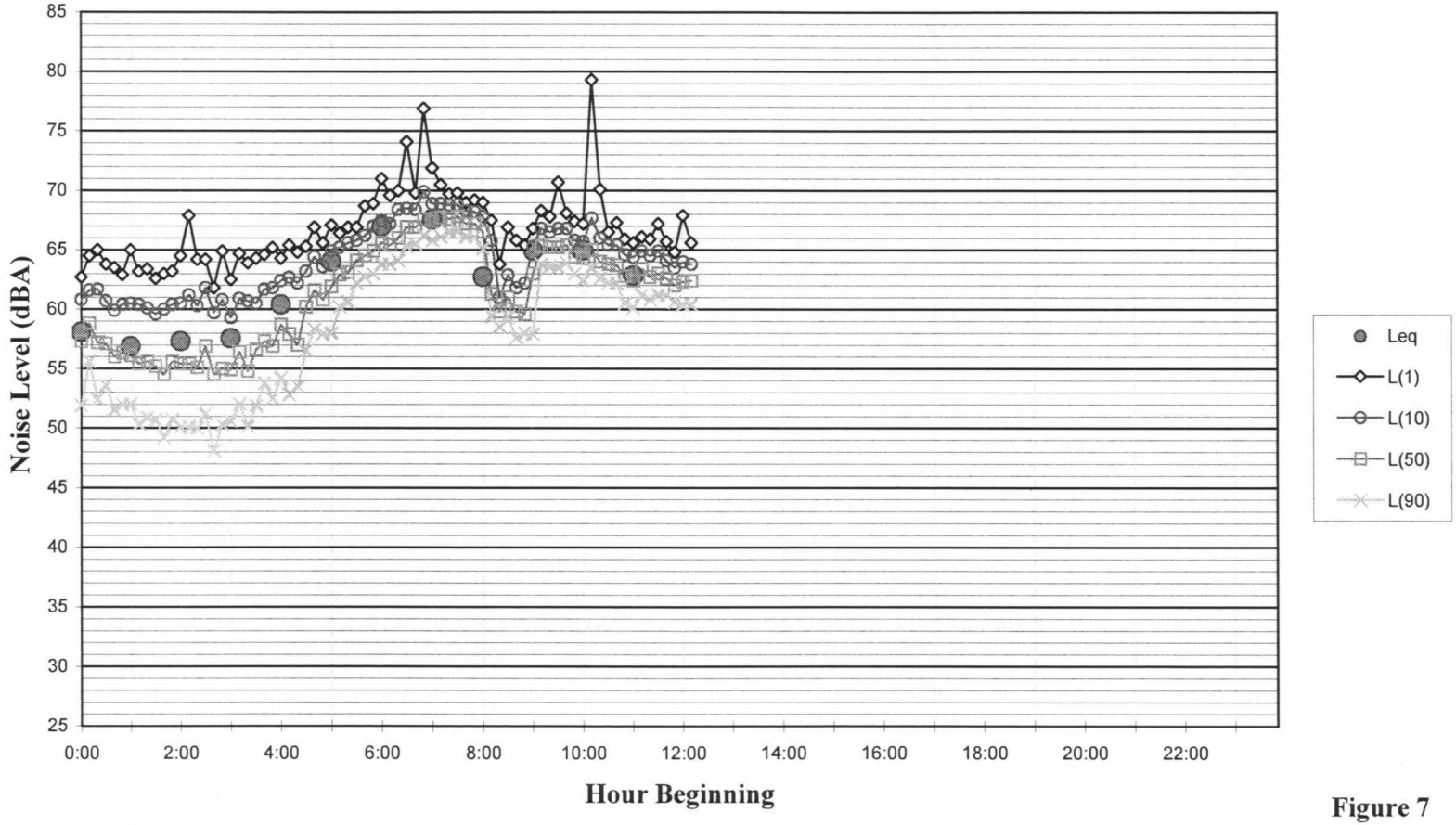

Figure 7

Noise Levels at LT-2
~105 feet from the Center of North 1st Street
Thursday, September 27, 2007

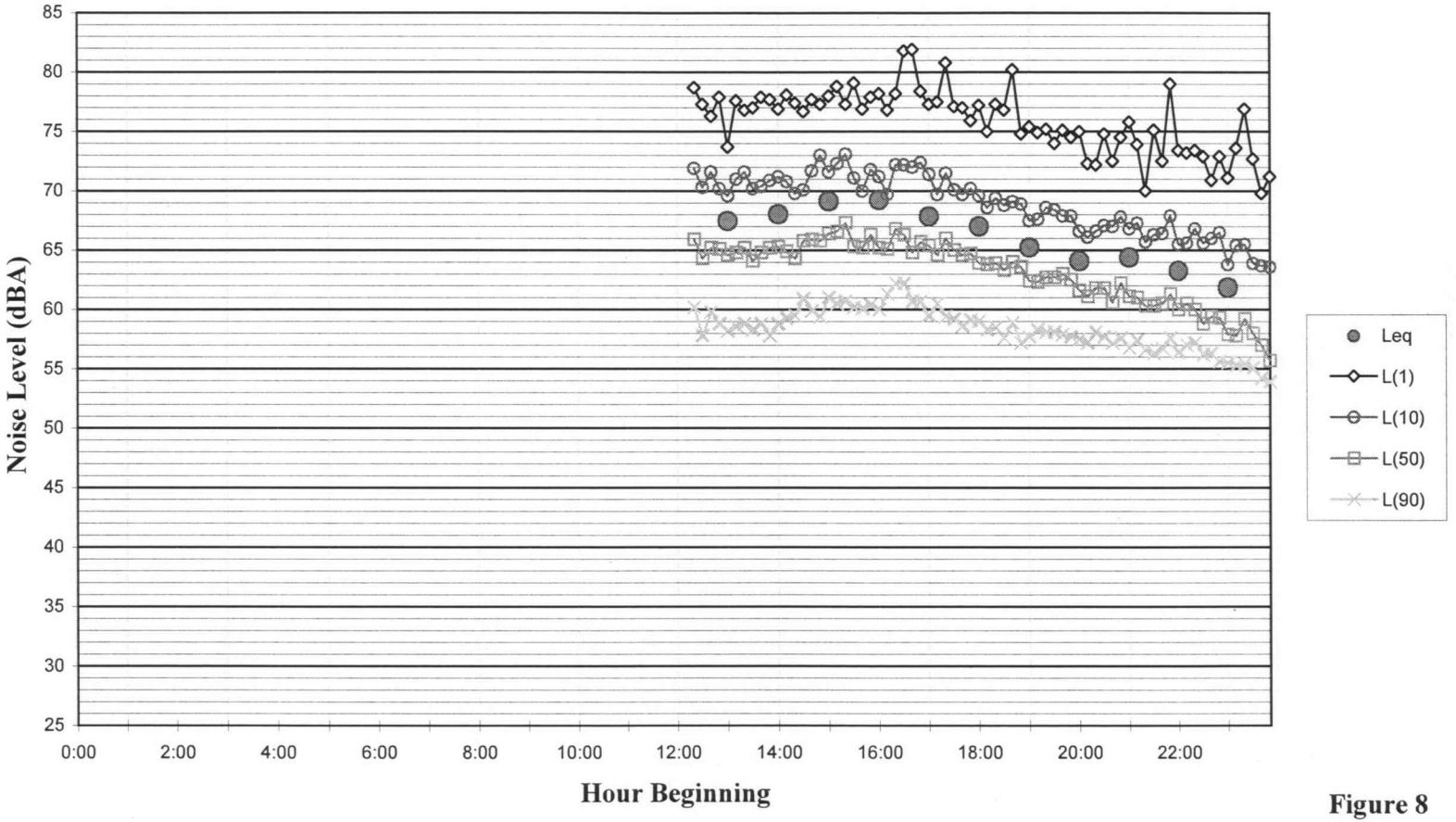

Figure 8

Noise Levels at LT-2
~105 feet from the Center of North 1st Street
Friday, September 28, 2007

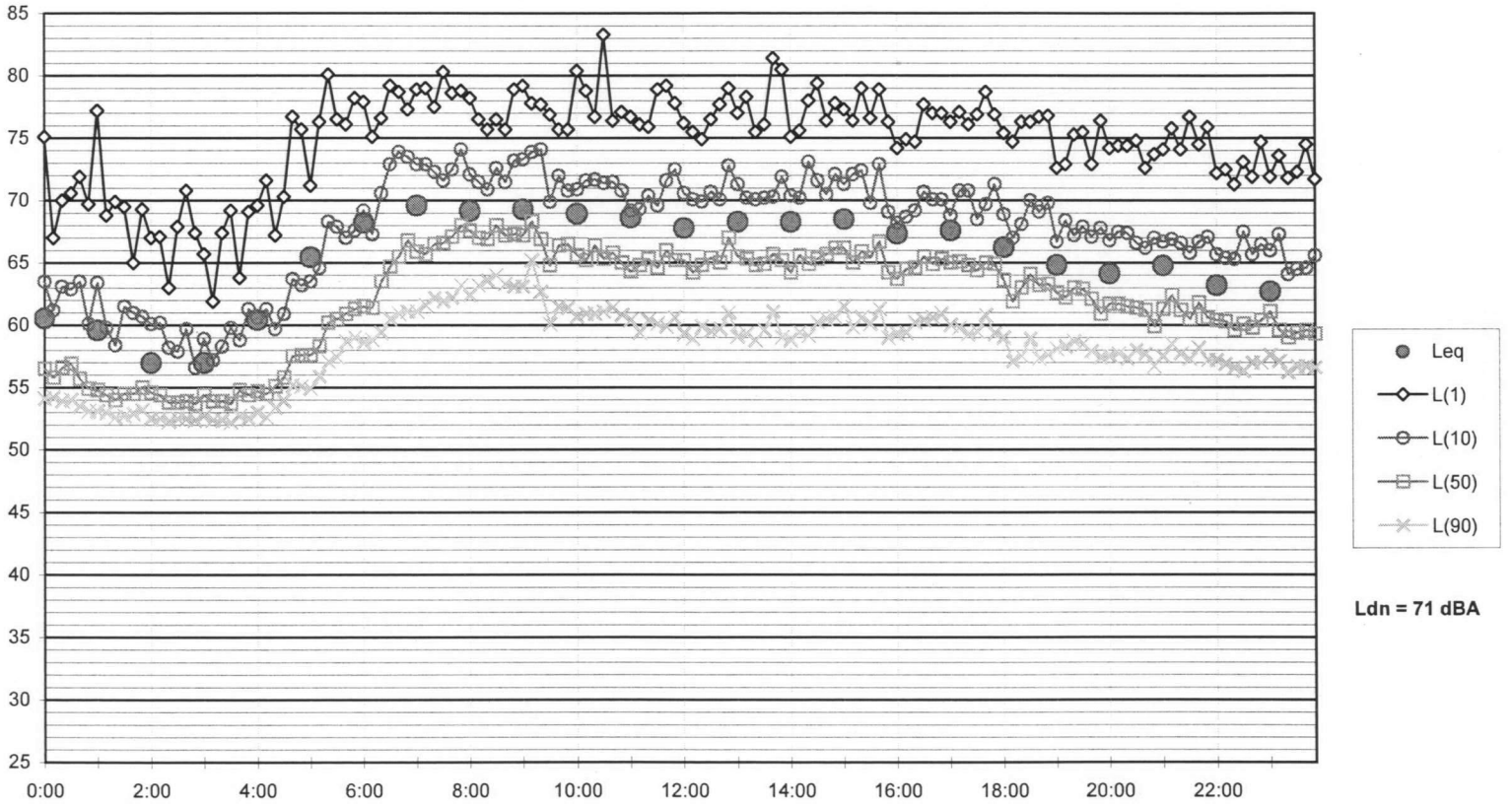

Figure 9

Noise Levels at LT-2
~105 feet from the Center of North 1st Street
Saturday, September 29, 2007

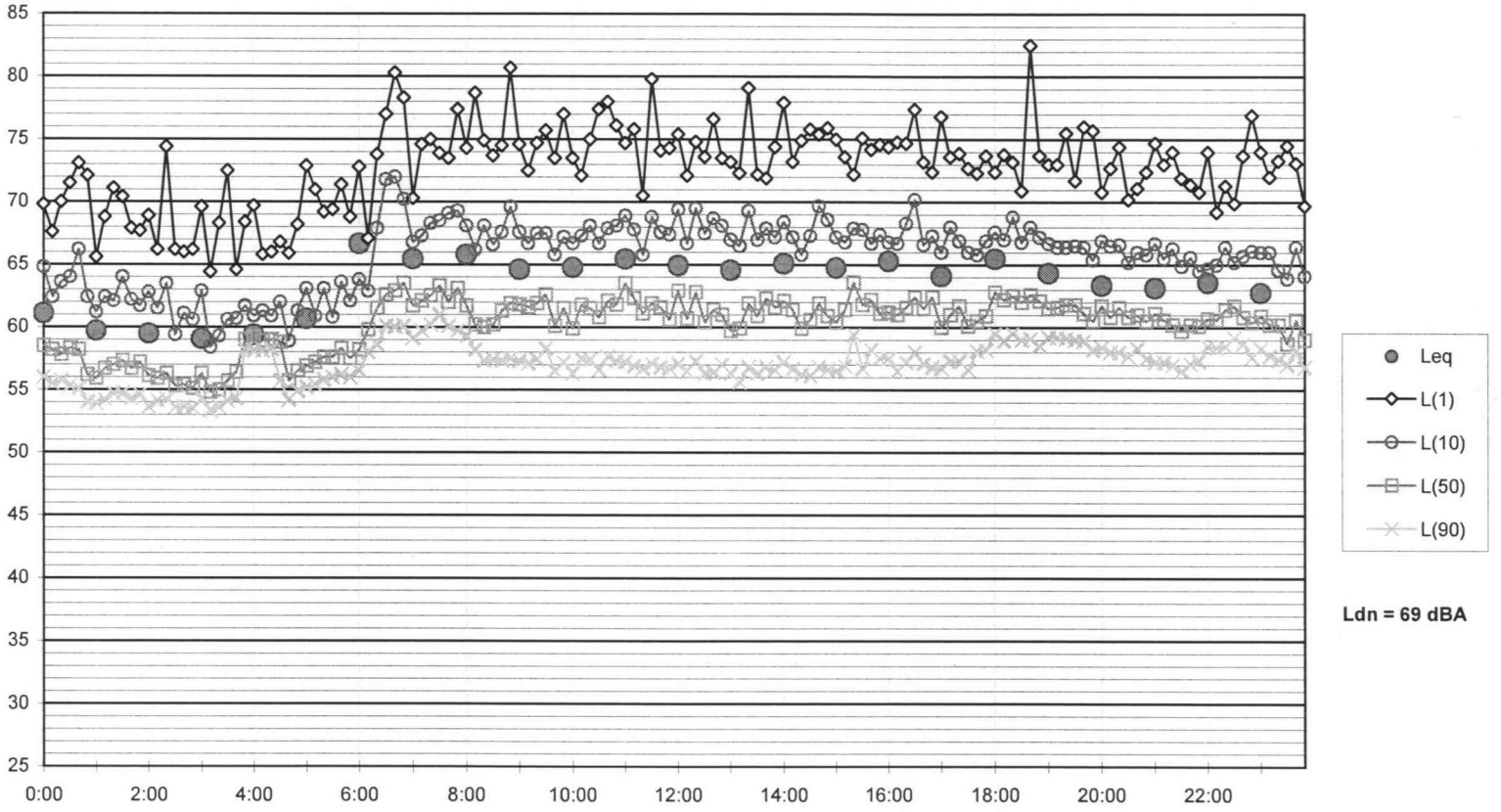

Figure 10

Noise Levels at LT-2
~105 feet from the Center of North 1st Street
Sunday, September 30, 2007

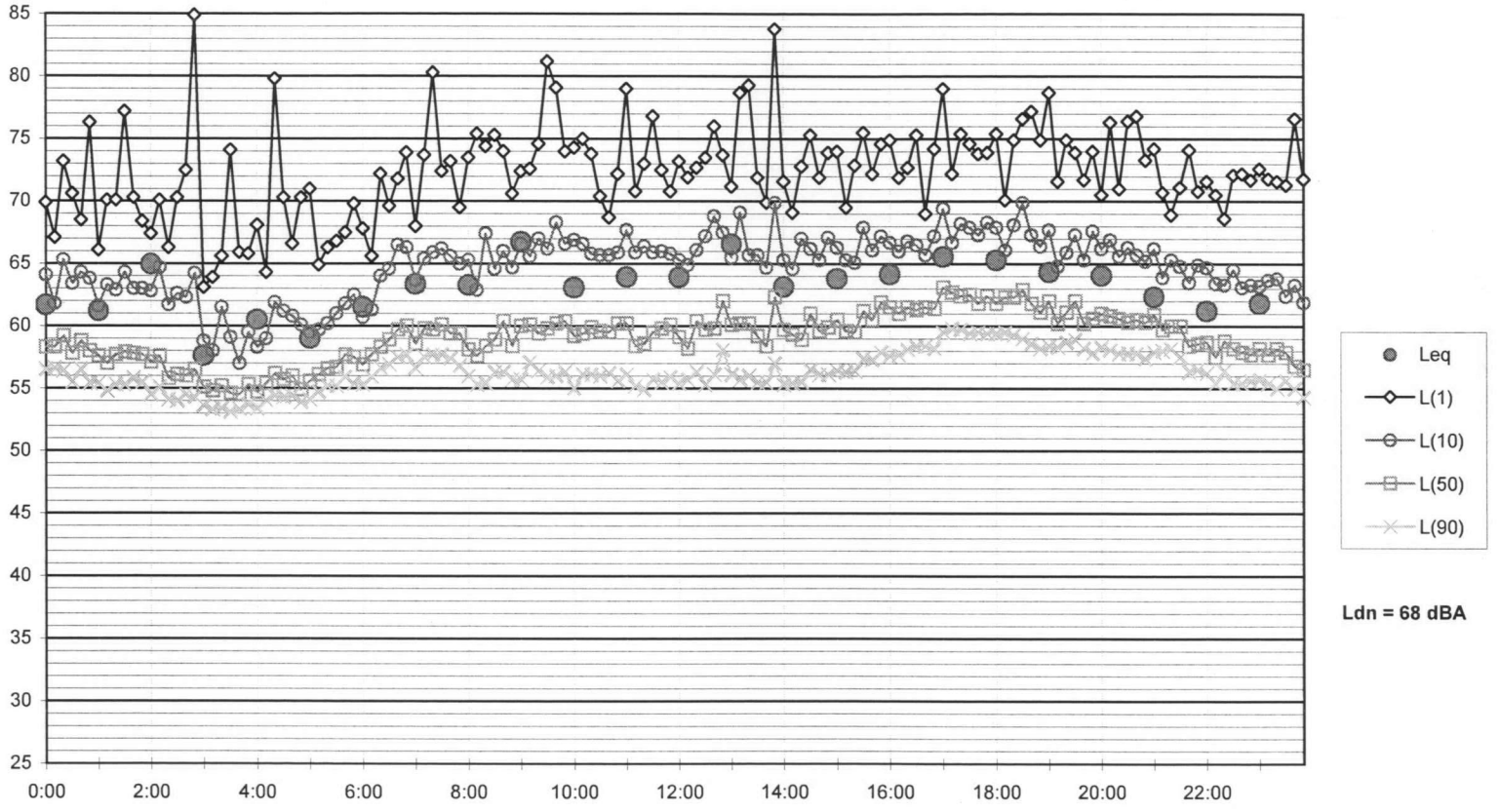

Figure 11

Noise Levels at LT-2
~105 feet from the Center of North 1st Street
Monday, October 1, 2007

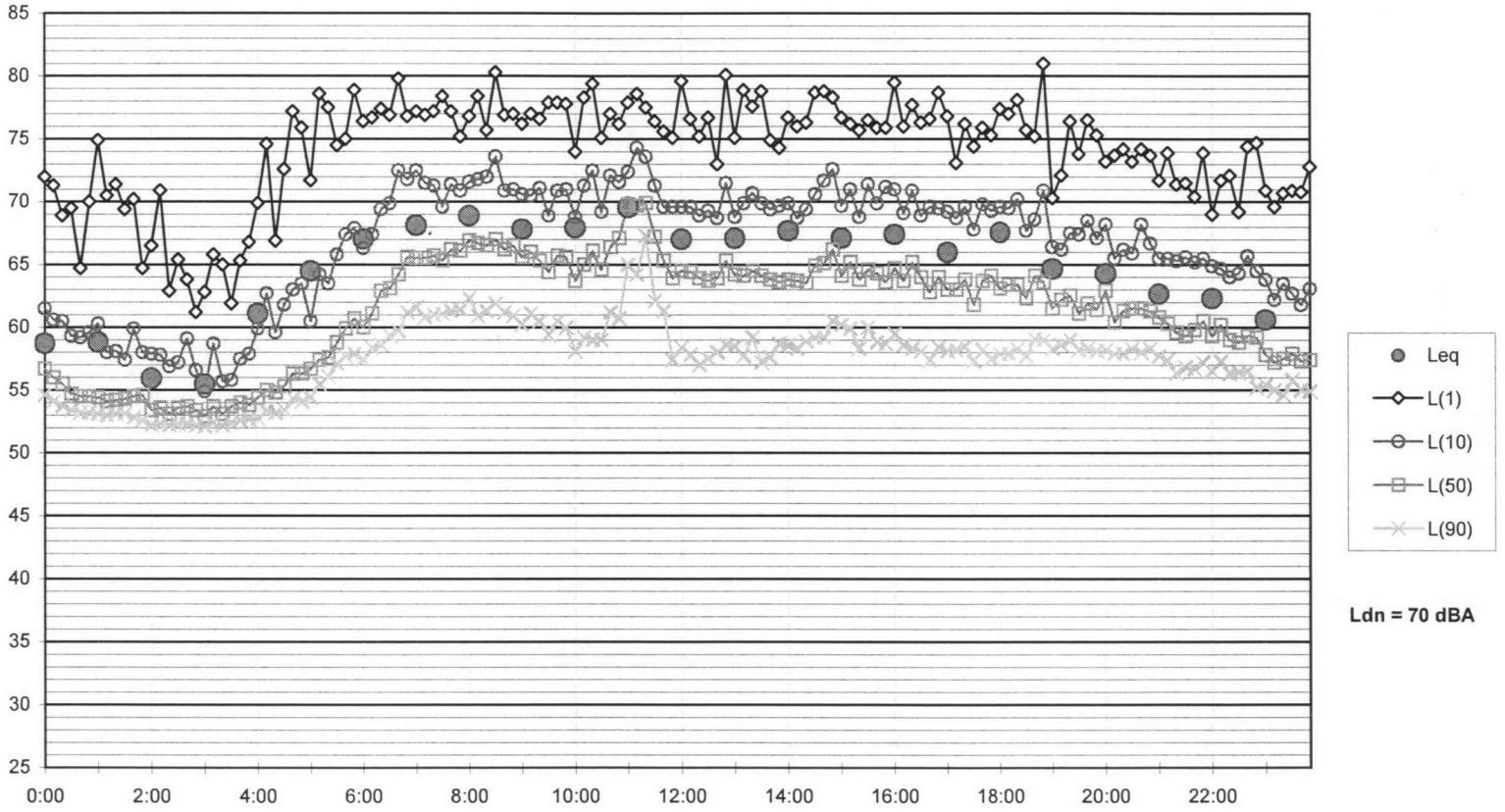

Figure 12

Noise Levels at LT-2
~105 feet from the Center of North 1st Street
Tuesday, October 2, 2007

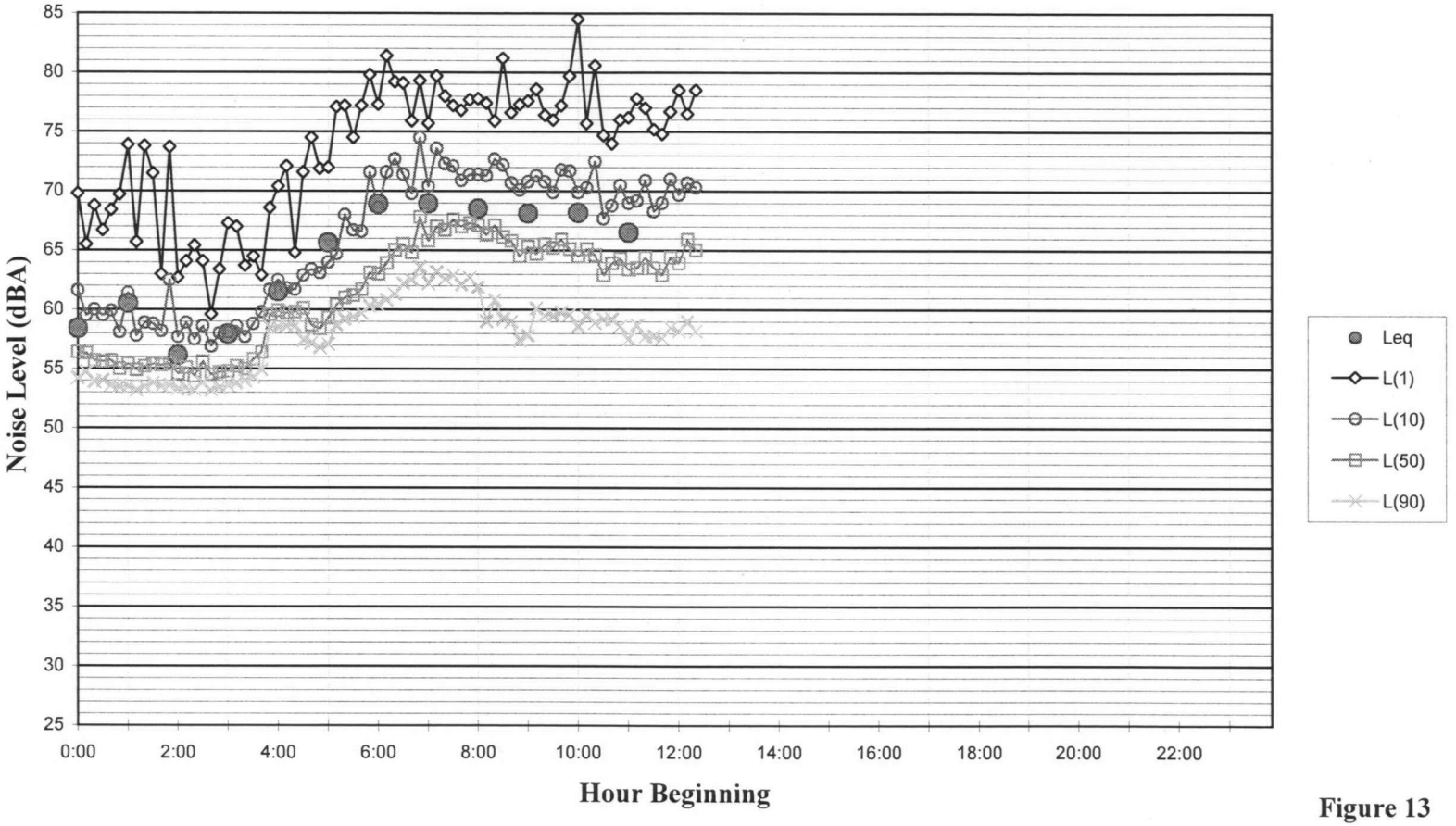

Figure 13