Appendix 4.9-1: Noise Impact Study

Kimley»Horn

TECHNICAL MEMORANDUM

To: Greg Tsujiuchi and Lisa Kranitz, City of Gardena

From: Olivia Chan

Date: August 15, 2023

Subject: **16911 Normandie Project Noise Impact Study Peer Review**

Kimley-Horn has conducted a follow-up third-party peer review of the Project's Noise Impact Study (Acoustical Engineering Services, Inc., July 2023) on behalf of the City of Gardena to verify that Kimley-Horn's March 27, 2023 third-party peer review Technical Memo (TM) recommendations have been incorporated. The revised July 2023 report addressed the third-party peer review comments and thus is in compliance with the TM recommendations. Thus, the analysis, as revised, meets the applicable provisions of CEQA and the State CEQA Guidelines and is adequate for inclusion in the Project EIR.

Please do not hesitate to contact Olivia Chan at olivia.chan@kimley-horn.com with any questions.

Noise Impact Study

16911 NORMANDIE PROJECT – GARDENA, CA

Prepared for:
16911 Normandie Associates, LLC

July 2023

Report Ref:
R2022101.1

Prepared by:
Acoustical Engineering Services, Inc.
22801 Crespi Street
Woodland Hills, CA 91364

Table of Content

List of Figures

List of Tables

Appendices

EXECUTIVE SUMMARY

This Noise Impact Study (Study) analyzes potential short-term and long-term environmental noise impacts associated with the proposed 16911 Normandie Project, a multi-family residential development (Project), located in the City of Gardena (City), California. The proposed Project includes a development of 403 residential dwelling units, including 328 apartment units and 75 townhomes, on Normandie Avenue, between 169th Street and 170th Street, as shown in Figure 1 (on page 8). This Study has been prepared in support of the Project's application with the City of Gardena and environmental clearance pursuant to the requirements of the California Environmental Quality Act (CEQA).

Findings

In order to analyze the potential noise impacts of the Project construction and operations, the existing ambient noise environment at the sensitive noise receptors in the vicinity of the Project Site was measured and tabulated in this report. The measured ambient sound data were utilized as baseline noise levels and in conjunction with the applicable standards and guidelines to define the Project noise impact thresholds.

The key findings of the noise analysis are as follows:

Existing Ambient Noise Environment

- Ambient noise measurements were taken at the six selected off-site locations, representing the nearest noise sensitive (residential use) receptors to the Project Site, on February 3, 2022. The locations of the six off-site noise-sensitive receptors are shown on Figure 1 (on page 8), as R1 through R6. The existing daytime ambient noise levels at the off-site receptor locations ranged from 49.0 dBA L_{eq} (at receptor location R1) to 69.9 dBA L_{eq} (at receptor location R3) while the measured nighttime ambient noise levels ranged from 48.7 dBA L_{eq} (at receptor R6) to 67.3 dBA L_{eq} (at receptor R3). The existing ambient noise environment currently exceeds the City's exterior daytime ambient noise standard of 55 dBA (L_{eq}) at receptors R2, R3 and R4 and the nighttime ambient noise standard 50 dBA (L_{eq}) at receptors R1 through R5, for residential use. Therefore, consistent with Gardena Municipal Code ("GMC") section 8.36.040C, the measured existing ambient noise levels are used as the baseline conditions for the purposes of determining Project impacts.

Construction Noise Impacts

- The estimated noise levels from the Project on-site temporary construction activities would temporarily increase current ambient noise levels in the immediate vicinity of the Project Site. As specified in the GMC Section 8.36.080, construction activities are exempt from the noise standards, provided that construction activities do not take place

between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, between 6:00 p.m. and 9:00 a.m. on Saturday or any time on Sunday and Federal holiday. Project construction would comply with the City allowable construction hours of 7:00 a.m. to 6:00 p.m. on Monday through Friday and 9:00 a.m. to 6:00 p.m. on Saturday. However, exceedance of measured ambient noise levels is used as a threshold of significance for this analysis. The estimated construction noise levels would exceed the measured existing ambient noise levels at the residences surrounding the Project Site, from 2.2 dBA (at receptor R3) to 37.8 dBA (at receptor R1). Noise mitigation measure NOI-MM-1, as described on page 3029, would provide approximately 12 dBA noise reduction, which is a substantial noise reduction for the residences north, south and west of the Project Site. However, the construction noise levels would still exceed the measured existing ambient noise levels at all sensitive receptors, except for receptor R3, the impacts to which are not considered significant. Therefore, due to the increased in ambient noise levels at all sensitive receptors except for receptor R3, it is conservatively concluded that temporary noise impacts associated with Project on-site construction activities would remain significant and unavoidable.

- Noise generated by construction trucks travelling along the anticipated haul route (Normandie Avenue, between the Project Site and the I-405 Freeway) would be 54.7 dBA L_{eq}. The estimated noise from off-site construction trucks would be lower than the measured existing ambient noise level of 66.9 dBA L_{eq} along Normandie Avenue. As such, significant noise impacts would not be expected from off-site construction traffic.

Construction Vibration Impacts

- The Project would generate ground-borne vibration associated with use of heavy construction equipment. However, the estimated vibration velocity levels from construction equipment would be below the significance criteria at the nearest off-site buildings. Therefore, the on-site vibration impacts, pursuant to the significance criteria for building damage, during construction of the Project would be less than significant.

- Construction vibration impacts were also evaluated pursuant to potential human annoyance. The estimated vibration velocity levels from all construction equipment would be below the significance criteria at all off-site sensitive receptors, with the exception of receptor R1. However, vibration impacts at receptor R1 would be reduced to a less than significant level with implementation of Mitigation Measure NOI-MM-2.

Operation Noise Impacts

- On-site stationary noise sources including, but not limited to, building mechanical equipment, parking facility, trash compactor, and outdoor uses, were evaluated against

the City's exterior noise standard. The estimated noise levels from on-site stationary noise sources would be below the Project significance thresholds at all off-site noise sensitive uses. Therefore, noise impacts associated with the Project on-site stationary sources would be less than significant.

- Off-site roadway traffic noise impacts were also analyzed based on traffic volumes provided by the Project Traffic Consultant (Fehr & Peers). Traffic volumes from the Project would result in a maximum noise increase of 0.2 dBA, 0.3 dBA, and 1.8 dBA CNEL along Normandie Avenue (between 169th Street and 170th Street), W 169th Street (west of Normandie Avenue), and W 170th Street (west of Normandie Avenue), respectively. The estimated noise increases due to off-site traffic are considered negligible. Therefore, off-site traffic noise impacts associated with the Project would be less than significant.

- A composite noise analysis was performed to evaluate the noise impacts from all Project-related on-site noise sources. The Project composite noise levels would range from 34.2 dBA at receptor R5 to 50.6 dBA at receptor R7, which would be below the existing measured ambient noise levels. Therefore, the composite noise level impacts due to Project operation would be less than significant.

1 INTRODUCTION

This Noise Impact Study (Study) has been prepared to evaluate potential noise impacts associated with the proposed 16911 Normandie project (Project), located in the City of Gardena (City), California. This Study has been prepared in support of the Project's application with the City of Gardena and associated environmental clearance, pursuant to the requirements of the California Environmental Quality Act (CEQA).

1.1 Project Description

The proposed Project includes a development of up to 403 residential dwelling units (328 apartment units and 75 townhouse units) located on Normandie Avenue, between 169th Street and 170th Street, in the City of Gardena, as shown in Figure 1 (on page 8). The proposed Project would replace the existing industrial buildings and open parking lots.

1.2 Purpose

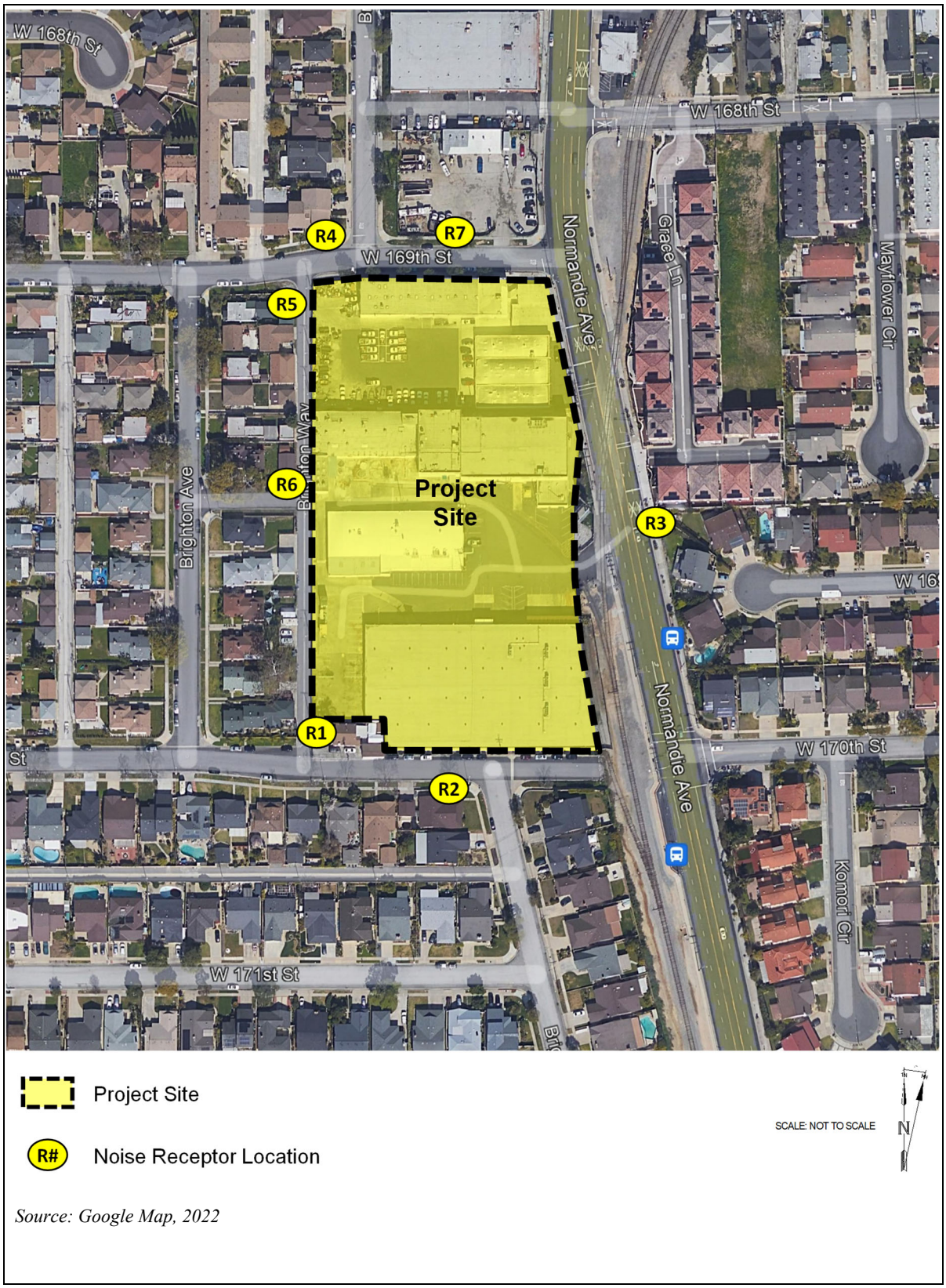
The objectives of this noise study are to:

a) Evaluate the Project construction-related noise impacts on noise sensitive uses in the vicinity of the Project Site.

b) Determine potential Project operation-related on-site stationary sources (i.e., mechanical equipment, parking operation, trash compactor, and outdoor uses) and off-site mobile sources (auto traffic) noise impacts on existing off-site noise sensitive uses.

c) Evaluate the Project construction-related vibration impacts on off-site noise sensitive uses.

d) Evaluate mitigations measures to avoid or reduce the potential noise and vibration impacts to less than significant levels.



Source: Google Map, 2022

Figure 1. Project Site Map

2 ENVIRONMENTAL SETTING

2.1 Fundamentals of Sound and Environmental Noise

Noise is commonly defined as sound that is undesirable because it interferes with speech communication, and hearing, causes sleep disturbance, or is otherwise annoying (unwanted sound). The decibel (dB) is a conventional unit for measuring the amplitude of sound because it accounts for the large variations in sound pressure amplitude and reflects the way people perceive changes in sound amplitude.[1] The human hearing system is not equally sensitive to sound at all frequencies. Therefore, to approximate this human frequency-dependent response, the A-weighted filtering system is used to adjust measured sound levels (dBA). The term "A-weighted" refers to filtering the noise signal in a manner that corresponds to the way the human ear perceives sound. Examples of various sound levels in different environments are provided in Table 1 (on page 10).

Generally, people judge the relative magnitude of sound sensation by subjective terms such as "loudness" or "noisiness." To the normal hearing a change in sound level of 3 dB is considered "just perceptible," a change in sound level of 5 dB is considered "clearly noticeable," and a change (i.e., increase) of 10 dB is generally recognized as "twice as loud."[2]

2.1.1 Outdoor Sound Propagation

In an outdoor environment, sound levels attenuate (reduce) through the air as a function of distance. Such attenuation is commonly referred to as "distance loss" or "geometric spreading," and is based on the noise source configuration (e.g., point source, or line source). For a point source, such as a piece of mechanical/electrical/construction equipment (e.g., air conditioner, electrical transformer, or bulldozer) the rate of sound attenuation is about 6 dB per doubling of distance from the noise source. For example, an outdoor condenser fan that generates a sound level of 60 dBA at a distance of five feet would attenuate to 54 dBA at a distance of 10 feet. For a line source, such as a constant flow of traffic on a roadway, the rate of sound attenuation is about 3 dB per doubling of distance.[3]

In addition, structures (e.g., buildings and solid walls) and natural topography (e.g., hills) that obstruct the line-of-sight between a noise source and a receptor further reduce the noise level if the receptor is located within the "shadow" of the obstruction, such as behind a sound wall. This type of sound attenuation is known as "barrier insertion loss." If a receptor is located behind the wall but still has a view of the source (i.e., line-of-sight is not fully blocked), some barrier insertion loss would still occur, however to a lesser extent. Additionally, a receptor located on the same side of the wall as a noise source may actually experience an increase in

---

1 *All sound levels measured in decibel (dB) in this study are relative to $2x10^{-5}$ N/m^2.*

2 *Caltrans, Technical Noise Supplement (TeNS), Table 2.10, 2013.*

3 *Caltrans, Technical Noise Supplement (TeNS), Chapter 2.1.4.1, 2013.*

the perceived noise level as the wall reflects noise back to the receptor, thereby compounding the noise. Outdoor noise barriers can provide noise level reductions ranging from approximately 5 dBA (where a barrier just breaks the acoustic line-of-sight between the noise source and receiver) to an upper range of 20 dBA with a more substantial barrier.[4]

Table 1. Typical Noise Levels

Common Outdoor Activities	Noise Levels, dBA	Common Indoor Activities
	110	Rock Band
Jet Fly-over at 1000 feet		
	100	
Gas Lawn Mower at 3 feet		
	90	
Diesel Truck at 50 feet at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
Gas Lawn Mower at 100 feet	**70**	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	**60**	
		Large Business Office
Quiet Urban Daytime	**50**	Dishwasher Next Room
Quiet Urban Nighttime	**40**	Theater, Large Conference Room
Quiet Suburban Nighttime		(Background)
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall
	20	(Background)
		Broadcast/Recording Studio
	10	
	0	

Source : Caltrans, Technical Noise Supplement (TeNS), Table 2-5, 2013

2.1.2 Environmental Noise Descriptors

Several rating scales have been developed to analyze the adverse effect of community noise on people. Since environmental noise fluctuates over time, these scales consider the total acoustical energy content, as well as the time and duration of occurrence. The most frequently used noise descriptors, including those used by the City, are summarized below.

[4] *Caltrans, Technical Noise Supplement (TeNS), Chapter 2.1.4.4, 2013.*

Equivalent Sound Level (L_{eq}). L_{eq} is a measurement of the acoustic energy content of noise averaged over a specified time period. Thus, the L_{eq} of a time-varying sound and that of a steady sound are the same if they deliver the same amount of energy to the receptor's ear during exposure. L_{eq} for one-hour periods, during the daytime or nighttime hours, and 24 hours are commonly used in environmental noise assessments. L_{eq} can be measured for any time period, but is typically measured for an increment of no less than 15 minutes for environmental studies. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during day or night.

Community Noise Equivalent Level (CNEL). CNEL is the time average of all A-weighted sound levels for a 24-hour day period with a 10 dBA adjustment (increase) added to the sound levels that occur in the nighttime hours (10:00 p.m. to 7:00 a.m.) and a 5 dBA adjustment (increase) added to the sound levels that occur in the evening hours (7:00 p.m. to 10:00 p.m.). These penalties attempt to account for increased human sensitivity to noise during the quieter nighttime periods, when the ambient background noise is less and where sleep is the most probable activity. In comparison, the 24-hour CNEL is approximately equal to the L_{eq} plus 7 dBA, for noise sources that is constant throughout the day, such as, mechanical equipment operating on a 24-hour basis. CNEL has been adopted by the State of California to define the community noise environment for development of the community noise element of a General Plan and is also used by the City of Gardena for land use planning.[5]

2.2 Ground-borne Vibration

Vibration is commonly defined as an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. The peak particle velocity (PPV) or the root-mean square (RMS) velocity is usually used to describe vibration amplitudes. PPV is defined as the maximum instantaneous peak of the vibration signal and is typically used for evaluating potential building damage.[6] The RMS velocity is defined as the square-root of the average of the squared amplitude of the vibration signal and is used for evaluating human response to ground-borne vibration.[7] Ground-borne vibration generated by man-made activities (e.g., road traffic, construction operations) typically weakens with greater horizontal distance away from the source of the vibration. The vibration impact studies show in most circumstances common ground-induced vibrations related to roadway traffic and construction activities pose no threat to buildings or structures.[8,9]

---

5 *State of California, General Plan Guidelines, 2017.*

6 *Vibration levels described in this report are in terms peak particle velocity level in the unit of inches per second.*

7 *FTA, "Transit Noise and Vibration Impact Assessment," Section 5, September 2018.*

8 *FTA, "Transit Noise and Vibration Impact Assessment," Section 5, September 2018.*

9 *Caltrans, "Transportation Related Earthborne Vibrations," February 2002.*

2.3 Applicable Noise Regulations

Various government agencies have established noise regulations and policies to protect citizens from potential hearing damage and other adverse effects associated with noise and ground-borne vibration. An overview of the State and City regulations and policies that are relevant to construction and operation of the Project is provided below. The City of Gardena has adopted a number of regulations and policies, which are based in part on federal and state regulations and are intended to control, minimize, or mitigate environmental noise effects. The Noise Element of the City of Gardena General Plan (General Plan) includes a number of goals, objectives, and policies for land use planning purposes. The City also has regulations to control unnecessary, excessive, and annoying noise, as set forth in the Gardena Municipal Code (GMC) Chapter 8.36.

2.3.1 City of Gardena General Plan Community Safety Element, Noise Plan

The City of Gardena General Plan, Noise Plan establishes goals, policies, and programs so that residents in the City will be protected from excessive noise.[10] The City has adopted noise compatibility guidelines for general land use planning, as provided in the City Noise Plan. The level of acceptability of the noise environment is dependent upon the activity associated with the particular land use. Table 2 (on page 13) provides the exterior noise standard associated with various land uses, as provided in the City Noise Plan. According to the City, an exterior noise environment up to 65 dBA CNEL is "conditionally acceptable" for single- and multi-family residential uses. In addition, noise levels up to 75 dBA CNEL are "normally unacceptable", while noise levels at 75 dBA CNEL and above are "clearly unacceptable" for residential.

[10] *City of Gardena, General Plan Noise Element, 2006.*

Table 2. City of Gardena Noise Land Use Compatibility

Land Use	Community Exposure Level, CNEL (dBA)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential: Single-Family, Multi-family, Duplex	50 to 60	60 to 65	65 to 75	Above 75
Residential: Mobile Homes	50 to 60	60 to 65	65 to 75	Above 75
Transient Lodging: Motels, Hotels	50 to 60	60 to 70	70 to 80	Above 80
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 to 70	60 to 65	65 to 75	Above 75
Auditoriums, Concert Halls, Amphitheaters, Meeting Halls	NA	50 to 60	60 to 70	Above 70
Sports Arena, Outdoor Spectator Sports, Amusement Parks	50 to 65	65 to 75	NA	Above 75
Playgrounds, Neighborhood Parks	50 to 65	65 to 70	70 to 75	Above 75
Golf Courses, Riding Stables, Cemeteries	50 to 75	70 to 75	Above 75	NA
Office and Professional Buildings	50 to 65	65 to 75	75 to 80	Above 80
Commercial Retail, Banks, Restaurants, Theaters	50 to 70	70 to 80	Above 80	NA
Industrial, Manufacturing, Utilities, Wholesale, Service Station	50 to 70	Above 70	NA	NA
Agriculture	50 to 80	NA	NA	NA

Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable: New construction or development should generally not be undertaken.

Source: City of Gardena, General Plan Community Safety Element, Noise Plan, Figure N-1, 2006.

2.3.2 City of Gardena Municipal Code

GMC Chapter 8.36 establishes acceptable ambient sound levels to regulate intrusive noises and provides procedures and criteria for the measurement of the sound level of noise sources. The GMC provides exterior noise limits for various type of land uses. Table 3 (on page 14) provides the allowable exterior noise levels in terms of 15-minute average noise level ($L_{eq\text{-}15min}$) and maximum noise level (L_{max}).

Table 3. City of Gardena Exterior Noise Limits

Type of Land Use	15-minute Average Noise Level, dBA (L_{eq})		Maximum Noise Level, dBA (Lmax)	
	7 a.m. - 10 p.m.	10 p.m. - 7 a.m.	7 a.m. - 10 p.m.	10 p.m. - 7 a.m.
Residential	55	50	75	70
Residential portions of mixed-use	60	50	80	70
Commercial	65	60	85	80
Industrial or manufacturing	70	70	90	90
Source: GMC Section 8.36.040				

In accordance with the GMC Section 8.36.040.C, if the existing measured ambient level exceeds the noise standard (Table 3), the ambient noise level shall become the noise standard.

GMC Section 8.36.080 Exemptions—The provisions of the City noise standard shall not apply to the following:

Item G - Noise associated with construction, repair, remodeling, grading or demolition of any real property, provided said activities do not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, between the hours of 6:00 p.m. and 9:00 a.m. on Saturdays or anytime on Sunday or Federal holiday.

Item H – Operation of refuse and recyclable collection vehicles, provided:

1. Collection of residential refuse/recyclables does not occur between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, or at any time on weekend or holiday, except as provided below.

2. Collection from commercial premises, audible in residential areas, and which does not occur between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, or at any time on a weekend or holiday, except as provided below.

3. When a collection day occurs on a holiday, alternative collections may be made on the following Saturday, between the hours of 7:00 a.m. and 6:00 p.m.

2.4 Applicable Vibration Standards

GMC Section 8.36.070 prohibits the operation of any device that creates vibration which is above the vibration perception threshold of an individual at or beyond the real property boundary of the source if on private property or at 150 feet from the source if on a public space or public right-of-way. The vibration perception threshold as defined by the GMC is 0.01 in/sec over the range of 1 to 100 Hz.

2.5 Existing Ambient Noise Levels

Some land uses are considered more sensitive to intrusive noise than others based on the types of activities typically involved at the noise receptor location. Typically, noise-sensitive uses include residences, transient lodgings, schools, libraries, churches, hospitals, nursing homes, auditoriums, concert halls, amphitheaters, playgrounds, and parks. Based on a review of the land uses in the Project area, there are noise sensitive receptors (i.e., single-family residential uses) surrounding the Project Site to the north, south, east and west. A total of seven off-site noise receptor locations were selected to represent noise sensitive uses surrounding the Project area. The locations of the seven off-site noise-sensitive receptors are described in Table 4 (on page 16) and shown on Figure 1 (on page 8), as R1 through R7.

Ambient noise measurements were taken at the six selected off-site locations on February 3, 2022. The ambient noise measurements were conducted using a Larson-Davis Model 870 Integrating/Logging Sound Level Meters, these sound level meters meet and exceed the minimum industry standard performance requirements for "Type 1" standard instruments as defined in the American National Standard Institute (ANSI) S1.4. Two 15-minute measurements were conducted at each of the off-site receptor locations one during the daytime hours and another during the nighttime hours. The daytime ambient noise levels were measured between 10:00 A.M. and 12:00 P.M., and the nighttime ambient noise levels were measured between 10:00 P.M. and 12:00 A.M. The ambient noise measurements were taken in accordance with the City's standards.

The results of the ambient sound measurements are summarized in Table 4 (on page 16). As indicated in Table 4, the existing daytime ambient noise levels at the off-site receptor locations ranged from 49.0 dBA L_{eq} (at receptor location R1) to 69.9 dBA L_{eq} (at receptor location R3) while the measured nighttime ambient noise levels ranged from 48.7 dBA L_{eq} (at receptor R6) to 67.3 dBA L_{eq} (at receptor R3). Based on field observation and measured sound data, the current ambient noise environment in the vicinity of the Project Site is controlled primarily by vehicular traffic on local roadways, railroad, commercial uses, and other typical urban noise. The existing ambient noise environment currently exceed the City's exterior presumed daytime ambient noise standard of 55 dBA (L_{eq}) at receptors R2, R3, R4 and R7 and the presumed nighttime ambient noise standard 50 dBA (L_{eq}) at receptors R1 through R5, for residential use. Therefore, consistent with GMC, the measured existing ambient noise levels are used as the baseline conditions for the purposes of determining Project impacts.[11]

[11] *City of Gardena Municipal Code, Chapter 8.36.040.C.*

Table 4. Existing Ambient Noise Levels

Receptor Location	Approximate Distance to Project Site,[a] Feet	Measured Ambient Noise Levels, dBA L_{eq}	
		Daytime Hours (7 a.m. to 10 a.m.)	Nighttime Hours (10 p.m. to 7 a.m.)
R1 – Single-family residential use located at 1089 Brighton Way, adjacent to the Project Site (southwest corner)	Adjacent to the Project Site	49.0	52.2
R2 – Single-family residential use 17001 Brighton Way, south of the Project Site	40	55.1	53.8
R3 – Single-family residential use at 1337 169th Place, east of the Project Site	80	69.9	67.3
R4 – Single-family residential use at 16815 Brighton Avenue, north of the Project Site	60	56.9	56.4
R5 – Single-family residential use at 16904 Brighton Avenue, west of the Project Site	25	54.8	53.0
R6 – Single-family residential use at 16934 Brighton Avenue, west of the Project Site	25	54.6	48.7
R7 – Multi-family residential use on the north side of Brighton Avenue, north of the Project Site.	55	56.9[b]	56.4[b]

[a] *Distances are estimated based on Google Earth map and are referenced to the Project nearest boundary.*

[b] *This receptor was under construction when the ambient noise measurements were taken on February 3, 2022. Therefore, no noise measurements were taken at this receptor location at that time. Because receptor locations R4 and R7 share similar surrounding land uses and distance from the Project site, receptor location R4's ambient noise levels are considered representative of receptor location R7's ambient noise levels, thus, are assumed for analysis purposes.*

Source: AES, 2022; Detail measurements data are provided in Appendix A.

3 IMPACT ANALYSIS

3.1 Methodology

3.1.1 Temporary Construction Noise

Construction noise impacts due to on-site construction activities associated with the Project were evaluated by calculating the construction-related noise levels at representative receptor locations and comparing these estimated Project construction-related noise levels to the existing ambient noise levels (i.e., noise levels without construction noise from the Project). Construction noise associated with the Project was analyzed based on the Project's potential construction equipment inventory, construction durations, and construction schedule. The construction equipment noise levels are based on the published noise data (equipment source levels) by Federal Highway Administration (FHWA) "Roadway Construction Noise Model (FHWA 2006)". The construction noise levels were then calculated for sensitive receptor locations based on the standard point source noise-distance attenuation factor of 6.0 dBA for each doubling of distance. For the noise analysis, a 5 dBA attenuation was assigned for receptor locations where the acoustic line-of-sight is just interrupted (i.e., around the edge of a building).

In addition, the construction-related off-site trucks noise impacts were analyzed using the FHWA's Traffic Noise Model (TNM). The TNM noise model calculates the hourly L_{eq} noise levels generated by construction-related trucks. Noise impacts were determined by comparing the predicted noise level with that of the existing ambient noise levels.

3.1.2 Temporary Construction Vibration

Ground-borne vibration impacts due to the Project's construction activities were evaluated by identifying potential vibration sources (i.e., construction equipment), estimating the vibration levels at the potentially affected receptors, and comparing the Project's activities to the applicable vibration significance thresholds, as described below.

Vibration levels were calculated based on the FTA published standard vibration velocities for various construction equipment operations.[12] The vibration velocities were calculated based on a point source with standard distance propagation conditions, pursuant to FTA procedures. Construction of the Project would not use impact pile driving methods and as such, impact pile driving vibration is not included in this construction vibration analysis.

[12] *FTA, "Transit Noise and Vibration Impact Assessment," Table 7-4, September 2018.*

3.1.3 Operation Noise

On-site stationary point-source noise impacts were evaluated by (1) identifying the noise levels that would be generated by the Project's stationary noise sources, such as rooftop mechanical equipment, outdoor activities (e.g., use of the outdoor courtyards, open spaces, and dog run), parking facilities, and trash compactor; (2) calculating the noise level from each noise source at surrounding sensitive receptor property line locations, including the composite noise of all sources; and (3) comparing such noise levels to ambient noise levels to determine significance. The on-site stationary noise sources were calculated using SoundPLAN (version 8.2), a 3-dimensional computer noise prediction model, which calculates noise transference (propagation) using approved engineering procedures and incorporates national and international noise standards. This calculation tool is widely used by acoustical engineers as a noise modeling tool for environmental noise analysis.

Off-site roadway noise was analyzed using the FHWA's TNM, based on the roadway traffic data provided in the Project's transportation study. The TNM is the current Caltrans standard computer noise model for traffic noise studies. The model allows for the input of roadway parameters, noise receivers, and sound barriers (if any). Roadway noise attributable to the project traffics "existing plus project" was calculated and compared to "existing without project" noise levels; to determine project noise impacts.

3.2 Thresholds of Significance

The Project thresholds of significance are based on the State CEQA Guidelines. In accordance with the State CEQA Guidelines Appendix G, the Project would have a significant impact related to noise if it would result in the:

Threshold (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; or*

Threshold (b): *Generation of excessive groundborne vibration or groundborne noise levels; or*

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

3.3 Project Design Features

The Project incorporates the following Project Design Feature (PDF) would be incorporated into the Project to minimize the Project's potential construction noise.

Project Design Feature PDF-NOI-1: Power construction equipment (including combustion engines), fixed or mobile, shall be equipped with state-of-the-art noise shielding and muffling devices (consistent with manufacturers' standards). All equipment shall be properly maintained to assure that no additional noise, due to worn or improperly maintained parts, would be generated.

3.4 Project Impacts

Threshold (a): Would the Project result in 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?

3.4.1 Temporary Construction Noise

As specified in the GMC Section 8.36.080, construction activities are exempt from the noise standards, provided that construction activities do not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, between 6:00 p.m. and 9:00 a.m. on Saturday or any time on Sunday and Federal holiday. Project construction would comply with the City allowable construction hours of 7:00 a.m. to 6:00 p.m. on Monday through Friday and 9:00 a.m. to 6:00 p.m. on Saturday. As described above, the GMC does not have a quantitative construction noise limit (i.e., increase over ambient level). However, the City utilizes a 10 dBA over ambient threshold to analyze construction noise impacts under CEQA. Therefore, Project construction activities would result in significant noise impacts if the construction noise level at sensitive exceed the ambient noise level by 10 dBA or more.

Noise impacts from Project construction activities would be a function of the noise generated by construction equipment, the location of the equipment, the timing and duration of the noise-generating construction activities, and the relative distance to noise-sensitive receptors. Construction activities for the Project would generally include demolition, site grading, building construction, and landscaping. Each stage of construction would involve the use of various types of construction equipment and would, therefore, have its own distinct noise characteristics. Demolition generally involves the use of backhoes, front-end loaders, and heavy-duty trucks. Grading and excavation typically require the use of earth-moving equipment, such as excavators, front-end loaders, and heavy-duty trucks. Building construction typically involves the use of forklifts, concrete trucks, concrete pumps, and delivery trucks. Noise from construction equipment would generate both steady-state and episodic noise that could be heard within and adjacent to the Project Site. Construction of the Project is anticipated to take approximately 3.5 years.

Individual pieces of construction equipment that would be used for construction produce maximum noise levels of 74 dBA to 89 dBA at a reference distance of 50 feet from the noise source, as shown in Table 5 (on page 20). The construction equipment noise levels at 50 feet distance (Referred to as Maximum Noise Levels) are based on the FHWA Roadway

Construction Noise Model User's Guide (RCNM, 2006), which is a technical report containing actual measured noise data for construction equipment. These maximum noise levels would occur when equipment is operating under full power conditions (i.e., the equipment engine at maximum speed). However, equipment used on construction sites often operates under less than full power conditions, or part power. To more accurately characterize construction-period noise levels, the average (Hourly L_{eq}) noise level associated with each construction stage is calculated based on the quantity, type, and usage factors for each type of equipment that would be used during each construction stage.[13] These noise levels are typically associated with multiple pieces of equipment operating simultaneously.

Table 6 (en page 21) provides the estimated construction noise levels for various construction phases at the off-site noise sensitive receptors. To present a conservative impact analysis, the estimated noise levels were calculated with all pieces of construction equipment for each construction phase assumed to operate simultaneously and be located at the construction area nearest to the affected receptors. These assumptions represent the worst-case noise scenario because construction activities would typically be spread out throughout the Project Site, and, thus, some equipment would be farther away from the affected receptors.

Table 5. Construction Equipment Noise Emission Reference Levels and Usage Factors

Type of Equipment	Acoustical Usage Factor (%)	Reference Maximum Noise Levels at 50 Feet,[a] L_{max} (dBA)
Backhoe	40	78
Concrete Mixer Truck	40	79
Crane	16	81
Dozer	40	82
Forklift	20	75
Gradall	40	83
Dump/Haul Truck	40	76
Excavator	40	81
Jackhammer	20	89
Man Lift	20	75
Grader	40	85
Rubber Tired Loader	40	79
Delivery Truck	40	74
Welders	40	74
Pneumatic Tool	50	85

[a] *Construction equipment noise levels are based on the FHWA RCNM.*
Source: FHWA Roadway Construction Noise Model User's Guide, Table 1, 2006

[13] *Pursuant to the FHWA Roadway Construction Noise Model User's Guide, 2005, the usage factor is the percentage of time during a construction noise operation that a piece of construction is operating at full power.*

Table 6. Construction Noise Levels by Construction Phase,[a]

Location	Estimated Noise Levels dBA (L_{eq})						Measured Ambient Noise Levels dBA (L_{eq})	Significance Threshold dBA (L_{eq})
	Demolition	Grading	Site Prep	Foundation	Building Construction	Paving/ Landscape		
R1	86.8	86.7	83.0	83.5	85.3	85.1	49.0	59.0
R2	83.8	83.7	79.7	80.4	81.4	81.1	55.1	65.1
R3	72.1	71.9	67.6	68.4	68.0	67.4	69.9	79.9
R4	81.2	81.0	76.9	77.7	78.0	77.6	56.9	66.9
R5	84.6	84.5	80.7	81.3	82.5	82.2	54.8	64.8
R6	84.6	84.5	80.7	81.3	82.5	82.2	54.6	64.6
R7	81.7	81.6	77.5	78.3	78.7	78.4	56.9	66.9

[a] *Detailed calculation worksheets, are included in Appendix B.*
Source: AES, 2023.

As indicated in Table 6, the estimated construction noise levels would exceed the City's exterior noise standard (presumed daytime or measured ambient noise level, whichever is greater) at the residences surrounding the Project Site, from 2.2 dBA (at receptor R3) to 37.8 dBA (at receptor R1), which would exceed the 10 dBA significance threshold at receptor locations R1, R2, R4, R5, R6 and R7. Noise mitigation measure NOI-MM-1, as described on page 3029, would provide approximately 12 dBA noise reduction, which is substantial noise reduction for the residences north, south and west of the Project Site. However, even after mitigation, the construction noise levels would still exceed the ambient noise levels by more than 10 dBA, at all off-site noise receptors with the exception of receptor R3. Therefore, due to the increases in ambient noise levels, it is conservatively concluded that impacts associated with Project on-site construction activities would remain significant and unavoidable.

In addition to on-site construction noise sources, materials delivery, concrete mixing, haul trucks (construction trucks), and construction worker vehicles would require access to the Project Site during the Project construction period. The major noise sources associated with off-site construction trucks would be from haul trucks traveling during the demolition and site grading/excavation, which would require approximately 20 daily truck trips (10 incoming trips and 10 outgoing trips). Construction-related trucks would be fewer during other construction phases with up to 10 delivery truck trips per day. Therefore, the noise analysis is based on the peak period with a maximum of 20 truck trips per day. Based on an eight-hour haul period and a uniform distribution of trips, there would be 3 truck trips per hour. Haul trucks would generally access the Project Site via Normandie to the I-405 Freeway.

The off-site construction trucks would generate noise levels of 54.7 dBA L_{eq} along Normandie Avenue between the Project Site and the nearby I-405 Freeway. The estimated noise from off-site construction trucks would be well below the existing ambient noise level of 69.9 dBA L_{eq}

(measured at receptor R3) along Normandie Avenue. As such, significant noise impacts would not be expected from off-site construction traffic.

3.4.2 Operation Noise

Noise associated with the Project operation would include: (a) on-site stationary noise sources, including outdoor mechanical equipment (e.g., HVAC equipment), activities within the proposed outdoor spaces (e.g., outdoor pool deck, courtyard, open spaces, and dog runs), parking facilities, trash compactor; and (b) off-site mobile (roadway traffic) noise sources.

3.4.2.1 Mechanical Equipment

The Project would include new mechanical equipment (e.g., air ventilation equipment), which would be located at the roof level and/or placed within the building structure. Project-related outdoor mechanical equipment would be designed to comply with the GMC, which limits the noise from the mechanical equipment to not exceed the City's exterior noise standards. Table 7 (below) presents the estimated on-site mechanical equipment noise levels at the off-site receptor locations. As shown on Table 7, the estimated noise levels from the mechanical equipment would range from 26.2 dBA (L_{eq}) at receptor location R7 to 34.1 dBA (L_{eq}) at receptor location R1, which would be below the Project significance thresholds. As such, noise impacts from the Project mechanical equipment would be less than significant.

Table 7. Mechanical Equipment Noise Levels

Receptor Location	Ambient Noise Levels,[a] dBA (L_{eq})	Estimated Noise from Project Mechanical Equipment,[b] dBA (L_{eq})	Significance Threshold,[c] dBA (L_{eq})	Exceed over Significance Threshold	Significant Impact?
R1	49.0	34.1	50.0	0.0	No
R2	53.8	29.7	53.8	0.0	No
R3	67.3	31.7	67.3	0.0	No
R4	56.4	28.0	56.4	0.0	No
R5	53.0	28.2	53.0	0.0	No
R6	48.7	29.3	50.0	0.0	No
R7	56.4	26.2	56.4	0.0	No

Notes:

[a] *Based on measured daytime or nighttime ambient noise levels, whichever is lower.*

[b] *Noise levels associated with the Project outdoor mechanical equipment were calculated based on manufacturer's published sound data for typical outdoor condenser units. Detailed calculation worksheets, are included in Appendix C.*

[c] *Significance thresholds are equivalent to the City's permissible exterior noise limits, which is equal to the measured ambient noise levels or the City's established exterior noise standard (i.e., 50 dBA at residential use), whichever is greater (GMC Section 8.36.040).*

Source: AES, 2023.

3.4.2.2 Outdoor Spaces

The Project outdoor amenities would include several common outdoor spaces, including: a dog run, courtyard, and open spaces at Level 1, an outdoor pool and courtyards at Level 3, and an open deck at Level 7. Noise sources associated with outdoor uses typically include noise from people gathering and conversing. For this operational noise analysis, reference noise levels of 65 dBA for a male and 62 dBA for a female speaking in a raised voice were used for analyzing potential noise impacts from people gathering at the outdoor spaces.[14] The noise analysis assumed up to 1352 people at the Courtyards 1, 2 and 3, up to 151 people at the Open Spaces and dog park, and up to 130 people gathering at the Level 7 outdoor deck. The number of people is calculated based on 15 square feet per person. In order to analyze a typical noise scenario, it was assumed that up to 50 percent of the people (half of which would be male and the other half female) would be talking at the same time. Noise levels associated with the dog run area were calculated based on measured noise level from an existing dog park, which generated approximately 58.4 dBA (L_{eq}) at a distance of 25 feet.[15]

Table 8 (on page 24on page 24) presents the estimated noise levels at the off-site sensitive receptors, resulting from the use of Project outdoor areas. The estimated noise levels were calculated with the assumption that the outdoor spaces would be fully occupied and operating concurrently to represent a worst-case noise analysis. As presented in Table 8, the estimated noise levels from the outdoor spaces would range from 29.6 dBA (L_{eq}) at receptor location R4 to 49.1 dBA (L_{eq}) at receptor location R3, which would be below the Project significance thresholds. Therefore, noise impacts from the outdoor uses would be less than significant.

---

[14] *Cyril M. Harris, Handbook of Acoustical Measurements and Noise Control, Table 16.1, Third Edition, 1991.*

[15] *City of San Diego, Noise Technical Report Beyer Community Park, April 2019. The measured noise levels provided in the referenced report are from an existing dog park with 5 to 11 dogs present in each of the small and large dog areas. The measured noise level is appropriate for the Project as the Project also includes areas for dogs. In addition, the reference noise level was adjusted up by 3.8 dBA to account for the maximum 19 dogs for the Project.*

Table 8. Outdoor Uses Noise Levels

Receptor Location	Ambient Noise Levels,[a] dBA (L_{eq})	Estimated Noise from Outdoor Uses,[b] dBA (L_{eq})	Significance Threshold,[c] dBA (L_{eq})	Exceed over Significance Threshold	Significant Impact?
R1	49.0	46.6	50.0	0.0	No
R2	53.8	37.7	53.8	0.0	No
R3	67.3	49.1	67.3	0.0	No
R4	56.4	37.0	56.4	0.0	No
R5	53.0	29.6	53.0	0.0	No
R6	48.7	40.1	50.0	0.0	No
R7	56.4	45.0	56.7	0.0	No

Notes:
[a] *Based on measured daytime or nighttime ambient noise levels, whichever is lower.*
[b] *Detailed calculation worksheets, are included in Appendix C.*
[c] *Significance thresholds are equivalent to the City's permissible exterior noise limits, which is equal to the measured ambient noise levels or the City's established exterior noise standard (i.e., 50 dBA at residential use), whichever is greater (GMC Section 8.36.040).*
Source: AES, 2023.

3.4.2.3 Parking Facilities

Parking for the Project would be provided within proposed above grade two-level parking garage, with a total of approximately 413 parking spaces. In addition to the entrance/exit driveways at the north and east sides, the parking garage includes ventilation openings along the north, south, east and west facades. In addition, there would be five surface parking spaces at the east side of the seven-story apartment building. Table 9 (on page 25) presents the estimated noise levels from parking garage at the off-site receptor locations. As indicated in Table 9, the estimated noise levels from the parking garage would range from 22.8 dBA (L_{eq}) at receptor location R2 to 49.2 dBA (L_{eq}) at receptor location R7, which would be below the Project significance thresholds. Therefore, noise impacts from the parking garage would be less than significant.

3.4.2.4 Trash Compactor

The Project trash compactor would be located within an enclosed room at the Level 1 of the enclosed parking garage. Therefore, the noise levels from the trash compactor operation would be effectively shielded to the off-site sensitive receptor locations. As such, noise impacts from the trash compactor operations would be less than significant.

Table 9. Parking Facilities Noise Levels

Receptor Location	Ambient Noise Levels,[a] dBA (L_{eq})	Estimated Noise from Project Parking,[b] dBA (L_{eq})	Significance Threshold,[c] dBA (L_{eq})	Exceed over Significance Threshold	Significant Impact?
R1	49.0	23.7	50.0	0.0	No
R2	53.8	22.8	53.8	0.0	No
R3	67.3	40.0	67.3	0.0	No
R4	56.4	43.9	56.4	0.0	No
R5	53.0	30.2	53.0	0.0	No
R6	48.7	28.8	50.0	0.0	No
R7	56.4	49.2	56.4	0.0	No

Notes:

[a] *Based on measured daytime or nighttime ambient noise levels, whichever is lower.*

[b] *Detailed calculation worksheets, are included in Appendix C.*

[c] *Significance thresholds are equivalent to the City's permissible exterior noise limits, which is equal to the measured ambient noise levels or the City's established exterior noise standard (i.e., 50 dBA at residential use), whichever is greater (GMC Section 8.36.040).*

Source: AES, 2023.

3.4.2.5 Off-Site Traffic

Project-generated traffic noise impacts were evaluated by comparing the increase in noise levels from the "existing" condition to the "existing plus project" condition, with the Project's significance threshold. Traffic noise levels at the off-site noise sensitive receptors were calculated using FHWA's Traffic Noise Model and the Project's traffic volume data.[16] The traffic noise impact analysis is based on the 24-hour CNEL noise descriptor.

Table 10 (on page 26) provides a summary of the off-site traffic noise analysis. As shown in Table 10, the Project generated traffic would result in a maximum noise increase of 1.8 dBA CNEL along W 170th Street (west of Normandie Avenue). In addition, the estimated noise increases along Normandie Avenue and W 169th Street (west of Normandie Avenue) would be 0.2 dBA CNEL and 0.3 dBA CNEL, respectively. The noise increases due to off-site traffic are considered negligible. Therefore, off-site traffic noise impacts associated with the Project would be less than significant.

[16] *Fehr & Peers Transportation Consultants, email dated 8/24/2022.*

Table 10. Off-Site Roadway Traffic Noise Impacts

Roadway Segment	Estimated Traffic Noise Levels,[a] CNEL		Increase in Noise Levels, CNEL	Significant Impact?
	Existing	Existing + Project		
Normandie Avenue - Between 169th St. and 170th St	68.6	68.8	0.2	No
W 169th Street - West of Normandie Avenue	55.5	55.8	0.3	No
W 170th Street - West of Normandie Avenue	47.6	49.4	1.8	No

[a] *Detailed calculation worksheets, are included in Appendix C.*
Source: AES, 2022.

3.4.2.6 Composite Noise Impacts from Project Operations

An evaluation of composite noise levels, including all Project related on-site noise sources, was conducted to identify the potential maximum Project-related noise level increase that may occur at the Project noise-sensitive receptor locations. The overall sound environment at the areas surrounding the Project Site would include contributions from each on-site individual noise source associated with the typical daily operation of the Project. Principal on-site noise sources associated with the Project would include mechanical equipment, parking facility, and outdoor uses. Table 11 (below) presents the estimated composite noise levels from Project-related noise sources. As indicated in Table 11, the Project composite noise levels would range from 34.2 dBA at receptor R5 to 50.6 dBA at receptor R7, which would be below the existing ambient noise levels. Therefore, the composite noise level impacts due to Project operation would be less than significant.

Table 11. Composite Noise Impacts

Receptor Location	Ambient Noise Levels,[a] dBA (L_{eq})	Calculated Project-Related Noise Levels, L_{eq} (dBA)			Project Composite Noise Levels, L_{eq} (dBA)	Significance Threshold,[c] dBA (L_{eq})	Significant Impact?
		Mechanical	Outdoor Uses	Parking			
R1	49.0	34.1	46.6	23.7	46.9	50.0	No
R2	53.8	29.7	37.7	22.8	38.5	53.8	No
R3	67.3	31.7	49.1	40.0	49.7	67.3	No
R4	56.4	28.0	37.0	43.9	44.8	56.4	No
R5	53.0	28.2	29.6	30.2	34.2	53.0	No
R6	48.7	29.3	40.1	28.8	40.7	50.0	No
R7	56.4	26.2	45.0	49.2	50.6	56.4	No

Notes:
[a] *Based on measured daytime or nighttime ambient noise levels, whichever is lower.*
[b] *Detailed calculation worksheets, are included in Appendix C.*

[c] *Significance thresholds are equivalent to the City's permissible exterior noise limits, which is equal to the measured ambient noise levels or the City's established exterior noise standard (i.e., 50 dBA at residential use), whichever is greater (GMC Section 8.36.040).*
Source: AES, 2023.

Threshold (b): Would the Project result in the exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?

3.4.3 Temporary Construction Vibration

Construction activities can generate varying degrees of ground vibration, depending on the construction procedures and the type of construction equipment used. The operation of construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of the construction site often varies, depending on soil type, ground strata, and construction characteristics of the receptor buildings.

The Project would generate ground-borne construction vibration forces during building demolition and site excavation/grading activities when heavy construction equipment, such as large bulldozer/excavator and loaded trucks, would be used. The FTA has published standard vibration velocities levels for various construction equipment operations.[17] It is noted that the Project construction would not use impact pile driving methods, therefore, impact pile driving vibration is not included in the on-site construction vibration analysis.

The City currently does not have any adopted standards, guidelines, or thresholds relative to vibration impacts with respect to building damage. Therefore, criteria from the FTA are utilized as threshold to assess impacts associated with potential building damage.[18] Table 12 (on page 28) provides the estimated vibration levels at the nearest off-site buildings. As indicated in Table 12, the estimated vibration velocity levels from construction equipment would be below the significance criteria at the nearest off-site buildings. Therefore, the on-site vibration impacts, pursuant to the significance criteria for building damage, during construction of the Project would be less than significant.

[17] *FTA, "Transit Noise and Vibration Impact Assessment," September 2018.*

[18] *FTA, "Transit Noise and Vibration Impact Assessment," September 2018.*

Table 12. Construction Vibration Impacts – Building Damage

Receptor Location	Estimated Vibration Velocity Levels at the Off-Site Buildings, PPV,[a]				Significance Threshold, VdB	Sig. Impacts?
	Large Bulldozer	Loaded Trucks	Jackhammer	Small Bulldozer		
FTA Reference Vibration Levels at 25 feet	0.089	0.076	0.035	0.003	--	--
Single-story residential building to the North	0.019	0.016	0.008	0.001	0.2[b]	No
Single-story residential buildings to the South	0.024	0.020	0.009	0.001	0.2[b]	No
Single-story residential buildings to the East	0.010	0.008	0.004	0.001	0.2[b]	No
Single-story residential buildings to West	0.089	0.076	0.035	0.003	0.2[b]	No
Single-story residential building adjacent to the Project Site	0.156	0.133	0.061	0.005	0.2[b]	No

[a] *Vibration level calculated based on FTA reference vibration level at a 25-foot distance. Detailed calculation worksheets, are included in Appendix B.*
[b] *FTA criteria for non-engineered timber and masonry buildings*
Source: FTA, 2018; AES, 2023

In addition, vibration impacts associated with potential human annoyance were analyzed at the off-site vibration sensitive receptors (residential uses). Table 13 (on page 29) provides the estimated vibration levels at the nearest off-site sensitive receptor locations. As indicated in Table 13, the estimated vibration velocity levels from all construction equipment would be below the significance criteria at all off-site sensitive receptors, with the exception of receptor R1. The estimated vibration level of up to 87 VdB at receptor R1 would exceed the 80 VdB significance threshold.[19] Therefore, the on-site vibration impacts, pursuant to the significance criteria for human annoyance, during construction of the Project would be significant, prior to mitigation measure.

[19] *The 80 VdB significance threshold is based on City vibration limit of 0.01 in/sec converted to VdB, 80 VdB = 20*log(0.01*1,000,000).*

Table 13. Construction Vibration Impacts – Human Annoyance

Receptor Location	Estimated Vibration Velocity Levels at the Off-Site Sensitive Uses, VdB,[a]				Significance Threshold,[b] VdB	Sig. Impacts?
	Large Bulldozer	Loaded Trucks	Jack-hammer	Small Bulldozer		
FTA Reference Vibration Levels at 25 feet	87	86	79	58	--	--
R1	87	86	79	58	80	Yes
R2	78	77	70	49	80	No
R3	68	67	60	39	80	No
R4	74	73	66	45	80	No
R5	79	78	71	50	80	No
R6	75	74	67	46	80	No
R7	77	76	69	48	80	No

[a] *Vibration level calculated based on FTA reference vibration level at 25 foot distance.*
[b] *Significance threshold is based on City vibration limit of 0.01 in/sec converted to VdB, 20*log(0.01*1,000,000).*
Source: FTA, 2018; AES, 2023

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

3.4.4 Airport Noise

The nearest airport is the Compton/Woodley Airport located approximately three miles northwest of the Project Site. Since the nearest airport is more than two miles from the Project Site, noise impacts associated with airport or airstrip noise would be less than significant.

4 MITIGATION MEASURES

4.1 Construction Noise

As analyzed above, the Project on-site construction activities would exceed the daytime ambient noise levels at the residential uses north, south and west of the Project Site by up to 37.8 dBA. Therefore, the following mitigation measure is provided to reduce construction-related noise impacts:

Mitigation Measure NOI-MM-1: A temporary and impermeable sound barrier shall be provided along the Project northern, southern and western property line. The temporary sound barrier shall be minimum 10-foot high and provide minimum 12 dBA noise reduction, and shall have a minimum Sound Transmission Class rating of STC-25, such as, acoustical barrier blanket (with STC-25 rating) or 3/4" thick exterior grade plywood.[20]

4.2 Construction Vibration

As analyzed above, construction of the Project would have the potential to result in significant vibration impacts with respect to potential human annoyance from Project construction. Therefore, the following mitigation measures are provided to reduce the vibration impacts associated with potential human annoyance:

Mitigation Measure NOI-MM-2: The use of large construction equipment (e.g., large bulldozer greater than 400 horsepower and/or loaded trucks) shall be a minimum of 45 feet away from the off-site residence adjacent to the Project Site (receptor R1).

[20] *Environmental Noise Control, STC-25 Acoustical Barrier Blanket. https://environmental-noise-control.com/products/stc-25-acoustical-barrier-blanket/*

5 REFERENCES

California Department of Transportation (Caltrans), *Technical Noise Supplement (TeNS),* September 2013.

California Governor's Office of Planning and Research, *State of California General Plan Guidelines,* 2017.

City of Gardena, *Municipal Code, Chapter 8.36 - Noise*.

City of Gardena, *Gardena General Plan 2006, Community Safety Element, Noise Plan,* 2006.

Cyril M. Harris, *Handbook of Acoustical Measurements and Noise Control,* Third Edition, 1991.

Federal Highway Administration (FHWA), *FHWA Roadway Construction Noise Model User's Guide*, January 2006.

Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment*, September 2018.

16911 Normandie Project
Noise Impact Analysis

Noise Calculations Worksheets

Provided by Acoustical Engineering Services

Appendix A – Ambient Measurements

Appendix B – Construction Noise and Vibration Calculations

Appendix C – Operation Noise Calculations

Appendix A
Ambient Noise Measurements

AES
ACOUSTICAL ENGINEERING SERVICES

Location: R1
Date: 2/8/2022

Time	Leq	Lmax
10:39:54 AM	41.5	44.6
10:40:04 AM	43.4	47.4
10:40:14 AM	43.1	47.8
10:40:24 AM	61.8	67.6
10:40:34 AM	58.3	67.2
10:40:44 AM	44.7	47.2
10:40:54 AM	44.7	47.3
10:41:04 AM	46	47.8
10:41:14 AM	44.4	45.7
10:41:24 AM	44.1	45.6
10:41:34 AM	43.5	46.2
10:41:44 AM	42.7	44.7
10:41:54 AM	42.5	44.8
10:42:04 AM	42	43.3
10:42:14 AM	41	41.9
10:42:24 AM	40.8	43.9
10:42:34 AM	42.8	45.5
10:42:44 AM	42.5	45.4
10:42:54 AM	42.9	47
10:43:04 AM	49.9	53.9
10:43:14 AM	50.8	55
10:43:24 AM	51.2	54.1
10:43:34 AM	47.3	49.6
10:43:44 AM	44.9	46.8
10:43:54 AM	43.2	45.1
10:44:04 AM	46.5	48.4
10:44:14 AM	44.2	45.6
10:44:24 AM	44.1	45.4
10:44:34 AM	44.8	47.4
10:44:44 AM	45.1	49.8
10:44:54 AM	44.2	46.2
10:45:04 AM	43.8	45.2
10:45:14 AM	43.3	45
10:45:24 AM	45.2	50.5
10:45:34 AM	64.2	70.1
10:45:44 AM	49.3	55.8
10:45:54 AM	53.7	56.7
10:46:04 AM	44.2	46.6
10:46:14 AM	42.8	44.4
10:46:24 AM	41.9	44.1
10:46:34 AM	41	42.3

10:46:44 AM	42	43.2
10:46:54 AM	41.3	42.6
10:47:04 AM	43	46.6
10:47:14 AM	42.1	43
10:47:24 AM	42	42.9
10:47:34 AM	42.9	44.1
10:47:44 AM	43.7	46.2
10:47:54 AM	43.8	45.8
10:48:04 AM	42.9	43.9
10:48:14 AM	41.2	43.7
10:48:24 AM	39.6	41.2
10:48:34 AM	38.9	39.8
10:48:44 AM	39.9	41.4
10:48:54 AM	39.6	41
10:49:04 AM	39.3	39.8
10:49:14 AM	39.1	40.1
10:49:24 AM	39.4	40.6
10:49:34 AM	38.6	39.1
10:49:44 AM	38.6	39.1
10:49:54 AM	38.9	40.1
10:50:04 AM	39.5	40.8
10:50:14 AM	40.1	40.8
10:50:24 AM	40.7	42.8
10:50:34 AM	40.4	43.1
10:50:44 AM	39.4	40.7
10:50:54 AM	39.3	40.1
10:51:04 AM	40.7	42
10:51:14 AM	40.7	41
10:51:24 AM	39.7	40.5
10:51:34 AM	39.1	40
10:51:44 AM	39.8	41.3
10:51:54 AM	40.4	41.6
10:52:04 AM	41.7	42.9
10:52:14 AM	40.5	42.1
10:52:24 AM	39.4	40.2
10:52:34 AM	39.8	40.7
10:52:44 AM	40.4	41.5
10:52:54 AM	40.2	41.9
10:53:04 AM	40.7	44.8
10:53:14 AM	39.2	40.1
10:53:24 AM	45.4	53.6
10:53:34 AM	44.4	51.2
10:53:44 AM	43.4	48.4
10:53:54 AM	45.8	51.8
10:54:04 AM	45.6	51.1

10:54:14 AM	45	49
10:54:24 AM	44	47.7
10:54:34 AM	48.8	52
10:54:44 AM	44.2	48.4
	49.0	

Time	Leq	Lmax
9:59:34 PM	53.7	54.6
9:59:44 PM	53.2	54
9:59:54 PM	52.6	53.1
10:00:04 PM	52.8	53.4
10:00:14 PM	58.3	64.5
10:00:24 PM	57.1	63.5
10:00:34 PM	53.4	53.7
10:00:44 PM	56.4	59.5
10:00:54 PM	52.8	54.1
10:01:04 PM	51.9	52.4
10:01:14 PM	52.4	52.7
10:01:24 PM	52.4	52.6
10:01:34 PM	52	52.4
10:01:44 PM	52.1	52.4
10:01:54 PM	52.4	53.2
10:02:04 PM	51.9	52.3
10:02:14 PM	52.1	53.9
10:02:24 PM	51	51.2
10:02:34 PM	50.4	51.1
10:02:44 PM	51.7	52.6
10:02:54 PM	54.9	57.6
10:03:04 PM	52.5	54.2
10:03:14 PM	50.8	51.4
10:03:24 PM	50	50.3
10:03:34 PM	50.3	50.7
10:03:44 PM	51.3	51.8
10:03:54 PM	52.1	53.5
10:04:04 PM	52.4	53.5
10:04:14 PM	52.1	52.6
10:04:24 PM	50.9	51.4
10:04:34 PM	50.4	51.1
10:04:44 PM	50.8	51.1
10:04:54 PM	51.4	51.7
10:05:04 PM	51.4	52.1
10:05:14 PM	52.1	52.6
10:05:24 PM	52.8	53.3
10:05:34 PM	52.5	53.2
10:05:44 PM	52.9	53.1

10:05:54 PM	52.6	53
10:06:04 PM	52	52.7
10:06:14 PM	51.5	51.9
10:06:24 PM	51.7	51.9
10:06:34 PM	51.6	51.9
10:06:44 PM	51.6	52.1
10:06:54 PM	51.6	52
10:07:04 PM	51.4	51.9
10:07:14 PM	51.3	51.8
10:07:24 PM	51.7	52.6
10:07:34 PM	51	51.3
10:07:44 PM	50.6	50.9
10:07:54 PM	50.7	51.1
10:08:04 PM	52.3	56.8
10:08:14 PM	51.1	54
10:08:24 PM	50.9	51.3
10:08:34 PM	50.4	51.3
10:08:44 PM	50.9	51.3
10:08:54 PM	49.8	50.3
10:09:04 PM	49.8	50.1
10:09:14 PM	52.4	55.5
10:09:24 PM	50.9	51.4
10:09:34 PM	51	51.4
10:09:44 PM	51.1	51.4
10:09:54 PM	51.2	51.6
10:10:04 PM	51.9	52.5
10:10:14 PM	52	52.2
10:10:24 PM	51.8	52.8
10:10:34 PM	51.2	51.5
10:10:44 PM	50.5	51.2
10:10:54 PM	51.8	52.5
10:11:04 PM	52	52.8
10:11:14 PM	50.7	51.1
10:11:24 PM	51.4	51.8
10:11:34 PM	51.5	51.8
10:11:44 PM	51.1	51.4
10:11:54 PM	51.7	52.6
10:12:04 PM	52.9	53.7
10:12:14 PM	53	53.7
10:12:24 PM	52.6	53
10:12:34 PM	52.1	52.6
10:12:44 PM	52.7	53
10:12:54 PM	52.5	53
10:13:04 PM	52	52.6
10:13:14 PM	52.6	53.3

10:13:24 PM	53.4	54
10:13:34 PM	52.8	53.4
10:13:44 PM	52.8	53.2
10:13:54 PM	52.1	52.8
10:14:04 PM	50.9	51.6
10:14:14 PM	50.9	51.4
10:14:24 PM	52.2	53
	52.2	

AES
Acoustical Engineering Services

Location: R2
Date: 2/8/2022

Time	Leq	Lmax
11:05:47 AM	43.5	45.8
11:05:57 AM	44.5	46.3
11:06:07 AM	45.3	47.4
11:06:17 AM	62.8	67.3
11:06:27 AM	58.5	65
11:06:37 AM	48	49.5
11:06:47 AM	45.1	46.5
11:06:57 AM	44.9	47
11:07:07 AM	44	45.9
11:07:17 AM	42.8	46.3
11:07:27 AM	45.1	47.1
11:07:37 AM	46.3	47.8
11:07:47 AM	48.8	53.8
11:07:57 AM	61	64.5
11:08:07 AM	60.5	64.1
11:08:17 AM	60	63.7
11:08:27 AM	51.8	54.3
11:08:37 AM	52.1	56.8
11:08:47 AM	48.1	50
11:08:57 AM	45.3	46.6
11:09:07 AM	43.9	47.1
11:09:17 AM	48.3	51.9
11:09:27 AM	40.5	42.7
11:09:37 AM	39.2	40.5
11:09:47 AM	37.8	38.8
11:09:57 AM	38.9	41.3
11:10:07 AM	42	43.2
11:10:17 AM	43.8	45
11:10:27 AM	46.1	47.8
11:10:37 AM	46	47.3
11:10:47 AM	45.9	47.1
11:10:57 AM	45.3	46.8
11:11:07 AM	43.4	45.5
11:11:17 AM	49.5	55.6
11:11:27 AM	50.4	55.8
11:11:37 AM	50.7	54.3
11:11:47 AM	47.6	49.7
11:11:57 AM	51.7	53.3
11:12:07 AM	45.1	47.9
11:12:17 AM	42.9	43.9
11:12:27 AM	43.6	45.4

11:12:37 AM	52.1	57.4
11:12:47 AM	56.8	63.3
11:12:57 AM	63.2	67.2
11:13:07 AM	60.9	67.4
11:13:17 AM	55.9	62.6
11:13:27 AM	55.1	61.8
11:13:37 AM	62.3	64.5
11:13:47 AM	57.8	59.1
11:13:57 AM	56.7	58.3
11:14:07 AM	52.3	55.7
11:14:17 AM	61.8	66.9
11:14:27 AM	64.7	69.5
11:14:37 AM	67.3	70.6
11:14:47 AM	54.1	62.6
11:14:57 AM	50	55.3
11:15:07 AM	52.7	56
11:15:17 AM	51.9	55.2
11:15:27 AM	47.5	49.9
11:15:37 AM	49.7	57.1
11:15:47 AM	51	57.2
11:15:57 AM	45.2	47.6
11:16:07 AM	45.6	46.9
11:16:17 AM	46.9	48.2
11:16:27 AM	42.2	44.5
11:16:37 AM	43.9	46.7
11:16:47 AM	44.8	47.8
11:16:57 AM	43.4	48
11:17:07 AM	46.5	49.8
11:17:17 AM	44.5	45.8
11:17:27 AM	44.5	46.4
11:17:37 AM	48.9	51.6
11:17:47 AM	43.8	49.4
11:17:57 AM	40.8	41.8
11:18:07 AM	43.8	46.6
11:18:17 AM	48.5	50
11:18:27 AM	49.2	51.7
11:18:37 AM	51.5	54.8
11:18:47 AM	52.6	56.2
11:18:57 AM	50.1	52.5
11:19:07 AM	51.9	54.7
11:19:17 AM	52.9	58.1
11:19:27 AM	57.5	58.7
11:19:37 AM	53.2	57.4
11:19:47 AM	44.4	46.8
11:19:57 AM	43.6	45.3

11:20:07 AM	43.7	48.8
11:20:17 AM	53.3	56.9
11:20:27 AM	52.4	56.8
11:20:37 AM	56.6	62.3
	55.1	

Time	Leq	Lmax
10:18:24 PM	51	52.4
10:18:34 PM	51.9	53.1
10:18:44 PM	51.1	51.5
10:18:54 PM	51	51.5
10:19:04 PM	51.3	52
10:19:14 PM	51	51.4
10:19:24 PM	50.8	51.5
10:19:34 PM	52.4	53.3
10:19:44 PM	53.7	55.3
10:19:54 PM	53.2	54.8
10:20:04 PM	51.8	52.6
10:20:14 PM	51.2	51.7
10:20:24 PM	50.4	51
10:20:34 PM	52.3	57
10:20:44 PM	51.3	52.4
10:20:54 PM	53.3	56.4
10:21:04 PM	61.5	66
10:21:14 PM	54.6	59.1
10:21:24 PM	50.8	52.2
10:21:34 PM	50.9	54
10:21:44 PM	51.4	54.2
10:21:54 PM	53.4	55.9
10:22:04 PM	51.9	52.6
10:22:14 PM	51.3	51.9
10:22:24 PM	51.3	52.4
10:22:34 PM	56.4	58.9
10:22:44 PM	53.8	57.1
10:22:54 PM	51.6	52.7
10:23:04 PM	51.1	51.6
10:23:14 PM	50.8	51.7
10:23:24 PM	50.6	51.3
10:23:34 PM	50.4	50.8
10:23:44 PM	50.4	51
10:23:54 PM	50.9	51.9
10:24:04 PM	51.2	52
10:24:14 PM	51.5	52.4
10:24:24 PM	52.3	52.5
10:24:34 PM	51.2	52.2

10:24:44 PM	51.6	53.1
10:24:54 PM	52.8	53.5
10:25:04 PM	52.8	53.2
10:25:14 PM	52.2	53.3
10:25:24 PM	51.9	52.7
10:25:34 PM	53	55
10:25:44 PM	52.5	53.2
10:25:54 PM	52.3	52.8
10:26:04 PM	53.2	55.2
10:26:14 PM	53.8	55.3
10:26:24 PM	53.3	53.7
10:26:34 PM	52.9	53.7
10:26:44 PM	52.9	53.6
10:26:54 PM	53.4	53.7
10:27:04 PM	55	57
10:27:14 PM	54	54.6
10:27:24 PM	53.5	53.8
10:27:34 PM	53.7	54.2
10:27:44 PM	53.5	54.3
10:27:54 PM	52.8	53.3
10:28:04 PM	55.2	58.4
10:28:14 PM	54.1	54.7
10:28:24 PM	53.9	54.6
10:28:34 PM	53.7	54.3
10:28:44 PM	52.9	53.4
10:28:54 PM	52.9	53.7
10:29:04 PM	53.8	54.5
10:29:14 PM	53.9	54.1
10:29:24 PM	53.4	54.1
10:29:34 PM	53.7	54.2
10:29:44 PM	53.9	55.4
10:29:54 PM	54.4	55.3
10:30:04 PM	54	54.4
10:30:14 PM	54.2	54.8
10:30:24 PM	55.2	56.3
10:30:34 PM	55.2	56.3
10:30:44 PM	54.8	56.8
10:30:54 PM	54.6	55.7
10:31:04 PM	53.9	55.1
10:31:14 PM	54.2	54.8
10:31:24 PM	58.6	64.6
10:31:34 PM	61.9	66.4
10:31:44 PM	57.5	60.3
10:31:54 PM	54.4	55.1
10:32:04 PM	54.2	54.9

10:32:14 PM	53.3	53.9
10:32:24 PM	55.3	55.8
10:32:34 PM	54.2	54.8
10:32:44 PM	54.4	54.9
10:32:54 PM	53.7	54.2
10:33:04 PM	54	55
10:33:14 PM	53.8	55
	53.8	

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie Project
Location: R3
Date: 2/8/2022

Time	Leq	Lmax
11:28:13 AM	72.2	77
11:28:23 AM	74.5	77.5
11:28:33 AM	70.2	72.1
11:28:43 AM	66.3	72.2
11:28:53 AM	51.1	55.9
11:29:03 AM	72	75.1
11:29:13 AM	70.3	74.6
11:29:23 AM	67.9	71
11:29:33 AM	69.1	73.7
11:29:43 AM	65.5	69.1
11:29:53 AM	60.3	65.9
11:30:03 AM	70.7	74.7
11:30:13 AM	73.7	75.8
11:30:23 AM	74.3	78.1
11:30:33 AM	71.3	75.8
11:30:43 AM	72.1	74.2
11:30:53 AM	69.2	72.5
11:31:03 AM	70.7	74.9
11:31:13 AM	70.8	72.8
11:31:23 AM	69.3	74.7
11:31:33 AM	65.8	74.2
11:31:43 AM	64.6	72.2
11:31:53 AM	68.6	71.8
11:32:03 AM	70	74.2
11:32:13 AM	74.2	77
11:32:23 AM	71.3	74.3
11:32:33 AM	69.4	71.4
11:32:43 AM	65.6	68.6
11:32:53 AM	60	64.3
11:33:03 AM	69.1	72.1
11:33:13 AM	72.2	77.1
11:33:23 AM	55.7	62.7
11:33:33 AM	64.1	68.7
11:33:43 AM	74	77.9
11:33:53 AM	69.1	73.7
11:34:03 AM	70.7	73.7
11:34:13 AM	70.4	74.1
11:34:23 AM	68.3	73.4
11:34:33 AM	67.5	70.8
11:34:43 AM	67.8	71.6

11:34:53 AM	70.9	75.3
11:35:03 AM	71.2	75.1
11:35:13 AM	67.2	69.6
11:35:23 AM	68	70.1
11:35:33 AM	68.3	71.6
11:35:43 AM	64.2	69
11:35:53 AM	66.8	69.3
11:36:03 AM	63.9	69.1
11:36:13 AM	71.8	74.3
11:36:23 AM	75.5	82.6
11:36:33 AM	74.2	82.1
11:36:43 AM	56.7	64.7
11:36:53 AM	70.3	74.4
11:37:03 AM	69.9	72.1
11:37:13 AM	66	67.2
11:37:23 AM	71.7	76.1
11:37:33 AM	72	75.3
11:37:43 AM	66.5	70.9
11:37:53 AM	68.7	71.8
11:38:03 AM	65	66.8
11:38:13 AM	65.5	70.8
11:38:23 AM	72.9	74.7
11:38:33 AM	72.2	75.3
11:38:43 AM	69.9	73.6
11:38:53 AM	65.2	69.1
11:39:03 AM	72.5	74.8
11:39:13 AM	71.1	73.7
11:39:23 AM	71.2	74.4
11:39:33 AM	63.4	71.2
11:39:43 AM	49.4	53.6
11:39:53 AM	63.6	68.4
11:40:03 AM	69.1	73.9
11:40:13 AM	73	78.2
11:40:23 AM	69.7	72.4
11:40:33 AM	69.2	72.6
11:40:43 AM	66.2	69.6
11:40:53 AM	68.7	73.1
11:41:03 AM	69.9	75.8
11:41:13 AM	70.8	74.4
11:41:23 AM	68.1	71.7
11:41:33 AM	67.7	71.6
11:41:43 AM	65.6	69.4
11:41:53 AM	64.5	65.7
11:42:03 AM	54.4	60.6
11:42:13 AM	69.6	72.7

11:42:23 AM	68.6	71.5
11:42:33 AM	71.1	77.8
11:42:43 AM	71.1	77.4
11:42:53 AM	68.5	71.2
11:43:03 AM	66	72.3
	69.9	

Time	Leq	Lmax
10:38:16 PM	73	77.2
10:38:26 PM	72.3	78.9
10:38:36 PM	64.5	71.7
10:38:46 PM	68.5	71.3
10:38:56 PM	64.7	71.3
10:39:06 PM	55	56.1
10:39:16 PM	55.5	56.2
10:39:26 PM	66.1	71.7
10:39:36 PM	68.4	73.5
10:39:46 PM	67.4	71.5
10:39:56 PM	59.8	64.2
10:40:06 PM	67.8	73.2
10:40:16 PM	56.5	61.4
10:40:26 PM	62.4	66.8
10:40:36 PM	56.7	60.9
10:40:46 PM	65.4	71.4
10:40:56 PM	55.4	58.3
10:41:06 PM	71.1	75.5
10:41:16 PM	65.1	71.2
10:41:26 PM	65.1	70.2
10:41:36 PM	61.5	67.5
10:41:46 PM	59	64.7
10:41:56 PM	65.6	70.7
10:42:06 PM	67.9	72.4
10:42:16 PM	66	69.5
10:42:26 PM	67.1	70.4
10:42:36 PM	65.7	69.8
10:42:46 PM	66.1	69.8
10:42:56 PM	65.8	72.3
10:43:06 PM	68.3	71.2
10:43:16 PM	62.2	68.8
10:43:26 PM	67.8	73.7
10:43:36 PM	57.3	63.3
10:43:46 PM	55	60.9
10:43:56 PM	59.8	64
10:44:06 PM	70.7	74.8
10:44:16 PM	61.4	67.8

10:44:26 PM	52.2	52.9
10:44:36 PM	54.4	57.9
10:44:46 PM	68.2	71.3
10:44:56 PM	58.2	64.6
10:45:06 PM	52.6	53.8
10:45:16 PM	66.9	70.6
10:45:26 PM	67.7	72.8
10:45:36 PM	52.8	54.1
10:45:46 PM	55	60.8
10:45:56 PM	69.2	75.9
10:46:06 PM	68.2	73.1
10:46:16 PM	69.4	73.9
10:46:26 PM	58.5	65.6
10:46:36 PM	73.4	81.8
10:46:46 PM	71.1	79.9
10:46:56 PM	62.7	69.7
10:47:06 PM	65.8	70.1
10:47:16 PM	69.9	74.9
10:47:26 PM	61.7	67.3
10:47:36 PM	78.1	84
10:47:46 PM	69.4	73.9
10:47:56 PM	73.6	76.3
10:48:06 PM	67.6	70.7
10:48:16 PM	69	72.2
10:48:26 PM	66.1	66.5
10:48:36 PM	66.5	68.7
10:48:46 PM	71.1	73.7
10:48:56 PM	68.4	70.7
10:49:06 PM	66.6	73
10:49:16 PM	55.3	58.2
10:49:26 PM	53.5	55.6
10:49:36 PM	60.9	67.1
10:49:46 PM	59.6	66.2
10:49:56 PM	56.5	59.9
10:50:06 PM	67.5	73
10:50:16 PM	57	58.7
10:50:26 PM	67	73.5
10:50:36 PM	67.2	71.4
10:50:46 PM	56.9	60.7
10:50:56 PM	63.6	68.6
10:51:06 PM	68.3	74.4
10:51:16 PM	58.9	61.2
10:51:26 PM	71.9	77.7
10:51:36 PM	69.9	72.2
10:51:46 PM	63.8	67.3

10:51:56 PM	51.3	54.5
10:52:06 PM	51	52.3
10:52:16 PM	66.6	71.5
10:52:26 PM	59.4	66.3
10:52:36 PM	67.2	72.7
10:52:46 PM	68.4	74.6
10:52:56 PM	62.5	66.5
10:53:06 PM	52.1	55.1
	67.3	

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie Project
Location: R4
Date: 2/8/2022

Time	Leq	Lmax
11:47:41 AM	49.7	52.4
11:47:51 AM	47.8	50.9
11:48:01 AM	58.9	64.6
11:48:11 AM	52.6	59.6
11:48:21 AM	49.2	49.7
11:48:31 AM	49.2	51.2
11:48:41 AM	50.1	52.7
11:48:51 AM	57.5	60.2
11:49:01 AM	65	71.2
11:49:11 AM	51.7	57.7
11:49:21 AM	49.4	50.1
11:49:31 AM	49.3	50.3
11:49:41 AM	49	50.2
11:49:51 AM	48.8	51.2
11:50:01 AM	52.6	54.9
11:50:11 AM	54.1	55.8
11:50:21 AM	55.4	59.4
11:50:31 AM	52.4	57.4
11:50:41 AM	51.4	54
11:50:51 AM	54.6	61.9
11:51:01 AM	59.7	65.1
11:51:11 AM	48	48.8
11:51:21 AM	47.8	50.8
11:51:31 AM	47.6	48.7
11:51:41 AM	54.7	62
11:51:51 AM	61	63.4
11:52:01 AM	59.5	62.4
11:52:11 AM	62	68.5
11:52:21 AM	62.3	68
11:52:31 AM	57.9	59.6
11:52:41 AM	58.3	60.6
11:52:51 AM	56.4	58
11:53:01 AM	60.1	66.8
11:53:11 AM	62.5	67.8
11:53:21 AM	59.5	60.7
11:53:31 AM	56.4	58.8
11:53:41 AM	52.1	53.9
11:53:51 AM	54.2	55.8
11:54:01 AM	65.2	70.3
11:54:11 AM	68.5	71.9

11:54:21 AM	59.6	63.3
11:54:31 AM	55.5	60.7
11:54:41 AM	55.4	59.4
11:54:51 AM	55.9	60
11:55:01 AM	48.6	51.9
11:55:11 AM	52.5	57.7
11:55:21 AM	52	56.9
11:55:31 AM	46.6	49
11:55:41 AM	47.7	49
11:55:51 AM	57.3	60.7
11:56:01 AM	57.5	62.6
11:56:11 AM	61.6	65.2
11:56:21 AM	53.4	56.4
11:56:31 AM	53.6	56.1
11:56:41 AM	51.3	53.7
11:56:51 AM	55.1	56.3
11:57:01 AM	58.8	61.3
11:57:11 AM	57.7	61.1
11:57:21 AM	52	54.5
11:57:31 AM	50.3	52.8
11:57:41 AM	48.6	51.2
11:57:51 AM	47.4	49.4
11:58:01 AM	47.7	49.1
11:58:11 AM	48.4	51
11:58:21 AM	48.9	50.1
11:58:31 AM	59.1	62.6
11:58:41 AM	52	58.9
11:58:51 AM	48	49.3
11:59:01 AM	48.6	50.9
11:59:11 AM	50.7	52.3
11:59:21 AM	52.1	57.2
11:59:31 AM	57.2	62
11:59:41 AM	47.1	48.2
11:59:51 AM	49.6	53.4
12:00:01 PM	54.8	58
12:00:11 PM	54.9	57.3
12:00:21 PM	53.2	57.2
12:00:31 PM	49.9	51.7
12:00:41 PM	50.4	52.7
12:00:51 PM	55.7	59.7
12:01:01 PM	49.6	53.6
12:01:11 PM	47.9	50.7
12:01:21 PM	50.7	52.1
12:01:31 PM	50.4	52.4
12:01:41 PM	47.2	48.9

12:01:51 PM	49.2	54.8
12:02:01 PM	58.2	63.2
12:02:11 PM	48.9	49.9
12:02:21 PM	55.5	58.2
12:02:31 PM	54.6	57.7
	56.9	

Time	Leq	Lmax
10:56:53 PM	50	52.9
10:57:03 PM	49.8	50.3
10:57:13 PM	49.4	50.4
10:57:23 PM	50.3	51
10:57:33 PM	49.5	49.8
10:57:43 PM	55.2	59.9
10:57:53 PM	50.9	55
10:58:03 PM	50	50.5
10:58:13 PM	50.6	51.8
10:58:23 PM	49.5	50.3
10:58:33 PM	49.2	50
10:58:43 PM	50.1	50.4
10:58:53 PM	49.8	50.9
10:59:03 PM	51.7	53.6
10:59:13 PM	60.9	64.5
10:59:23 PM	57.4	62.3
10:59:33 PM	53.1	57.2
10:59:43 PM	50.5	51
10:59:53 PM	51	51.8
11:00:03 PM	52.2	53.6
11:00:13 PM	52.4	52.9
11:00:23 PM	52.4	53.2
11:00:33 PM	51.7	52.5
11:00:43 PM	51.8	52.4
11:00:53 PM	52	52.6
11:01:03 PM	52.7	55.7
11:01:13 PM	51.3	53.5
11:01:23 PM	51.2	52
11:01:33 PM	52.2	52.9
11:01:43 PM	52.7	54
11:01:53 PM	54	55.1
11:02:03 PM	52.2	52.7
11:02:13 PM	57.9	62.9
11:02:23 PM	53.4	57.9
11:02:33 PM	51.4	52.1
11:02:43 PM	51	51.7
11:02:53 PM	52.5	53.1

11:03:03 PM	52.4	53.8
11:03:13 PM	60.2	65.9
11:03:23 PM	72.2	76.9
11:03:33 PM	57.8	63
11:03:43 PM	59.4	61.9
11:03:53 PM	53.8	55.2
11:04:03 PM	53.8	54.6
11:04:13 PM	53.3	53.8
11:04:23 PM	53.2	54.3
11:04:33 PM	53.6	54.1
11:04:43 PM	53.4	53.6
11:04:53 PM	54.6	55.5
11:05:03 PM	55.1	55.4
11:05:13 PM	55	55.8
11:05:23 PM	55	55.6
11:05:33 PM	57.4	58.5
11:05:43 PM	55.4	56.3
11:05:53 PM	56.9	58.2
11:06:03 PM	56.4	57.6
11:06:13 PM	55.9	57.1
11:06:23 PM	53.7	54.1
11:06:33 PM	54.2	54.9
11:06:43 PM	53.9	54.3
11:06:53 PM	54.5	55.3
11:07:03 PM	54.4	55.1
11:07:13 PM	54.3	54.7
11:07:23 PM	54	54.4
11:07:33 PM	54.3	54.7
11:07:43 PM	54.7	55.1
11:07:53 PM	54.2	55
11:08:03 PM	55.5	57.9
11:08:13 PM	58	61.1
11:08:23 PM	55.9	59.5
11:08:33 PM	54.2	54.8
11:08:43 PM	54.3	54.7
11:08:53 PM	53.7	54.8
11:09:03 PM	54.2	55.8
11:09:13 PM	53	53.6
11:09:23 PM	52	52.4
11:09:33 PM	52.5	53.5
11:09:43 PM	51.9	52.3
11:09:53 PM	50.8	51.8
11:10:03 PM	52.1	52.6
11:10:13 PM	51.7	52.4
11:10:23 PM	51.2	51.8

11:10:33 PM	53	56.9
11:10:43 PM	55.6	58.4
11:10:53 PM	51.3	52.6
11:11:03 PM	51.1	51.9
11:11:13 PM	51.5	52
11:11:23 PM	51.2	52.3
11:11:33 PM	53.1	55.4
11:11:43 PM	51	51.9
	56.4	

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie Project
Location: R5
Date: 2/8/2022

Time	Leq	Lmax
12:04:57 PM	44.5	47.4
12:05:07 PM	41.9	45.9
12:05:17 PM	44.1	47.9
12:05:27 PM	44.6	46.1
12:05:37 PM	47.1	50.4
12:05:47 PM	47.3	49.8
12:05:57 PM	50.5	55.7
12:06:07 PM	68.9	75.7
12:06:17 PM	57.2	63.1
12:06:27 PM	53.7	56.3
12:06:37 PM	52.2	54.7
12:06:47 PM	50.7	51.7
12:06:57 PM	53.2	54.9
12:07:07 PM	60.4	63.1
12:07:17 PM	63.6	64.9
12:07:27 PM	59	61.8
12:07:37 PM	52.6	54.8
12:07:47 PM	49.8	52.7
12:07:57 PM	48.6	51.7
12:08:07 PM	48.6	52.7
12:08:17 PM	54.9	63.3
12:08:27 PM	59	63.1
12:08:37 PM	49.3	53.2
12:08:47 PM	53.8	62.2
12:08:57 PM	65.2	69.7
12:09:07 PM	53.5	56.1
12:09:17 PM	48.1	53.6
12:09:27 PM	48.1	54.1
12:09:37 PM	46.9	49.8
12:09:47 PM	44.5	47.2
12:09:57 PM	43.6	47
12:10:07 PM	42.3	44.1
12:10:17 PM	56.7	66.3
12:10:27 PM	56.8	65.5
12:10:37 PM	51.7	54.6
12:10:47 PM	48.4	50.3
12:10:57 PM	45.4	46.7
12:11:07 PM	46.2	47.2
12:11:17 PM	49.9	53.6
12:11:27 PM	51.4	55.9

12:11:37 PM	49.8	55.7
12:11:47 PM	44.6	47.3
12:11:57 PM	42.9	44.4
12:12:07 PM	50.6	54.6
12:12:17 PM	43.9	49.1
12:12:27 PM	43.3	44
12:12:37 PM	51.7	55.4
12:12:47 PM	51.4	53.8
12:12:57 PM	51.4	55
12:13:07 PM	47.4	50.8
12:13:17 PM	47	49.8
12:13:27 PM	48.6	52.2
12:13:37 PM	46.2	47.4
12:13:47 PM	44.4	47.5
12:13:57 PM	47.1	48.6
12:14:07 PM	47.7	50.8
12:14:17 PM	47.7	54
12:14:27 PM	57.7	61.5
12:14:37 PM	49	55.2
12:14:47 PM	46.1	52.4
12:14:57 PM	56	60
12:15:07 PM	47.2	49.9
12:15:17 PM	47.7	51.1
12:15:27 PM	44.9	47.2
12:15:37 PM	44	45.4
12:15:47 PM	54.3	61.7
12:15:57 PM	60.1	65.4
12:16:07 PM	54.4	60.1
12:16:17 PM	52.5	53.2
12:16:27 PM	51.2	53.4
12:16:37 PM	45.9	47.1
12:16:47 PM	46.7	48.1
12:16:57 PM	49.6	51.4
12:17:07 PM	47.9	49.5
12:17:17 PM	47.4	50.7
12:17:27 PM	54.4	60.4
12:17:37 PM	46.6	47.1
12:17:47 PM	47.9	49.7
12:17:57 PM	44.2	47.2
12:18:07 PM	43.7	44.9
12:18:17 PM	51.6	57.3
12:18:27 PM	47.2	50.8
12:18:37 PM	47	52.1
12:18:47 PM	47.7	50.5
12:18:57 PM	50	52.7

12:19:07 PM	49.7	51.4
12:19:17 PM	52.7	54.9
12:19:27 PM	53.7	56.4
12:19:37 PM	49.1	51.4
12:19:47 PM	51.9	54.2
	54.8	

Time	Leq	Lmax
11:15:56 PM	52.8	53.4
11:16:06 PM	52.7	53.4
11:16:16 PM	51.7	52.1
11:16:26 PM	52	52.2
11:16:36 PM	51.9	52.3
11:16:46 PM	51.9	52.3
11:16:56 PM	52.4	52.9
11:17:06 PM	51.2	51.6
11:17:16 PM	50.9	51.3
11:17:26 PM	52.5	53.2
11:17:36 PM	52.7	53
11:17:46 PM	52.5	53.2
11:17:56 PM	52.8	56.6
11:18:06 PM	52.6	53.3
11:18:16 PM	52.4	53.2
11:18:26 PM	52.3	53.5
11:18:36 PM	51.9	52.3
11:18:46 PM	52.1	52.8
11:18:56 PM	53	53.3
11:19:06 PM	52.2	52.9
11:19:16 PM	52.6	53.8
11:19:26 PM	54.5	58
11:19:36 PM	52.8	56
11:19:46 PM	52.8	53.1
11:19:56 PM	52.6	52.8
11:20:06 PM	52.5	52.9
11:20:16 PM	52.1	52.4
11:20:26 PM	52.2	52.5
11:20:36 PM	52.2	52.5
11:20:46 PM	53	53.7
11:20:56 PM	53.2	53.6
11:21:06 PM	52.5	53.3
11:21:16 PM	52.3	52.9
11:21:26 PM	52.3	52.7
11:21:36 PM	53.2	55.1
11:21:46 PM	52.4	53
11:21:56 PM	52.4	53

11:22:06 PM	54.8	57
11:22:16 PM	54.2	55.3
11:22:26 PM	53.8	54.8
11:22:36 PM	52.7	53.1
11:22:46 PM	52.9	53.3
11:22:56 PM	53.1	53.8
11:23:06 PM	52.7	54.4
11:23:16 PM	55	56.6
11:23:26 PM	53.1	53.5
11:23:36 PM	52.1	52.7
11:23:46 PM	52.4	52.7
11:23:56 PM	53.2	54.1
11:24:06 PM	54	56.6
11:24:16 PM	56.6	58.4
11:24:26 PM	52.3	53.6
11:24:36 PM	52.2	52.9
11:24:46 PM	52.9	53.5
11:24:56 PM	53.5	54.1
11:25:06 PM	53.6	54.1
11:25:16 PM	52.6	53.4
11:25:26 PM	52.2	52.8
11:25:36 PM	52.2	52.8
11:25:46 PM	52.4	53.5
11:25:56 PM	53	53.7
11:26:06 PM	53.8	55.1
11:26:16 PM	53.4	53.8
11:26:26 PM	53.2	53.5
11:26:36 PM	52.9	53.2
11:26:46 PM	53.4	54
11:26:56 PM	53.4	53.9
11:27:06 PM	53.4	53.7
11:27:16 PM	53.2	53.4
11:27:26 PM	53	53.6
11:27:36 PM	53.8	55.3
11:27:46 PM	53.1	53.4
11:27:56 PM	52.9	53.6
11:28:06 PM	53.2	53.7
11:28:16 PM	53.8	56.5
11:28:26 PM	54.9	57.4
11:28:36 PM	56.4	61.3
11:28:46 PM	52.3	52.6
11:28:56 PM	52.7	55
11:29:06 PM	54.8	58.7
11:29:16 PM	52	52.4
11:29:26 PM	52.3	52.7

11:29:36 PM	52.4	53.3
11:29:46 PM	51.7	52.9
11:29:56 PM	55.8	59.8
11:30:06 PM	51.9	52.7
11:30:16 PM	52.4	53.8
11:30:26 PM	51.6	53.3
11:30:36 PM	51.5	52.3
11:30:46 PM	53.1	55.1
	53.0	

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie Project
Location: R6
Date: 2/8/2022

Time	Leq	Lmax
12:22:20 PM	46.2	49.7
12:22:30 PM	53.3	59.4
12:22:40 PM	63	71.9
12:22:50 PM	48	51.2
12:23:00 PM	69.5	77.3
12:23:10 PM	64	73.6
12:23:20 PM	47.3	48.3
12:23:30 PM	47.8	49.5
12:23:40 PM	46.9	49.2
12:23:50 PM	49.4	55.1
12:24:00 PM	46.2	51.5
12:24:10 PM	49.9	54.1
12:24:20 PM	47.6	53.6
12:24:30 PM	45.7	49.3
12:24:40 PM	45.9	47.4
12:24:50 PM	44.5	47.1
12:25:00 PM	43	44.8
12:25:10 PM	47.2	52.3
12:25:20 PM	52.6	56.4
12:25:30 PM	56.5	56.9
12:25:40 PM	55.5	56.5
12:25:50 PM	55.3	57.8
12:26:00 PM	44.4	45.7
12:26:10 PM	57.8	66.1
12:26:20 PM	60.8	67.3
12:26:30 PM	58.4	60.4
12:26:40 PM	55.5	59.6
12:26:50 PM	49.9	52.2
12:27:00 PM	48.4	50.4
12:27:10 PM	46.2	48
12:27:20 PM	46.7	48.7
12:27:30 PM	47.1	49.3
12:27:40 PM	54.2	62.3
12:27:50 PM	56.9	65.8
12:28:00 PM	45.2	48.3
12:28:10 PM	49.8	53.6
12:28:20 PM	49.8	51.8
12:28:30 PM	52.4	53.8
12:28:40 PM	53	54.6
12:28:50 PM	52.2	54

12:29:00 PM	54.8	57.6
12:29:10 PM	52.4	57.2
12:29:20 PM	48.7	51.3
12:29:30 PM	47.5	49.9
12:29:40 PM	44.1	46.1
12:29:50 PM	43.7	45.9
12:30:00 PM	43	45
12:30:10 PM	44.1	46
12:30:20 PM	42.7	44.8
12:30:30 PM	42.3	44.8
12:30:40 PM	42.7	44.3
12:30:50 PM	47.4	51.8
12:31:00 PM	43.5	46.3
12:31:10 PM	40.7	43.7
12:31:20 PM	41.3	45
12:31:30 PM	42.4	44.7
12:31:40 PM	42.5	45.3
12:31:50 PM	44	46.1
12:32:00 PM	45.9	49.9
12:32:10 PM	45.3	47
12:32:20 PM	57.6	66.7
12:32:30 PM	57.9	64.7
12:32:40 PM	46.7	51.4
12:32:50 PM	50.6	55
12:33:00 PM	54	59.7
12:33:10 PM	51.3	55.6
12:33:20 PM	45.9	52
12:33:30 PM	47.8	53.1
12:33:40 PM	42.5	47
12:33:50 PM	45.6	49.4
12:34:00 PM	47.8	52.7
12:34:10 PM	46.4	52.8
12:34:20 PM	45.4	48.3
12:34:30 PM	48.7	53.3
12:34:40 PM	44.4	48.9
12:34:50 PM	43.8	46.6
12:35:00 PM	49.2	54.9
12:35:10 PM	52.1	56.1
12:35:20 PM	50.2	53.1
12:35:30 PM	53	56.5
12:35:40 PM	50.5	54
12:35:50 PM	48.9	51.1
12:36:00 PM	55.8	59.4
12:36:10 PM	57.3	60.9
12:36:20 PM	55.6	58.1

12:36:30 PM	50.1	51.6
12:36:40 PM	47.4	50.6
12:36:50 PM	48	54.7
12:37:00 PM	40.6	42.2
12:37:10 PM	50.2	59.2
	54.6	

Time	Leq	Lmax
11:34:18 PM	48.3	50
11:34:28 PM	48.1	49.4
11:34:38 PM	48.3	49
11:34:48 PM	47.7	48
11:34:58 PM	48.4	49.2
11:35:08 PM	47.8	48.2
11:35:18 PM	49.9	53.6
11:35:28 PM	51.7	54.2
11:35:38 PM	47.4	48.7
11:35:48 PM	48	48.4
11:35:58 PM	48.1	48.9
11:36:08 PM	48.7	49.4
11:36:18 PM	48.9	49.3
11:36:28 PM	50	50.6
11:36:38 PM	49.3	50.1
11:36:48 PM	48.7	49.8
11:36:58 PM	50.3	51.9
11:37:08 PM	50.7	52.8
11:37:18 PM	48	48.5
11:37:28 PM	48.3	49.1
11:37:38 PM	51.1	53.5
11:37:48 PM	49.6	50.4
11:37:58 PM	50.2	52.4
11:38:08 PM	48.8	49.5
11:38:18 PM	49.3	50.2
11:38:28 PM	48.9	49.4
11:38:38 PM	49	49.3
11:38:48 PM	49.1	49.9
11:38:58 PM	48.3	48.8
11:39:08 PM	48.2	48.5
11:39:18 PM	48.8	49.4
11:39:28 PM	52.2	57.1
11:39:38 PM	49.2	50.3
11:39:48 PM	48.7	49.2
11:39:58 PM	49.3	49.6
11:40:08 PM	49.1	49.4
11:40:18 PM	49.4	49.8

11:40:28 PM	49.3	49.7
11:40:38 PM	49.1	49.7
11:40:48 PM	49.2	49.6
11:40:58 PM	48.9	49.5
11:41:08 PM	49.1	49.5
11:41:18 PM	49.5	49.9
11:41:28 PM	48.8	49.4
11:41:38 PM	48.7	49.1
11:41:48 PM	48.5	49.1
11:41:58 PM	48.8	49.7
11:42:08 PM	47.9	48.3
11:42:18 PM	47.8	48.1
11:42:28 PM	47.9	48.1
11:42:38 PM	48.5	49.2
11:42:48 PM	49	49.9
11:42:58 PM	49	49.6
11:43:08 PM	49.2	49.8
11:43:18 PM	48.5	49.6
11:43:28 PM	47.8	48.4
11:43:38 PM	47.4	47.7
11:43:48 PM	48.4	49
11:43:58 PM	47.9	48.5
11:44:08 PM	47.8	49.2
11:44:18 PM	47.5	47.7
11:44:28 PM	47.1	47.4
11:44:38 PM	47.4	47.7
11:44:48 PM	47.9	48.3
11:44:58 PM	48.2	48.4
11:45:08 PM	48.4	49.6
11:45:18 PM	49.1	49.4
11:45:28 PM	49.4	49.9
11:45:38 PM	48.2	49.1
11:45:48 PM	48.4	49.3
11:45:58 PM	47.9	50.3
11:46:08 PM	48	48.7
11:46:18 PM	47.9	48.9
11:46:28 PM	48.1	48.8
11:46:38 PM	49.3	51.3
11:46:48 PM	48.5	49.4
11:46:58 PM	48	48.7
11:47:08 PM	48	48.5
11:47:18 PM	47.9	48.4
11:47:28 PM	47.2	47.9
11:47:38 PM	47.2	47.9
11:47:48 PM	47.3	47.8

11:47:58 PM	47.5	47.7
11:48:08 PM	47.6	48.3
11:48:18 PM	47.6	48.6
11:48:28 PM	47.2	47.9
11:48:38 PM	47	47.3
11:48:48 PM	48.1	49.8
11:48:58 PM	48.7	50.9
11:49:08 PM	48.9	49.9
	48.7	

Appendix B
Construction Noise & Vibration Calculations

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Demolition***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	40%	25	0
Jackhammer	1	89	20%	50	0
Backhoe loader	1	79	40%	75	0
Dump trucks	1	76	40%	75	0
Hand tools	1	85	50%	100	0

5

Receptor: ***R1***

Results:

1-hour Leq: **86.8**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Site Preparation***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	40%	25	0
Graders	1	85	40%	50	0
Bulldozer	1	82	40%	75	0
Graders	1	85	40%	75	0

4

Receptor: ***R1***

Results:

1-hour Leq: 86.7

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	20%	25	0
Excavator	1	81	40%	50	0
Backhoe loader	1	79	40%	75	0
Dump trucks	1	76	40%	75	0

4

Receptor: ***R1***

Results:

1-hour Leq: 83.0

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Garage and Residential Concrete***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete trucks	1	79	40%	25	0
Gradall	1	83	40%	50	0
Forklift	1	75	20%	75	0
Crane	1	81	16%	75	0
Backhoe	1	78	40%	100	0

5

Receptor: ***R1***

Results:

1-hour Leq: 83.5

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Building Construction***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Gradall	1	83	40%	25	0
Forklift	1	75	20%	50	0
Crane	1	81	16%	75	0
Man lift	1	75	20%	75	0

4

Receptor: ***R1***

Results:

1-hour Leq: 85.3

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Finishing Work/Paving***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Gradall	1	83	40%	25	0
Man lift	1	75	20%	50	0

2

Receptor: ***R1***

Results:

1-hour Leq: 85.1

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Demolition***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	40%	40	0
Jackhammer	1	89	20%	65	0
Backhoe loader	1	79	40%	90	0
Dump trucks	1	76	40%	90	0
Hand tools	1	85	50%	115	0

5

Receptor: ***R2***

Results:

1-hour Leq: **83.8**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Site Preparation***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	40%	40	0
Graders	1	85	40%	65	0
Bulldozer	1	82	40%	90	0
Graders	1	85	40%	90	0

4

Receptor: ***R2***

Results:

1-hour Leq: 83.7

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	20%	40	0
Excavator	1	81	40%	65	0
Backhoe loader	1	79	40%	90	0
Dump trucks	1	76	40%	90	0

4

Receptor: ***R2***

Results:

1-hour Leq: 79.7

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Garage and Residential Concrete***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete trucks	1	79	40%	40	0
Gradall	1	83	40%	65	0
Forklift	1	75	20%	90	0
Crane	1	81	16%	90	0
Backhoe	1	78	40%	115	0

5

Receptor: ***R2***

Results:

1-hour Leq: 80.4

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Building Construction***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Gradall	1	83	40%	40	0
Forklift	1	75	20%	65	0
Crane	1	81	16%	90	0
Man lift	1	75	20%	90	0
	4				

Receptor: ***R2***

Results:

1-hour Leq: 81.4

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Finishing Work/Paving***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Gradall	1	83	40%	40	0
Man lift	1	75	20%	65	0

2

Receptor: ***R2***

Results:

1-hour Leq: 81.1

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Demolition***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	40%	110	5
Jackhammer	1	89	20%	135	5
Backhoe loader	1	79	40%	160	5
Dump trucks	1	76	40%	160	5
Hand tools	1	85	50%	185	5

5

Receptor: ***R3***

Results:

1-hour Leq: **72.1**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Site Preparation***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	40%	110	5
Graders	1	85	40%	135	5
Bulldozer	1	82	40%	160	5
Graders	1	85	40%	160	5

4

Receptor: ***R3***

Results:

1-hour Leq: 71.9

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	20%	110	5
Excavator	1	81	40%	135	5
Backhoe loader	1	79	40%	160	5
Dump trucks	1	76	40%	160	5

4

Receptor: ***R3***

Results:

1-hour Leq: 67.6

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Garage and Residential Concrete***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete trucks	1	79	40%	110	5
Gradall	1	83	40%	135	5
Forklift	1	75	20%	160	5
Crane	1	81	16%	160	5
Backhoe	1	78	40%	185	5

5

Receptor: ***R3***

Results:

1-hour Leq: **68.4**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Building Construction***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Gradall	1	83	40%	110	5
Forklift	1	75	20%	135	5
Crane	1	81	16%	160	5
Man lift	1	75	20%	160	5

4

Receptor: ***R3***

Results:

1-hour Leq: 68.0

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Finishing Work/Paving***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Gradall	1	83	40%	110	5
Man lift	1	75	20%	135	5

2

Receptor: ***R3***

Results:

1-hour Leq: 67.4

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Demolition***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	40%	60	0
Jackhammer	1	89	20%	85	0
Backhoe loader	1	79	40%	110	0
Dump trucks	1	76	40%	110	0
Hand tools	1	85	50%	135	0

5

Receptor: ***R4***

Results:

1-hour Leq: 81.2

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Site Preparation***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	40%	60	0
Graders	1	85	40%	85	0
Bulldozer	1	82	40%	110	0
Graders	1	85	40%	110	0

4

Receptor: ***R4***

Results:

1-hour Leq: 81.0

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	20%	60	0
Excavator	1	81	40%	85	0
Backhoe loader	1	79	40%	110	0
Dump trucks	1	76	40%	110	0

4

Receptor: ***R4***

Results:

1-hour Leq: 76.9

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Garage and Residential Concrete***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete trucks	1	79	40%	60	0
Gradall	1	83	40%	85	0
Forklift	1	75	20%	110	0
Crane	1	81	16%	110	0
Backhoe	1	78	40%	135	0

5

Receptor: ***R4***

Results:

1-hour Leq: **77.7**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Building Construction***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Gradall	1	83	40%	60	0
Forklift	1	75	20%	85	0
Crane	1	81	16%	110	0
Man lift	1	75	20%	110	0

4

Receptor: ***R4***

Results:

1-hour Leq: 78.0

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Finishing Work/Paving***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Gradall	1	83	40%	60	0
Man lift	1	75	20%	85	0

2

Receptor: ***R4***

Results:

1-hour Leq: 77.6

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Demolition***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	40%	35	0
Jackhammer	1	89	20%	60	0
Backhoe loader	1	79	40%	85	0
Dump trucks	1	76	40%	85	0
Hand tools	1	85	50%	110	0

5

Receptor: ***R5***

Results:

1-hour Leq: 84.6

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Site Preparation***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	40%	35	0
Graders	1	85	40%	60	0
Bulldozer	1	82	40%	85	0
Graders	1	85	40%	85	0

4

Receptor: ***R5***

Results:

1-hour Leq: 84.5

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	20%	35	0
Excavator	1	81	40%	60	0
Backhoe loader	1	79	40%	85	0
Dump trucks	1	76	40%	85	0

4

Receptor: ***R5***

Results:

1-hour Leq: 80.7

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Garage and Residential Concrete***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete trucks	1	79	40%	35	0
Gradall	1	83	40%	60	0
Forklift	1	75	20%	85	0
Crane	1	81	16%	85	0
Backhoe	1	78	40%	110	0

5

Receptor: ***R5***

Results:

1-hour Leq: **81.3**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Building Construction***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Gradall	1	83	40%	35	0
Forklift	1	75	20%	60	0
Crane	1	81	16%	85	0
Man lift	1	75	20%	85	0

4

Receptor: ***R5***

Results:

1-hour Leq: 82.5

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Finishing Work/Paving***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Gradall	1	83	40%	35	0
Man lift	1	75	20%	60	0

2

Receptor: ***R5***

Results:

1-hour Leq: 82.2

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Demolition***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	40%	35	0
Jackhammer	1	89	20%	60	0
Backhoe loader	1	79	40%	85	0
Dump trucks	1	76	40%	85	0
Hand tools	1	85	50%	110	0

5

Receptor: ***R6***

Results:

1-hour Leq: **84.6**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Site Preparation***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	40%	35	0
Graders	1	85	40%	60	0
Bulldozer	1	82	40%	85	0
Graders	1	85	40%	85	0

4

Receptor: ***R6***

Results:

1-hour Leq: 84.5

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	20%	35	0
Excavator	1	81	40%	60	0
Backhoe loader	1	79	40%	85	0
Dump trucks	1	76	40%	85	0

4

Receptor: ***R6***

Results:

1-hour Leq: 80.7

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Garage and Residential Concrete***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete trucks	1	79	40%	35	0
Gradall	1	83	40%	60	0
Forklift	1	75	20%	85	0
Crane	1	81	16%	85	0
Backhoe	1	78	40%	110	0

5

Receptor: ***R6***

Results:

1-hour Leq: **81.3**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Building Construction***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Gradall	1	83	40%	35	0
Forklift	1	75	20%	60	0
Crane	1	81	16%	85	0
Man lift	1	75	20%	85	0

4

Receptor: ***R6***

Results:

1-hour Leq: 82.5

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Finishing Work/Paving***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Gradall	1	83	40%	35	0
Man lift	1	75	20%	60	0

2

Receptor: ***R6***

Results:

1-hour Leq: 82.2

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Demolition***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	40%	55	0
Jackhammer	1	89	20%	80	0
Backhoe loader	1	79	40%	105	0
Dump trucks	1	76	40%	105	0
Hand tools	1	85	50%	130	0

5

Receptor: ***R7***

Results:

1-hour Leq: **81.7**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Site Preparation***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	40%	55	0
Graders	1	85	40%	80	0
Bulldozer	1	82	40%	105	0
Graders	1	85	40%	105	0
	4				

Receptor: ***R7***

Results:

1-hour Leq: **81.6**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Grading***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Bulldozer	1	82	20%	55	0
Excavator	1	81	40%	80	0
Backhoe loader	1	79	40%	105	0
Dump trucks	1	76	40%	105	0

4

Receptor: ***R7***

Results:

1-hour Leq: 77.5

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Garage and Residential Concrete***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Concrete trucks	1	79	40%	55	0
Gradall	1	83	40%	80	0
Forklift	1	75	20%	105	0
Crane	1	81	16%	105	0
Backhoe	1	78	40%	130	0

5

Receptor: ***R7***

Results:

1-hour Leq: 78.3

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Building Construction***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Gradall	1	83	40%	55	0
Forklift	1	75	20%	80	0
Crane	1	81	16%	105	0
Man lift	1	75	20%	105	0
	4				

Receptor: ***R7***

Results:

1-hour Leq: **78.7**

Source for Ref. Noise Levels: FHWA RCNM, 2006

AES
ACOUSTICAL ENGINEERING SERVICES

Project: 16911 Normandie

Construction Phase: ***Finishing Work/Paving***

Equipment

Description	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance to Receptor, ft	Estimated Noise Shielding, dBA
Gradall	1	83	40%	55	0
Man lift	1	75	20%	80	0

2

Receptor: ***R7***

Results:

1-hour Leq: 78.4

Source for Ref. Noise Levels: FHWA RCNM, 2006

16911 Normandie Associates, LLC 20 May 2022
Sean Bui TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 16911 Normandie
RUN: Construction Trucks - Demo Phase

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

Roadway		Points									
Name	Width	Name	No.	Coordinates (pavement)			Flow Control			Segment	
				X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Haul Route	12.0	point1	1	0.0	0.0	0.00	Signal	0.00	100	Average	
		point2	2	1,000.0	0.0	0.00					

16911 Normandie Associates, LLC **20 May 2022**
Sean Bui **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **16911 Normandie**
RUN: **Construction Trucks - Demo Phase**

Roadway	Points											
Name	Name	No.	Segment									
			User 1		User 2		User 3		User 4		<unknown>	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Haul Route	point1	1										
	point2	2										

16911 Normandie Associates, LLC
Sean Bui

20 May 2022
TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 16911 Normandie
RUN: Construction Trucks - Demo Phase

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
At 50 feet from Roadway CL	1	1	500.0	50.0	0.00	4.92	0.00	71	5.0	0.0	Y

16911 Normandie Associates, LLC
Sean Bui

20 May 2022
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 16911 Normandie
RUN: Construction Trucks - Demo Phase
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
At 50 feet from Roadway CL	1	1	0.0	54.7	71	54.7	5	----	54.7	0.0	0	0.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	1	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	1	0.0	0.0	0.0

Project: 16911 Normandie

Construction Vibration Impacts

Reference Levels at 25 feet are based on FTA, 2006 (Transit Noise and Vibration Impact Assessment)
Calculations using FTA procedure with n= **1.5** (for receptors 25 feet or greater)
n= **1.1** (for receptors less than 25 feet, per Caltrans procedure)

ON-SITE CONSTRUCTION ACTIVITIES

Table 1: Construction Equipment Vibration Levels (PPV) - Building Damage

Equipment	Reference Vibration Levels at 25 ft., PPV	Estimated Vibration Levels at nearest off-site building structures, distance in feet, PPV									
		Residential Building to the North		Residential Buildings to the South		Residential Buildings to the East		Residential Buildings to the West		Residential Building Adjacent to the Project Site	
		Distance	Level	Distance	Level	Distance	Level	Distance	Level	Distance	Level
Large Bulldozer	0.089	70	0.019	60	0.024	110	0.010	25	0.089	15	0.156
Loaded Trucks	0.076	70	0.016	60	0.020	110	0.008	25	0.076	15	0.133
Jackhammer	0.035	70	0.008	60	0.0094	110	0.004	25	0.035	15	0.061
Small bulldozer	0.003	70	0.001	60	0.001	110	0.0003	25	0.003	15	0.005

Table 2a: Construction Equipment Vibration Levels (VdB) - Human Annoyance

Equipment	Reference Vibration Levels at 25 ft., VdB	Estimated Vibration Levels at Off-Site Receptors (at note distance in feet), VdB									
		R1		R2		R3		R4		R5	
		Distance	Level	Distance	Level	Distance	Level	Distance	Level	Distance	Level
Large Bulldozer	87	25	87.0	50	78.0	110	67.7	70	73.6	45	79.3
Loaded Trucks	86	25	86.0	50	77.0	110	66.7	70	72.6	45	78.3
Jackhammer	79	25	79.0	50	70.0	110	59.7	70	65.6	45	71.3
Small bulldozer	58	25	58.0	50	49.0	110	38.7	70	44.6	45	50.3

Table 2b: Construction Equipment Vibration Levels (VdB) - Human Annoyance

Equipment	Reference Vibration Levels at 25 ft., VdB	Estimated Vibration Levels at Off-Site Receptors (at note distance in feet), VdB									
		R6		R7							
		Distance	Level	Distance	Level	Distance	Level	Distance	Level	Distance	Level
Large Bulldozer	87	65	74.6	55	76.7						
Loaded Trucks	86	65	73.6	55	75.7						
Jackhammer	79	65	66.6	55	68.7						
Small bulldozer	58	65	45.6	55	47.7						

Appendix C
Operation Noise Calculations

AES
Acoustical Engineering Services

Project Composite Noise Calculations (Leq)

Project: 16911 Normandie (Podium)

Receptor	Ambient	Mechanical	Parking	Outdoor	Project Composite
R1	49.0	34.1	23.7	46.6	46.9
R2	53.8	29.7	22.8	37.7	38.5
R3	67.3	31.7	40.0	49.1	49.7
R4	56.4	28.0	43.9	37.0	44.8
R5	53.0	28.2	30.2	29.6	34.2
R6	48.7	29.3	28.8	40.1	40.7
R7	56.4	26.2	49.2	45.0	50.6

AES
Acoustical Engineering Services

Outdoor Mechanical Equipment Noise Calculations

Project: 16911 Normandie (Podium)

	Estimated Noise Levels, Leq from SOUNDPLAN		Hours of Operations Ld (7am to 7pm)	Le (7pm to 10pm)	Ln (10pm to 7am)
Receptor	Leq	CNEL	12	3	9
R1	34.1	44.9	34.1	34.1	38.9
R2	29.7	35.0	29.7	23.7	28.5
R3	31.7	37.0	31.7	25.7	30.5
R4	28.0	33.3	28.0	22.0	26.8
R5	28.2	33.5	28.2	22.2	27.0
R6	29.3	34.6	29.3	23.3	28.1
R7	26.2	31.5	26.2	20.2	25.0

AES
Acoustical Engineering Services

Parking Structure Noise Calculations

Project: 16911 Normandie (Podium)

	Estimated Noise Levels, Leq from SOUNDPLAN		Hours of Operations Ld (7am to 7pm)	Le (7pm to 10pm)	Ln (10pm to 7am)
Receptor	Leq	CNEL	12	3	9
R1	23.7	30.4	23.7	23.7	23.7
R2	22.8	29.5	22.8	22.8	22.8
R3	40.0	46.7	40.0	40.0	40.0
R4	43.9	50.6	43.9	43.9	43.9
R5	30.2	36.9	30.2	30.2	30.2
R6	28.8	35.5	28.8	28.8	28.8
R7	49.2	55.9	49.2	49.2	49.2

AES
Acoustical Engineering Services

Outdoor Noise Calculations

Project: 16911 Normandie (Podium)

	Estimated Noise Levels, Leq from SOUNDPLAN		Hours of Operations Ld (7am to 7pm)	Le (7pm to 10pm)	Ln (10pm to 7am)
Receptor	Leq	CNEL	12	3	4
R1	46.6	50.7	46.6	46.6	43.1
R2	37.7	41.8	37.7	37.7	34.2
R3	49.1	53.2	49.1	49.1	45.6
R4	37.0	41.1	37.0	37.0	33.5
R5	29.6	33.7	29.6	29.6	26.1
R6	40.1	44.2	40.1	40.1	36.6
R7	45.0	49.1	45.0	45.0	41.5

AES
ACOUSTICAL ENGINEERING SERVICES

Off-Site Traffic Noise Calculations

Project: 16911 Normandie Project (Podium)

Traffic Distribution as % of ADT				
Vehicle Type	**Day**	**Eve**	**Night**	**Sub total**
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

PHV to ADT factor 10%

EXISTING CONDITIONS

Roadway Segment	Roadway Width*, ft	Distance to Edge of Roadway, ft	Distance to Centerline, feet	Speed mph	Traffic Volume PHV	Traffic Volume ADT	PHV to ADT factor	Barrier Atten.	Site Adjust., dBA	24-Hour CNEL
Normandie Avenue										
- Between 166th St. and 169th St.	60	10	40	35	2,117	21,170	10%	0	0	68.6
169th Street										
- West of Normandie Ave.	30	10	25	25	130	1,343	10%	0	0	55.5
170th Street										
- West of Normandie Ave.	30	10	25	25	22	217	10%	0	0	47.6

* Estimated based on Google Earth map.

** Calculated using FHWA's TNM Version 2.5 Computer Noise Model.

Date Printed: 8/26/2022

AES
ACOUSTICAL ENGINEERING SERVICES

Off-Site Traffic Noise Calculations

Project: 16911 Normandie Project (Podium)

Traffic Distribution as % of ADT				
Vehicle Type	**Day**	**Eve**	**Night**	**Sub total**
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

PHV to ADT factor 10%

EXISTING + PROJECT CONDITIONS

Roadway Segment	Roadway Width*, ft	Distance to Edge of Roadway, ft	Distance to Centerline, feet	Speed mph	Traffic Volume PHV	Traffic Volume ADT	PHV to ADT factor	Barrier Atten.	Site Adjust., dBA	24-Hour CNEL
Normandie Avenue										
- Between 166th St. and 169th St.	60	10	40	35	2,190	21,900	10%	0	0	68.8
169th Street										
- West of Normandie Ave.	30	10	25	25	187	1,425	10%	0	0	55.8
170th Street										
- West of Normandie Ave.	30	10	25	25	33	328	10%	0	0	49.4

* Estimated based on Google Earth map.

** Calculated using FHWA's TNM Version 2.5 Computer Noise Model.

Date Printed: 8/26/2022

AES
ACOUSTICAL ENGINEERING SERVICES

Off-Site Traffic Noise Calculations
Project: 16911 Normandie Project (Podium)

Traffic Distribution as % of ADT				
Vehicle Type	**Day**	**Eve**	**Night**	**Sub total**
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

PHV to ADT factor 10%

FUTURE NO PROJECT CONDITIONS

Roadway Segment	Roadway Width*, ft	Distance to Edge of Roadway, ft	Distance to Centerline, feet	Speed mph	Traffic Volume PHV	Traffic Volume ADT	PHV to ADT factor	Barrier Atten.	Site Adjust., dBA	Peak Hour, Leq**	24-Hour CNEL
Normandie Avenue											
- Between 166th St. and 169th St.	60	10	40	35	2,230	22,300	10%	0	0	69.4	68.8
169th Street											
- West of Normandie Ave.	30	10	25	25	136	1,398	10%	0	0	56.1	55.7
170th Street											
- West of Normandie Ave.	30	10	25	25	23	226	10%	0	0	48.3	47.8

* Estimated based on Google Earth map.

** Calculated using FHWA's TNM Version 2.5 Computer Noise Model.

Date Printed: 8/26/2022

AES
ACOUSTICAL ENGINEERING SERVICES

Off-Site Traffic Noise Calculations
Project: 16911 Normandie Project (Podium)

Traffic Distribution as % of ADT				
Vehicle Type	**Day**	**Eve**	**Night**	**Sub total**
Auto	77.6%	9.7%	9.7%	97.0%
Medium Truck	1.6%	0.2%	0.2%	2.0%
Heavy Truck	0.8%	0.1%	0.1%	1.0%
	80.0%	10.0%	10.0%	100.0%

PHV to ADT factor 10%

FUTURE + PROJECT CONDITIONS

Roadway Segment	Roadway Width*, ft	Distance to Edge of Roadway, ft	Distance to Centerline, feet	Speed mph	Traffic Volume PHV	Traffic Volume ADT	PHV to ADT factor	Barrier Atten.	Site Adjust., dBA	Peak Hour, Leq**	24-Hour CNEL
Normandie Avenue											
- Between 166th St. and 169th St.	60	10	40	35	2,247	22,470	10%	0	0	69.4	68.9
169th Street											
- West of Normandie Ave.	30	10	25	25	191	1,480	10%	0	0	57.6	56.0
170th Street											
- West of Normandie Ave.	30	10	25	25	34	337	10%	0	0	50.1	49.5

* Estimated based on Google Earth map.

** Calculated using FHWA's TNM Version 2.5 Computer Noise Model.

Date Printed: 8/26/2022

16911 Normandie
Source Levels in dB(A) - Mechanical (Podium)

Name	Source type	Lw dB(A)	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	

16911 Normandie
Source Levels in dB(A) - Mechanical (Podium)

Name	Source type	Lw dB(A)	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	

16911 Normandie
Source Levels in dB(A) - Mechanical (Podium)

Name	Source type	Lw dB(A)	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	

16911 Normandie
Source Levels in dB(A) - Mechanical (Podium)

3

Name	Source type	Lw dB(A)	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	

16911 Normandie
Source Levels in dB(A) - Mechanical (Podium)

Name	Source type	Lw dB(A)	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Mechanical HVAC	Point	70.0	
Transformer 1	Point	75.0	
Transformer 2	Point	75.0	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Receiver R1 Leq,d 34.1 dB(A)			
Mechanical HVAC	Point	2.0	
Mechanical HVAC	Point	-1.5	
Mechanical HVAC	Point	-3.3	
Mechanical HVAC	Point	-3.6	
Mechanical HVAC	Point	2.1	
Mechanical HVAC	Point	-1.4	
Mechanical HVAC	Point	-3.2	
Mechanical HVAC	Point	-3.5	
Mechanical HVAC	Point	-3.3	
Mechanical HVAC	Point	-3.3	
Mechanical HVAC	Point	-3.3	
Mechanical HVAC	Point	-3.4	
Mechanical HVAC	Point	-3.4	
Mechanical HVAC	Point	-3.4	
Mechanical HVAC	Point	-3.4	
Mechanical HVAC	Point	-3.6	
Mechanical HVAC	Point	-1.3	
Mechanical HVAC	Point	-6.7	
Mechanical HVAC	Point	5.9	
Mechanical HVAC	Point	7.8	
Mechanical HVAC	Point	7.8	
Mechanical HVAC	Point	7.8	
Mechanical HVAC	Point	6.0	
Mechanical HVAC	Point	8.6	
Mechanical HVAC	Point	8.6	
Mechanical HVAC	Point	8.6	
Mechanical HVAC	Point	3.4	
Mechanical HVAC	Point	3.3	
Mechanical HVAC	Point	2.7	
Mechanical HVAC	Point	1.5	
Mechanical HVAC	Point	3.8	
Mechanical HVAC	Point	3.5	
Mechanical HVAC	Point	0.1	
Mechanical HVAC	Point	1.8	
Mechanical HVAC	Point	1.1	
Mechanical HVAC	Point	1.4	
Mechanical HVAC	Point	0.8	
Mechanical HVAC	Point	2.0	
Mechanical HVAC	Point	1.6	
Mechanical HVAC	Point	0.3	
Mechanical HVAC	Point	1.9	
Mechanical HVAC	Point	1.7	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	1.5	
Mechanical HVAC	Point	1.0	
Mechanical HVAC	Point	-0.2	
Mechanical HVAC	Point	0.1	
Mechanical HVAC	Point	2.6	
Mechanical HVAC	Point	1.7	
Mechanical HVAC	Point	0.8	
Mechanical HVAC	Point	0.5	
Mechanical HVAC	Point	2.3	
Mechanical HVAC	Point	1.7	
Mechanical HVAC	Point	0.8	
Mechanical HVAC	Point	0.3	
Mechanical HVAC	Point	0.1	
Mechanical HVAC	Point	0.0	
Mechanical HVAC	Point	4.2	
Mechanical HVAC	Point	3.0	
Mechanical HVAC	Point	2.6	
Mechanical HVAC	Point	4.2	
Mechanical HVAC	Point	2.8	
Mechanical HVAC	Point	2.3	
Mechanical HVAC	Point	-1.8	
Mechanical HVAC	Point	-2.4	
Mechanical HVAC	Point	-2.7	
Mechanical HVAC	Point	-2.9	
Mechanical HVAC	Point	-3.1	
Mechanical HVAC	Point	-1.1	
Mechanical HVAC	Point	-1.5	
Mechanical HVAC	Point	-1.8	
Mechanical HVAC	Point	-0.7	
Mechanical HVAC	Point	0.1	
Mechanical HVAC	Point	-0.3	
Mechanical HVAC	Point	-0.7	
Mechanical HVAC	Point	3.0	
Mechanical HVAC	Point	2.4	
Mechanical HVAC	Point	1.9	
Mechanical HVAC	Point	1.4	
Mechanical HVAC	Point	0.7	
Mechanical HVAC	Point	4.5	
Mechanical HVAC	Point	3.7	
Mechanical HVAC	Point	3.0	
Mechanical HVAC	Point	5.5	
Mechanical HVAC	Point	8.0	
Mechanical HVAC	Point	6.6	
Mechanical HVAC	Point	5.5	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	-1.9	
Mechanical HVAC	Point	-2.1	
Mechanical HVAC	Point	-1.0	
Mechanical HVAC	Point	-0.8	
Mechanical HVAC	Point	-0.9	
Mechanical HVAC	Point	-3.0	
Mechanical HVAC	Point	-2.3	
Mechanical HVAC	Point	-2.5	
Mechanical HVAC	Point	-2.8	
Mechanical HVAC	Point	-1.8	
Mechanical HVAC	Point	-2.6	
Mechanical HVAC	Point	-0.6	
Mechanical HVAC	Point	-1.2	
Mechanical HVAC	Point	-1.7	
Mechanical HVAC	Point	-2.5	
Mechanical HVAC	Point	-2.6	
Mechanical HVAC	Point	-2.3	
Mechanical HVAC	Point	-1.4	
Mechanical HVAC	Point	-1.1	
Mechanical HVAC	Point	-0.8	
Mechanical HVAC	Point	-0.4	
Mechanical HVAC	Point	-0.1	
Mechanical HVAC	Point	0.8	
Mechanical HVAC	Point	0.0	
Mechanical HVAC	Point	0.4	
Mechanical HVAC	Point	0.5	
Mechanical HVAC	Point	1.8	
Mechanical HVAC	Point	1.2	
Mechanical HVAC	Point	3.3	
Mechanical HVAC	Point	4.6	
Mechanical HVAC	Point	5.2	
Mechanical HVAC	Point	5.9	
Mechanical HVAC	Point	4.3	
Mechanical HVAC	Point	5.4	
Mechanical HVAC	Point	12.2	
Mechanical HVAC	Point	13.6	
Mechanical HVAC	Point	14.8	
Mechanical HVAC	Point	16.1	
Mechanical HVAC	Point	19.0	
Mechanical HVAC	Point	22.9	
Mechanical HVAC	Point	3.3	
Mechanical HVAC	Point	4.4	
Mechanical HVAC	Point	4.4	
Mechanical HVAC	Point	3.1	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	3.5	
Mechanical HVAC	Point	3.7	
Mechanical HVAC	Point	4.3	
Mechanical HVAC	Point	12.0	
Mechanical HVAC	Point	20.8	
Mechanical HVAC	Point	17.4	
Mechanical HVAC	Point	15.7	
Mechanical HVAC	Point	14.2	
Mechanical HVAC	Point	12.8	
Mechanical HVAC	Point	10.4	
Mechanical HVAC	Point	9.2	
Mechanical HVAC	Point	8.4	
Mechanical HVAC	Point	11.0	
Mechanical HVAC	Point	8.4	
Mechanical HVAC	Point	27.4	
Mechanical HVAC	Point	27.2	
Mechanical HVAC	Point	18.2	
Mechanical HVAC	Point	16.7	
Mechanical HVAC	Point	15.4	
Mechanical HVAC	Point	16.7	
Mechanical HVAC	Point	16.1	
Mechanical HVAC	Point	12.8	
Mechanical HVAC	Point	11.6	
Mechanical HVAC	Point	10.8	
Mechanical HVAC	Point	8.0	
Mechanical HVAC	Point	18.3	
Mechanical HVAC	Point	14.7	
Mechanical HVAC	Point	14.1	
Mechanical HVAC	Point	9.1	
Mechanical HVAC	Point	11.7	
Mechanical HVAC	Point	8.5	
Mechanical HVAC	Point	9.0	
Mechanical HVAC	Point	7.8	
Mechanical HVAC	Point	7.1	
Mechanical HVAC	Point	13.0	
Mechanical HVAC	Point	7.1	
Mechanical HVAC	Point	4.8	
Mechanical HVAC	Point	6.6	
Mechanical HVAC	Point	14.2	
Mechanical HVAC	Point	9.8	
Mechanical HVAC	Point	2.6	
Mechanical HVAC	Point	3.0	
Mechanical HVAC	Point	12.1	
Mechanical HVAC	Point	7.0	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	3.0	
Mechanical HVAC	Point	3.3	
Transformer 1	Point	-1.1	
Transformer 2	Point	-0.9	
Receiver R2 Leq,d 29.7 dB(A)			
Mechanical HVAC	Point	-8.3	
Mechanical HVAC	Point	-8.4	
Mechanical HVAC	Point	-8.5	
Mechanical HVAC	Point	-8.5	
Mechanical HVAC	Point	-8.2	
Mechanical HVAC	Point	-8.3	
Mechanical HVAC	Point	-8.4	
Mechanical HVAC	Point	-8.4	
Mechanical HVAC	Point	-8.6	
Mechanical HVAC	Point	-8.6	
Mechanical HVAC	Point	-8.6	
Mechanical HVAC	Point	-8.6	
Mechanical HVAC	Point	-8.6	
Mechanical HVAC	Point	-8.6	
Mechanical HVAC	Point	-7.2	
Mechanical HVAC	Point	-8.7	
Mechanical HVAC	Point	-8.7	
Mechanical HVAC	Point	-8.7	
Mechanical HVAC	Point	-3.4	
Mechanical HVAC	Point	-3.2	
Mechanical HVAC	Point	-3.2	
Mechanical HVAC	Point	-3.2	
Mechanical HVAC	Point	-3.2	
Mechanical HVAC	Point	-3.0	
Mechanical HVAC	Point	-3.1	
Mechanical HVAC	Point	-3.0	
Mechanical HVAC	Point	-4.8	
Mechanical HVAC	Point	-4.6	
Mechanical HVAC	Point	-4.3	
Mechanical HVAC	Point	-4.3	
Mechanical HVAC	Point	-4.6	
Mechanical HVAC	Point	-4.6	
Mechanical HVAC	Point	-4.6	
Mechanical HVAC	Point	-3.0	
Mechanical HVAC	Point	-0.1	
Mechanical HVAC	Point	-0.6	
Mechanical HVAC	Point	-4.1	
Mechanical HVAC	Point	-4.6	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	-4.5	
Mechanical HVAC	Point	-3.0	
Mechanical HVAC	Point	-1.3	
Mechanical HVAC	Point	-4.7	
Mechanical HVAC	Point	-4.4	
Mechanical HVAC	Point	-2.1	
Mechanical HVAC	Point	-0.5	
Mechanical HVAC	Point	-0.5	
Mechanical HVAC	Point	4.3	
Mechanical HVAC	Point	3.4	
Mechanical HVAC	Point	3.1	
Mechanical HVAC	Point	3.0	
Mechanical HVAC	Point	4.0	
Mechanical HVAC	Point	3.4	
Mechanical HVAC	Point	2.9	
Mechanical HVAC	Point	2.7	
Mechanical HVAC	Point	2.9	
Mechanical HVAC	Point	2.6	
Mechanical HVAC	Point	5.0	
Mechanical HVAC	Point	4.4	
Mechanical HVAC	Point	4.3	
Mechanical HVAC	Point	5.0	
Mechanical HVAC	Point	4.1	
Mechanical HVAC	Point	4.0	
Mechanical HVAC	Point	-7.5	
Mechanical HVAC	Point	-7.7	
Mechanical HVAC	Point	-7.9	
Mechanical HVAC	Point	-8.1	
Mechanical HVAC	Point	-8.3	
Mechanical HVAC	Point	-6.8	
Mechanical HVAC	Point	-7.2	
Mechanical HVAC	Point	-7.5	
Mechanical HVAC	Point	-6.6	
Mechanical HVAC	Point	-6.1	
Mechanical HVAC	Point	-6.3	
Mechanical HVAC	Point	-6.6	
Mechanical HVAC	Point	-4.0	
Mechanical HVAC	Point	-5.1	
Mechanical HVAC	Point	-5.4	
Mechanical HVAC	Point	-5.6	
Mechanical HVAC	Point	-6.0	
Mechanical HVAC	Point	-3.3	
Mechanical HVAC	Point	-3.7	
Mechanical HVAC	Point	-4.0	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	-3.0	
Mechanical HVAC	Point	-3.1	
Mechanical HVAC	Point	-3.5	
Mechanical HVAC	Point	-3.8	
Mechanical HVAC	Point	-4.8	
Mechanical HVAC	Point	-2.7	
Mechanical HVAC	Point	-2.2	
Mechanical HVAC	Point	-3.6	
Mechanical HVAC	Point	-4.4	
Mechanical HVAC	Point	-3.5	
Mechanical HVAC	Point	-2.1	
Mechanical HVAC	Point	-5.0	
Mechanical HVAC	Point	-3.2	
Mechanical HVAC	Point	-1.5	
Mechanical HVAC	Point	-2.1	
Mechanical HVAC	Point	-4.5	
Mechanical HVAC	Point	-4.5	
Mechanical HVAC	Point	-2.7	
Mechanical HVAC	Point	-10.5	
Mechanical HVAC	Point	-11.1	
Mechanical HVAC	Point	-10.8	
Mechanical HVAC	Point	-10.5	
Mechanical HVAC	Point	-10.3	
Mechanical HVAC	Point	-8.0	
Mechanical HVAC	Point	-7.6	
Mechanical HVAC	Point	-7.2	
Mechanical HVAC	Point	-6.8	
Mechanical HVAC	Point	-6.4	
Mechanical HVAC	Point	-6.0	
Mechanical HVAC	Point	-5.5	
Mechanical HVAC	Point	-5.1	
Mechanical HVAC	Point	-4.6	
Mechanical HVAC	Point	-3.9	
Mechanical HVAC	Point	-3.3	
Mechanical HVAC	Point	-2.7	
Mechanical HVAC	Point	-2.0	
Mechanical HVAC	Point	10.1	
Mechanical HVAC	Point	10.6	
Mechanical HVAC	Point	11.1	
Mechanical HVAC	Point	1.3	
Mechanical HVAC	Point	15.1	
Mechanical HVAC	Point	15.7	
Mechanical HVAC	Point	16.3	
Mechanical HVAC	Point	17.0	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	-0.6	
Mechanical HVAC	Point	-0.3	
Mechanical HVAC	Point	-0.7	
Mechanical HVAC	Point	0.1	
Mechanical HVAC	Point	0.8	
Mechanical HVAC	Point	1.8	
Mechanical HVAC	Point	3.2	
Mechanical HVAC	Point	4.4	
Mechanical HVAC	Point	17.2	
Mechanical HVAC	Point	17.1	
Mechanical HVAC	Point	17.6	
Mechanical HVAC	Point	16.8	
Mechanical HVAC	Point	16.1	
Mechanical HVAC	Point	14.9	
Mechanical HVAC	Point	14.1	
Mechanical HVAC	Point	13.4	
Mechanical HVAC	Point	12.7	
Mechanical HVAC	Point	12.2	
Mechanical HVAC	Point	17.3	
Mechanical HVAC	Point	19.0	
Mechanical HVAC	Point	7.6	
Mechanical HVAC	Point	7.1	
Mechanical HVAC	Point	6.6	
Mechanical HVAC	Point	6.2	
Mechanical HVAC	Point	13.6	
Mechanical HVAC	Point	12.0	
Mechanical HVAC	Point	3.3	
Mechanical HVAC	Point	2.7	
Mechanical HVAC	Point	2.5	
Mechanical HVAC	Point	13.3	
Mechanical HVAC	Point	3.4	
Mechanical HVAC	Point	3.5	
Mechanical HVAC	Point	3.1	
Mechanical HVAC	Point	1.4	
Mechanical HVAC	Point	8.4	
Mechanical HVAC	Point	6.8	
Mechanical HVAC	Point	6.5	
Mechanical HVAC	Point	0.3	
Mechanical HVAC	Point	11.5	
Mechanical HVAC	Point	7.2	
Mechanical HVAC	Point	5.9	
Mechanical HVAC	Point	5.6	
Mechanical HVAC	Point	6.9	
Mechanical HVAC	Point	4.4	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	3.3	
Mechanical HVAC	Point	2.3	
Mechanical HVAC	Point	5.0	
Mechanical HVAC	Point	7.2	
Mechanical HVAC	Point	4.4	
Mechanical HVAC	Point	2.9	
Transformer 1	Point	-1.7	
Transformer 2	Point	0.3	
Receiver R3 Leq,d 31.7 dB(A)			
Mechanical HVAC	Point	-1.2	
Mechanical HVAC	Point	-1.3	
Mechanical HVAC	Point	-1.1	
Mechanical HVAC	Point	-0.8	
Mechanical HVAC	Point	-1.2	
Mechanical HVAC	Point	-1.3	
Mechanical HVAC	Point	-1.1	
Mechanical HVAC	Point	-0.8	
Mechanical HVAC	Point	-0.2	
Mechanical HVAC	Point	0.1	
Mechanical HVAC	Point	0.5	
Mechanical HVAC	Point	0.9	
Mechanical HVAC	Point	1.3	
Mechanical HVAC	Point	1.8	
Mechanical HVAC	Point	2.2	
Mechanical HVAC	Point	2.8	
Mechanical HVAC	Point	-0.1	
Mechanical HVAC	Point	0.8	
Mechanical HVAC	Point	-4.8	
Mechanical HVAC	Point	-5.3	
Mechanical HVAC	Point	-5.1	
Mechanical HVAC	Point	-3.4	
Mechanical HVAC	Point	-4.8	
Mechanical HVAC	Point	-5.2	
Mechanical HVAC	Point	-4.4	
Mechanical HVAC	Point	-3.9	
Mechanical HVAC	Point	0.7	
Mechanical HVAC	Point	1.1	
Mechanical HVAC	Point	1.5	
Mechanical HVAC	Point	1.9	
Mechanical HVAC	Point	0.8	
Mechanical HVAC	Point	1.1	
Mechanical HVAC	Point	1.5	
Mechanical HVAC	Point	1.9	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	2.5	
Mechanical HVAC	Point	2.4	
Mechanical HVAC	Point	3.0	
Mechanical HVAC	Point	3.5	
Mechanical HVAC	Point	4.1	
Mechanical HVAC	Point	4.8	
Mechanical HVAC	Point	3.0	
Mechanical HVAC	Point	3.6	
Mechanical HVAC	Point	4.1	
Mechanical HVAC	Point	4.8	
Mechanical HVAC	Point	5.5	
Mechanical HVAC	Point	5.5	
Mechanical HVAC	Point	9.1	
Mechanical HVAC	Point	8.9	
Mechanical HVAC	Point	8.9	
Mechanical HVAC	Point	8.8	
Mechanical HVAC	Point	9.5	
Mechanical HVAC	Point	9.4	
Mechanical HVAC	Point	9.3	
Mechanical HVAC	Point	9.3	
Mechanical HVAC	Point	8.8	
Mechanical HVAC	Point	9.2	
Mechanical HVAC	Point	9.5	
Mechanical HVAC	Point	9.0	
Mechanical HVAC	Point	9.0	
Mechanical HVAC	Point	9.9	
Mechanical HVAC	Point	9.5	
Mechanical HVAC	Point	9.5	
Mechanical HVAC	Point	-0.6	
Mechanical HVAC	Point	-0.7	
Mechanical HVAC	Point	-0.8	
Mechanical HVAC	Point	-0.8	
Mechanical HVAC	Point	-0.9	
Mechanical HVAC	Point	-1.9	
Mechanical HVAC	Point	-0.5	
Mechanical HVAC	Point	-0.5	
Mechanical HVAC	Point	-3.5	
Mechanical HVAC	Point	-0.4	
Mechanical HVAC	Point	-1.0	
Mechanical HVAC	Point	-3.5	
Mechanical HVAC	Point	-0.5	
Mechanical HVAC	Point	-0.6	
Mechanical HVAC	Point	-0.7	
Mechanical HVAC	Point	0.0	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	-0.8	
Mechanical HVAC	Point	-4.6	
Mechanical HVAC	Point	-0.5	
Mechanical HVAC	Point	-0.6	
Mechanical HVAC	Point	-4.8	
Mechanical HVAC	Point	-4.2	
Mechanical HVAC	Point	-4.8	
Mechanical HVAC	Point	-4.8	
Mechanical HVAC	Point	6.8	
Mechanical HVAC	Point	6.7	
Mechanical HVAC	Point	6.7	
Mechanical HVAC	Point	2.7	
Mechanical HVAC	Point	2.5	
Mechanical HVAC	Point	7.1	
Mechanical HVAC	Point	6.9	
Mechanical HVAC	Point	6.8	
Mechanical HVAC	Point	7.2	
Mechanical HVAC	Point	7.4	
Mechanical HVAC	Point	7.2	
Mechanical HVAC	Point	6.3	
Mechanical HVAC	Point	4.0	
Mechanical HVAC	Point	7.7	
Mechanical HVAC	Point	-10.0	
Mechanical HVAC	Point	-9.8	
Mechanical HVAC	Point	-9.6	
Mechanical HVAC	Point	-9.5	
Mechanical HVAC	Point	-9.3	
Mechanical HVAC	Point	-9.2	
Mechanical HVAC	Point	-9.0	
Mechanical HVAC	Point	-8.9	
Mechanical HVAC	Point	-8.7	
Mechanical HVAC	Point	-8.6	
Mechanical HVAC	Point	-8.6	
Mechanical HVAC	Point	-8.5	
Mechanical HVAC	Point	-8.4	
Mechanical HVAC	Point	-8.4	
Mechanical HVAC	Point	-7.5	
Mechanical HVAC	Point	-7.2	
Mechanical HVAC	Point	-7.5	
Mechanical HVAC	Point	-0.1	
Mechanical HVAC	Point	0.0	
Mechanical HVAC	Point	2.4	
Mechanical HVAC	Point	2.6	
Mechanical HVAC	Point	3.2	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	-0.3	
Mechanical HVAC	Point	-1.0	
Mechanical HVAC	Point	-2.1	
Mechanical HVAC	Point	-2.5	
Mechanical HVAC	Point	15.9	
Mechanical HVAC	Point	15.1	
Mechanical HVAC	Point	13.7	
Mechanical HVAC	Point	13.3	
Mechanical HVAC	Point	12.7	
Mechanical HVAC	Point	12.3	
Mechanical HVAC	Point	11.9	
Mechanical HVAC	Point	11.7	
Mechanical HVAC	Point	-0.1	
Mechanical HVAC	Point	0.5	
Mechanical HVAC	Point	1.2	
Mechanical HVAC	Point	1.9	
Mechanical HVAC	Point	2.7	
Mechanical HVAC	Point	3.7	
Mechanical HVAC	Point	4.9	
Mechanical HVAC	Point	6.3	
Mechanical HVAC	Point	8.4	
Mechanical HVAC	Point	12.6	
Mechanical HVAC	Point	0.4	
Mechanical HVAC	Point	0.5	
Mechanical HVAC	Point	2.0	
Mechanical HVAC	Point	2.7	
Mechanical HVAC	Point	3.8	
Mechanical HVAC	Point	4.6	
Mechanical HVAC	Point	1.3	
Mechanical HVAC	Point	1.8	
Mechanical HVAC	Point	1.9	
Mechanical HVAC	Point	3.5	
Mechanical HVAC	Point	5.2	
Mechanical HVAC	Point	0.5	
Mechanical HVAC	Point	1.4	
Mechanical HVAC	Point	2.8	
Mechanical HVAC	Point	4.3	
Mechanical HVAC	Point	7.5	
Mechanical HVAC	Point	9.9	
Mechanical HVAC	Point	6.9	
Mechanical HVAC	Point	7.8	
Mechanical HVAC	Point	8.5	
Mechanical HVAC	Point	6.5	
Mechanical HVAC	Point	8.2	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	14.0	
Mechanical HVAC	Point	9.0	
Mechanical HVAC	Point	-5.8	
Mechanical HVAC	Point	-4.9	
Mechanical HVAC	Point	-3.4	
Mechanical HVAC	Point	2.0	
Mechanical HVAC	Point	-3.9	
Mechanical HVAC	Point	-2.0	
Mechanical HVAC	Point	12.5	
Mechanical HVAC	Point	14.5	
Transformer 1	Point	28.6	
Transformer 2	Point	19.0	
Receiver R4 Leq,d 28.0 dB(A)			
Mechanical HVAC	Point	14.4	
Mechanical HVAC	Point	10.9	
Mechanical HVAC	Point	9.0	
Mechanical HVAC	Point	8.0	
Mechanical HVAC	Point	14.2	
Mechanical HVAC	Point	10.7	
Mechanical HVAC	Point	8.8	
Mechanical HVAC	Point	7.6	
Mechanical HVAC	Point	7.0	
Mechanical HVAC	Point	6.7	
Mechanical HVAC	Point	6.4	
Mechanical HVAC	Point	6.1	
Mechanical HVAC	Point	5.8	
Mechanical HVAC	Point	5.6	
Mechanical HVAC	Point	5.3	
Mechanical HVAC	Point	5.1	
Mechanical HVAC	Point	5.0	
Mechanical HVAC	Point	5.6	
Mechanical HVAC	Point	1.7	
Mechanical HVAC	Point	0.3	
Mechanical HVAC	Point	-0.4	
Mechanical HVAC	Point	-1.3	
Mechanical HVAC	Point	1.0	
Mechanical HVAC	Point	0.1	
Mechanical HVAC	Point	-0.8	
Mechanical HVAC	Point	-1.5	
Mechanical HVAC	Point	1.8	
Mechanical HVAC	Point	1.2	
Mechanical HVAC	Point	0.8	
Mechanical HVAC	Point	0.4	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	1.7	
Mechanical HVAC	Point	1.2	
Mechanical HVAC	Point	0.7	
Mechanical HVAC	Point	0.2	
Mechanical HVAC	Point	0.4	
Mechanical HVAC	Point	-0.1	
Mechanical HVAC	Point	-0.2	
Mechanical HVAC	Point	0.4	
Mechanical HVAC	Point	-0.6	
Mechanical HVAC	Point	-1.2	
Mechanical HVAC	Point	-0.3	
Mechanical HVAC	Point	0.3	
Mechanical HVAC	Point	-0.5	
Mechanical HVAC	Point	-1.3	
Mechanical HVAC	Point	-1.7	
Mechanical HVAC	Point	-1.8	
Mechanical HVAC	Point	-3.4	
Mechanical HVAC	Point	-3.2	
Mechanical HVAC	Point	-3.1	
Mechanical HVAC	Point	-3.0	
Mechanical HVAC	Point	-3.4	
Mechanical HVAC	Point	-3.3	
Mechanical HVAC	Point	-3.2	
Mechanical HVAC	Point	-3.0	
Mechanical HVAC	Point	-2.8	
Mechanical HVAC	Point	-2.9	
Mechanical HVAC	Point	-8.2	
Mechanical HVAC	Point	-8.2	
Mechanical HVAC	Point	-3.4	
Mechanical HVAC	Point	-8.3	
Mechanical HVAC	Point	-3.5	
Mechanical HVAC	Point	-3.4	
Mechanical HVAC	Point	6.9	
Mechanical HVAC	Point	7.1	
Mechanical HVAC	Point	7.4	
Mechanical HVAC	Point	7.7	
Mechanical HVAC	Point	8.0	
Mechanical HVAC	Point	6.2	
Mechanical HVAC	Point	6.6	
Mechanical HVAC	Point	6.9	
Mechanical HVAC	Point	6.0	
Mechanical HVAC	Point	5.5	
Mechanical HVAC	Point	5.7	
Mechanical HVAC	Point	6.0	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	0.3	
Mechanical HVAC	Point	0.5	
Mechanical HVAC	Point	0.7	
Mechanical HVAC	Point	5.1	
Mechanical HVAC	Point	5.3	
Mechanical HVAC	Point	-0.1	
Mechanical HVAC	Point	0.3	
Mechanical HVAC	Point	0.2	
Mechanical HVAC	Point	-0.4	
Mechanical HVAC	Point	-1.0	
Mechanical HVAC	Point	-0.6	
Mechanical HVAC	Point	-0.4	
Mechanical HVAC	Point	0.5	
Mechanical HVAC	Point	0.7	
Mechanical HVAC	Point	0.9	
Mechanical HVAC	Point	3.0	
Mechanical HVAC	Point	3.9	
Mechanical HVAC	Point	-0.4	
Mechanical HVAC	Point	-0.2	
Mechanical HVAC	Point	0.4	
Mechanical HVAC	Point	-1.0	
Mechanical HVAC	Point	-1.3	
Mechanical HVAC	Point	-1.0	
Mechanical HVAC	Point	-1.9	
Mechanical HVAC	Point	-1.8	
Mechanical HVAC	Point	-1.6	
Mechanical HVAC	Point	19.9	
Mechanical HVAC	Point	16.0	
Mechanical HVAC	Point	17.6	
Mechanical HVAC	Point	16.6	
Mechanical HVAC	Point	16.3	
Mechanical HVAC	Point	13.4	
Mechanical HVAC	Point	10.2	
Mechanical HVAC	Point	6.7	
Mechanical HVAC	Point	8.4	
Mechanical HVAC	Point	5.0	
Mechanical HVAC	Point	5.5	
Mechanical HVAC	Point	3.7	
Mechanical HVAC	Point	3.1	
Mechanical HVAC	Point	2.8	
Mechanical HVAC	Point	2.3	
Mechanical HVAC	Point	2.1	
Mechanical HVAC	Point	1.8	
Mechanical HVAC	Point	1.6	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	1.4	
Mechanical HVAC	Point	1.2	
Mechanical HVAC	Point	1.1	
Mechanical HVAC	Point	0.9	
Mechanical HVAC	Point	0.8	
Mechanical HVAC	Point	0.6	
Mechanical HVAC	Point	0.4	
Mechanical HVAC	Point	0.5	
Mechanical HVAC	Point	4.6	
Mechanical HVAC	Point	4.9	
Mechanical HVAC	Point	-7.6	
Mechanical HVAC	Point	-7.9	
Mechanical HVAC	Point	-8.2	
Mechanical HVAC	Point	-11.4	
Mechanical HVAC	Point	-9.0	
Mechanical HVAC	Point	-9.3	
Mechanical HVAC	Point	-8.5	
Mechanical HVAC	Point	-10.8	
Mechanical HVAC	Point	-11.1	
Mechanical HVAC	Point	-11.3	
Mechanical HVAC	Point	-11.5	
Mechanical HVAC	Point	-11.7	
Mechanical HVAC	Point	-10.1	
Mechanical HVAC	Point	-10.0	
Mechanical HVAC	Point	-10.0	
Mechanical HVAC	Point	-10.1	
Mechanical HVAC	Point	-10.2	
Mechanical HVAC	Point	-9.2	
Mechanical HVAC	Point	-10.7	
Mechanical HVAC	Point	-10.9	
Mechanical HVAC	Point	-11.1	
Mechanical HVAC	Point	-9.3	
Mechanical HVAC	Point	-6.6	
Mechanical HVAC	Point	-9.5	
Mechanical HVAC	Point	-10.0	
Mechanical HVAC	Point	-10.4	
Mechanical HVAC	Point	-10.7	
Mechanical HVAC	Point	-6.6	
Mechanical HVAC	Point	-10.0	
Mechanical HVAC	Point	-10.4	
Mechanical HVAC	Point	-8.5	
Mechanical HVAC	Point	-5.7	
Mechanical HVAC	Point	-9.2	
Mechanical HVAC	Point	-9.4	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	-7.2	
Mechanical HVAC	Point	-7.3	
Mechanical HVAC	Point	-8.8	
Mechanical HVAC	Point	-9.1	
Mechanical HVAC	Point	-8.4	
Mechanical HVAC	Point	-6.9	
Mechanical HVAC	Point	-8.4	
Mechanical HVAC	Point	-8.7	
Mechanical HVAC	Point	-9.1	
Mechanical HVAC	Point	-7.0	
Mechanical HVAC	Point	-8.7	
Mechanical HVAC	Point	-9.0	
Mechanical HVAC	Point	-8.0	
Mechanical HVAC	Point	-6.3	
Transformer 1	Point	-7.4	
Transformer 2	Point	-8.4	
Receiver R5 Leq,d 28.2 dB(A)			
Mechanical HVAC	Point	11.6	
Mechanical HVAC	Point	8.0	
Mechanical HVAC	Point	5.9	
Mechanical HVAC	Point	4.5	
Mechanical HVAC	Point	11.6	
Mechanical HVAC	Point	8.0	
Mechanical HVAC	Point	5.9	
Mechanical HVAC	Point	4.4	
Mechanical HVAC	Point	2.3	
Mechanical HVAC	Point	1.5	
Mechanical HVAC	Point	0.8	
Mechanical HVAC	Point	0.1	
Mechanical HVAC	Point	-0.5	
Mechanical HVAC	Point	-1.1	
Mechanical HVAC	Point	-1.5	
Mechanical HVAC	Point	-2.1	
Mechanical HVAC	Point	-2.1	
Mechanical HVAC	Point	-2.9	
Mechanical HVAC	Point	7.9	
Mechanical HVAC	Point	4.7	
Mechanical HVAC	Point	2.7	
Mechanical HVAC	Point	1.4	
Mechanical HVAC	Point	7.8	
Mechanical HVAC	Point	4.5	
Mechanical HVAC	Point	2.6	
Mechanical HVAC	Point	1.3	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	-0.4	
Mechanical HVAC	Point	-0.7	
Mechanical HVAC	Point	-1.7	
Mechanical HVAC	Point	-0.8	
Mechanical HVAC	Point	-0.5	
Mechanical HVAC	Point	-1.2	
Mechanical HVAC	Point	-1.7	
Mechanical HVAC	Point	-1.0	
Mechanical HVAC	Point	-2.6	
Mechanical HVAC	Point	-1.8	
Mechanical HVAC	Point	-0.8	
Mechanical HVAC	Point	-1.7	
Mechanical HVAC	Point	-3.1	
Mechanical HVAC	Point	-4.3	
Mechanical HVAC	Point	-1.5	
Mechanical HVAC	Point	-2.5	
Mechanical HVAC	Point	-3.6	
Mechanical HVAC	Point	-4.4	
Mechanical HVAC	Point	-4.6	
Mechanical HVAC	Point	-4.7	
Mechanical HVAC	Point	-6.7	
Mechanical HVAC	Point	-6.1	
Mechanical HVAC	Point	-6.0	
Mechanical HVAC	Point	-5.9	
Mechanical HVAC	Point	-6.8	
Mechanical HVAC	Point	-6.2	
Mechanical HVAC	Point	-6.1	
Mechanical HVAC	Point	-6.0	
Mechanical HVAC	Point	-5.8	
Mechanical HVAC	Point	-5.9	
Mechanical HVAC	Point	-6.8	
Mechanical HVAC	Point	-6.8	
Mechanical HVAC	Point	-6.7	
Mechanical HVAC	Point	-6.8	
Mechanical HVAC	Point	-6.9	
Mechanical HVAC	Point	-6.8	
Mechanical HVAC	Point	4.7	
Mechanical HVAC	Point	4.8	
Mechanical HVAC	Point	5.0	
Mechanical HVAC	Point	5.1	
Mechanical HVAC	Point	5.3	
Mechanical HVAC	Point	4.4	
Mechanical HVAC	Point	4.5	
Mechanical HVAC	Point	4.7	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	4.2	
Mechanical HVAC	Point	3.8	
Mechanical HVAC	Point	4.0	
Mechanical HVAC	Point	4.3	
Mechanical HVAC	Point	2.7	
Mechanical HVAC	Point	2.9	
Mechanical HVAC	Point	3.5	
Mechanical HVAC	Point	4.4	
Mechanical HVAC	Point	3.5	
Mechanical HVAC	Point	2.5	
Mechanical HVAC	Point	2.8	
Mechanical HVAC	Point	2.8	
Mechanical HVAC	Point	2.3	
Mechanical HVAC	Point	2.0	
Mechanical HVAC	Point	2.2	
Mechanical HVAC	Point	2.3	
Mechanical HVAC	Point	-3.4	
Mechanical HVAC	Point	-2.5	
Mechanical HVAC	Point	-2.4	
Mechanical HVAC	Point	-1.8	
Mechanical HVAC	Point	-1.6	
Mechanical HVAC	Point	-4.2	
Mechanical HVAC	Point	-4.0	
Mechanical HVAC	Point	-3.6	
Mechanical HVAC	Point	-4.4	
Mechanical HVAC	Point	-4.2	
Mechanical HVAC	Point	-4.4	
Mechanical HVAC	Point	-4.9	
Mechanical HVAC	Point	-4.8	
Mechanical HVAC	Point	-4.7	
Mechanical HVAC	Point	17.7	
Mechanical HVAC	Point	17.5	
Mechanical HVAC	Point	17.1	
Mechanical HVAC	Point	16.5	
Mechanical HVAC	Point	15.4	
Mechanical HVAC	Point	14.7	
Mechanical HVAC	Point	13.7	
Mechanical HVAC	Point	13.1	
Mechanical HVAC	Point	12.3	
Mechanical HVAC	Point	11.8	
Mechanical HVAC	Point	11.1	
Mechanical HVAC	Point	10.6	
Mechanical HVAC	Point	10.2	
Mechanical HVAC	Point	9.9	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	9.5	
Mechanical HVAC	Point	9.3	
Mechanical HVAC	Point	9.0	
Mechanical HVAC	Point	8.6	
Mechanical HVAC	Point	8.3	
Mechanical HVAC	Point	7.9	
Mechanical HVAC	Point	7.7	
Mechanical HVAC	Point	7.4	
Mechanical HVAC	Point	7.1	
Mechanical HVAC	Point	6.8	
Mechanical HVAC	Point	6.6	
Mechanical HVAC	Point	6.9	
Mechanical HVAC	Point	-7.1	
Mechanical HVAC	Point	-7.2	
Mechanical HVAC	Point	-7.4	
Mechanical HVAC	Point	-9.9	
Mechanical HVAC	Point	-8.0	
Mechanical HVAC	Point	-8.2	
Mechanical HVAC	Point	-8.5	
Mechanical HVAC	Point	-8.8	
Mechanical HVAC	Point	-4.0	
Mechanical HVAC	Point	-4.7	
Mechanical HVAC	Point	-5.3	
Mechanical HVAC	Point	-9.7	
Mechanical HVAC	Point	-9.9	
Mechanical HVAC	Point	-10.2	
Mechanical HVAC	Point	-10.5	
Mechanical HVAC	Point	-10.8	
Mechanical HVAC	Point	-11.1	
Mechanical HVAC	Point	-11.5	
Mechanical HVAC	Point	-3.3	
Mechanical HVAC	Point	-1.8	
Mechanical HVAC	Point	-9.0	
Mechanical HVAC	Point	-9.3	
Mechanical HVAC	Point	-9.6	
Mechanical HVAC	Point	-9.9	
Mechanical HVAC	Point	-1.3	
Mechanical HVAC	Point	-2.8	
Mechanical HVAC	Point	-8.3	
Mechanical HVAC	Point	-8.9	
Mechanical HVAC	Point	-9.4	
Mechanical HVAC	Point	-1.9	
Mechanical HVAC	Point	-3.3	
Mechanical HVAC	Point	-8.8	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	-9.3	
Mechanical HVAC	Point	0.0	
Mechanical HVAC	Point	-7.4	
Mechanical HVAC	Point	-7.5	
Mechanical HVAC	Point	-8.5	
Mechanical HVAC	Point	-6.6	
Mechanical HVAC	Point	-1.3	
Mechanical HVAC	Point	-6.2	
Mechanical HVAC	Point	-7.5	
Mechanical HVAC	Point	-6.1	
Mechanical HVAC	Point	0.0	
Mechanical HVAC	Point	-6.9	
Mechanical HVAC	Point	-6.3	
Mechanical HVAC	Point	-5.3	
Mechanical HVAC	Point	-6.8	
Mechanical HVAC	Point	-7.2	
Mechanical HVAC	Point	-5.3	
Mechanical HVAC	Point	-5.5	
Transformer 1	Point	0.6	
Transformer 2	Point	-12.4	
Receiver R6 Leq,d 29.3 dB(A)			
Mechanical HVAC	Point	7.7	
Mechanical HVAC	Point	4.4	
Mechanical HVAC	Point	2.5	
Mechanical HVAC	Point	1.2	
Mechanical HVAC	Point	7.8	
Mechanical HVAC	Point	4.5	
Mechanical HVAC	Point	2.6	
Mechanical HVAC	Point	1.3	
Mechanical HVAC	Point	-0.6	
Mechanical HVAC	Point	-1.2	
Mechanical HVAC	Point	-1.8	
Mechanical HVAC	Point	-2.4	
Mechanical HVAC	Point	-2.8	
Mechanical HVAC	Point	-3.3	
Mechanical HVAC	Point	-3.7	
Mechanical HVAC	Point	-4.1	
Mechanical HVAC	Point	-4.1	
Mechanical HVAC	Point	-4.7	
Mechanical HVAC	Point	12.1	
Mechanical HVAC	Point	8.1	
Mechanical HVAC	Point	5.9	
Mechanical HVAC	Point	4.5	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	12.1	
Mechanical HVAC	Point	8.1	
Mechanical HVAC	Point	5.9	
Mechanical HVAC	Point	4.5	
Mechanical HVAC	Point	1.4	
Mechanical HVAC	Point	0.6	
Mechanical HVAC	Point	-0.1	
Mechanical HVAC	Point	-0.7	
Mechanical HVAC	Point	1.4	
Mechanical HVAC	Point	0.7	
Mechanical HVAC	Point	0.0	
Mechanical HVAC	Point	-0.7	
Mechanical HVAC	Point	-1.3	
Mechanical HVAC	Point	-1.2	
Mechanical HVAC	Point	-1.9	
Mechanical HVAC	Point	-2.4	
Mechanical HVAC	Point	-2.9	
Mechanical HVAC	Point	-3.3	
Mechanical HVAC	Point	-1.9	
Mechanical HVAC	Point	-2.4	
Mechanical HVAC	Point	-2.9	
Mechanical HVAC	Point	-3.3	
Mechanical HVAC	Point	-3.7	
Mechanical HVAC	Point	-3.7	
Mechanical HVAC	Point	-5.2	
Mechanical HVAC	Point	-5.2	
Mechanical HVAC	Point	-5.2	
Mechanical HVAC	Point	-5.2	
Mechanical HVAC	Point	-5.3	
Mechanical HVAC	Point	-5.3	
Mechanical HVAC	Point	-5.3	
Mechanical HVAC	Point	-5.3	
Mechanical HVAC	Point	-4.7	
Mechanical HVAC	Point	-4.9	
Mechanical HVAC	Point	-5.3	
Mechanical HVAC	Point	-5.2	
Mechanical HVAC	Point	-5.2	
Mechanical HVAC	Point	-5.4	
Mechanical HVAC	Point	-5.3	
Mechanical HVAC	Point	-5.3	
Mechanical HVAC	Point	2.8	
Mechanical HVAC	Point	2.6	
Mechanical HVAC	Point	2.4	
Mechanical HVAC	Point	2.2	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	2.1	
Mechanical HVAC	Point	3.3	
Mechanical HVAC	Point	3.0	
Mechanical HVAC	Point	2.8	
Mechanical HVAC	Point	3.4	
Mechanical HVAC	Point	3.9	
Mechanical HVAC	Point	3.7	
Mechanical HVAC	Point	3.4	
Mechanical HVAC	Point	4.7	
Mechanical HVAC	Point	4.6	
Mechanical HVAC	Point	4.5	
Mechanical HVAC	Point	4.2	
Mechanical HVAC	Point	4.1	
Mechanical HVAC	Point	5.1	
Mechanical HVAC	Point	4.9	
Mechanical HVAC	Point	4.7	
Mechanical HVAC	Point	5.1	
Mechanical HVAC	Point	5.1	
Mechanical HVAC	Point	5.2	
Mechanical HVAC	Point	5.1	
Mechanical HVAC	Point	-4.7	
Mechanical HVAC	Point	-4.8	
Mechanical HVAC	Point	-4.9	
Mechanical HVAC	Point	-4.2	
Mechanical HVAC	Point	-3.5	
Mechanical HVAC	Point	-4.5	
Mechanical HVAC	Point	-4.6	
Mechanical HVAC	Point	-4.7	
Mechanical HVAC	Point	-4.4	
Mechanical HVAC	Point	-4.4	
Mechanical HVAC	Point	-4.4	
Mechanical HVAC	Point	-4.1	
Mechanical HVAC	Point	-4.2	
Mechanical HVAC	Point	-4.2	
Mechanical HVAC	Point	10.4	
Mechanical HVAC	Point	10.5	
Mechanical HVAC	Point	11.0	
Mechanical HVAC	Point	11.5	
Mechanical HVAC	Point	12.1	
Mechanical HVAC	Point	12.7	
Mechanical HVAC	Point	13.3	
Mechanical HVAC	Point	14.1	
Mechanical HVAC	Point	14.9	
Mechanical HVAC	Point	16.0	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	16.8	
Mechanical HVAC	Point	17.3	
Mechanical HVAC	Point	17.4	
Mechanical HVAC	Point	17.1	
Mechanical HVAC	Point	16.2	
Mechanical HVAC	Point	15.0	
Mechanical HVAC	Point	14.2	
Mechanical HVAC	Point	13.4	
Mechanical HVAC	Point	12.7	
Mechanical HVAC	Point	12.1	
Mechanical HVAC	Point	11.5	
Mechanical HVAC	Point	11.0	
Mechanical HVAC	Point	10.5	
Mechanical HVAC	Point	10.0	
Mechanical HVAC	Point	9.7	
Mechanical HVAC	Point	9.7	
Mechanical HVAC	Point	-6.5	
Mechanical HVAC	Point	-4.4	
Mechanical HVAC	Point	-4.6	
Mechanical HVAC	Point	-4.7	
Mechanical HVAC	Point	-4.9	
Mechanical HVAC	Point	-5.1	
Mechanical HVAC	Point	-5.3	
Mechanical HVAC	Point	-5.4	
Mechanical HVAC	Point	-1.6	
Mechanical HVAC	Point	-2.3	
Mechanical HVAC	Point	-3.0	
Mechanical HVAC	Point	-3.5	
Mechanical HVAC	Point	-4.1	
Mechanical HVAC	Point	-4.6	
Mechanical HVAC	Point	-5.1	
Mechanical HVAC	Point	-5.5	
Mechanical HVAC	Point	-6.0	
Mechanical HVAC	Point	-6.4	
Mechanical HVAC	Point	-0.7	
Mechanical HVAC	Point	1.0	
Mechanical HVAC	Point	-2.0	
Mechanical HVAC	Point	-2.6	
Mechanical HVAC	Point	-3.1	
Mechanical HVAC	Point	-3.8	
Mechanical HVAC	Point	1.9	
Mechanical HVAC	Point	0.2	
Mechanical HVAC	Point	-1.1	
Mechanical HVAC	Point	-2.3	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	-3.0	
Mechanical HVAC	Point	1.0	
Mechanical HVAC	Point	-0.4	
Mechanical HVAC	Point	-1.8	
Mechanical HVAC	Point	-2.9	
Mechanical HVAC	Point	3.5	
Mechanical HVAC	Point	1.2	
Mechanical HVAC	Point	-0.4	
Mechanical HVAC	Point	-1.7	
Mechanical HVAC	Point	-2.8	
Mechanical HVAC	Point	2.3	
Mechanical HVAC	Point	0.5	
Mechanical HVAC	Point	-0.9	
Mechanical HVAC	Point	-2.2	
Mechanical HVAC	Point	4.6	
Mechanical HVAC	Point	2.4	
Mechanical HVAC	Point	0.5	
Mechanical HVAC	Point	-3.8	
Mechanical HVAC	Point	3.2	
Mechanical HVAC	Point	1.3	
Mechanical HVAC	Point	-0.3	
Mechanical HVAC	Point	-1.6	
Transformer 1	Point	1.4	
Transformer 2	Point	1.4	
Receiver R7 Leq,d 26.2 dB(A)			
Mechanical HVAC	Point	10.0	
Mechanical HVAC	Point	8.9	
Mechanical HVAC	Point	9.0	
Mechanical HVAC	Point	9.3	
Mechanical HVAC	Point	8.4	
Mechanical HVAC	Point	8.2	
Mechanical HVAC	Point	8.4	
Mechanical HVAC	Point	8.6	
Mechanical HVAC	Point	9.4	
Mechanical HVAC	Point	9.5	
Mechanical HVAC	Point	9.6	
Mechanical HVAC	Point	9.7	
Mechanical HVAC	Point	9.7	
Mechanical HVAC	Point	9.7	
Mechanical HVAC	Point	9.6	
Mechanical HVAC	Point	9.5	
Mechanical HVAC	Point	9.3	
Mechanical HVAC	Point	9.2	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	-1.7	
Mechanical HVAC	Point	-1.7	
Mechanical HVAC	Point	-0.9	
Mechanical HVAC	Point	-4.1	
Mechanical HVAC	Point	-1.8	
Mechanical HVAC	Point	-1.0	
Mechanical HVAC	Point	-1.8	
Mechanical HVAC	Point	-2.8	
Mechanical HVAC	Point	0.1	
Mechanical HVAC	Point	0.1	
Mechanical HVAC	Point	0.1	
Mechanical HVAC	Point	0.0	
Mechanical HVAC	Point	0.0	
Mechanical HVAC	Point	-0.3	
Mechanical HVAC	Point	0.5	
Mechanical HVAC	Point	0.1	
Mechanical HVAC	Point	0.4	
Mechanical HVAC	Point	-0.3	
Mechanical HVAC	Point	0.2	
Mechanical HVAC	Point	0.2	
Mechanical HVAC	Point	0.1	
Mechanical HVAC	Point	0.4	
Mechanical HVAC	Point	0.0	
Mechanical HVAC	Point	-0.4	
Mechanical HVAC	Point	-0.4	
Mechanical HVAC	Point	0.4	
Mechanical HVAC	Point	0.0	
Mechanical HVAC	Point	0.3	
Mechanical HVAC	Point	-2.5	
Mechanical HVAC	Point	-2.3	
Mechanical HVAC	Point	-2.0	
Mechanical HVAC	Point	-1.7	
Mechanical HVAC	Point	-2.5	
Mechanical HVAC	Point	-2.3	
Mechanical HVAC	Point	-2.0	
Mechanical HVAC	Point	-1.7	
Mechanical HVAC	Point	-1.4	
Mechanical HVAC	Point	-1.4	
Mechanical HVAC	Point	-2.9	
Mechanical HVAC	Point	-2.8	
Mechanical HVAC	Point	-2.5	
Mechanical HVAC	Point	-2.9	
Mechanical HVAC	Point	-2.8	
Mechanical HVAC	Point	-2.5	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	4.7	
Mechanical HVAC	Point	5.3	
Mechanical HVAC	Point	6.0	
Mechanical HVAC	Point	6.8	
Mechanical HVAC	Point	7.7	
Mechanical HVAC	Point	3.5	
Mechanical HVAC	Point	4.1	
Mechanical HVAC	Point	4.7	
Mechanical HVAC	Point	3.0	
Mechanical HVAC	Point	2.0	
Mechanical HVAC	Point	2.5	
Mechanical HVAC	Point	3.0	
Mechanical HVAC	Point	-0.1	
Mechanical HVAC	Point	0.3	
Mechanical HVAC	Point	1.2	
Mechanical HVAC	Point	1.1	
Mechanical HVAC	Point	1.4	
Mechanical HVAC	Point	-0.6	
Mechanical HVAC	Point	-0.3	
Mechanical HVAC	Point	-0.1	
Mechanical HVAC	Point	-5.2	
Mechanical HVAC	Point	-3.3	
Mechanical HVAC	Point	-3.8	
Mechanical HVAC	Point	-5.0	
Mechanical HVAC	Point	3.7	
Mechanical HVAC	Point	4.1	
Mechanical HVAC	Point	5.5	
Mechanical HVAC	Point	6.1	
Mechanical HVAC	Point	6.6	
Mechanical HVAC	Point	2.7	
Mechanical HVAC	Point	3.2	
Mechanical HVAC	Point	3.7	
Mechanical HVAC	Point	2.4	
Mechanical HVAC	Point	2.2	
Mechanical HVAC	Point	2.3	
Mechanical HVAC	Point	0.7	
Mechanical HVAC	Point	0.7	
Mechanical HVAC	Point	1.2	
Mechanical HVAC	Point	16.9	
Mechanical HVAC	Point	1.5	
Mechanical HVAC	Point	12.2	
Mechanical HVAC	Point	-1.7	
Mechanical HVAC	Point	10.5	
Mechanical HVAC	Point	9.7	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	-3.9	
Mechanical HVAC	Point	8.2	
Mechanical HVAC	Point	5.1	
Mechanical HVAC	Point	1.4	
Mechanical HVAC	Point	-6.2	
Mechanical HVAC	Point	5.6	
Mechanical HVAC	Point	-7.2	
Mechanical HVAC	Point	4.5	
Mechanical HVAC	Point	-8.3	
Mechanical HVAC	Point	3.3	
Mechanical HVAC	Point	2.9	
Mechanical HVAC	Point	-9.5	
Mechanical HVAC	Point	-9.9	
Mechanical HVAC	Point	-10.3	
Mechanical HVAC	Point	-10.7	
Mechanical HVAC	Point	-11.0	
Mechanical HVAC	Point	-11.4	
Mechanical HVAC	Point	-11.6	
Mechanical HVAC	Point	-12.0	
Mechanical HVAC	Point	-12.3	
Mechanical HVAC	Point	-9.3	
Mechanical HVAC	Point	-9.6	
Mechanical HVAC	Point	-9.8	
Mechanical HVAC	Point	-10.0	
Mechanical HVAC	Point	0.9	
Mechanical HVAC	Point	0.8	
Mechanical HVAC	Point	0.6	
Mechanical HVAC	Point	0.8	
Mechanical HVAC	Point	-2.4	
Mechanical HVAC	Point	-2.3	
Mechanical HVAC	Point	-2.3	
Mechanical HVAC	Point	-2.3	
Mechanical HVAC	Point	-2.4	
Mechanical HVAC	Point	-2.4	
Mechanical HVAC	Point	-1.9	
Mechanical HVAC	Point	-0.3	
Mechanical HVAC	Point	-4.5	
Mechanical HVAC	Point	-1.8	
Mechanical HVAC	Point	-1.2	
Mechanical HVAC	Point	-1.6	
Mechanical HVAC	Point	-1.3	
Mechanical HVAC	Point	-1.3	
Mechanical HVAC	Point	-1.3	
Mechanical HVAC	Point	-1.3	

16911 Normandie
Calculated Noise Levels - Mechanical (Podium)

Source	Source type	Leq,d dB(A)	
Mechanical HVAC	Point	-4.0	
Mechanical HVAC	Point	-0.2	
Mechanical HVAC	Point	-0.1	
Mechanical HVAC	Point	-0.1	
Mechanical HVAC	Point	0.5	
Mechanical HVAC	Point	-9.9	
Mechanical HVAC	Point	-0.3	
Mechanical HVAC	Point	-0.3	
Mechanical HVAC	Point	-0.3	
Mechanical HVAC	Point	-9.5	
Mechanical HVAC	Point	-9.2	
Mechanical HVAC	Point	1.2	
Mechanical HVAC	Point	1.2	
Mechanical HVAC	Point	1.8	
Mechanical HVAC	Point	-8.9	
Mechanical HVAC	Point	1.5	
Mechanical HVAC	Point	1.5	
Mechanical HVAC	Point	1.5	
Mechanical HVAC	Point	-8.5	
Mechanical HVAC	Point	-8.4	
Mechanical HVAC	Point	-7.8	
Mechanical HVAC	Point	-7.9	
Mechanical HVAC	Point	-8.6	
Mechanical HVAC	Point	2.5	
Mechanical HVAC	Point	2.5	
Mechanical HVAC	Point	2.5	
Transformer 1	Point	-6.9	
Transformer 2	Point	-7.4	

16911 Normandie
Source Levels in dB(A) - People (Podium)

Name	Source type	Lw dB(A)	
Dog Run	Area	87.0	
People Courtyard I	Area	95.2	
People Courtyard II	Area	97.4	
People Courtyard III	Area	91.3	
People Dog Run	Area	80.3	
People Level 7 Deck	Area	89.9	
People Open Space I	Area	84.8	
People Open Space II	Area	84.1	
People Open Space III	Area	86.9	

16911 Normandie
Contribution level - People (Podium)

Source	Source type	Leq,d dB(A)	
Receiver R1 Leq,d 46.6 dB(A)			
Dog Run	Area	13.7	
People Courtyard I	Area	26.4	
People Courtyard II	Area	24.0	
People Courtyard III	Area	46.5	
People Dog Run	Area	7.4	
People Level 7 Deck	Area	15.6	
People Open Space I	Area	16.5	
People Open Space II	Area	19.0	
People Open Space III	Area	16.5	
Receiver R2 Leq,d 37.7 dB(A)			
Dog Run	Area	14.5	
People Courtyard I	Area	27.0	
People Courtyard II	Area	20.6	
People Courtyard III	Area	37.1	
People Dog Run	Area	7.7	
People Level 7 Deck	Area	14.0	
People Open Space I	Area	15.0	
People Open Space II	Area	12.9	
People Open Space III	Area	17.0	
Receiver R3 Leq,d 48.7 dB(A)			
Dog Run	Area	44.1	
People Courtyard I	Area	36.8	
People Courtyard II	Area	26.1	
People Courtyard III	Area	19.0	
People Dog Run	Area	37.7	
People Level 7 Deck	Area	29.6	
People Open Space I	Area	38.9	
People Open Space II	Area	36.6	
People Open Space III	Area	44.0	
Receiver R4 Leq,d 28.8 dB(A)			
Dog Run	Area	7.6	
People Courtyard I	Area	19.8	
People Courtyard II	Area	27.1	
People Courtyard III	Area	11.7	
People Dog Run	Area	1.2	
People Level 7 Deck	Area	20.4	
People Open Space I	Area	8.1	
People Open Space II	Area	3.0	
People Open Space III	Area	9.1	

16911 Normandie
Contribution level - People (Podium)

Source	Source type	Leq,d dB(A)	
Receiver R5 Leq,d 29.6 dB(A)			
Dog Run	Area	8.2	
People Courtyard I	Area	20.8	
People Courtyard II	Area	28.3	
People Courtyard III	Area	13.0	
People Dog Run	Area	1.7	
People Level 7 Deck	Area	17.5	
People Open Space I	Area	8.6	
People Open Space II	Area	3.5	
People Open Space III	Area	9.5	
Receiver R6 Leq,d 30.0 dB(A)			
Dog Run	Area	11.2	
People Courtyard I	Area	24.6	
People Courtyard II	Area	27.4	
People Courtyard III	Area	17.8	
People Dog Run	Area	4.4	
People Level 7 Deck	Area	15.9	
People Open Space I	Area	11.3	
People Open Space II	Area	6.0	
People Open Space III	Area	12.4	

Parking lot	PLT	Parking Spaces	
Parking Level 1	Housing estate	189	
Parking Level 1	Housing estate	5	
Parking Level 2	Housing estate	224	

16911 Normandie
Source Levels in dB(A) - Parking (Podium) with Openings

Name	Source type	Lw dB(A)	
Parking Level 1	PLot	74.5	
Parking Level 1	PLot	95.9	
Parking Level 2	PLot	96.8	

16911 Normandie
Calculated Noise Levels - Parking (Podium) with Openings

Source	Source type	Leq,d dB(A)	
Receiver R1 Leq,d 23.7 dB(A)			
Parking Level 1	PLot	19.7	
Parking Level 1	PLot	-1.7	
Parking Level 2	PLot	21.4	
Receiver R2 Leq,d 22.8 dB(A)			
Parking Level 1	PLot	18.8	
Parking Level 1	PLot	-3.9	
Parking Level 2	PLot	20.6	
Receiver R3 Leq,d 40.0 dB(A)			
Parking Level 1	PLot	35.9	
Parking Level 1	PLot	26.5	
Parking Level 2	PLot	37.6	
Receiver R4 Leq,d 43.9 dB(A)			
Parking Level 1	PLot	37.6	
Parking Level 1	PLot	17.4	
Parking Level 2	PLot	42.7	
Receiver R5 Leq,d 30.2 dB(A)			
Parking Level 1	PLot	25.9	
Parking Level 1	PLot	2.6	
Parking Level 2	PLot	28.2	
Receiver R6 Leq,d 28.8 dB(A)			
Parking Level 1	PLot	25.2	
Parking Level 1	PLot	1.5	
Parking Level 2	PLot	26.3	
Receiver R7 Leq,d 49.2 dB(A)			
Parking Level 1	PLot	45.5	
Parking Level 1	PLot	9.0	
Parking Level 2	PLot	46.8	