INTERSTATE 395
HOV AND AUXILIARY LANE PROJECT

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City of Alexandria, Virginia

NOISE IMPACT ANALYSIS TECHNICAL REPORT

for

Virginia Department of Transportation

November 2013

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Executive Summary

This Noise Analysis Technical Report analyzes possible future worst case traffic noise impacts and subsequent abatement measures resulting from the Interstate 395 (I-395) HOV Ramp at Seminary Road (HOV Ramp Project) and the I-395 Northbound Auxiliary Lane Extension (Aux-Lane Project). The proposed HOV ramp will be built on the east side of the HOV lanes and connects to the third level of Seminary Road Bridge. The I-395 Aux-Lane Project will widen I-395 northbound lanes from Duke Street to Sanger Avenue and tie into the HOV Ramp Project; thereby creating a continuous auxiliary lane from Duke Street to Seminary Road.

This document conforms to the regulations and standards of the Federal Highway Administration's (FHWA) 23 CFR 772 Procedures for Abatement of Highway Traffic Noise and Construction Noise (July 13, 2011) for Type I projects as well as the current Virginia Department of Transportation (VDOT) State Noise Abatement Policy. The Noise Abatement Criteria (NAC), which represent the threshold at which abatement of highway traffic noise must be considered for specific types of land uses, was used for determining traffic noise impacts as established by FHWA (23 CFR 772). The regulations do not mandate that the abatement criteria be met in all situations, but rather require that reasonable and feasible efforts be made to provide noise mitigation when the abatement criteria are approached or exceeded.

This study details the noise impact assessment of the Existing (2010) conditions as well as the for the design year (2035) Build alternative. Traffic on I-395 was determined to be the primary source of noise attributed to the traffic noise impacts within the study area. The secondary traffic noise source is North Van Dorn Street which is a local surface street that parallels I-395 along the northbound lanes. Traffic noise modeling was performed using FHWA's Traffic Noise Model (TNM) Version 2.5.

Noise impacts are predicted under the design year Build condition (2035) due to peak hour traffic noise levels approaching or exceeding the NAC. Land use in the study area is predominately dense multi-family residential developments; however, there is also one large recreation park and some commercial areas. Traffic noise levels under the Build condition would result in a total of 258 impacted receptors which represent 409 outdoor use areas. Since the study area contains multi-storied multi-family residential units with private balconies, only the balconies at or below a maximum 30-foot high noise barrier were eligible to be used for the determination of feasibility and reasonableness. Based on the maximum allowable noise barrier height, only 162 of the impacted receptors for the Build condition that are representing 255 outdoor use areas would be eligible for the consideration of noise abatement measures. Since the increase in traffic noise levels from the existing to build conditions was determined to be 1 to 2 dB, there would be no substantial impacts (an increase of 10 dB or more) within the study area.

Table ES-1 shows the range of modeled traffic noise levels and resulting impact counts for each condition.

Table ES-1. Summary of Modeled Traffic Noise Levels and Impacted Receptors

Condition	Predicted Range of Traffic Noise Levels $L_{eq[h]}$, dBA	Total Impacted Receptors	Total Impacted Frequent Outdoor Use Areas[1]
Existing	37 - 73	253	399
Build	39 - 73	258	409

Note:
1 - Each receptor represents one or more frequent outdoor use areas.
Source: Parsons, 2013.

Five noise barriers were evaluated and determined to be feasible and reasonable in accordance with VDOT's State Noise Abatement Policy. These barriers would provide feasible and reasonable traffic noise abatement for 157 impacted receptors which represent 247 outdoor use areas. Furthermore, these five noise barriers would provide a traffic noise reduction of at least 5 dB to 459 non-impacted receptors that represent 779 outdoor use areas. An additional 86 dwelling units which were not eligible to be counted for feasibility and reasonableness calculations would also be benefited. Therefore, the total number of both impacted and non-impacted frequent outdoor use areas that would receive at least a 5 dB reduction in traffic noise levels for the Build condition would be 1,026 after implementation of the noise barriers. An additional 86 outdoor use areas above the maximum 30-foot high noise barrier analysis height were also shown to benefit from the noise barrier systems.

The total length of the barriers would be approximately 11,532 feet; the heights would range from 12 to 20 feet; and the total surface area would be 174,244 square feet. These dimensions would result in a total cost of $6,447,046 with an assumed cost per square foot of $37 which is the statewide average in Virginia when the total square area is greater than 50,000. An overview of the parameters and analysis calculations for each barrier is shown in Table ES-2. Furthermore, absorptive barriers will be used for the construction of noise barriers within the project to avoid the possibility of reflected traffic noise.

Table ES-2. Summary of Feasible and Reasonable Noise Abatement Measures

Noise Barrier I.D.	Height Range, (ft)	Total Length, (ft)	Total Surface Area (ft^2)	Outdoor Use Areas with Feasible Abatement	Surface Area per Outdoor Use Area with Feasible Abatement	Cost per Sq. Ft	Total Cost
Noise Barrier 1	15	243	3,641	23	158	$37	$134,735
Noise Barrier 2	12 - 20	4,550	65,484	513	128	$37	$2,422,908
Noise Barrier 3	15 - 17	1,256	19,541	73	268	$37	$723,017
Noise Barriers 4 and 5	15 - 20	5,484	85,578	417	205	$37	$3,166,386
Total	12 - 20	11,532	174,244	1,026	--	$37	$6,447,046

Source: Parsons, 2013.

During the construction phase of the proposed project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Any construction noise impacts that may occur as a result of roadway construction are anticipated to be temporary in nature and would cease upon completion of the project construction phase. The contractor will be required to conform to the specifications found in VDOT's 2007 Road and Bridge Specifications, Section 107.16(b.3), “Noise”. Adherence to this policy of establishing a maximum level of noise that construction operations can generate would reduce the potential impact of construction noise on the surrounding community.

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1 Introduction

1.1. Project Description

The Project consists of the Interstate 395 (I-395) HOV Ramp at Seminary Road (HOV Ramp Project), and the I-395 Northbound Auxiliary Lane Extension (Aux-Lane Project). The proposed HOV ramp will be built on the east side of the HOV lanes and connects to the third level of the Seminary Road Bridge. The new intersection where the proposed ramp ties to the bridge will be controlled by a traffic signal. A separate pedestrian bridge over I-395 will be built to current Americans with Disabilities Act (ADA) standards north of Seminary Road. In addition, Seminary Road bridge deck will be reconstructed along with superstructure and substructure rehabilitation. The northbound lanes of I-395 will be shifted to the east and widened from Sanger Avenue to Seminary Road including widening the Seminary Road exit ramp. The I-395 Aux-Lane Project will widen I-395 northbound lanes from Duke Street to Sanger Avenue and tie into the HOV ramp project; thereby creating a continuous Auxiliary Lane from Duke Street to Seminary Road. A Project Location map is shown in Figure 1-1.

1.2. Purpose of the Noise Analysis Technical Report

The purpose of this Noise Analysis Report (NAR) is to evaluate noise impacts and abatement/mitigation under the requirements of Title 23, Part 772 of the Code of Federal Regulations (23 CFR 772) “Procedures for Abatement of Highway Traffic Noise”. The 23 CFR 772 regulations provide procedures for preparing operational and construction noise studies and evaluating noise abatement/mitigation considered for federal and federal-aid highway projects. According to 23 CFR 772.3, all highway projects that are developed in conformance with this regulation are deemed to be in conformance with Federal Highway Administration (FHWA) noise regulations.

A Noise Abatement Report for both the HOV Ramp and Aux-Lane Projects was previously completed in December 2011 and October 2012, respectively (VDOT 2011 and 2012). This study assumes that both projects will be built for the project design year of 2035. The study includes (a) short-term noise measurements; (b) roadway traffic noise modeling using Federal Highway Administration’s Traffic Noise Model (TNM); (c) feasible and reasonable noise abatement measures.

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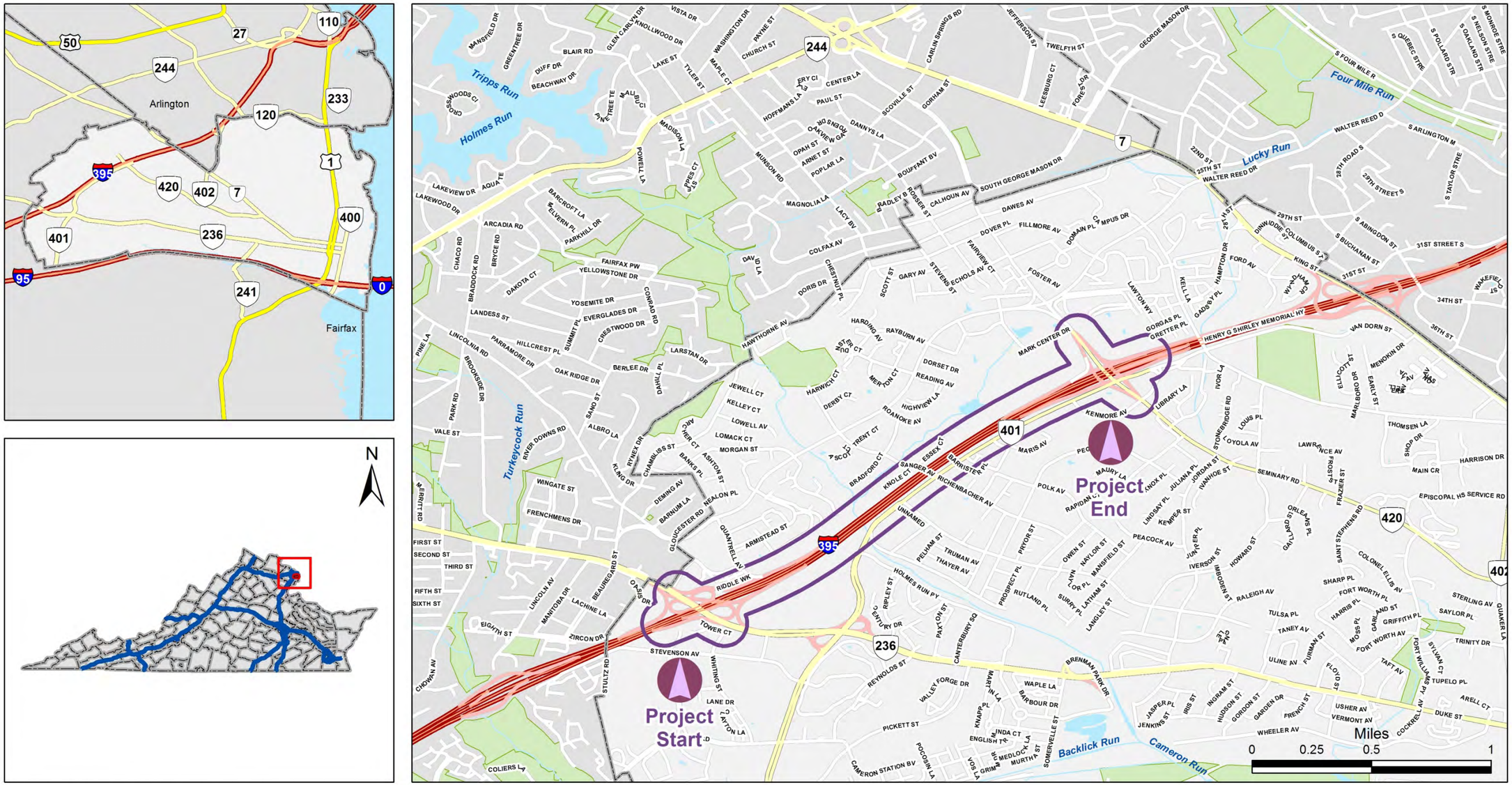
Figure 1-1. Project Location Map



I-395 HOV Ramp And I-395 NB
Auxiliary Lane Extension
From Duke Street To Sanger Avenue
City of Alexandria, Virginia
State Project No.: 0395-100-722/ 736, B684, B685, B686, B687, C501, R201
UPC# 96261

Legend

- Project Area
- Interstate
- US Highway
- State Highway

VDOT Virginia Department of Transportation

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2 Methodology

2.1. Federal Regulation and State Policy Compliance

The Noise Control Act of 1972 gives the US Environmental Protection Agency (USEPA) the authority to establish noise regulations to control major noise sources, including motor vehicles and construction equipment. Furthermore, the USEPA is required to set noise emission standards for motor vehicles used for interstate commerce and the FHWA is required to enforce the USEPA noise emission standards through the Office of Motor Carrier Safety. The National Environmental Policy Act (NEPA) of 1969 gives broad authority and responsibility to Federal agencies to evaluate and mitigate adverse environmental impacts caused by Federal actions. FHWA is required to comply with NEPA including mitigating adverse highway traffic noise effects.

The Federal-Aid Highway Act of 1970 mandates FHWA to develop standards for mitigating highway traffic noise. It also requires FHWA to establish traffic noise level criteria for various types of land uses. The Act prohibits FHWA approval of federal-aid highway projects unless adequate consideration has been made for noise abatement measures to comply with the standards. FHWA regulations for highway traffic noise for federal-aid highway projects are contained in 23 CFR 772 Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR 772 2011). The regulations contain noise abatement criteria, which represent the threshold at which abatement of highway traffic noise must be considered for specific types of land uses. The regulations do not mandate that the abatement criteria be met in all situations, but rather require that reasonable and feasible efforts be made to provide noise mitigation when the abatement criteria are approached or exceeded.

The Virginia Department of Transportation (VDOT) State Noise Abatement Policy was developed to implement the requirements of 23 CFR 772 Procedures for Abatement of Highway Traffic Noise and Construction Noise, FHWA's Highway Traffic Noise Analysis and Abatement Policy and Guidance (FHWA 2011), and the noise related requirements of The National Environmental Policy Act of 1969. The current VDOT State Noise Abatement Policy became effective on July 13, 2011 and was updated on August 6, 2013 (VDOT 2013a).

Under Title 23 CFR 772.7, projects are categorized as Type I, Type II, or Type III projects. Type I projects include those that create a completely new noise source, as well as those that increase the volume or speed of traffic or move the traffic closer to a receiver. Type I projects include the addition of an interchange, high-occupancy vehicle (HOV) lane, ramp, auxiliary lane, or truck-climbing lane to an existing highway, or the widening an existing ramp by a full lane width for its entire length. A Type II project is a noise barrier retrofit project that involves no changes to highway capacity or alignment. Projects unrelated to increased noise levels, such as striping,

lighting, signing, and landscaping projects would be considered Type III. This project would be considered as a Type I project.

2.2. Sound Level Metrics

The following sections describe the necessary technical terminologies and concepts that are used when presenting and discussing the noise study analysis:

2.2.1. Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound. In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determines the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

2.2.2. Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

2.2.3. Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (µPa). One µPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 µPa. Because of this huge range of values, sound is rarely expressed in terms of µPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of hearing for humans is 0 dB, which corresponds to 20 µPa.

2.2.4. Addition of Decibels

Because decibels are logarithmic units, SPLs cannot be added or subtracted through ordinary arithmetic means. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it

passes an observer, two cars passing simultaneously would not produce 140 dB—rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

2.2.5. A-Weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz, and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an "A-weighted" sound level (expressed in units of dBA) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-weighted levels of those sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with highway-traffic noise. Noise levels for traffic noise reports are typically reported in terms of A-weighted decibels or dBA. Table 2-1 shows typical A-weighted noise levels for various noise sources.

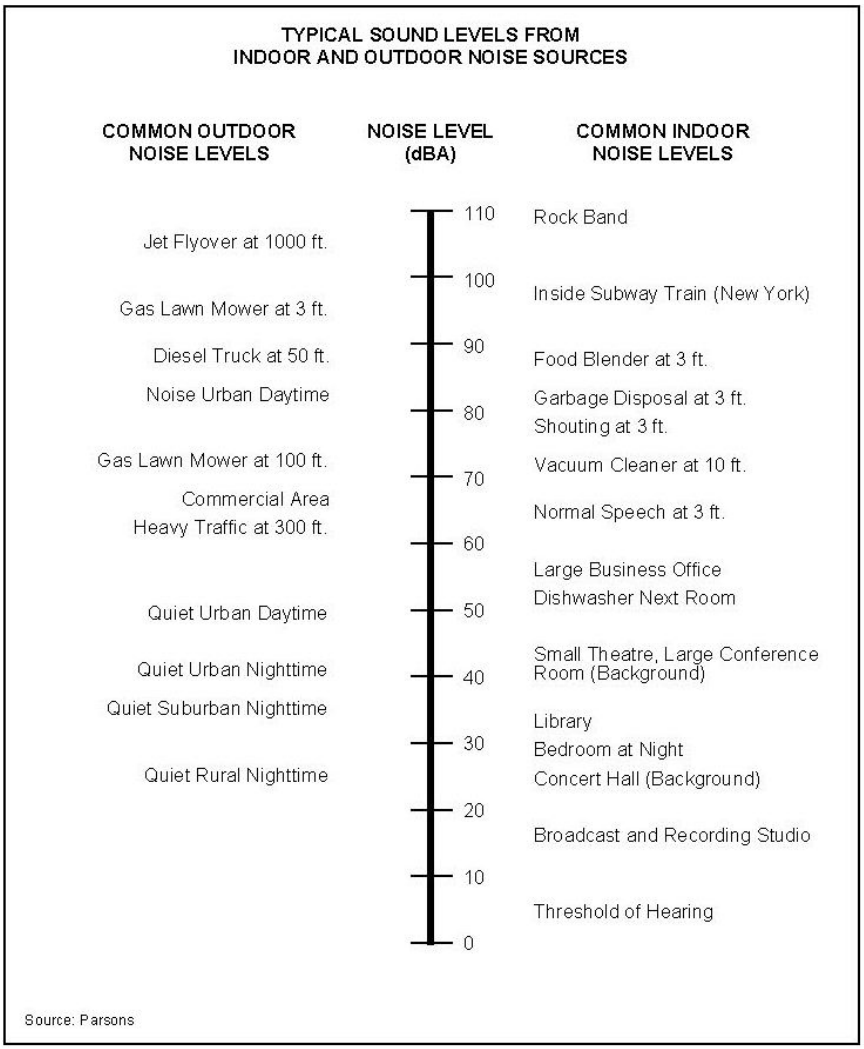
2.2.6. Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3 dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different than what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels, when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Furthermore, a 5 dB increase is generally perceived as a distinctly noticeable increase, and a 10 dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy (e.g.,

doubling the volume of traffic on a highway) that would result in a 3 dB increase in sound, would generally be perceived as barely detectable.

Table 2-1. Typical A-Weighted Noise Levels



2.3. Sound Propagation

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on the following factors:

2.3.1. Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as

cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source.

2.3.2. Ground Absorption

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective-wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance.

2.3.3. Atmospheric Effects

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have some effects.

2.3.4. Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in at least 5 dB of noise reduction. Taller barriers provide increased noise reduction.

2.4. Noise Descriptors

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously and fluctuate over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Most environmental noise includes a conglomeration

of noise from distant sources, creating a relatively steady background noise in which no particular source is identifiable. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in traffic noise analysis:

- **Equivalent Sound Level (L_{eq}):** L_{eq} represents an average of the sound energy occurring over a specified period. In effect, L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level ($L_{eq[h]}$) is the energy average of A-weighted sound levels occurring during a one-hour period.
- **Percentile-Exceeded Sound Level (L_n):** L_n represents the sound level exceeded for a given percentage of a specified period (e.g., L_{10} is the sound level exceeded 10 percent of the time, and L_{90} is the sound level exceeded 90 percent of the time).
- **Maximum Sound Level (L_{max}):** L_{max} is the highest instantaneous sound level measured during a specified period.
- **Day-Night Level (L_{dn}):** L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10 dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.

2.5. Noise Abatement Criteria

The State Noise Abatement Policy has adopted the Noise Abatement Criteria (NAC) that have been established by FHWA (23 CFR 772) for determining traffic noise impacts for a variety of land uses. The NAC, listed in Table 2-2 for various activities, represent the upper limit of acceptable traffic noise conditions and also a balancing of that which may be desirable with that which may be achievable. The NAC applies to outdoor areas having regular human use and where lowered noise levels are desired. They do not apply to the entire tract of land on which the activity is based, but only to that portion where the activity takes place. The NAC is given in terms of the hourly, A-weighted, equivalent sound level in decibels (dBA). The noise impact assessment is made using the guidelines listed in Table 2-2.

Table 2-2. Activity Categories and Noise Abatement Criteria

PART 772—NOISE ABATEMENT CRITERIA (Hourly A–Weighted Sound Level decibels (dB(A))[1]				
Activity category	**Activity $L_{eq(h)}$[4]**	**Criteria[2] $L_{10(h)}$**	**Evaluation location**	**Activity description**
A	57	60	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[3]	67	70	Exterior	Residential.
C[3]	67	70	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	55	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[3]	72	75	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A–D or F.
F	--	--	Exterior	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	--	--	Undeveloped lands that are not permitted.

[1] Either $L_{eq(h)}$ or $L_{10(h)}$ (but not both) may be used on a project.
[2] The $L_{eq(h)}$ and $L_{10(h)}$ Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.
[3] Includes undeveloped lands permitted for this activity category.
[4] VDOT uses the $L_{eq(h)}$ designation

Source: 23 CFR Part 772, 2011.

2.6. Noise Impact Determination and Analysis Procedure

Traffic noise impacts, as defined in 23 CFR 772.5, occur when the predicted noise level in the design year approaches or exceeds the NAC specified in 23 CFR 772, or a predicted noise level substantially exceeds the existing noise level (a "substantial" noise increase). The terms "substantial increase" or "approach" are not specifically defined in 23 CFR 772; these criteria are defined on a state by state basis. Under VDOT policy, traffic noise impacts occur if either of the following two conditions is met:

- The predicted traffic noise levels (future design year) approach or exceed the NAC, as shown in Table 2-2. The VDOT State Noise Abatement Policy defines an approach level to be used when determining a traffic noise impact. The "Approach" level has been defined by VDOT as 1 dB(A) less than the NAC for Activity Categories A to E. For example, for a category B receptor, 66 dBA would be approaching 67 dBA and would be

considered an impact. If design year noise levels "approach or exceed" the NAC, then the activity is impacted and a series of abatement measures must be considered.

- The predicted traffic noise levels are substantially higher than the existing noise levels. A substantial noise increase has been defined by VDOT when the predicted (future design year) highway traffic noise levels exceed existing noise levels by 10 dB or more for all noise-sensitive exterior activity categories. For example, if a receptor's existing noise level is 50 dBA, and if the future noise level is 60 dBA, then it would be considered an impact. The noise levels of the substantial increase impact do not have to exceed the appropriate NAC. Receptors that satisfy this condition warrant consideration of highway traffic noise abatement.

If a traffic noise impact is identified within the project corridor, then consideration of noise abatement measures is necessary. The final decision on whether or not to provide noise abatement along a project corridor will take into account the feasibility of the design and overall cost weighted against the environmental benefit.

In identifying noise impacts, primary consideration is given to exterior areas of frequent human use. In situations where there are no exterior activities, or where the exterior activities are far from the roadway or physically shielded in a manner that prevents an impact on exterior activities, the interior criterion (Activity Category D) is used as the basis for determining a noise impact. The final decision on whether or not to provide noise abatement along a project corridor will take into account the feasibility of the design, the reasonableness or cost-effectiveness, and input from benefited property owners.

2.7. Traffic Noise Level Prediction

2.7.1. Highway Noise Computation Model

Since roadway noise can be determined accurately through computer modeling techniques for areas that are dominated by roadway traffic, design year traffic noise calculations have been predicted using the Federal Highway Administration's Traffic Noise Model (FHWA TNM) Version 2.5, which is the latest approved version. The FHWA TNM was developed and sponsored by the U. S. Department of Transportation and John A. Volpe National Transportation Systems Center, Acoustics facility. The TNM estimates vehicle noise emissions and resulting noise levels based on reference energy mean emission levels. The existing and proposed alignments (horizontal and vertical) are input into the model, along with the receptor locations, traffic volumes of cars, medium trucks (vehicles with 2 axles and 6 tires), heavy trucks, average vehicle speeds, pavement type, and any traffic control devices. The TNM uses its acoustic algorithms to predict noise levels at the selected receptor locations by taking into account sound propagation variables such as, atmospheric absorption, divergence, intervening ground, barriers, building rows, and sometimes heavy vegetation (FHWA, 2004).

TNM input is based on a three-dimensional grid created for the study area to be modeled. All roadways, barriers, terrain lines, and receiver points are defined by x, y, and z coordinates. Receivers, defined as single points, are typically located at frequent outdoor use areas such as residences, schools, and recreational areas. Roadways, terrain lines, and barriers are coded into TNM as line segments defined by a series of points. A series of line segments which represent a particular modeling feature is often referred as a "line string". Line strings are created for all pertinent roadways and distinguishing terrain features within the study area. To obtain the elevations for existing areas, line strings are draped onto three dimensional (3D) digital terrain map files. The line strings are then extracted from the design files and imported into TNM. Elevations for proposed roadways, barriers, and terrain features are extracted from the proposed plan and profile data.

2.7.2. Modeling Assumptions and Considerations

Receivers were modeled at a height of 5 feet above the corresponding elevation of their represented outdoor use area. For multiple storied multi-family residences with balconies, receivers are stacked on top of one another and assigned offsetting heights in order to represent each building level. An estimated offset height of 10 feet was used between the floors of residential buildings with multiple levels.

The propagation path between source and receiver is modeled in TNM by specifying special terrain features, rows of houses or building structures, and existing walls. Propagation of noise can be further specified by selecting ground types such as hard soil, loose soil, pavement, lawn, and field grass. The lawn option was chosen as the overall ground type for this study. Where there were significant differences in ground type – such as large parking lots – a ground zone area was included to represent the hard surfaces which would affect reflections within noise propagation paths. All other natural obstructions, such as cuts and fills that could affect the predicted noise levels were also included in the input file.

Per FHWA policy, densely vegetated areas should only be modeled as tree zones in the prediction model when the trees to be modeled keep their leaves in the winter months. This is necessary to avoid under-prediction of traffic noise levels for the worst case noise period. The noise monitoring conducted for this study was completed during the summer months when all trees and dense brush areas were retaining their leaves; however, aerial photos of the project area in the winter months show that all the trees in the study area drop their leaves during winter. Therefore, the prediction model for this study does not include tree zone objects in order to obtain the worst case traffic noise scenario.

Typically, heavy trucks do not travel in the inner or "fast" lanes; thus, heavy truck traffic volumes are usually modeled only in the outer lanes. However, field observations of traffic flow

concluded that heavy trucks were not entirely constrained to the outer traffic lanes. Therefore, all three vehicle types were evenly distributed among the traffic lanes in the TNM traffic inputs.

2.7.3. Traffic Volumes and Flow Control

Traffic noise is a function of traffic volumes and traffic speed. Noise increases with speed and higher volumes of traffic. However, at higher volumes, speed decreases (stop and go), so the worst-case traffic noise levels are experienced when there is a balance between the volume and speed. Since TNM produces hourly L_{eq} values, all traffic inputs are based on hourly traffic volumes. The worst-case traffic noise levels produced within the peak noise hour can be – but is not always found to occur – during the peak hour volume. In some cases, the peak noise hour will occur before or after the AM or PM rush periods. Since this area of the I-395 corridor experiences stop and go traffic during the AM and PM rush periods, it would be assumed that the worst-case noise levels are experienced before or after each of the AM or PM peak hour volumes. In order to determine the noise levels generated by traffic, the TNM computer program requires inputs of traffic volumes, speeds, and vehicle types. The source of the volumes and speeds used for the noise analysis as well as the determination of the worst noise hour is discussed in the next sections.

2.7.4. Traffic Data Sources

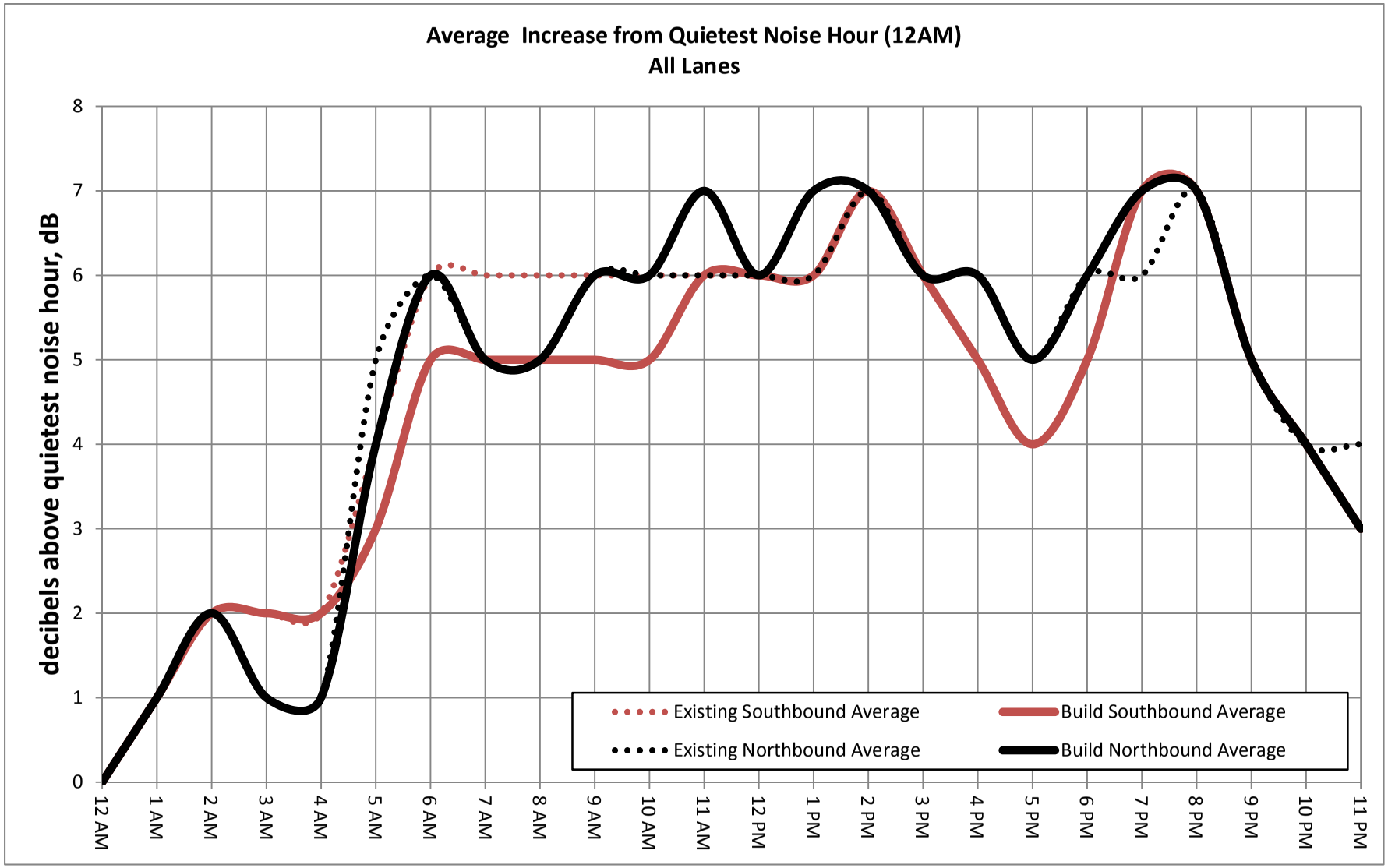
Traffic volumes for environmental analysis were based on the daily and peak hour traffic volumes shown in the Interchange Modification Report (IMR) for the I-395 HOT/Transit Ramp at Seminary Road. Peak hour traffic volumes, including turning movement volumes, were assembled from the IMR to estimate an origin-destination (OD) matrix for the I-395 and Seminary Road interchange for the peak hours. The OD matrices were averaged for non-peak hours and then using diurnal traffic of the main input and output links at the interchange, an iterative balancing (Fratar) technique was used to produce volumes between each OD pair for each hour of the day through the interchange. The volumes associated with these OD pairs was applied to individual links to get total traffic volume on each travel link. The diurnal traffic used as an input for the iterative balancing was obtained by fitting the traffic volumes in the IMR to generic diurnal curves. Peak hour volumes from the IMR were kept constant, and off-peak hours were adjusted to produce a three-peaked curve (AM and PM peak periods with a lesser peak during mid-day) that would total the daily volumes shown in the IMR. These diurnal curves were then adjusted such that traffic volumes would balance across the interchange for each hour. The truck percentages used in the traffic operations analysis were then applied to the total volume estimates to get medium and heavy truck volumes. Traffic volumes on facilities not included in the IMR, such as Van Dorn Street, were developed using generic diurnal curves, peak hour volumes borrowed from other traffic counts and daily volumes estimated through VDOT's count program. It should be noted that not all volumes shown in the IMR balanced throughout the

I-395 and Seminary Road interchange. In these cases, volumes were adjusted as minimally as possible from the IMR volumes in order to maintain balanced traffic flow (WR&A 2012). ***Appendix C*** presents the comprehensive listing of the future traffic volumes, speeds, and traffic distribution per direction of travel used for the noise analysis for the Existing and Build scenarios.

2.7.5. Worst Noise Hour Determination

After traffic volumes were provided by the traffic engineers, each hour of the day for the Existing (2010) and Build (2035) alternatives was modeled in TNM to determine the worst noise hour. Operational speeds corresponding to the traffic volumes of each hour were included in the data provided by the traffic engineers. This process was used in determining the peak noise hour since no long term measurements were conducted for this study. Figure 2-1 shows the rise in calculated traffic noise levels from the quietest noise level (12 AM) for each scenario. The worst noise hour was somewhat difficult to discern due to an additional peak mid-day. Although this suggests a dual peak noise hour, the large daytime volumes are moving at reduced speeds which are about 10 to 15 mph below the free-flow speed of 60 mph. The northbound and southbound sides seem to be slightly out of phase until the PM peak volume hour at 5 PM. After the PM rush period, both sides of the freeway are at free-flow speeds and are producing either the highest or matching the highest traffic noise levels throughout the 24 hour period. The average increase in Figure 2-1 was based on selected first row ground level receivers from each side of the traffic noise model. The peak noise hour is predicted to occur at 8 PM.

Figure 2-1. Worst Noise Hour Modeling Results



3 Existing Noise Environment

A field investigation was conducted to identify frequent outdoor use areas that could be subject to traffic noise impacts from the proposed project and to document the geometry of the freeway alignment relative to those areas. Noise monitoring was also conducted in order to develop a comparison between the monitored results and the output obtained from the noise prediction model. This exercise is performed to validate the model so that it can be used with confidence to predict the worst hour traffic noise levels for the existing and future conditions. Short-term noise measurements of 30 minutes in duration were conducted at a total of seven sites on the 18th and 19th of June, 2013 within the project corridor. The main purpose of these noise measurements was to validate the accuracy of the noise prediction model.

3.1. Noise Measurement Procedure

Noise measurements were conducted in conformance with the guidelines outlined in the FHWA's "Measuring of Highway Related Noise," FHWA-DP-96-046. The following are brief descriptions of the measurement procedures used for this project:

- Microphones were primarily placed approximately 5 feet above the ground and were positioned more than 10 feet from any wall or building to prevent reflections or unrepresentative shielding of the noise.
- Sound level meters were calibrated before and after each set of measurements.
- Following the calibration of equipment, a windscreen was placed over the microphone.
- Frequency weighting was set on "A", and the slow detector response was selected.
- Results of the short-term noise measurements were recorded on data sheets in the field.
- During the noise measurements, any transient noise sources such as birds, unusual vehicle emissions, etc. were noted in the field log sheets.
- Traffic was counted for model validation measurements. Vehicle types were separated into three vehicle groups: automobiles, medium trucks (2-axle with 6-wheels but not including dually pick-up trucks), and heavy trucks (3 or more axle vehicles). Average traffic speeds were measured using a radar gun.
- Wind speed, temperature, humidity, and sky conditions were observed and documented during the noise measurements.

The instruments used for the noise measurements included the following:

- Sound Level Meter – Brüel & Kjær 2250.
- Brüel & Kjær 2250 Transducer Components – Brüel & Kjær model ZC 0032 microphone preamp; Brüel & Kjær model 4189, ½-inch pressure microphone.

- Acoustic Field Calibrators – Brüel & Kjær Type 4231 sound calibrator.
- Microphone cables; 4-inch diameter windscreens; and tripods.
- Wind Monitor/Temperature and Humidity Gauge – Kestrel 3000 Pocket Weather Meter.
- Handheld Traffic Radar Detector – Kustom Radar Detector.

Manual documentation of the short-term measurements, site photographs, and equipment certifications are located in ***Appendix B***.

NOTE: Short-term noise monitoring is not a process to determine design year noise impacts or barrier locations. Short-term noise monitoring provides a level of consistency between what is present in real-world situations and how that is represented in the computer noise model. Short-term monitoring does not need to occur within every Common Noise Environment (CNE) to validate the computer noise model.

3.2. Noise Measurement Results

The dominant source of noise for all the short-term measurement sites was traffic on I-395. Measurement sites ST5 through ST7 included additional traffic noise from North Van Dorn Street which is located between the northbound lanes of I-395 and the adjacent residential areas. Project layout plans shown in Figure 1 in ***Appendix A*** present the measurement locations. Results for the short-term measurements are presented in Table 3-1.

Table 3-1. Short-Term Noise Measurement Results

Site No.	Street Address, City	CNE	Land Use[1]	Meas. Date	Start Time	Meas. L_{eq}, dBA[2]
ST1	*Quantrell Mews Townhomes* 6013 Riddle Walk, Alexandria	1	MFR townhouses	06/19/13	13:30	61.8
ST2	*Bennington Crossings Apartments* 467 Armistead Street, Alexandria	3	MFR 4-story apartments	06/19/13	14:20	65.2
ST3	*Woodmont Park Apartments* 5400 North Morgan Street, Alexandria	3	MFR 5-story apartments	06/19/13	11:20	67.2
ST4	*Mark Center Apartments* 5301 Essex Court, Alexandria	4	MFR 3-story apartments	06/19/13	10:30	68.2
ST5	*Brookville Apartments* 847 Van Dorn Street, Alexandria	7	MFR townhouses	06/19/13	09:30	70.9
ST6	*Hollandtowne at Brookville* 5401 Wycklow Court, Alexandria	9	MFR townhouses	06/18/13	10:45	69.7
ST7	*Parkside Townhomes* (Building 6) 1601 North Van Dorn Street, Alexandria	10	MFR townhouses	06/18/13	11:35	65.4

Notes:

1. MFR – Multi-family residential.
2. All short-term measured noise levels are 30-minute L_{eq}.

3.3. Traffic Noise Model Validation

Measurement data at all seven short-term sites were used for model validation. During the validation measurements, traffic volumes and speeds on I-395 and North Van Dorn Street were concurrently recorded. The traffic counts were tabulated according to vehicle types, including automobiles, medium trucks (2-axle with 6-wheels but not including dually pick-up trucks), heavy trucks (3 or more axle vehicles), motorcycles, and busses. Traffic volumes were normalized to 1-hour after manually counting the traffic during the measurement periods or by reviewing simultaneous video recordings of traffic lanes at a later time. These normalized volumes were assigned to the corresponding roadways within the project area to simulate the noise source strength at the roadways during the actual measurement periods. After inputting the traffic counts, site geometry, and any other pertinent existing features, noise levels at the validation sites were calculated in the TNM software. Table 3-2 presents the results of the model validation. Traffic volumes collected during the validation measurements are included in ***Appendix C.***

Table 3-2. Noise Model Validation Results

Measurement Site	Date	Start Time	Noise Levels, $L_{eq(h)}$, dBA		Deviation, dB (Measured - Modeled)
			Measured	Modeled	
ST1	06/19/13	13:30	61.8	61.5	-0.3
ST2	06/19/13	14:20	65.2	69.4	4.2
ST3	06/19/13	11:20	67.2	67.4	0.2
ST4	06/19/13	10:30	68.2	71.2	3.0
ST5	06/19/13	09:30	70.9	70.2	-0.7
ST6	06/18/13	10:45	69.7	69.7	0.0
ST7	06/18/13	11:35	65.4	67.5	2.1

Source: Parsons 2013.

According to VDOT's *Highway Traffic Noise Impact Analysis Guidance Manual*, the difference between measured and modeled values must lie within ±3 dB to fall within the accepted level of accuracy. Differences greater than ±3 dB require that both the observed and predicted data be carefully examined to determine the reason(s) for the margin of error (VDOT 2013a). The modeled noise levels were compared to the measured levels wherein discrepancies were studied to determine if the TNM model needed to be modified. Initial results indicated that the over-prediction of traffic noise levels for three of the validation sites (ST2, ST4, and ST7) were due to

some loss in the direct line of sight to the freeway traffic lanes due to dense trees and brush. Adding tree zones to the prediction model produced traffic noise levels that matched very closely to the measured levels. This assumption was confirmed further by measurement site (ST3) which was surrounded by similar vegetation but did not possess a blockage in line of sight to freeway traffic lanes. After careful review, it was determined that, when tree zones were considered, the modeled noise levels at the validation locations were within ±1 dB difference from the measured noise levels. Table 3-3 shows the comparison between the measured and modeled noise levels when tree zones are included in the validation model. Validation of the prediction model shows that this vegetation plays some role in the amount of traffic exposure that is experienced over the course of a year; however, in order to represent the worst case traffic noise conditions, trees have been assumed to be without their leaves for this analysis. Therefore, as stated earlier in Section 2.7.2, tree zones were not included in the final version of the existing or future TNM files since trees would not provide any significant noise reduction during the winter.

Table 3-3. Extraneous Noise Model Validation Results

Measurement Site	Date	Start Time	Noise Levels, $L_{eq(h)}$, dBA		Deviation, dB (Measured - Modeled)
			Measured	Modeled with Tree Zones	
ST2	06/19/13	14:20	65.2	69.4	0.7
ST4	06/19/13	10:30	68.2	71.2	0.1
ST7	06/18/13	11:35	65.4	67.5	0.7

Source: Parsons 2013.

3.4. Common Noise Environment (CNE) Determination and Existing Noise Setting

Since there are no undeveloped lands within the project area limits, only developed lands were addressed in the noise analysis. This section outlines the CNEs within the project area which contain all of the noise sensitive receivers within at least 500 feet of the proposed project limits which were considered for evaluation of traffic noise analysis. A CNE is defined as a group of receptors that share similar noise sources, traffic variables, and topographic features. Generally, CNE's will also be separated by NAC Category but not in all cases. Fourteen CNE areas were determined to be present within the study area. Land use in the study area is predominately dense multi-family residential developments; however, there is also one large recreation park and some commercial areas. Table 3-4 at the end of this section presents the ranges of modeled worst case traffic noise levels under the existing setting as well as the types of NAC categories that are present in each CNE.

CNE 1 – Carmel Apartments / Quantrell Mews Townhomes / Tower 2000 Apartments

CNE 1 is located in the northwest quadrant of the I-395 / Duke Street interchange along the southbound lanes of I-395 between Duke Street and the Quantrell Avenue off-ramp. This area is comprised of residential properties which include the Carmel Apartments, Tower 2000 Apartments, and the Quantrell Mews townhome community. The elevations of the residences in this area are located higher than the traffic lanes of I-395. Furthermore, there is an existing berm resembling a cut slope which protects the Quantrell Mews townhomes. The bulk of the frequent outdoor use areas of the Carmel Apartments consist of private balconies (NAC Category B) at each floor of the complex which has both 5 and 8 story sections. In addition to the balconies, an outdoor pool area (NAC Category C) is present at the ground level. Private balconies (NAC Category B) at each floor also make up the outdoor use areas of the Tower 2000 apartment complex which is a 15 story apartment building set back from the freeway behind the townhome community. The Quantrell Mews townhomes have decks/patios located on the second floor of each residential unit (NAC Category B). Existing noise levels within CNE 1 range from 42 to 68 dBA; consequently, 18 receptor locations which represent a total of 30 noise sensitive sites within this area are predicted to experience noise impacts due to levels approaching or exceeding the NAC under the existing condition. Sheet 1 of Figure 1 located in ***Appendix A*** shows the receiver locations within CNE 1.

CNE 2 – The Seasons Apartments

CNE 2 is located along the southbound lanes of I-395 north of Quantrell Avenue. This CNE represents The Seasons multi-family apartment complex. The outdoor use areas consist of private balconies at each of the seven floors of the five building complex (NAC Category B). A pool area (NAC Category C) is located in the center of the property and is shielded from direct exposure to traffic on I-395 by several of the buildings. The ground floor of the closest building to traffic lanes is even with the roadway; however, the elevation in comparison to I-395 traffic lanes increases with added distance from the roadway. Existing traffic noise levels within CNE 2 range from 38 to 72 dBA; consequently, 52 receptor locations which represent a total of 78 residences are predicted to experience noise impacts due to levels approaching or exceeding the NAC under the existing condition. Sheets 1 and 2 of Figure 1 located in ***Appendix A*** show the receiver locations within CNE 2.

CNE 3 – Bennington Crossings / Saxony Square / Woodmont Park Apartments

CNE 3 is located along the southbound lanes of I-395 between Duke Street and Sanger Avenue. Multi-family apartment complexes with private balconies at each floor make up the NAC Category B frequent outdoor use areas in this CNE. There is one pool area in the Bennington Crossings property (NAC Category C). For both Bennington Crossings and Saxony Square, the first row of buildings from I-395 traffic lanes is below the roadway; however, the elevation in comparison to I-395 traffic lanes increases with added distance from the roadway. Due to this

slope, the Bennington Crossings and Saxony Square apartment buildings are four stories on one side and three stories on the opposite side wherein the four story building façade faces the traffic lanes of I-395. Although higher in elevation, the second row of buildings is shielded from traffic noise by the first row of buildings. Three five story buildings are located at the Woodmont Park apartments. All three buildings are depressed relative to the freeway lanes. This CNE has large areas of dense trees and brush in the direct path of freeway traffic lanes; however, in order to represent the worst case traffic noise conditions, trees have been assumed to be without their leaves for this analysis. Existing noise levels within CNE 3 range from 43 to 73 dBA; consequently, 59 receptor locations which represent a total of 112 noise sensitive sites are predicted to experience noise impacts due to levels approaching or exceeding the NAC under the existing condition. Sheets 2 and 3 of Figure 1 located in ***Appendix A*** show the receiver locations within CNE 3.

CNE 4 – Mark Center Apartments

CNE 4 is representative of the Mark Center Apartment complex which is located along the southbound lanes of I-395. The property is divided north and south by Sanger Avenue which runs perpendicular to I-395. Varying topographic slopes occur within the area, this complex is comprised of multi-family apartment buildings which have three floors on one side and two floors on the opposite sides of each building. Each of the buildings that directly face traffic lanes of I-395 expose the building façade that has two stories. Each building has private patios/balconies used as the primary frequent outdoor use areas (NAC Category B). This CNE has large areas of dense trees and brush in the direct path of freeway traffic lanes; however, in order to represent the worst case traffic noise conditions, trees have been assumed to be without their leaves for this analysis. Existing noise levels within CNE 4 range from 48 to 71 dBA; consequently, 28 noise sensitive sites are predicted to experience noise impacts due to levels approaching or exceeding the NAC under the existing condition. Sheets 3 and 4 of Figure 1 located in ***Appendix A*** show the receiver locations within CNE 4.

CNE 5 – Winkler Botanical Preserve

CNE 5 represents the Winkler Botanical Preserve which is located along southbound I-395 between Sanger Avenue and Seminary Road. This park and associated outdoor use areas are defined within NAC Category C. The majority of the park area is protected from traffic noise from I-395 by a large earth berm with a tall ridgeline that is adjacent to the freeway. Analysis for this Category C area was performed using the procedure outlined in VDOT's *Noise Report and Development and Guidance Document* (VDOT 2013b). Receptors were placed in a grid pattern using 100-foot intervals both parallel and perpendicular to the freeway traffic lanes which encompassed the extents of the trail network and other frequent outdoor use areas within the park. Existing traffic noise levels within the park range from 43 to 67 dBA; therefore, there are areas within the park which are predicted to experience noise impacts due to levels approaching

or exceeding the NAC. Under the existing condition, four of a total 113 receptors within the preserve are impacted by traffic noise. This CNE has large areas of dense trees and brush in the direct path of freeway traffic lanes;however, in order to represent the worst case traffic noise conditions, trees have been assumed to be without their leaves for this analysis. Sheets 4 and 5 of Figure 1 located in ***Appendix A*** show the receiver locations within CNE 5.

CNE 6 – Hawthorn Suites / Place One Condominiums

CNE 6 is located along the northbound lanes of I-395 between Duke Street and Holmes Run Parkway. Frequent outdoor use areas in this CNE include the pool and picnic area of the Hawthorn Suites hotel and the tennis courts of the Place One residential development and are labeled as NAC Categories E and C, respectively. Both properties are located below the elevation of the traffic lanes of I-395. Existing traffic noise levels for the hotel are estimated to be at 67 dBA and the tennis courts at 61 dBA; therefore, these areas are not predicted to experience noise impacts due to levels approaching or exceeding their respective NAC. Sheet 7 of Figure 1 located in ***Appendix A*** shows the receiver locations of CNE 6.

CNE 7 – Brookville Apartment Townhomes

CNE 7 is located along the northbound lanes of I-395 between Holmes Run Parkway and Taney Avenue. The Brookville Apartment Townhome community is a multi-family residential development with private patio entrances which serve as the primary frequent outdoor use areas for the occupants. The residential units closest to the freeway are experiencing higher traffic noise due to the added traffic noise of a frontage road – North Van Dorn Street – which parallels I-395. The freeway is elevated in comparison to the apartment buildings which increases the significance of the contribution of traffic noise from Van Dorn Street to the overall noise level. Existing traffic noise levels were modeled and ranged from 47 to 67 dBA. Traffic noise levels for this CNE would approach or exceed the NAC Category B frequent outdoor use areas at four residences. Sheets 7 and 8 of Figure 1 located in ***Appendix A*** show the receiver locations within CNE 7.

CNE 8 – Willow Run Apartments

CNE 8 is located along the northbound lanes of I-395 between Taney and Richenbacher Avenues. The Willow Run Apartments have private balconies at each floor of the multi-family apartment buildings; however, the buildings in the complex have three floors on one side and two floors on the opposite sides of each building. The ground floor units located on the two floor side are located slightly below the ground elevation of the buildings and do not have patios. All the balconies are NAC Category B frequent outdoor use areas. The residential units closest to the freeway are experiencing higher traffic noise due to the added traffic noise of a frontage road – North Van Dorn Street – which parallels I-395. The freeway is elevated in comparison to the apartment buildings which increases the significance of the contribution of traffic noise from

Van Dorn Street to the overall noise level. Modeled existing traffic noise levels ranged from 47 to 72 dBA; consequently, 13 receptor locations which represent a total of 16 noise sensitive areas are predicted to experience noise impacts due to levels approaching or exceeding the NAC under the existing condition. Sheets 8 and 9 of Figure 1 located in ***Appendix A*** show the receiver locations within CNE 8.

CNE 9 – Hollandtowne Townhomes / Parkside Townhomes

CNE 9 is located along the northbound lanes of I-395 between Richenbacher and Maris Avenues. There are two multi-family residential townhome communities within this CNE which include adjacent fenced-in patios which serve as the frequent outdoor use area for each unit. The outdoor use areas for the Hollandtowne properties are only on one side of each building row while the patios for the Parkside townhomes are located on both sides. In addition, each of the Parkside buildings has three stories one side and only two stories on the opposite side. The buildings within this CNE are located below the elevation of the northbound lanes of I-395. Local traffic from North Van Dorn Street contributes to the overall traffic noise levels for the properties which are closest to the freeway. Modeled existing traffic noise levels ranged from 42 to 69 dBA; consequently, eight receptor locations which represent a total of 18 noise sensitive sites are predicted to experience noise impacts due to levels approaching or exceeding the NAC under the existing condition. Sheets 8 and 9 of Figure 1 located in ***Appendix A*** show the receiver locations within CNE 9.

CNE 10 – Parkside Townhomes / Seminary Hill Apartments

CNE 10 is located along the northbound lanes of I-395 between Maris and Kenmore Avenues. As discussed for CNE 9, the Parkside townhomes are multi-family residential units with fenced-in patios; however, in CNE 10, the buildings are elevated to both the I-395 freeway and Van Dorn Street. An earth berm blocks some of the freeway traffic lanes which increases the effects of the local traffic to the overall noise levels for those areas closest to Van Dorn Street. The Seminary Hill Apartments within this CNE share similar topography and traffic sources. Like other apartments within the study area, these apartments also have a different number of floors on opposite sides of each building. Each unit has a private balcony which functions as the outdoor use area (NAC Category B). Furthermore, a community pool area of NAC Category C is located in the center of the complex. Modeled existing traffic noise levels ranged from 37 to 70 dBA; consequently, 17 receptor locations which represent a total of 31 noise sensitive sites are predicted to experience noise impacts due to levels approaching or exceeding the NAC under the existing condition. Sheets 10 and 11 of Figure 1 located in ***Appendix A*** show the receiver locations within CNE 10.

CNE 11 – Seminary Hill Apartments / Seminary Towers

CNE 11 is located in the southeast quadrant of the I-395 / Seminary Road interchange along the northbound lanes of I-395. Seminary Towers, which includes two 13 story apartment buildings are encircled by North Van Dorn Street, Seminary Road, and Kenmore Avenue. The balconies of the residential units serve as the private outdoor use area for each unit (NAC Category B) in addition to the community pool area (NAC Category C). The buildings of the Seminary Hill apartment complex within CNE 11 are set back from the freeway behind the Seminary Towers along Kenmore Avenue and experience a mix of ambient noise from multiple sources which include I-395, North Van Dorn Street, and Seminary Road. Second and third stories have private balconies and the ground level units have open patios. The facade which has only two exposed balconies does not have a ground floor patio. Modeled existing traffic noise levels ranged from 39 to 71 dBA; consequently, 35 receptor locations which represent a total of 61 noise sensitive sites are predicted to experience noise impacts due to levels approaching or exceeding the NAC under the existing condition. Sheets 10 and 11 of Figure 1 located in ***Appendix A*** show the receiver locations within CNE 11.

CNE 12 – Courtyard by Marriot / Commercial Offices

CNE 12 is located in the northeast quadrant of the I-395 / Seminary Road interchange along the northbound lanes of I-395. The hotel and commercial properties in this area do not have any defined exterior frequent outdoor use areas since the open areas are primarily used for parking and access routes. Since there were no dedicated frequent outdoor use areas such as benches, receptors were placed in areas in which people may congregate as well as near the property lines. All receptors in this area are of NAC Category E; however, since there are no outdoor use areas, these traffic noise levels are only used for reporting purposes. Existing traffic noise levels for the hotel are estimated to range between 50 and 67 dBA; therefore, these areas are not predicted to experience noise impacts due to levels approaching or exceeding the NAC. Sheet 11 of Figure 1 located in ***Appendix A*** shows the receiver locations within CNE 12.

CNE 13 – Mark Center Business Park

CNE 13 is located in the southwest quadrant of the I-395 / Seminary Road interchange along the southbound lanes of I-395. CNE 13 contains several large office buildings, parking garages, and other commercial properties. The open areas primarily consist of parking and access routes; however, there are two outdoor seating areas, an outdoor work area, and a tennis court within the business park. All receptors in this area are of NAC Category E. Existing traffic noise levels for this area are estimated to range between 50 and 67 dBA; therefore, these areas are not predicted to experience noise impacts due to levels approaching or exceeding the NAC. Sheets 5 and 6 of Figure 1 located in ***Appendix A*** show the receiver locations within CNE 13.

CNE 14 – Southern Towers Apartments

CNE 14 is located in the northwest quadrant of the I-395 / Seminary Road interchange along the southbound lanes of I-395. The Southern Towers consist of five large apartment buildings with resident balconies at each floor as well as two pool areas and a playground. These NAC Categories B and C outdoor use areas are expected to experience existing traffic noise levels from 45 to 70 dBA; consequently, 12 receptor locations which represent a total of 15 noise sensitive sites are predicted to experience noise impacts due to levels approaching or exceeding the NAC under the existing condition. Sheet 6 of Figure 1 located in ***Appendix A*** shows the receiver locations within CNE 14.

Table 3-4. Ranges of Modeled Existing Peak Noise Hour Traffic Noise Levels

CNE I.D.	NAC Categories Present	Min. $L_{eq[h]}$, dBA	Max. $L_{eq[h]}$, dBA	Number of Impacted Receptors	Number of Impacted Outdoor Use Areas
CNE1	B (67) / C (67)	42	68	18	30
CNE2	B (67) / C (67)	38	72	52	78
CNE3	B (67) / C (67)	43	73	59	112
CNE4	B (67)	48	71	28	28
CNE5	C (67)	43	67	4	4
CNE6	C (67) / E (72)	61	67	0	0
CNE7	B (67)	47	67	4	4
CNE8	B (67)	47	72	13	16
CNE9	B (67)	42	69	8	18
CNE10	B (67) / C (67)	37	70	17	31
CNE11	B (67) / C (67)	39	71	35	61
CNE12	E (72)	58	67	0	0
CNE13	E (72)	50	67	0	0
CNE14	B (67) / C (67)	45	70	12	15

Note: Each receptor represents one or more frequent outdoor use areas.
Source: Parsons, 2013.

4 Future Noise Environment, Impacts, and Noise Abatement Determination

This section presents predicted peak-hour traffic noise levels within the project area under the Build alternative scenarios. An analysis with barrier heights ranging from 10 to 30 feet was conducted for the potentially impacted areas. The peak-hour traffic noise levels for the design year were predicted using TNM. The predicted traffic noise levels for each receptor are presented in ***Appendix D***.

4.1. Modeled Future Environment

Traffic noise levels in the study area were predicted for the design year (2035) under the Build condition. Under the Build condition, an auxiliary lane would be constructed along the northbound lanes between the Duke Street on-ramp and Seminary Road off-ramp; in addition, an exit ramp for the existing managed HOV lane facility would be also constructed to provide a new connection between the Seminary Road over-crossing and the managed lanes. Construction of the auxiliary lane would shift the northbound lanes towards North Van Dorn Street which parallels I-395. The horizontal alignment of Van Dorn Street would not be affected by the project. The new HOV ramp would provide some reduction in traffic noise levels of the opposing lanes for some areas; however, the traffic on the new HOV ramp would be elevated when progressing towards Seminary Road.

4.2. Traffic Noise Impacts

Noise impacts are predicted under the design year Build condition (2035) due to noise levels approaching or exceeding the NAC. For this study, 1,349 receivers representing 2,378 frequent outdoor use areas were used to adequately cover the project limits. However, since this area contains multi-storied multi-family residential units with private balconies, only the balconies at or below a maximum 30-foot high noise barrier are eligible to be counted for feasibility and reasonableness calculations. The elevation of the maximum analysis height is established as the top of a 30-foot high noise barrier at the placement of potential abatement. After consideration of the maximum analysis height along the project corridor, 968 receptors representing 1,738 outdoor use areas were analyzed for traffic noise impacts and subsequent abatement consideration.

Table 4-1 presents the range of traffic noise levels predicted for the worst noise hour in the future Build condition. Traffic noise levels under the Build alternative would result in a total of 258 impacted receptors which represent 409 outdoor use areas. Since the increase in traffic noise levels from the existing to build conditions was determined to be 1 to 2 dB, there would be no substantial impacts (an increase of 10 dB or more) within the study area. Table 4-2 presents an

overview of the total number of impacts as well as the total number of receptors and areas eligible for abatement consideration. Figure 1 in ***Appendix A*** shows the predicted 66 dBA contours for the project under the Build alternative. Tables in ***Appendix D*** provide detailed traffic noise levels for all modeled receptors.

Table 4-1. Ranges of Modeled Build Peak Noise Hour Traffic Noise Levels

CNE I.D.	NAC Categories Present	Build (2035)	
		Min. $L_{eq[h]}$, dBA	Max. $L_{eq[h]}$, dBA
CNE1	B (67) / C (67)	42	68
CNE2	B (67) / C (67)	39	73
CNE3	B (67) / C (67)	44	73
CNE4	B (67)	49	71
CNE5	C (67)	42	67
CNE6	C (67) / E (72)	61	66
CNE7	B (67)	47	66
CNE8	B (67)	47	71
CNE9	B (67)	42	68
CNE10	B (67) / C (67)	40	71
CNE11	B (67) / C (67)	39	71
CNE12	E (72)	56	67
CNE13	E (72)	51	68
CNE14	B (67) / C (67)	45	70

Source: Parsons, 2013.

Table 4-2. Summary of Traffic Noise Impacts by CNE

CNE I.D.	NAC Categories Present	Total Number of Modeled Receptors		Total Number of Impacted Receptors				Impacted and Non-Impacted Receptors Eligible for Abatement Analysis[2]		Impacted Receptors Eligible for Abatement Consideration[2]	
				Existing (2010)		Build (2035)		Build (2035)		Build (2035)	
		Receptors	Frequent Outdoor Use Areas[1]	Receptors	Frequent Outdoor Use Areas[1]	Receptors	Frequent Outdoor Use Areas[1]	Receptors	Frequent Outdoor Use Areas[1]	Receptors	Frequent Outdoor Use Areas[1]
CNE 1	B (67) / C (67)	96	172	18	30	19	32	50	108	4	5
CNE 2	B (67) / C (67)	211	351	52	78	55	84	50	79	18	27
CNE 3	B (67) / C (67)	283	517	63	119	65	122	235	421	65	122
CNE 4	B (67)	121	121	28	28	33	33	117	117	33	33
CNE 5	C (67)	113	113	4	4	4	4	113	113	4	4
CNE 6	C (67) / E (72)	2	2	0	0	0	0	2	2	0	0
CNE 7	B (67)	56	136	4	4	2	2	56	136	2	2
CNE 8	B (67)	68	119	13	16	10	11	68	119	10	11
CNE 9	B (67)	74	204	8	18	7	17	74	204	7	17
CNE 10	B (67) / C (67)	131	315	17	31	17	32	129	309	17	32
CNE 11	B (67) / C (67)	111	221	34	56	35	58	45	95	2	2
CNE 12	E (72)	5	5	0	0	0	0	5	5	0	0
CNE 13	E (72)	4	4	0	0	0	0	4	4	0	0
CNE 14	B (67) / C (67)	74	98	12	15	11	14	20	26	0	0
	Totals	***1,349***	***2,378***	***253***	***399***	***258***	***409***	***968***	***1,738***	***162***	***255***

Notes:

1 - Each receptor represents one or more frequent outdoor use areas.

2 - Excludes the outdoor use areas above the maximum barrier height of 30 feet.

Source: Parsons, 2013.

4.3. Noise Abatement Determination

The progression of the noise analysis follows three phases where each must be considered and satisfied before proceeding further.

4.3.1. Warranted Criterion

This first phase of the process is to determine if highway traffic noise abatement consideration is warranted for the affected communities and/or the affected receptors. In order to make a determination that a noise impact exists, one of the following conditions must be met:

- Predicted highway traffic noise levels (for the design year) approach or exceed the highway traffic noise abatement criteria in Table 2-2. “Approach” has been defined by VDOT as 1 dB below the noise abatement criteria.
- A substantial noise increase has been defined by VDOT as a 10 dB increase above existing noise levels for all noise-sensitive exterior activity categories. A 10 dB increase in noise reflects the generally accepted range of a perceived doubling of the loudness. Receptors that satisfy this condition warrant consideration of highway traffic noise abatement.

4.3.2. Feasibility Criteria for Noise Barriers

To determine feasibility of a highway traffic noise barrier, the following two conditions shall be considered:

- At least a 5 dB highway traffic noise reduction at impacted receptors. Per 23 CFR 772 FHWA requires the highway agency to determine the number of impacted receptors required to achieve at least 5 dB of reduction. VDOT requires that fifty percent (50%) or more of the impacted receptors experience 5 dB or more of insertion loss to be feasible; and;
- The determination that it is possible to design and construct the noise abatement measure. The factors related to the design and construction include: safety, barrier height, topography, drainage, utilities, and maintenance of the abatement measure, maintenance access to adjacent properties, and general access to adjacent properties (i.e. arterial widening projects).

4.3.3. Reasonableness Criteria for Noise Barriers

Noise barrier reasonableness is determined by assessing multiple issues including:

- The viewpoints of the benefited receptors

- Cost effectiveness value, based on a square foot cost ceiling (maximum square footage of abatement per benefited receptor)
- Noise reduction design goal of 7 dB of insertion loss for at least one impacted receptor

Typically, the limiting factor related to barrier reasonableness is the cost effectiveness value, where the total surface area of the barrier is divided by the number of benefited receptors receiving at least a 5 dB reduction in noise level. VDOT's approved cost is based on a maximum square footage of abatement per benefited receptor, a value of 1,600 square feet per benefited receptor.

For non-residential properties such as parks and public use facilities, a special calculation is preformed in order to quantify the type and duration of activity and compare to the cost effectiveness criterion. The determination is based on cost, severity of impact (both in terms of noise levels and the size of the impacted area and the activity it contains), and amount of noise reduction.

4.4. Alternative Abatement Measures

VDOT guidelines recommend a variety of mitigation measures that should be considered in response to transportation-related noise impacts. While noise barriers and/or earth berms are generally the most effective form of noise mitigation, additional mitigation measures exist which have the potential to provide considerable noise reductions, under certain circumstances. Mitigation measures considered for this project included:

- Traffic management;
- Alignment modifications;
- Acoustical insulation of public use and non-profit facilities;
- Buffer lands;
- Construction of noise barriers;
- Construction of earth berms.

Additionally, the Noise Policy Code of Virginia (HB 2577, as amended by HB 2025) states: *Requires that whenever the Commonwealth Transportation Board or the Department plan for or undertake any highway construction or improvement project and such project includes or may include the requirement for the mitigation of traffic noise impacts, first consideration should be given to the use of noise reducing design and low noise pavement materials and techniques in lieu of construction of noise walls or sound barriers. Vegetative screening, such as the planting of appropriate conifers, in such a design would be utilized to act as a visual screen if visual screening is required.* Consideration will be given to these measures during the final design

stage, where feasible. The response from VDOT regarding alternative abatement measures were discussed during the preliminary design phase of the project and are included in ***Appendix H***.

4.5. Noise Barrier Design Considerations

The effectiveness of a noise barrier depends on the distance and elevation difference between roadway and receptor and the available placement location for a barrier. Gaps between overlapping noise barriers also decrease the effectiveness of the barrier, as opposed to a single connected barrier. The barrier's ability to attenuate noise decreases as the gap width increases. As a general practice, noise barriers are most effective when placed at a relatively high point between the roadway and the impacted noise sensitive land use. To achieve the greatest benefit from a potential noise barrier, the goal of the barrier should focus on breaking the line-of-sight (to the greatest degree possible) from the roadway to the receptor. In roadway fill conditions, where the highway is above the natural grade, noise barriers are typically most effective when placed on the edge of the roadway shoulder or on top of the fill slope. In roadway cut conditions, where the roadway is located below the natural grade, barriers are typically most effective when placed at the top of the cut slope. Engineering and safety issues have the potential to alter these typical barrier locations.

4.6. Noise Abatement Measures

Noise barriers were evaluated for areas predicted to experience traffic noise impacts in the Build alternative. Five noise barriers were evaluated and all were determined to be feasible and reasonable in accordance with VDOT's State Noise Abatement Policy. Sheets 1 through 11 of Figure 1 in ***Appendix A*** show the barrier locations as well as the lengths and heights required to provide feasible and reasonable abatement. Table 4-3 presents the total number of benefited receptors and frequent outdoor use areas that would achieve a reduction of at least 5 dB of future peak noise hour traffic noise levels by CNE. Noise barriers which are necessary to provide feasible abatement for receptors located below the maximum 30-foot high barrier would also provide feasible abatement to some receptors located above the 30-foot limit; Table 4-4 presents these receptors for the different CNEs. Section 4.6.5. *Impacted Areas Without Feasible Noise Abatement* addresses cases where feasible abatement for impacted receptors was not possible. Receptors described in the text and shown in ***Appendix D*** have designations for CNE, location number, and a floor number when applicable (e.g. Receptor CNE1.Location3.Floor2 = R1.3.2). Top-of-wall elevations for all noise barriers are shown in ***Appendix E***. Warranted, Feasible, and Reasonableness Worksheets are located in ***Appendix F***.

Table 4-3. Summary of Feasible Abatement for Receptors by CNE (at or below maximum 30-foot high noise barrier)

CNE I.D.	NAC Categories Present	Number of Impacted Receptors with Feasible Abatement[1]		Number of Non-Impacted Receptors with Feasible Abatement[1]		Total Number of Receptors with Feasible Abatement[1,2]	
		Receptors	Frequent Outdoor Use Areas[3]	Receptors	Frequent Outdoor Use Areas[3]	Receptors	Frequent Outdoor Use Areas[3]
CNE 1*	B (67) / C (67)	2	2	11	21	13	23
CNE 1**	B (67) / C (67)	--	--	2	5	2	5
CNE 2	B (67) / C (67)	18	27	21	32	39	59
CNE 3	B (67) / C (67)	65	122	131	221	196	343
CNE 4	B (67)	33	33	73	73	106	106
CNE 5	C (67)	4	4	68	68	72	72
CNE 6	C (67) / E (72)	0	0	0	0	0	0
CNE 7	B (67)	0	0	33	94	33	94
CNE 8	B (67)	10	11	41	78	51	89
CNE 9	B (67)	7	17	52	131	59	148
CNE 10	B (67) / C (67)	16	29	22	48	38	77
CNE 11	B (67) / C (67)	2	2	4	7	6	9
CNE 12	E (72)	0	0	0	0	0	0
CNE 13	E (72)	0	0	1	1	1	1
CNE 14	B (67) / C (67)	0	0	0	0	0	0
	Totals	***157***	***247***	***459***	***779***	***616***	***1,026***

Notes:

1 - Excludes the outdoor use areas above the maximum barrier height of 30 feet.

2 - Represents the total number of units used for feasibility and reasonableness determination calculations.

3 - Each receptor represents one or more frequent outdoor use areas.

* - Receptors benefited by Noise Barrier 1.

** - Receptors benefited by Noise Barrier 2.

Source: Parsons, 2013.

Table 4-4. Summary of Feasible Abatement for Receptors by CNE (above maximum 30-foot high noise barrier)

CNE I.D.	NAC Categories Present	Number of Impacted Receptors with Feasible Abatement[1]		Number of Non-Impacted Receptors with Feasible Abatement[1]	
		Receptors	Frequent Outdoor Use Areas[2]	Receptors	Frequent Outdoor Use Areas[2]
CNE 1*	B (67) / C (67)	--	--	2	2
CNE 1**	B (67) / C (67)	--	--	--	--
CNE 2	B (67) / C (67)	3	4	24	36
CNE 3	B (67) / C (67)	--	--	18	36
CNE 4	B (67)	--	--	--	--
CNE 5	C (67)	--	--	--	--
CNE 6	C (67) / E (72)	--	--	--	--
CNE 7	B (67)	--	--	--	--
CNE 8	B (67)	--	--	--	--
CNE 9	B (67)	--	--	--	--
CNE 10	B (67) / C (67)	--	--	--	--
CNE 11	B (67) / C (67)	2	3	3	5
CNE 12	E (72)	--	--	--	--
CNE 13	E (72)	--	--	--	--
CNE 14	B (67) / C (67)	--	--	--	--
	Totals	***5***	***7***	***47***	***79***

Notes:
1 - Includes only the outdoor use areas above the maximum barrier height of 30 feet.
2 - Each receptor represents one or more frequent outdoor use areas.
* - Receptors benefited by Noise Barrier 1.
** - Receptors benefited by Noise Barrier 2.
Source: Parsons, 2013.

The following discussions present the noise abatement measures for each of the impacted CNE areas:

4.6.1. Noise Barrier 1 – CNE 1

Noise Barrier 1 would provide abatement for impacted areas within CNE 1 and extends along the right-of-way line next to the southbound I-395 Duke Street / Little River Turnpike off-ramp from Stations 260+00 to 626+08. Barrier 1 has a height of 15 feet and an approximate total length of 243 feet, resulting in a surface area of 3,641 square feet. Noise Barrier 1 would provide feasible abatement for the pool area (Receptor R1.9) and one second floor balcony (Receptor R1.3.2) of the Carmel Apartments residential complex. The third floor balcony (Receptor R1.3.3) located above Receptor R1.3.2 was impacted but unable to achieve a feasible reduction of traffic noise levels of at least 5 dB even with a maximum barrier height of 30 feet. All other balconies in the complex were either above the maximum 30-foot evaluation limit or not impacted; therefore, two

of the three impacted outdoor use areas would be benefited by Noise Barrier 1; however, 11 non-impacted balconies below the evaluation limit and three 4th floor balconies above the evaluation limit were benefited by the barrier. Furthermore, an additional 10 benefited residential units from the neighboring Quantrell Mews townhomes were added to the total number of benefited units since non-impacted Receptors R1.10, R1.17, and R1.27 were able to attain a reduction in predicted future traffic noise levels of at least 5 dB. Details of the barrier analysis including barrier insertion losses are listed in ***Appendix D***. An overview of the evaluated barrier parameters and analysis calculations is shown in Table 4-5.

Since there are 23 benefited units within the evaluation limit, the square feet per benefited receptor value would be 158. This barrier would provide feasible abatement for at least 50% of impacted receivers, meets the noise reduction design goal of 7 dB for at least one receptor, and has a square feet per benefited receptor value less than 1,600; therefore, Noise Barrier 1 would be both feasible and reasonable in accordance with VDOT's State Noise Abatement Policy. The total number of receptors and frequent outdoor use areas used for feasibility and reasonableness calculations are presented in ***Appendix F*** within the *Warranted, Feasible, and Reasonableness Worksheets*.

4.6.2. Noise Barrier 2 – CNE 1, CNE 2, CNE 3, and CNE 4

Noise Barrier 2 would provide abatement for impacted receptors within CNEs 2 through 4. The barrier would be located at the edge of shoulder along the southbound lanes of I-395 from Stations 266+89 to 312+00. Noise Barrier 2 would have heights of 12, 15, and 20 feet with an approximate total length of 4,550 feet, resulting in a surface area of 65,484 square feet. All impacted receptors – with the exception of one pool area – are multi-storied multi-family residential units which represent either patios or balconies. Receptors within CNE 2 represent balconies of The Seasons residential complex which is comprised of seven storied apartment buildings. Due to the close proximity of ground floor receptor elevations to the traffic lanes of I-395, balconies at and above the fourth stories are above the maximum 30-foot evaluation limit and would not achieve feasible abatement with a maximum 30-foot high wall. Within CNE 3 moving south to north, the interstate becomes more elevated in comparison to the ground floor receptors and the floor at which the maximum evaluation limit strikes varies due to the topography of the area. All receptors within CNE 4 were below the maximum 30-foot evaluation limit. An overview of the evaluated barrier parameters and analysis calculations is shown in Table 4-5. Details of the barrier analysis including barrier insertion losses are listed in ***Appendix D***.

There were a total of 116 impacted receptors which represent 182 outdoor use areas within CNEs 2 through 4. Noise Barrier 2 would provide a feasible reduction of traffic noise levels for all 182 impacted areas. Additional benefits from non-impacted receptors within the maximum 30-foot

evaluation limit included 326 outdoor use areas from CNEs 2 through 4. Furthermore, an additional 5 non-impacted residential units (Receptors R1.16 and R1.22) from the neighboring Quantrell Mews townhomes were also benefited by Noise Barrier 2. The square feet per benefited receptor value would be 128. This barrier would provide feasible abatement for at least 50% of impacted receivers, meets the noise reduction design goal of 7 dB for at least one receptor, and has a square feet per benefited receptor value less than 1,600; therefore, Noise Barrier 2 would be both feasible and reasonable in accordance with VDOT's State Noise Abatement Policy. An additional 72 outdoor use areas above the evaluation limit from CNE 2 and CNE 3 which were not impacted by future peak hour traffic noise levels were also benefited from Noise Barrier 2. The total number of receptors and frequent outdoor use areas used for feasibility and reasonableness calculations are presented in ***Appendix F*** within the *Warranted, Feasible, and Reasonableness Worksheets*.

4.6.3. Noise Barrier 3 – CNE 5 and CNE 13

Noise Barrier 3 would provide feasible and reasonable abatement for four impacted areas of the Winkler Botanical Preserve in CNE 5. The barrier would be located along southbound lanes of I-395 at the edge of shoulder from Stations 621+50 to 634+00. Noise Barrier 3 would have heights of 15 and 17 feet with an approximate total length of 1,256 feet, resulting in a surface area of 19,541 square feet. Feasibility and reasonableness calculations for this Category C area was performed using the procedure outlined in VDOT's *Noise Report and Development and Guidance Document*. Receptors were placed in a grid pattern using 100-foot intervals both parallel and perpendicular to the freeway traffic lanes which encompasses the trail network and other frequent outdoor use areas within the park. An additional 68 receptors within the park which were not impacted by future peak hour traffic noise levels would also be benefited by Noise Barrier 3 due to an increase in receptor elevations with added distance from the roadway in comparison to I-395 traffic lanes. Furthermore, a non-impacted outdoor seating area in the Mark Center business park (Receptor R13.1) would also be benefited by this noise barrier. With a total number of benefited units of 73, the square feet per benefited receptor value was calculated to be 268. This barrier would provide feasible abatement for at least 50% of impacted receivers, meets the noise reduction design goal of 7 dB for at least one receptor, and has a square feet per benefited receptor value less than 1,600; therefore, Noise Barrier 3 would be both feasible and reasonable in accordance with VDOT's State Noise Abatement Policy. An overview of the evaluated barrier parameters and analysis calculations is shown in Table 4-5. Details of the barrier analysis including barrier insertion losses are listed in ***Appendix D***. The total number of receptors and frequent outdoor use areas used for feasibility and reasonableness calculations are presented in ***Appendix F*** within the Warranted, Feasible, and Reasonableness Worksheets.

4.6.4. Noise Barriers 4 and 5 – CNE 7, CNE 8, CNE 9, CNE 10, and CNE 11

This noise barrier system would protect receptors located along the northbound lanes of I-395 from traffic noise impacts. Noise Barrier 4 would be a 15-foot high barrier located at the edge of the shoulder of the new northbound I-395 auxiliary lane from Stations 288+00 to 317+00 and the approximate total length of 2,892 feet would produce a surface area of 43,386 square feet. Noise Barrier 5 would be located at the top-of-cut line and within the right-of-way along northbound I-395 traffic lanes from Station 316+32 of the northbound mainline to Station 415+49 of the redesigned northbound I-395 Seminary Road off-ramp. This 15 to 20-foot high barrier would have an approximate total length of 2,591 feet, resulting in a surface area of 42,192 square feet. These two barriers would be physically separated due an existing drainage channel that was assumed to be preserved in the final design; however, all feasibility and reasonableness calculations revere this as a single barrier system. Therefore, the total length and surface area of this wall was calculated to be 5,484 feet and 85,578 square feet, respectively.

Under the Build alternative, 64 outdoor use areas would experience traffic noise levels approaching or exceeding the NAC Category B impact criterion of 67 dBA. Noise Barriers 4 and 5 working as a barrier system would provide feasible and reasonable traffic noise abatement for 59 impacted outdoor use areas in CNEs 8 through 11. An additional 358 non-impacted outdoor use areas at or below the evaluation limit from CNEs 7 through CNE 11 were also benefited from Noise Barriers 4 and 5. Impacted Receptors R7.16, and R7.24, and R10.74 were not able to achieve feasible abatement with Noise Barriers 4 and 5 and are addressed in detail in Section 4.6.5. In addition, some receptors in close proximity but not adjacent to North Van Dorn Street were not benefited by Noise Barriers 4 and 5 due to shielding of traffic noise by buildings within the community. Furthermore, some first row receivers were not impacted by traffic noise levels or experienced a reduced barrier insertion loss due to the addition of the solid safety barrier along the auxiliary lane under the Build Alternative. Details of the barrier analysis including barrier insertion losses are listed in ***Appendix D***.

Since there are 417 benefited dwelling units within the evaluation limit, the square feet per benefited receptor value would be 205. This barrier system would provide feasible abatement for at least 50% of impacted receivers, meets the noise reduction design goal of 7 dB for at least one receptor, and has a square feet per benefited receptor value less than 1,600; therefore, Noise Barriers 4 and 5 would be both feasible and reasonable in accordance with VDOT's State Noise Abatement Policy. Furthermore, Noise Barriers 4 and 5 would still be both feasible and reasonable even if evaluated separately. An overview of the evaluated barrier parameters and analysis calculations is shown in Table 4-5. The total number of receptors and frequent outdoor use areas used for feasibility and reasonableness calculations are presented in ***Appendix F*** within the *Warranted, Feasible, and Reasonableness Worksheets*.

Table 4-5. Summary of Feasible and Reasonable Noise Abatement Measures

Noise Barrier I.D.	Height Range, (ft)	Total Length, (ft)	Total Surface Area (ft^2)	Outdoor Use Areas with Feasible Abatement	Surface Area per Outdoor Use Area with Feasible Abatement	Cost per Sq. Ft	Total Cost
Noise Barrier 1	15	243	3,641	23	158	$37	$134,735
Noise Barrier 2	12 - 20	4,550	65,484	513	128	$37	$2,422,908
Noise Barrier 3	15 - 17	1,256	19,541	73	268	$37	$723,017
Noise Barriers 4 and 5	15 - 20	5,484	85,578	417	205	$37	$3,166,386
Total	12 - 20	11,532	174,244	1,026	--	$37	$6,447,046

Source: Parsons, 2013.

4.6.5. Impacted Areas Without Feasible Noise Abatement

CNE 1 – Carmel Apartments / Quantrell Mews Townhomes

Receptor R1.3.3 would be impacted by peak hour traffic noise levels in the Build alternative but unable to achieve a feasible reduction of traffic noise of at least 5 dB even with a maximum barrier height of 30 feet. With Noise Barrier 1, future traffic noise levels would be reduced at Receptor R1.3.3 by 1 dB. Sheet 1 of Figure 1 located in ***Appendix A*** shows this receiver location within CNE 1.

Receptor R1.23 would also be impacted by peak hour traffic noise levels in the Build alternative; however, a noise barrier within or at the right-of-way line would not provide feasible abatement. In order to provide feasible abatement for two raised patios of the Quantrell Mews townhome community, a noise barrier would need to run perpendicular to the interstate along tall retaining wall along private property at a height much taller than the maximum allowable height of 30 feet; consequently, this would not be cost effective. Furthermore, Noise Barrier 2 could not be extended to provide abatement for Receptor R1.23 since the Quantrell Avenue off-ramp would need to be removed in order for that to occur; however, the current design of Noise Barrier 2 would provide a reduction of future traffic noise levels of 2 dB. Sheet 1 of Figure 1 located in ***Appendix A*** shows this receiver location within CNE 1.

CNE 7 – Brookville Apartment Townhomes

Receptor R7.16 would be impacted by peak hour traffic noise levels in the Build alternative but unable to achieve a feasible reduction of traffic noise of at least 5 dB even with a maximum barrier height of 30 feet. This is most likely due to the local traffic on North Van Dorn Street

which is directly in front of this receptor. A reduction in future traffic noise levels for Receptor R7.16 of 3 dB would be provided by Noise Barrier 4.

Impacted Receptor R7.24 was not able to achieve feasible abatement due to diminishing returns. It was possible to extend Noise Barrier 4 beyond CNE 7 into CNE 6 in order to achieve feasible abatement for impacted Receptor R7.24; however, it would take an additional length of 400 feet at a barrier height of 15 feet for Receptor R7.24 to achieve feasible abatement, and the extension would only provide an additional reduction in traffic noise of 1 dB. A reduction in future traffic noise levels of 4 dB would be provided by Noise Barrier 4 for Receptor R7.24. Sheets 7 and 8 of Figure 1 located in ***Appendix A*** show the receiver locations within CNE 7.

CNE 10 – Parkside Townhomes / Seminary Hill Apartments

Receptor R10.74 would be impacted by peak hour traffic noise levels in the Build alternative but unable to achieve a feasible reduction of traffic noise of at least 5 dB even with a maximum barrier height of 30 feet. This is most likely due to the local traffic on North Van Dorn Street which is directly in front of this receptor. A reduction in future traffic noise levels of 3 dB would be provided by Noise Barrier 5 for these three impacted outdoor use areas. Sheets 10 and 11 of Figure 1 located in ***Appendix A*** show the receiver locations within CNE 10.

CNE 11 – Seminary Towers

The Seminary Towers consist of two large 13 story apartment buildings with resident balconies at each floor. The bottom floor units (2nd floor) would not be impacted by future peak hour traffic noise levels. Balconies above the 4th floor that would be impacted are above the maximum 30-foot allowable barrier height; therefore, these impacted receptors do not qualify for abatement consideration. Sheet 11 of Figure 1 located in ***Appendix A*** shows the receiver locations within CNE 11.

CNE 14 – Southern Towers Apartments

The Southern Towers consist of large 15 story apartment buildings with resident balconies at each floor. The bottom floor units (2nd floor) would not be impacted by future peak hour traffic noise levels. Balconies above the 3rd floor would be impacted but are above the maximum 30-foot allowable barrier height; therefore, these impacted receptors do not qualify for abatement consideration. Sheet 6 of Figure 1 located in ***Appendix A*** shows the receiver locations within CNE 14.

4.6.6. Non-Impacted Areas

CNE 6 – Hawthorn Suites / Place One Condominiums

Frequent outdoor use areas in this CNE include the pool and picnic area of the Hawthorn Suites hotel and the tennis courts of the Place One residential development and are identified as NAC Categories E and C, respectively. Predicted future peak hour traffic noise levels for the hotel are

estimated to be at 66 dBA and the tennis courts at 61 dBA; therefore, these areas are not predicted to experience noise impacts due to levels approaching or exceeding their respective NAC. Since Noise Barrier 4 must be extended to provide feasible abatement for areas of CNE 7, the hotel pool will receive a noise reduction of 7 dB. Noise Barrier 4 would also block line of sight to traffic on I-395 for the tennis courts of the Place One residential development and would experience a reduction in predicted traffic noise levels by 3 dB. Sheet 7 of Figure 1 located in ***Appendix A*** shows the receiver locations of CNE 6.

CNE 12 – Courtyard by Marriot / Commercial Offices

The hotel and commercial properties in this area do not have any defined exterior frequent outdoor use areas with the exception of parking and access routes; therefore, receptors were placed in areas in which people may congregate as well as near the property lines. Since this area does not have any definable outdoor use areas, it does not qualify for impact determination or abatement consideration; however, all of the receptors in this area – which are of NAC Category E – did not approach or exceed the NAC criterion level of 71 dBA and therefore not predicted to experience noise impacts. Sheet 11 of Figure 1 located in ***Appendix A*** shows the receiver locations within CNE 12.

CNE 13 – Mark Center Business Park

CNE 13 contains several large office buildings, parking garages, and other commercial properties. The open areas primarily consist of parking and access routes; however, there are two outdoor seating areas, an outdoor work area, and a tennis court within the business park. Shielding of traffic noise from I-395 from the large buildings of the business park prevented the predicted future peak noise hour traffic noise levels from approaching or exceeding the NAC criterion level of 71 dBA; therefore, this CNE is not predicted to experience noise impacts. Sheets 5 and 6 of Figure 1 located in ***Appendix A*** show the receiver locations within CNE 13.

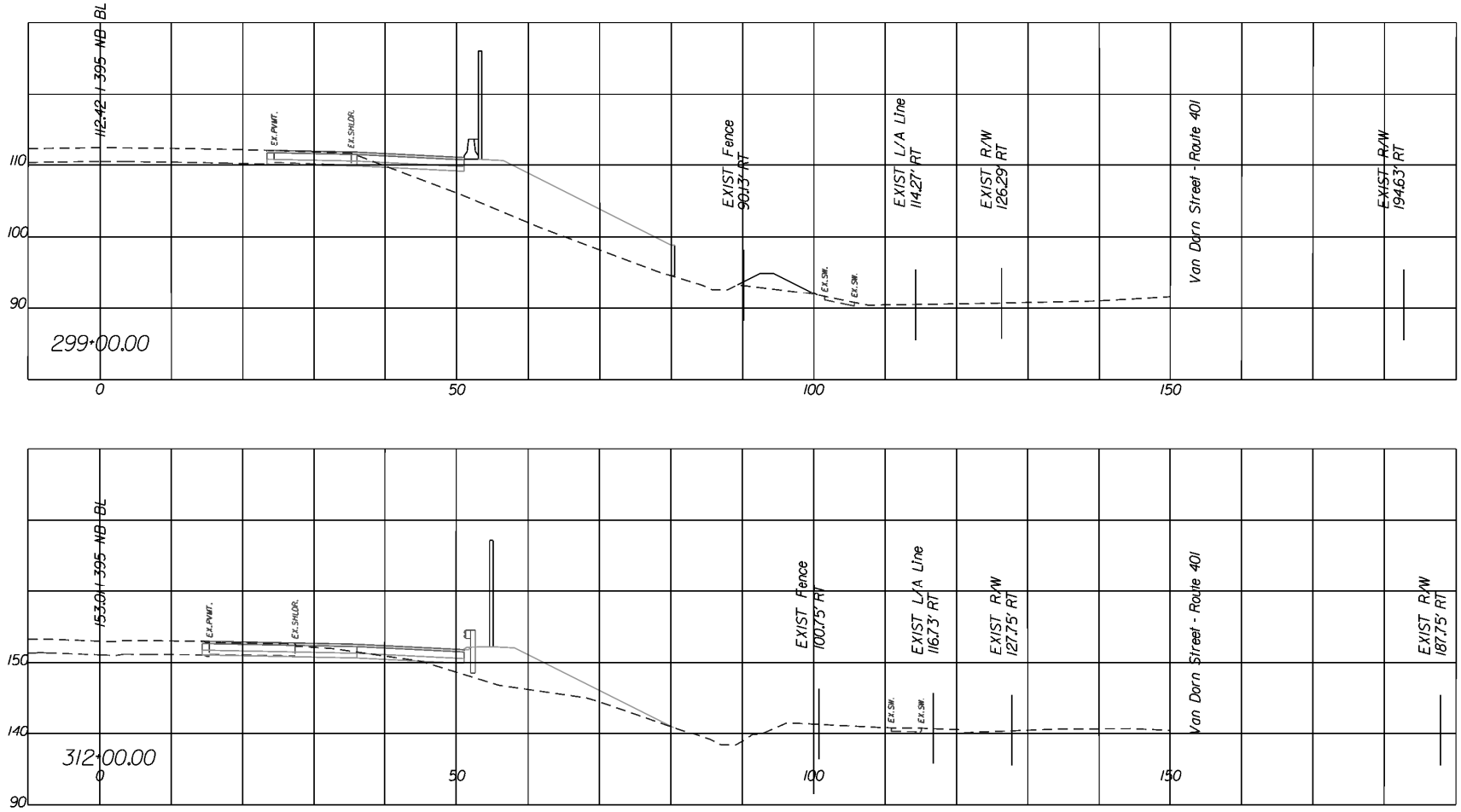
4.6.7. Reflection of Traffic Noise from Noise Barriers

When two parallel noise barriers are close to each other, reflections from traffic noise could occur between these noise barriers which would reduce the effectiveness of the barriers' noise reduction capability. Absorptive materials are used in such instances to minimize or eliminate reflective noise. In accordance to FHWA guidelines, when the ratio of the distance between two parallel noise barriers to barrier height is 10 or less then there is a good possibility of reflective noise build-up between two parallel barriers. VDOT's policy states that when the distance to height ratio is between 10 and 20 the use of absorptive noise barriers must receive consideration.

The smallest value for the distance to height ratio for this project is approximately 12; therefore, absorptive materials, although not required, would need to be considered. Where the smallest distance to height ratio of 12 occurs, the receptors along the northbound and southbound lanes of I-395 are depressed in elevation as compared to the freeway traffic lanes. In this situation,

specular reflections would not occur and absorptive noise barriers would not be needed. However, the varying topography within the project area allows for a number of possible situations where receptors would be elevated in comparison to I-395 traffic lanes exposing reflected traffic noise. For example, Noise Barriers 4 and 5 are located parallel to North Van Dorn Street which could create traffic noise reflection issues for the residences adjacent to the roadway. Reflections could also be an issue for residential areas which are at a higher elevation than Van Dorn Street. Cross sections of I-395, Noise Barrier 4, and Van Dorn Street presented in Figure 4-1 show the two possible conditions of the slope between I-395 and Van Dorn Street. Due to the dirt slope and elevated location of the noise barrier, reflected noise would not be of concern. However, there could be reflected traffic noise from Noise Barrier 5 which is located closer in elevation to Van Dorn Street than Noise Barrier 4. Therefore, due to this example and potential parallel barrier configurations within the project, absorptive barriers were chosen for all noise barriers to avoid the possibility of reflected traffic noise.

Figure 4-1. Typical Cross Sections for Noise Barrier 4



5 Construction Noise

VDOT is also concerned with noise generated during the construction phase of the proposed project since noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. While the degree of construction noise impact will vary, as it is directly related to the types and number of equipment used and the proximity to the noise-sensitive land uses within the project area. Land uses that are sensitive to traffic noise, are also potentially considered to be sensitive to construction noise. Any construction noise impacts that do occur as a result of roadway construction measures are anticipated to be temporary in nature and will cease upon completion of the project construction phase. A method of controlling construction noise is to establish the maximum level of noise that construction operations can generate. In view of this, VDOT has developed and FHWA has approved a specification that establishes construction noise limits. This specification can be found in VDOT's 2007 Road and Bridge Specifications, Section 107.16(b.3), “Noise”. The contractor will be required to conform to this specification to reduce the impact of construction noise on the surrounding community.

The specifications have been reproduced below:

- The Contractor’s operations shall be performed so that exterior noise levels measured during a noise-sensitive activity shall not exceed 80 decibels. Such noise level measurements shall be taken at a point on the perimeter of the construction limit that is closest to the adjoining property on which a noise-sensitive activity is occurring. A noise sensitive activity is any activity for which lowered noise levels are essential if the activity is to serve its intended purpose and not present an unreasonable public nuisance. Such activities include, but are not limited to, those associated with residences, hospitals, nursing homes, churches, schools, libraries, parks, and recreational areas.
- VDOT may monitor construction-related noise. If construction noise levels exceed 80 decibels during noise sensitive activities, the Contractor shall take corrective action before proceeding with operations. The Contractor shall be responsible for costs associated with the abatement of construction noise and the delay of operations attributable to noncompliance with these requirements.
- VDOT may prohibit or restrict to certain portions of the project any work that produces objectionable noise between 10 PM and 6 AM. If other hours are established by local ordinance, the local ordinance shall govern.
- Equipment shall in no way be altered so as to result in noise levels that are greater than those produced by the original equipment.

- When feasible, the Contractor shall establish haul routes that direct his vehicles away from developed areas and ensure that noise from hauling operations is kept to a minimum.

These requirements shall not be applicable if the noise produced by sources other than the Contractor's operation at the point of reception is greater than the noise from the Contractor's operation at the same point.

6 Public Involvement Process

FHWA and VDOT policies require that VDOT provides certain information to local officials within whose jurisdiction the highway project is located, to minimize future traffic noise impacts of Type I projects on currently undeveloped lands (Type I projects involve highway improvements with noise analysis). This information must include information on noise-compatible land-use planning, noise impact zones in undeveloped land in the highway project corridor. This section of the report provides that information, as well as information about VDOT's noise abatement program.

6.1. Noise-Compatible Land-Use Planning

Sections 12.1 and 12.2 of VDOT's 2011 Highway Traffic Noise Impact Analysis Guidance Manual outline VDOT's approach to communication with local officials, and provide information and resources on highway noise and noise-compatible land-use planning. VDOT's intention is to assist local officials in planning the uses of undeveloped land adjacent to highways to minimize the potential impacts of highway traffic noise.

Entering the Quiet Zone is a brochure that provides general information and examples to elected officials, planners, developers, and the general public about the problem of traffic noise and effective responses to it. A link to this brochure on FHWA's website is provided:

http://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/land_use/qz00.cfm

A wide variety of administrative strategies may be used to minimize or eliminate potential highway noise impacts, thereby preventing the need or desire for costly noise abatement structures such as noise barriers in future years. There are five broad categories of such strategies:

- Zoning,
- Other legal restrictions (subdivision control, building codes, health codes),
- Municipal ownership or control of the land,
- Financial incentives for compatible development, and
- Educational and advisory services.

The Audible Landscape: A Manual for Highway and Land Use is a very well-written and comprehensive guide addressing these noise-compatible land use planning strategies, with significant detailed information. This document is available through FHWA's Website, at

http://www.fhwa.dot.gov/environment/noise/noise_compatible_planning/federal_approach/audible_landscape/al00.cfm

Noise Impact Zones in Undeveloped Land along the Study Corridor

Also required under the revised 2011 FHWA and VDOT noise policies is information on the noise impact zones adjacent to project roadways in undeveloped lands. To determine these zones, noise levels are computed at various distances from the edge of the project roadways in each of the undeveloped areas of the project study area. Then, the distances from the edge of the roadway to the NAC sound levels are determined through interpolation. Distances vary in the project corridor due to changes in traffic volumes, or terrain features. Any noise sensitive sites within these zones should be considered noise impacted if no barrier is present to reduce sound levels. The graphics in ***Appendix A*** show the predicted 66 dBA contours for the project.

6.2. Public Involvement Efforts

For noise barriers determined to be feasible and reasonable, the affected public will be given an opportunity to decide whether they are in favor of construction of the noise barrier. A final determination as to the construction of barriers will be made after the public hearing process. As part of the final design noise analysis, for barriers that are determined to be feasible and reasonable, input from the impacted property owners and renters must be obtained through citizen surveys via certified mail. Of the votes tallied, 50% or more must be in favor of a proposed noise barrier in order for that barrier to be considered further.

Upon completion of the citizen survey, the VDOT Noise Abatement staff will make recommendations to the Chief Engineer for approval. Approved barriers will be incorporated into the road project plans. A technical memorandum (noise barrier survey addendum report) will be prepared after the voting process has finished, which documents the voting results and summary of public comments of the noise barrier public survey process. This report is then submitted to the FHWA.

7 References

23 CFR Part 772, 2011. *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, 23 Codes of Federal Regulations, Part 772, July.

FHWA, 2004. U.S. Department of Transportation, FHWA Traffic Noise Model, TNM 2.5, Report No. FHWA–PD–96–010, Revision No. 1, April.

FHWA, 2011. U.S. Department of Transportation, *FHWA Highway Traffic Noise Analysis and Abatement Policy and Guidance*, December.

VDOT, 2011. *Noise Analysis Technical Report: I-395 HOV Ramp at Seminary Road and Mark Center Short- and Mid-Term Improvements*, Virginia Department of Transportation, prepared by Harris Miller Miller & Hanson, December.

VDOT, 2012. *Noise Analysis Technical Report: I-395 Auxiliary Lane*, Virginia Department of Transportation, prepared by Harris Miller Miller & Hanson, October.

VDOT 2013a. *Highway Traffic Noise Impact Analysis Guidance Manual*. Virginia Department of Transportation. Version No. 3. August.

VDOT 2013b. *Noise Report Development and Guidance Document*. Virginia Department of Transportation. Version No. 1. April.

WR&A 2012. *Interchange Modification Report for the I-395 HOT/Transit Ramp at Seminary Road*. Whitman Requardt & Associates, LLP. April.

8 List of Preparers

Jason Ogden, Environmental Noise Specialist. Bachelor of Arts, Acoustics, Columbia College Chicago, Chicago, IL; 6 years of experience in environmental noise and vibration analysis. Contribution: Lead author of Noise Analysis Report. Performed all traffic noise analysis, noise barrier design, and quality assurance/quality control.

Areg Gharabegian, Principal Project Manager. Master of Science, Energy, Resources, and Environment, George Washington University, Washington, D.C.; 33 years experience in environmental and transportation noise and vibration analysis. Contribution: Conducted review and quality control for the Noise Analysis Report.

Appendix A Receptor Locations and Potential Noise Barrier Locations

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VDOT
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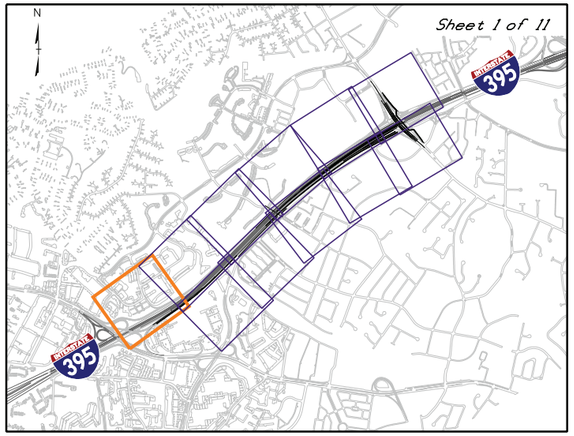
Figure 1
Build Alternative Noise Prediction Locations/Category and Potential Noise Barriers

City of Alexandria, Virginia

Project Number: 0395-100-722, 723, UPC No. 96261, 102437

Receiver Site and Number

- Impacted and Benefited w/ 5 or 6 dB Insertion Loss
- Impacted and Benefited w/ 7 dB or more Insertion Loss
- Impacted and Not Benefited
- Benefited w/ 5 dB or more Insertion Loss
- Not Benefited or Impacted
- Top Floor Noise Prediction Result
- Bottom Floor Noise Prediction Result
- Potential Barrier - Feasible and Reasonable
- 66 dBA $L_{eq(h)}$ Ground Floor Noise Contour without Potential Barriers in Residential and Recreational Areas
- Common Noise Environment (CNE) Areas
- Noise Measurement Site



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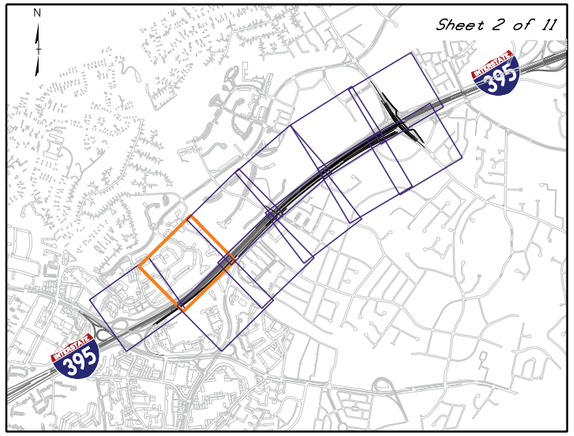

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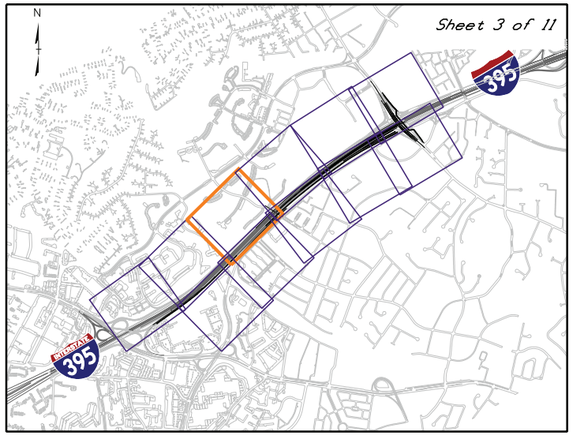

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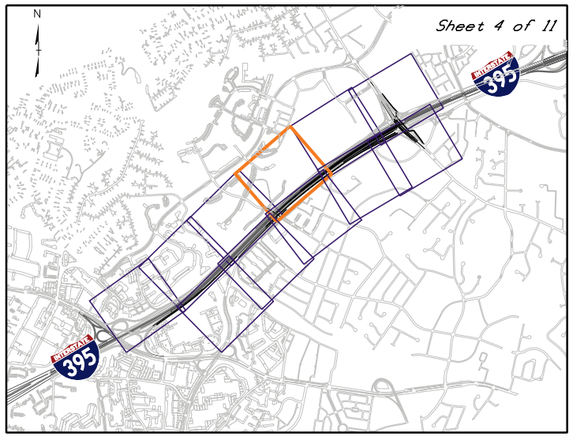

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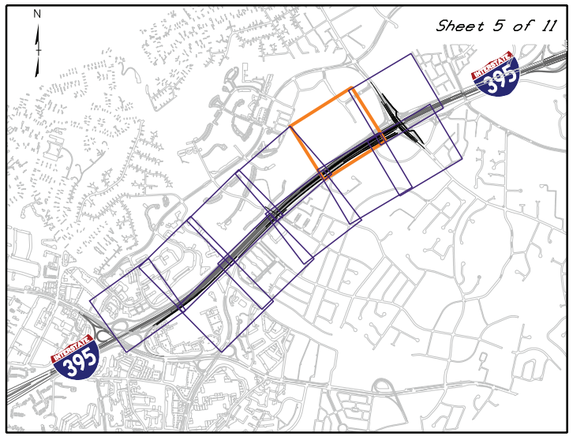

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CNE5

R5.108 R5.109 R5.110 R5.111 R5.112 R5.113

R5.97 R5.98 R5.99 R5.100 R5.101 R5.102

R5.84 R5.85 R5.86 R5.87 R5.88 R5.89

R5.70 R5.71 R5.72 R5.73 R5.74 R5.75

R5.55 R5.56 R5.57 R5.58 R5.59 R5.60

R5.40 R5.41 R5.42 R5.43 R5.44 R5.45

R5.25 R5.26 R5.27 R5.28 R5.29 R5.30

R5.10 R5.11 R5.12 R5.13 R5.14 R5.15

66 dBA

R13.1

R13.2

CNE13

Noise Barrier 3

17' 17' 15' 15'

I-395 SB

I-395 HOV

I-395 NB

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Build Alternative Noise Prediction Locations/Category and Potential Noise Barriers

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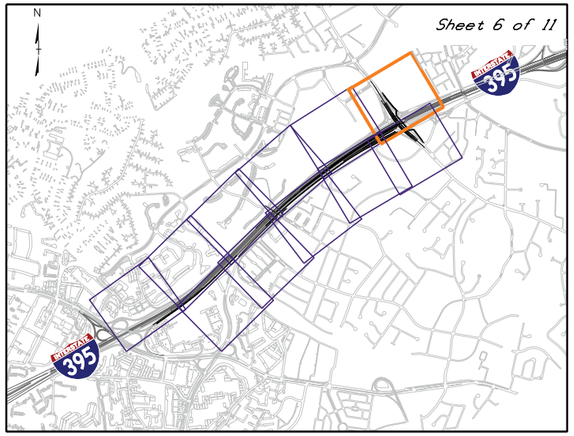

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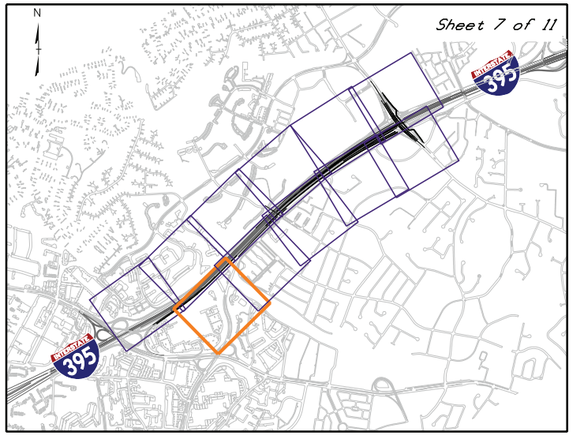

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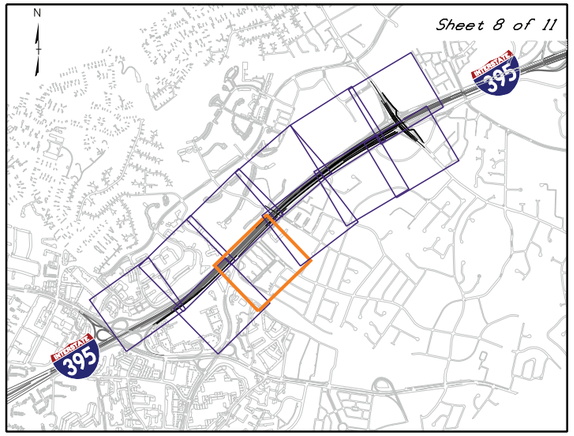

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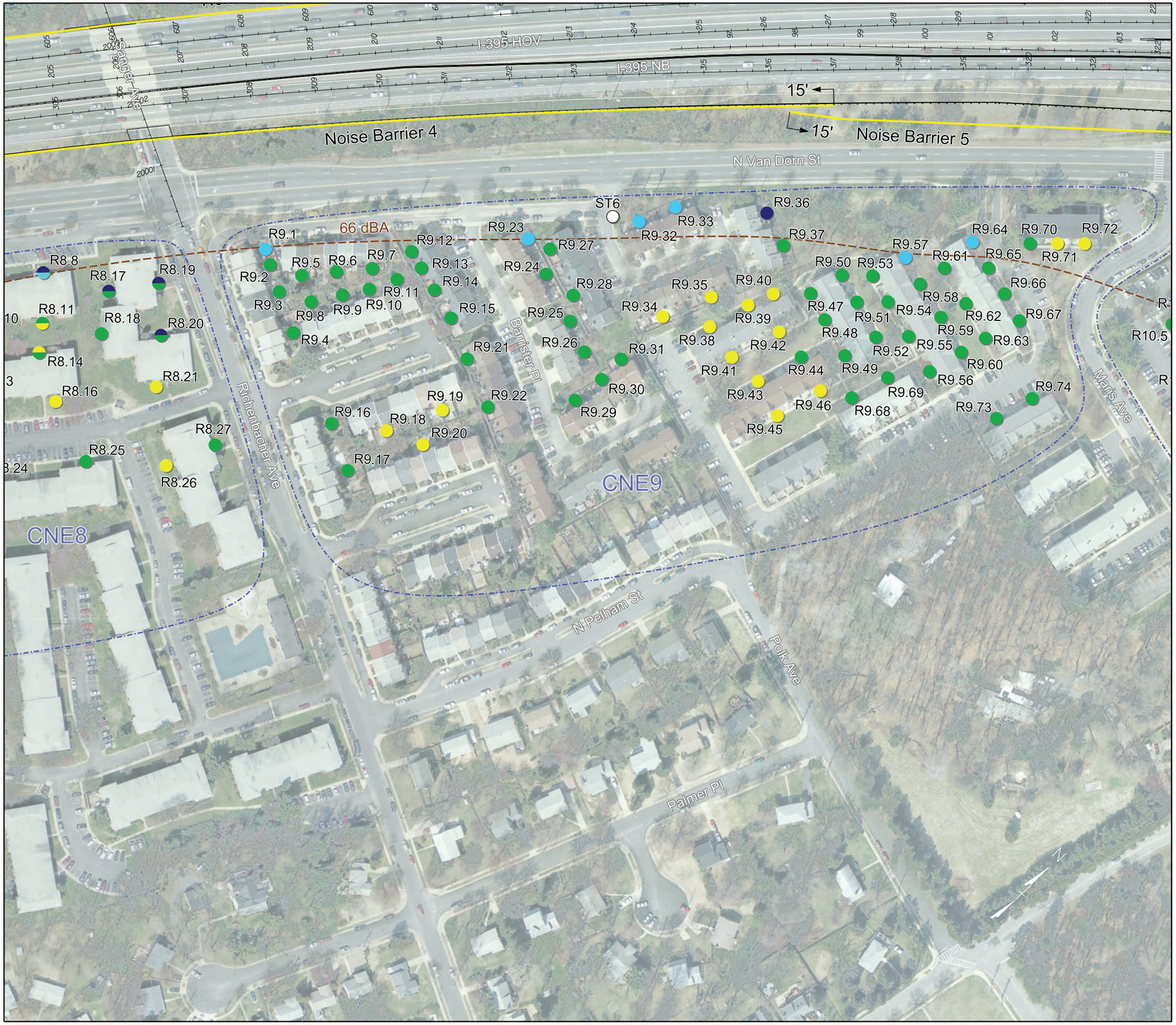

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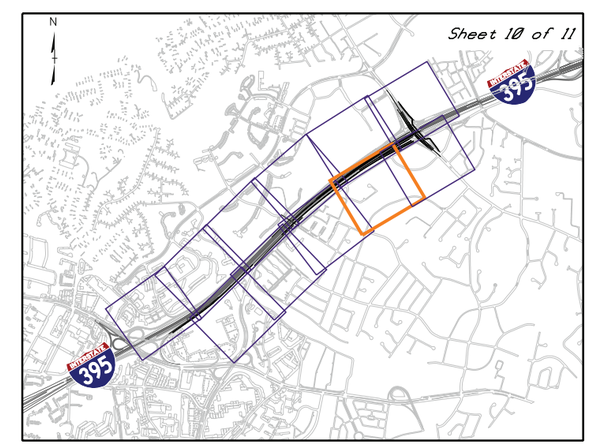

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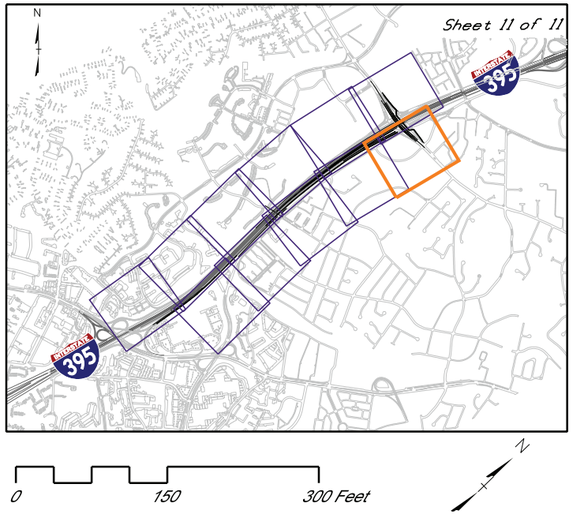

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Appendix B Noise Measurement Data, Site Photographs, and Equipment Calibration Records

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NOISE MEASUREMENT FORM

PROJECT:	ENGINEER:	DATE:
I-395 HOV/Aux	OGDEN	06/19/13

LOCATION:	SITE NO.:
6013 Riddle walk / Sidewalk -- front entrances	1

SOUND LEVEL METER:	MICROPHONE:	PRE AMP:	NOTES:
B+K 2250	B+K 4189	B+K 2L0032	77°F
SERIAL #: 2676029	SERIAL #: 2663101	SERIAL #: 4031	68° humi
CALIBRATOR: B+K 4231	CALIBRATION/OFFSET, dB: 47.1 mV/Pa -0.10dB	TIME: 13:20	Calm (no wind)
METER SETTING: A-weighting / slow			

TIME START	TIME END	L_1	L_{10}	L_{25}	L_{50}	L_{90}	L_{99}	L_{MIN}	L_{MAX}	L_{eq}	NOTES:
13:30	13:40	64.1	63.0		61.6	59.7	57.8	57.4	65.7	61.6	Steady traffic
13:40	13:50	63.9	62.9		61.5	60.1	58.7	58.3	64.3	61.6	retaining wall &
13:50	14:00	64.9	63.5		62.0	60.3	58.7	58.4	65.9	62.2	earth berm
											protecting
											residents
											bird 13:32 13:42

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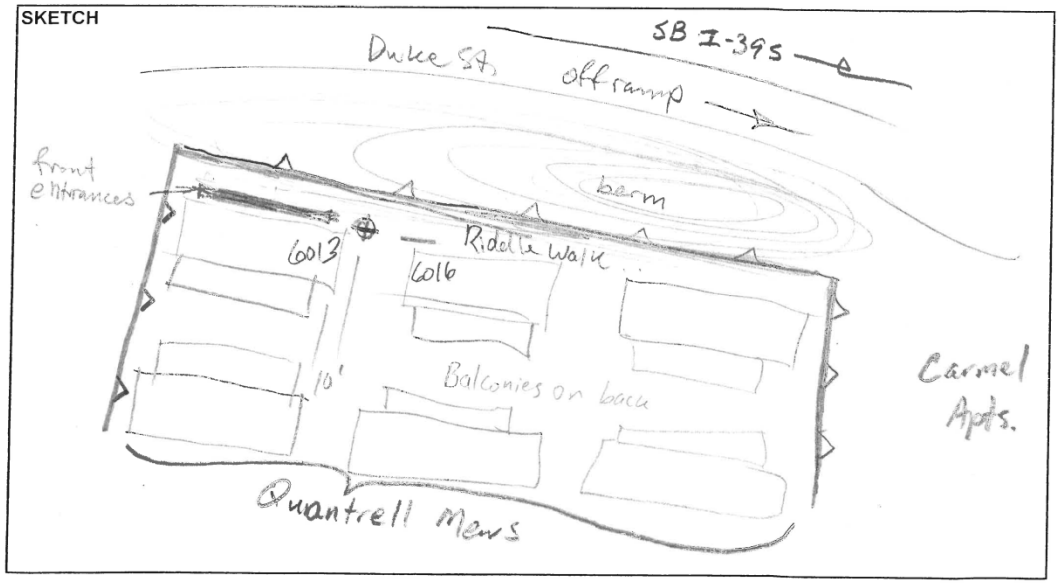


PARSONS

(Facing east)

(Facing west)

SHORT TERM MEASUREMENT SITE ST1

NOISE MEASUREMENT FORM

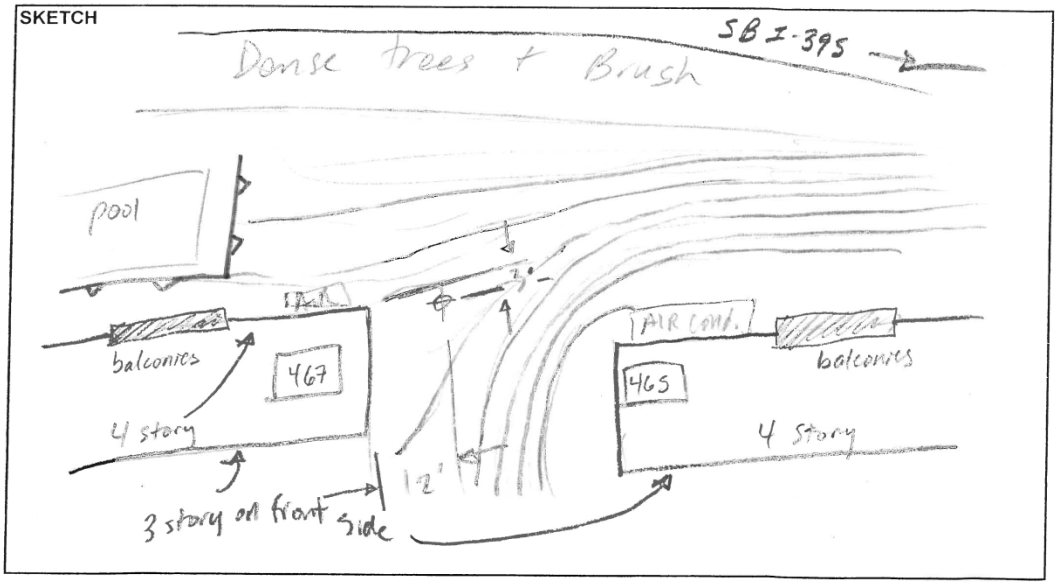
PROJECT:	ENGINEER:	DATE:
I-395 HOV/Auxo	OGDEN	06/19/13

LOCATION:	SITE NO.:
467 Armistead St / open-area (Bennington Crossings)	2

SOUND LEVEL METER:	MICROPHONE:	PRE AMP:	NOTES:
B&K 2250	B&K 4189	B+K ZC 0032	
SERIAL #: 2646029	SERIAL #: 2663101	SERIAL #: 4031	0.8 MPH
CALIBRATOR: B+K 4231	CALIBRATION/OFFSET, dB: 47.2 mV/Pa -0.09dB	TIME: 14:55	77°F
METER SETTING: A weighting / slow			68%

TIME START	TIME END	L_1	L_{10}	L_{25}	L_{50}	L_{90}	L_{99}	L_{MIN}	L_{MAX}	L_{eq}	NOTES:
14:20	14:30	72.2	66.6		64.5	62.9	59.6	58.8	76.3	65.2	Steady traffic
14:30	14:40	67.4	65.7		64.2	62.9	60.0	59.3	68.4	64.4	heli 14:44
14:40	14:50	73.4	66.7		64.5	63.2	62.1	61.3	79.6	65.8	motorcycle end of 1st interval

SKETCH



PARSONS

(Facing east)

(Facing west)

SHORT TERM MEASUREMENT SITE ST2

NOISE MEASUREMENT FORM

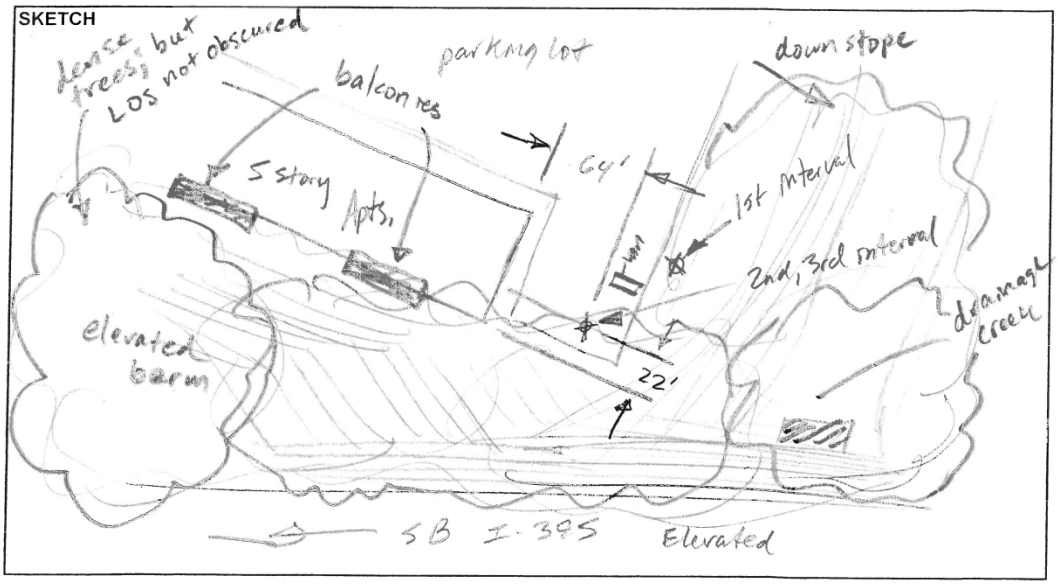
PROJECT:	ENGINEER:	DATE:
I-395 HOV/Aux	OGDEN	06/19/13

LOCATION:	SITE NO.:
Woodmont Park Apartments (parking lot)	3

SOUND LEVEL METER:	MICROPHONE:	PRE AMP:	NOTES:
B+K 2250	B+K 4189	B+K ZC0032	dump trucks from site exiting freeway
SERIAL #: 2676029	SERIAL #: 2663101	SERIAL #: 4031	meter moved after 1st interval (van + building sheilding the roadway)
CALIBRATOR: B+K 4231	CALIBRATION/OFFSET, dB: 93.1 mV/Pa -0.11dB	TIME: 09:17	
METER SETTING: A-weighting / slow			

TIME START	TIME END	L_1	L_{10}	L_{25}	L_{50}	L_{90}	L_{99}	L_{MIN}	L_{MAX}	L_{eq}	NOTES:
11:20	11:30	70.3	67.6		65.1	63.1	61.2	60.0	71.3	65.6	low auto noise
11:30	11:40	71.0	68.9		66.6	64.7	60.9	60.4	71.8	67.0	transient HT
11:40	11:50	71.5	69.2		66.7	64.7	63.0	62.5	73.0	67.3	stacks
											0.6 mPH
											72°F
											71%

SKETCH



PARSONS

(Facing east)

(Facing west)

SHORT TERM MEASUREMENT SITE ST3

NOISE MEASUREMENT FORM

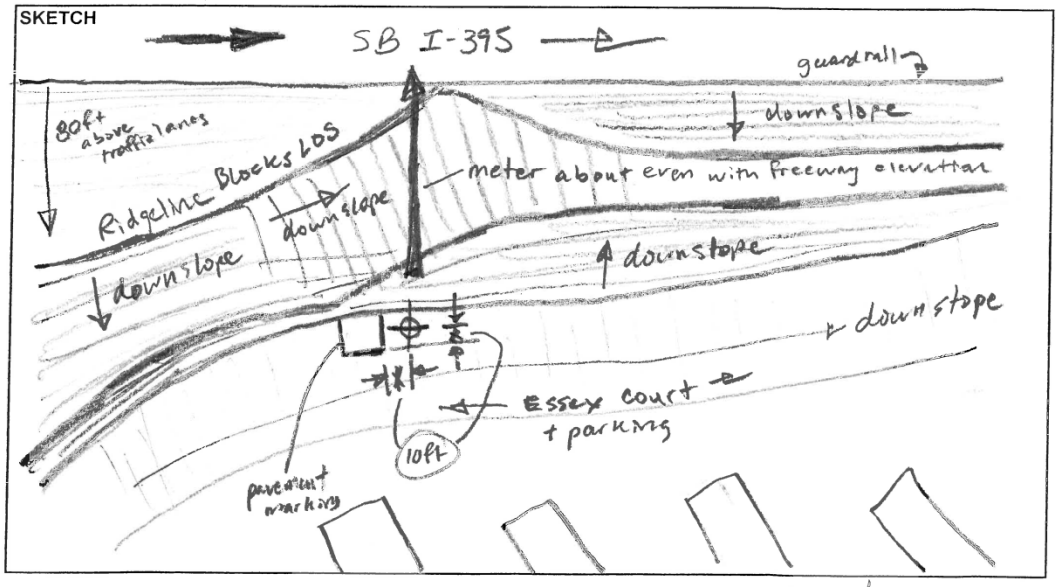
PROJECT:	ENGINEER:	DATE:
I-395 HOV/Aux	OGDEN	06/19/13

LOCATION:	SITE NO.:
Mark Center Apartments Parking Area (Essex Court)	4

SOUND LEVEL METER:	MICROPHONE:	PRE AMP:	NOTES:
B+K 2250	B+K 4189	B+K ZC 0032	trucks bouncing on bridge deck and/or down shifting
SERIAL #: 2676029	SERIAL #: 2663101	SERIAL #: 4031	
CALIBRATOR: B+K 4231	CALIBRATION/OFFSET, dB: 47.1 mPa -0.11dB	TIME: 09:17	dump trucks from nearby construction
METER SETTING: A-weighting / slow			

TIME START	TIME END	L_1	L_{10}	L_{25}	L_{50}	L_{90}	L_{99}	L_{MIN}	L_{MAX}	L_{eq}	NOTES:
10:30	10:40	71.1	69.7		67.5	64.8	62.7	61.8	76.5	67.8	car dragged 10:31
10:40	10:50	73.0	70.3		68.0	65.4	61.4	59.9	77.5	68.5	Siren 10:32
10:50	11:00	72.4	70.1		68.1	65.9	64.2	63.2	73.2	68.4	car doors 10:35
											76% Hum.
											no wind
											73°F

SKETCH



PARSONS

balconies + patios ⇒ both sides 2 story / 3 story walkout

(Facing east)

(Facing west)

SHORT TERM MEASUREMENT SITE ST4

NOISE MEASUREMENT FORM

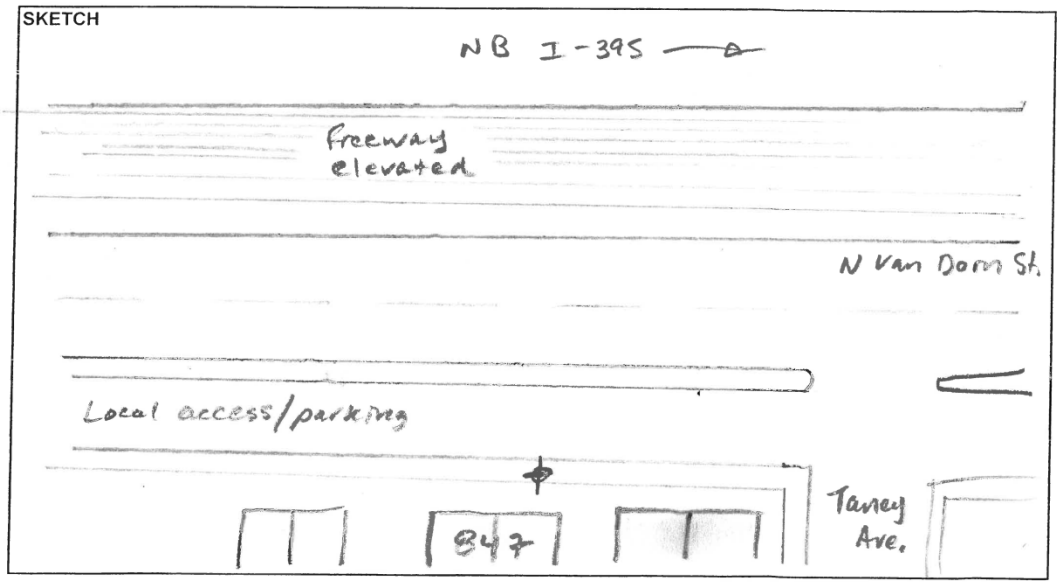
PROJECT:	ENGINEER:	DATE:
I-395 HOV / Aux	OGDEN	06/19/13

LOCATION:	SITE NO.:
847 Van Dorn St. / Sidewalk	5

SOUND LEVEL METER:	MICROPHONE:	PRE AMP:	NOTES:
B+K 2250	B+K 4189	B+K ZC 0032	1.2 MPH
SERIAL #: 2626029	SERIAL #: 2663101	SERIAL #: 4031	68.7 % Hum.
CALIBRATOR: B+K 4231	CALIBRATION/OFFSET, dB: 47.1 mV/Pa -0.11dB	TIME: 09:17	72 °F
METER SETTING: A-weighting / slow			

TIME START	TIME END	L_1	L_{10}	L_{25}	L_{50}	L_{90}	L_{99}	L_{MIN}	L_{MAX}	L_{eq}	NOTES:
09:30	09:40	76.7	72.9		70.5	68.2	67.1	65.9	78.7	71.1	
09:40	09:50	76.4	72.8		70.2	68.2	67.0	66.3	77.7	70.9	
09:50	10:00	76.8	72.7		69.6	67.9	66.8	65.9	79.5	70.6	

SKETCH



PARSONS

(Facing south)

(Facing north)

SHORT TERM MEASUREMENT SITE ST5

NOISE MEASUREMENT FORM

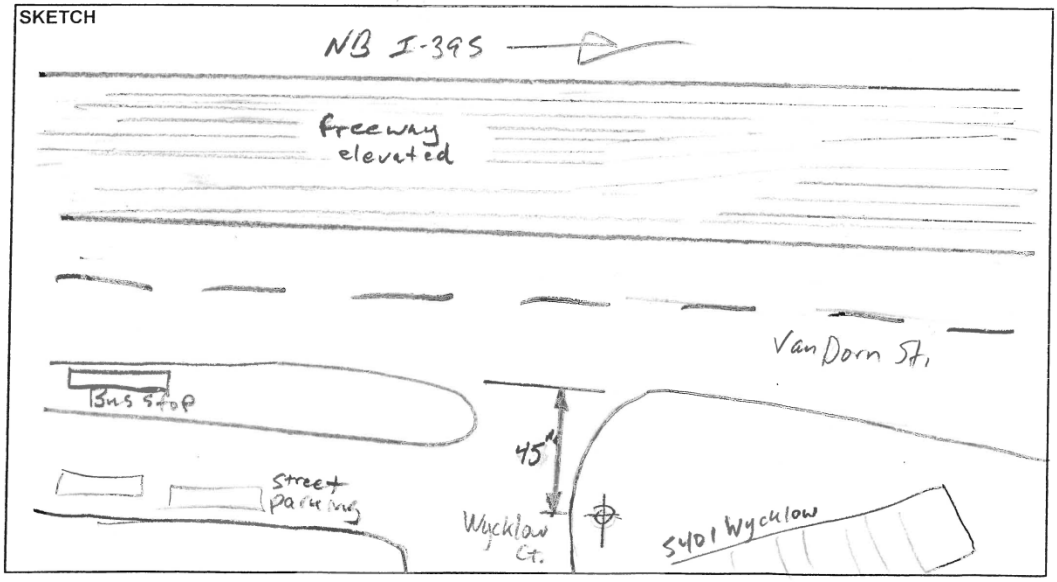
PROJECT:	ENGINEER:	DATE:
I-395 HOV/AUX	OGDEN	06/13/13

LOCATION:	SITE NO.:
N Van Dorn Street @ Wycklow Court (Hollandtowne at Brookville Apts.)	6

SOUND LEVEL METER:	MICROPHONE:	PRE AMP:	NOTES:
B&K 2250	B&K 4189	B&K ZC 0032	0.8 MPH 80% Hum 77°F
SERIAL #: 2676029	SERIAL #: 2663101	SERIAL #: 4031	
CALIBRATOR: B&K 4231	CALIBRATION/OFFSET, dB: 47.2mV/Pa -0.12dB	TIME: 10:42	
METER SETTING: A-weighting / Slow			

TIME START	TIME END	L_1	L_{10}	L_{25}	L_{50}	L_{90}	L_{99}	L_{MIN}	L_{MAX}	L_{eq}	NOTES:
10:45	10:55	79.2	71.9		68.7	65.9	64.3	63.7	81.3	70.0	
10:55	11:05	77.2	71.7		67.9	65.3	64.4	64.1	81.7	69.4	
11:05	11:15	77.6	72.2		68.0	65.5	64.2	63.6	82.2	69.7	

SKETCH



PARSONS

(Facing west)

(Facing east)

SHORT TERM MEASUREMENT SITE ST6

NOISE MEASUREMENT FORM

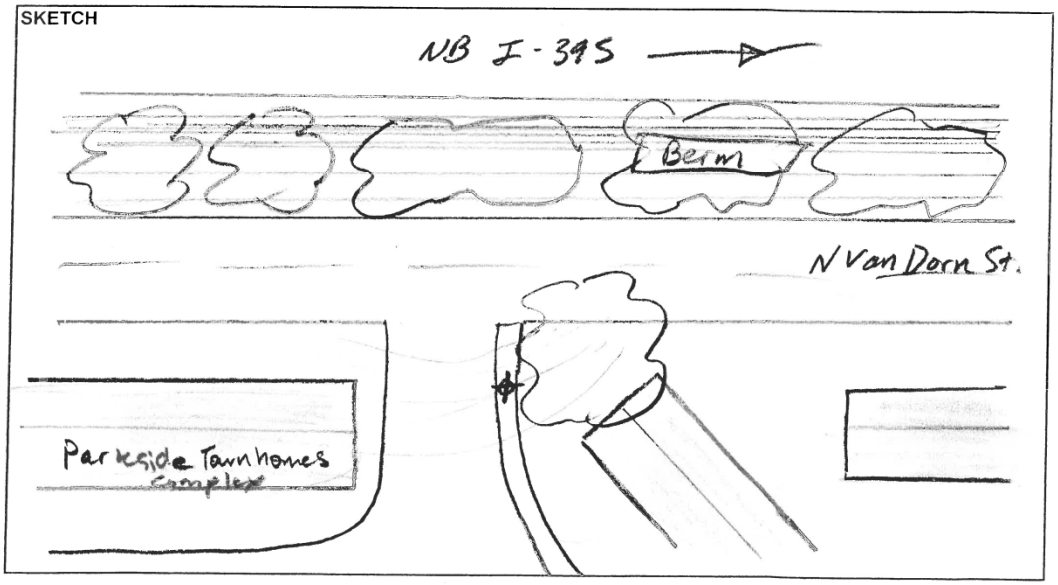
PROJECT:	ENGINEER:	DATE:
I-395 HOV / AUX	OGDEN	06/18/13

LOCATION:	SITE NO.:
Parkside Townhomes / sidewalk	7

SOUND LEVEL METER:	MICROPHONE:	PRE AMP:	NOTES:
B+K 2250	B+K 4189	B+K ZC 0032	1.3 MPH 77 °F 74% Hum
SERIAL #: 2676029	SERIAL #: 2663101	SERIAL #: 4031	
CALIBRATOR: B+K 4231	CALIBRATION/OFFSET, dB: 47.0 mV/Pa -0.12dB	TIME: 12:40	
METER SETTING: A-weighting / slow			

TIME START	TIME END	L_1	L_{10}	L_{25}	L_{50}	L_{90}	L_{99}	L_{MIN}	L_{MAX}	L_{eq}	NOTES:
11:35	11:45	71.0	67.7		64.5	61.7	60.1	58.7	73.0	65.3	
11:45	11:55	72.6	67.4		64.9	61.8	60.9	60.5	75.2	65.6	
11:55	12:05	72.2	67.3		64.2	61.6	60.0	59.2	78.7	65.4	

SKETCH



PARSONS

SHORT TERM MEASUREMENT SITE ST7

CERTIFICATE OF CALIBRATION
19793-6
FOR BRÜEL & KJÆR
HANDHELD ANALYZER

Model **2250** — Serial No. **2676029**
ID No. **N/A**

With Microphone **4189** — Serial No. **2663101**
With Preamplifier **ZC0032** — ID No. **10769**

Customer: **Parsons**
Pasadena, CA 91124 — P.O. No. **Verbal**

was tested and met factory specifications at the points tested.
Complies to: IEC 61672:2002 Class 1

on **08 MAR 2013** BY **HAROLD LYNCH**
Service Manager

As received condition: Within Specification.
Re-calibration due on: **08 MAR 2014**

Certified References*

Mfg.	Type	Serial No.	Cal Date	Due Date
B&K	1049	1288946	05 NOV 2012	05 NOV 2013
B&K	2636	1601487	23 MAY 2012	23 MAY 2013
B&K	4226	1774068	15 MAR 2012	15 MAR 2013
B&K	4231	2094472	27 FEB 2013	27 FEB 2014
HP	34401A	US36071531	12 JUN 2012	12 JUN 2013
HP	3458A	2823A17713	17 JUL 2012	17 JUL 2013

Performed in Compliance with ANSI, NCSL Z-540-1, 1994 and ISO 17025,
ISO 9001:2008 Certification NQA No. 11252
*References are traceable to NIST (National Institute of Standards and Technology).

Note: For calibration data see enclosed pages.
The data represent both "as found" and "as left" conditions.

Reference Test Procedure: **ACCT Procedure 2250-Light-2270 Version 3.1.3.**

Temperature	Relative Humidity	Barometric Pressure
23°C	**34** %	**984.93** hPa

Note: This calibration report shall not be reproduced, except in full, without written consent by Odin Metrology, Inc..

Signed: Harold Lynch

ODIN METROLOGY, INC.
CALIBRATION OF BRÜEL & KJÆR INSTRUMENTS
3533 OLD CONEJO ROAD, SUITE 125 THOUSAND OAKS CA 91320
PHONE: (805) 375-0830 FAX: (805) 375-0405

Odin Metrology, Inc.
Calibration of Sound & Vibration Instruments

Certificate Number: **19793-7**

Certificate of Calibration for Brüel & Kjær 1/2" Free-field Microphone

This calibration is performed by comparison with measurement reference standard microphone:

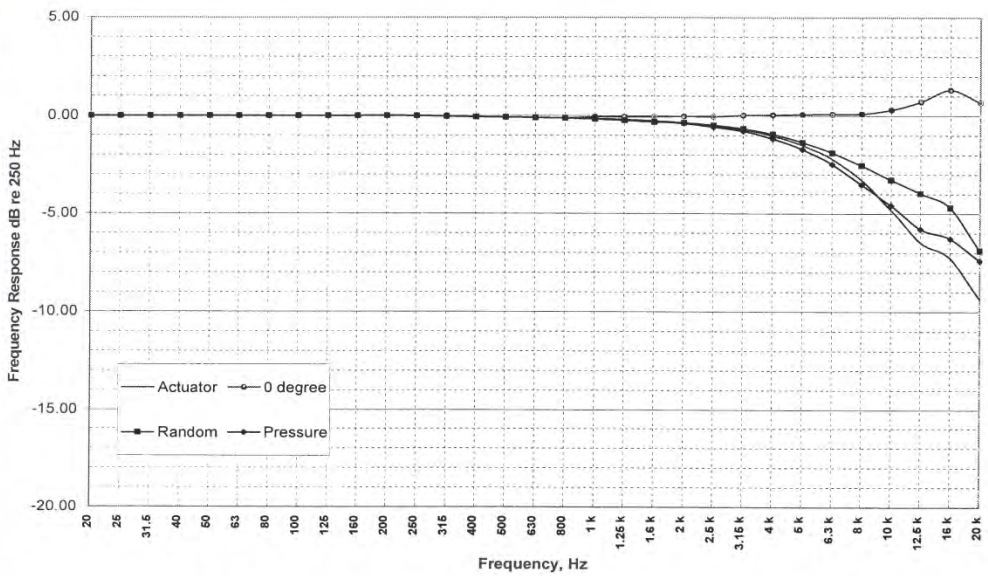
REFERENCE STANDARDS	
Type No.	4134/UA0825
Serial No.	1866523
Calibrated by	DANAK
Cal Date	21 SEP 2012
Due Date	21 SEP 2014

a) Estimated uncertainty of comparison: ± **0.05** dB
b) Estimated uncertainty of reference microphone: ± **0.04** dB
c) Total uncertainty: $\sqrt{a^2+b^2}$ = ± **0.064** dB
d) Expanded uncertainty (coverage factor k = 2 for 95% confidence level): = ± **0.13** dB

Type no.	**4189**
Serial no.	**2663101**
With preamplifier type no.	**N/A**
Preamplifier Serial no.	**N/A**
Submitted by	**Parsons Pasadena, CA 91124**
Purchase order no.	**Verbal**
Asset no.	**N/A**

PERFORMANCE DATA		
Open circuit sensitivity at 1,013 hPa, 23°C, 50% RH, 251.2 Hz	**-26.22**	dB re 1 V/Pa
	48.87	mV/Pa
Open circuit correction factor K_0	**0.2**	dB
System sensitivity (with preamplifier) at 251.2 Hz	**N/A**	dB re 1 V/Pa
	N/A	mV/Pa
Correction factor K	**N/A**	dB

Microphone Frequency Response Type 4189
S/N 2663101 : Measured 7 Mar 2013



Calibration performed by Harold Lynch

Harold Lynch, Service Manager

CONDITION OF TEST		
Ambient Pressure	**988.29**	hPa
Temperature	**23**	°C
Relative Humidity	**36**	%
Polarization Voltage	**0**	V
Frequency	**251.2**	Hz
Date of Calibration	**07 MAR 2013**	
Re-calibration due on	**07 MAR 2014**	

ODIN METROLOGY, INC.
3533 OLD CONEJO ROAD, SUITE 125
THOUSAND OAKS, CA 91320
PHONE: (805) 375-0830; FAX: (805) 375-0405

The calibration data is both "as found" and "as final." At the time of calibration this microphone was found to be **within** the manufacturer's specifications.

This calibration is traceable to NIST Test Number: **681/280896-11 D1308**.

Note: This calibration report shall not be reproduced, except in full, without written consent of Odin Metrology, Inc.

Odin Metrology, Inc.
Calibration of Sound & Vibration Instruments

Certificate Number: **19793-8**

Certificate of Calibration for Brüel & Kjær Sound Level Calibrator

This calibration is performed by comparison with measurement reference standard pistonphones:

Type No.	4220	4228
Serial No.	1048473	1504084
Calibrated by	TE	TE
Cal Date	23 OCT 2012	23 OCT 2012
Due Date	23 OCT 2013	23 OCT 2013

a) Estimated uncertainty of comparison: ± **0.05** dB
b) Estimated uncertainty of calibration service for standard pistonphone: ± **0.06** dB
c) Total uncertainty: $\sqrt{a^2+b^2}$ = ± **0.08** dB
d) Expanded uncertainty (coverage factor k = **2** for 95% confidence level): = ± **0.16** dB

This acoustic calibrator has been calibrated using standards with values traceable to the National Institute of Standards and Technology. This calibration is traceable to NIST Test Number **681/280896-11 D1308**.

CONDITION OF TEST		
Ambient Pressure	**993.82**	hPa
Temperature	**23**	°C
Relative Humidity	**32**	%
Date of Calibration	**11 MAR 2013**	
Re-calibration due on	**11 MAR 2014**	

The calibration of this acoustic calibrator was performed using a test system conforming to the requirements of ANSI/NCSLZ540-1, 1994, ISO 17025, and ISO 9001-2008, Certification NQA No. 11252.

Calibration performed by

Harold Lynch, Service Manager

ODIN METROLOGY, INC.
3533 OLD CONEJO ROAD, SUITE 125
THOUSAND OAKS, CA 91320
PHONE: (805) 375-0830; FAX: (805) 375-0405

Calibrator type	**4231**
Serial no.	**2507137**
Submitted by	**Parsons** **Pasadena, CA 91124**
Purchase order no.	**Verbal**
Asset no.	**N/A**

This calibrator has been found to perform **within** the specifications listed below at the normalized conditions stated.

SPL produced in coupler terminated by a loading volume of 1.333 cm^3	94.0 ± 0.2 dB
Level Step	20 ± 0.1 dB
Frequency	1,000 Hz ± 0.1%
Distortion	< 1%
At 1,013 hPa, 20°C, and 65% relative humidity	

PERFORMANCE AS RECEIVED		
Frequency	**1000.0**	Hz
SPL	**93.97**	dB
SPL+20 dB	**114.00**	dB
Distortion	**0.3**	%
Battery Voltage	**1.52**	V

Was repair or adjustment performed?	**No**
Were parts replaced?	**No**
Were batteries replaced?	**No**

FINAL PERFORMANCE		
Frequency	**1000.0**	Hz
SPL	**93.97**	dB
SPL+20 dB	**114.00**	dB
Distortion	**0.3**	%

Note: This calibrator was **within** manufacturer's specifications as received.

Note: This calibration report shall not be reproduced, except in full, without written consent of Odin Metrology, Inc.

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Table C-1. Noise Model Validation Traffic Counts

Description of Traffic Lane	Number of Lanes	Total Traffic Volumes	Auto Travel Speeds, mph	Truck Travel Speeds, mph	Hourly Volumes by Vehicle Type				
					Cars	Medium Trucks	Heavy Trucks	Buses	Motorcycles
Hourly Traffic Counts for Measurement 1 dated 06/19/2010 from 13:30 to 14:00									
Interstate 395 Traffic									
NB General Purpose Lanes	3	3,478	60	55	3,310	82	86	4	14
NB Duke Street On-Ramp	1	1,202	55 to 20	55 to 20	1,168	18	16	10	0
SB General Purpose Lanes	4	4,168	55	55	3,916	122	130	8	2
SB HOT Lanes	2	1,214	60	60	1,158	22	34	2	22
SB Quantrell Avenue Off-Ramp	1	130	55 to 20	55 to 20	126	4	0	0	0
SB 236 Turnpike Off-Ramp	1	496	55 to 20	55 to 20	490	4	2	0	0
Hourly Traffic Counts for Measurement 2 dated 06/19/2010 from 14:20 to 14:50									
Interstate 395 Traffic									
NB General Purpose Lanes	3	3,304	55	55	3,178	66	60	24	6
NB Duke Street On-Ramp	1	1,216	55 to 20	55 to 20	1,184	22	10	2	2
SB General Purpose Lanes	4	5,412	55	55	5,160	140	112	6	2
SB HOT Lanes	2	2,608	60	60	2,552	24	32	10	32
SB Quantrell Avenue Off-Ramp	1	654	55 to 20	55 to 20	644	6	4	2	2
SB 236 Turnpike Off-Ramp	1	148	55 to 20	55 to 20	148	0	0	0	0
Hourly Traffic Counts for Measurement 3 dated 06/19/2010 from 11:20 to 11:50									
Interstate 395 Traffic									
NB General Purpose Lanes	3	3,370	60	55	3,194	70	106	20	16
NB HOT Lanes	2	148	60	60	130	2	16	2	2
NB Duke Street On-Ramp	1	1,270	55 to 20	55 to 20	1,216	34	20	2	2
SB General Purpose Lanes	4	3,782	55	55	3,460	154	168	6	22
SB Quantrell Avenue Off-Ramp	1	98	55 to 20	55 to 20	98	0	0	0	0
SB 236 Turnpike Off-Ramp	1	458	55 to 20	55 to 20	444	12	2	0	0
Hourly Traffic Counts for Measurement 4 dated 06/19/2010 from 10:30 to 11:00									
Interstate 395 Traffic									
NB General Purpose Lanes	3	3,072	60	55	2,888	82	102	6	4
NB HOT Lanes	2	1,350	60	55	1,314	12	24	16	6
NB Duke Street On-Ramp	1	1,330	55 to 20	55 to 20	1,272	32	26	2	2
SB General Purpose Lanes	4	3,580	55	55	3,300	126	154	14	6
SB Quantrell Avenue Off-Ramp	1	92	55 to 20	55 to 20	90	2	0	0	0
SB 236 Turnpike Off-Ramp	1	324	55 to 20	55 to 20	314	10	0	2	0

Table C-1. Noise Model Validation Traffic Counts (continued)

Description of Traffic Lane	Number of Lanes	Total Traffic Volumes	Auto Travel Speeds, mph	Truck Travel Speeds, mph	Hourly Volumes by Vehicle Type				
					Cars	Medium Trucks	Heavy Trucks	Buses	Motorcycles
Hourly Traffic Counts for Measurement 5 dated 06/19/2010 from 9:30 to 10:00									
Interstate 395 Traffic									
NB General Purpose Lanes	3	3,288	60	60	3,062	150	76	0	6
NB HOT Lanes	2	1,916	60	60	1,880	18	18	6	6
NB Duke Street On-Ramp	1	1,206	55 to 20	55 to 20	1,168	24	14	2	4
SB General Purpose Lanes	4	3,298	60	55	3,032	86	180	8	12
SB Quantrell Avenue Off-Ramp	1	88	55 to 20	55 to 20	84	4	0	0	0
SB 236 Turnpike Off-Ramp	1	362	55 to 20	55 to 20	356	6	0	2	0
Local Traffic									
NB Van Dorn Street	2	655	35	35	626	24	5	4	4
SB Van Dorn Street	2	614	35	35	594	20	0	6	4
Hourly Traffic Counts for Measurement 6 dated 06/18/2010 from 10:45 to 11:15									
Interstate 395 Traffic									
NB General Purpose Lanes	3	3,582	55	55	3,322	156	104	2	2
NB HOT Lanes	2	1,138	60	60	1,100	10	28	10	2
NB Seminary Road Off-Ramp	1	742	55 to 20	55 to 20	714	12	16	0	2
SB General Purpose Lanes	4	3,564	55	55	3,228	184	152	10	14
SB Seminary Road On-Ramp	1	698	20 to 55	20 to 55	666	30	2	0	0
Local Traffic									
Van Dorn Street	4	878	40	40	850	28	0	26	0
Hourly Traffic Counts for Measurement 7 dated 06/18/2010 from 11:35 to 12:05									
Interstate 395 Traffic									
NB General Purpose Lanes	3	3,652	55	55	3,452	82	118	8	8
NB HOT Lanes	2	236	60	60	224	6	6	0	2
NB Seminary Road Off-Ramp	1	570	55 to 20	55 to 20	544	18	8	0	0
SB General Purpose Lanes	4	3,688	55	55	3,410	154	124	10	12
SB Seminary Road On-Ramp	1	722	20 to 55	20 to 55	674	28	20	0	2
Local Traffic									
Van Dorn Street	4	788	35	35	774	14	0	8	0

Table C-2. Existing (2010) Modeled Traffic Volumes

Description of Traffic Lane	Number of Lanes	Total Peak Hour Traffic Volumes	Travel Speeds, mph	Volumes by Vehicle Type		
				Cars	Medium Trucks	Heavy Trucks
Interstate 395 - Northbound						
I-395 North - Duke Street Interchange †						
I-395 - North - General Purpose Lanes	3	2,421	57	2,324	22	75
I-395 - North - EB Duke Street Off-Ramp	1	412	55 to 20	395	4	13
I-395 - North - WB Duke Street Loop Off-Ramp	1	291	55 to 20	279	3	9
I-395 - North - EB Duke Street On-Ramp	1	323	20 to 55	310	3	10
I-395 - North - WB Duke Street On-Ramp	1	484	20 to 55	465	4	15
I-395 North - Between Duke Street and Seminary Road †						
I-395 - North - General Purpose Lanes	3	3,228	57	3,099	29	100
I-395 North - Seminary Road Interchange †						
I-395 - North - General Purpose Lanes	3	2,777	59	2,666	25	86
I-395 - North - Seminary Road Off-Ramp	1	451	55 to 20	433	4	14
I-395 - North - Seminary Road On-Ramp	2	348	20 to 55	334	3	11
Interstate 395 - Southbound						
I-395 South - Seminary Road Interchange †						
I-395 - South - General Purpose Lanes	4	3,626	59	3,481	33	112
I-395 - South - Seminary Road Off-Ramp	2	547	55 to 20	525	5	17
I-395 - South - Seminary Road HOV Off-Ramp	3	71	70 to 20	70	1	0
I-395 - South - EB Seminary Road On-Ramp	1	514	20 to 55	493	5	16
I-395 - South - Seminary Road SB Rotory On-Ramp	1	23	20 to 55	22	0	1
I-395 South - Between Seminary Road and Duke Street †						
I-395 - South - General Purpose Lanes	4	4,140	58	3,975	37	128
I-395 - South - Reversable HOV Lanes	2	1,129	70	1,109	20	0
I-395 South - Duke Street Interchange †						
I-395 - South - General Purpose Lanes	3/4	3,726	57	3,577	34	116
I-395 - South - Quantrell Avenue Off-Ramp Off-Ramp	1	83	55 to 20	79	1	3
I-395 - South - 236 Turnpike Off-Ramp	1	331	55 to 20	318	3	10
I-395 - South - EB Duke Street Loop Off-Ramp	1	538	55 to 20	517	5	17
I-395 - South - WB Duke Street Loop On-Ramp	1	484	20 to 55	465	4	15
I-395 - South - EB Duke Street On-Ramp	1	335	20 to 55	322	3	10

†Source: Parsons, 2013.
‡Source: VDOT, 2012.

Table C-2. Existing (2010) Modeled Traffic Volumes (continued)

Description of Traffic Lane	Number of Lanes	Total Peak Hour Traffic Volumes	Travel Speeds, mph	Volumes by Vehicle Type		
				Cars	Medium Trucks	Heavy Trucks
Local Traffic						
Seminary Road Interchange †						
WB - Seminary Road West of I-395	3	1,391	35	1,356	13	22
WB - Seminary Road East of I-395 (Overpass)	2	207	35	202	2	3
WB - Seminary Road (Rotary Bypass and SB Off-Ramp)	2	1,096	35	1,068	10	18
WB - SB I-395 Seminary Rd Off-Ramp (free right turn)	1	552	35	530	5	17
WB - Seminary Road (Rotary Bypass)	2	547	35	533	5	9
WB - Seminary Road East of I-395 (Rotary Bypass)	2	204	35	199	2	3
EB - Seminary Road West of I-395	3	1,372	35	1,338	12	22
EB - Seminary Road East of I-395 (Overpass)	2	315	35	307	3	5
EB - Seminary Road (Rotary Bypass and SB On-Ramp)	2	972	35	947	9	16
EB - SB I-395 Seminary Rd On-Ramp (free right turn)	1	539	35	517	5	17
EB - Seminary Road (Rotary Bypass)	2	454	35	443	4	7
EB - Seminary Road East of I-395 (Rotary Bypass)	2	95	35	92	1	2
NB - Seminary Road (Rotary)	2	832	35	799	7	26
SB - Seminary Road (Rotary)	2	23	35	22	0	1
North Van Dorn Street †						
NB - Duke Street to Richenbacher Avenue	2	312	34	309	3	0
SB - Richenbacher Avenue to Duke Street	2	806	30	799	7	0
NB - Richenbacher Avenue to Seminary Road	2	348	34	345	3	0
SB - Seminary Road to Richenbacher Avenue	2	864	30	856	8	0
Duke Street Interchange ‡						
EB - Duke Street	2	1,873	40	1,832	32	9
WB - Duke Street	2	853	40	836	12	5

†Source: Parsons, 2013.
‡Source: VDOT, 2012.

Table C-3. No-Build (2035) Modeled Traffic Volumes

Description of Traffic Lane	Number of Lanes	Total Peak Hour Traffic Volumes	Travel Speeds, mph	Volumes by Vehicle Type		
				Cars	Medium Trucks	Heavy Trucks
Interstate 395 - Northbound						
I-395 North - Duke Street Interchange †						
I-395 - North - General Purpose Lanes	3	2,590	55	2,486	23	80
I-395 - North - EB Duke Street Off-Ramp	1	414	55 to 20	398	4	13
I-395 - North - WB Duke Street Loop Off-Ramp	1	233	55 to 20	224	2	7
I-395 - North - EB Duke Street On-Ramp	1	315	20 to 55	302	3	10
I-395 - North - WB Duke Street On-Ramp	1	595	20 to 55	571	5	18
I-395 North - Between Duke Street and Seminary Road †						
I-395 - North - General Purpose Lanes	3	3,500	55	3,359	32	109
I-395 North - Seminary Road Interchange †						
I-395 - North - General Purpose Lanes	3	3,010	58	2,890	27	93
I-395 - North - Seminary Road Off-Ramp	1	490	57 to 10	471	4	15
I-395 - North - Seminary Road On-Ramp	2	363	10 to 59	349	3	11
Interstate 395 - Southbound						
I-395 South - Seminary Road Interchange †						
I-395 - South - General Purpose Lanes	4	3,712	59	3,564	33	115
I-395 - South - Seminary Road Off-Ramp	2	498	55 to 20	479	4	15
I-395 - South - Seminary Road HOV Off-Ramp	3	93	55 to 20	91	2	0
I-395 - South - EB Seminary Road On-Ramp	1	707	20 to 55	679	6	22
I-395 - South - Seminary Road SB Rotory On-Ramp	1	6	20 to 55	6	0	0
I-395 South - Between Seminary Road and Duke Street †						
I-395 - South - General Purpose Lanes	4	4,419	56	4,242	40	137
I-395 - South - Reversable HOV Lanes	2	1,347	70	1,109	25	0
I-395 South - Duke Street Interchange †						
I-395 - South - General Purpose Lanes	3	3,712	55	3,563	33	115
I-395 - South - Quantrell Avenue Off-Ramp Off-Ramp	1	141	55 to 20	136	1	4
I-395 - South - 236 Turnpike Off-Ramp	1	566	55 to 20	543	5	18
I-395 - South - EB Duke Street Loop Off-Ramp	1	398	55 to 20	382	4	12
I-395 - South - WB Duke Street Loop On-Ramp	1	334	20 to 55	321	3	10
I-395 - South - EB Duke Street On-Ramp	1	520	20 to 55	499	5	16

†Source: Parsons, 2013.
‡Source: VDOT, 2012.

Table C-3. No-Build (2035) Modeled Traffic Volumes (continued)

Description of Traffic Lane	Number of Lanes	Total Peak Hour Traffic Volumes	Travel Speeds, mph	Volumes by Vehicle Type		
				Cars	Medium Trucks	Heavy Trucks
Local Traffic						
Seminary Road Interchange †						
WB - Seminary Road West of I-395	3	1,480	35	1,443	13	24
WB - Seminary Road East of I-395 (Overpass)	2	350	35	341	3	6
WB - Seminary Road (Rotary Bypass and SB Off-Ramp)	2	1,077	35	1,050	10	17
WB - SB I-395 Seminary Rd Off-Ramp (free right turn)	1	486	35	467	4	15
WB - Seminary Road (Rotary Bypass)	2	609	35	594	5	10
WB - Seminary Road East of I-395 (Rotary Bypass)	2	370	35	361	3	6
EB - Seminary Road West of I-395	3	1,653	35	1,612	15	26
EB - Seminary Road East of I-395 (Overpass)	2	351	35	342	3	6
EB - Seminary Road (Rotary Bypass and SB On-Ramp)	2	1,251	35	1,220	11	20
EB - SB I-395 Seminary Rd On-Ramp (free right turn)	1	713	35	685	6	22
EB - Seminary Road (Rotary Bypass)	2	568	35	554	5	9
EB - Seminary Road East of I-395 (Rotary Bypass)	2	217	35	212	2	3
NB - Seminary Road (Rotary)	2	856	35	821	8	27
SB - Seminary Road (Rotary)	2	44	35	43	0	1
North Van Dorn Street †						
NB - Duke Street to Richenbacher Avenue	2	368	34	365	3	0
SB - Richenbacher Avenue to Duke Street	2	952	29	943	9	0
NB - Richenbacher Avenue to Seminary Road	2	411	34	407	4	0
SB - Seminary Road to Richenbacher Avenue	2	1,019	28	1,010	9	0
Duke Street Interchange ‡						
EB - Duke Street	2	1,924	40	1,882	33	9
WB - Duke Street	2	1,523	40	1,491	22	10

†Source: Parsons, 2013.
‡Source: VDOT, 2012.

Table C-4. Build (2035) Modeled Traffic Volumes

Description of Traffic Lane	Number of Lanes	Total Peak Hour Traffic Volumes	Travel Speeds, mph	Volumes by Vehicle Type		
				Cars	Medium Trucks	Heavy Trucks
Interstate 395 - Northbound						
I-395 North - Duke Street Interchange †						
I-395 - North - General Purpose Lanes	3	2,582	59	2,479	23	80
I-395 - North - EB Duke Street Off-Ramp	1	413	55 to 20	397	4	13
I-395 - North - WB Duke Street Loop Off-Ramp	1	232	55 to 20	223	2	7
I-395 - North - EB Duke Street On-Ramp	1	314	20 to 55	301	3	10
I-395 - North - WB Duke Street On-Ramp	1	593	20 to 55	569	5	18
I-395 North - Between Duke Street and Seminary Road †						
I-395 - North - General Purpose Lanes	3/4	3,489	59	3,350	31	108
I-395 North - Seminary Road Interchange †						
I-395 - North - General Purpose Lanes	3	3,018	58	2,897	27	94
I-395 - North - Seminary Road Off-Ramp	1	471	57 to 10	452	4	15
I-395 - North - Seminary Road On-Ramp	2	390	10 to 59	374	4	12
Interstate 395 - Southbound						
I-395 South - Seminary Road Interchange †						
I-395 - South - General Purpose Lanes	4	3,703	59	3,555	33	115
I-395 - South - Reversable HOV Lanes	2	1,347	70	1,011	19	0
I-395 - South - Seminary Road Off-Ramp	2	459	55 to 20	441	4	14
I-395 - South - Seminary Road HOV Off-Ramp	3	103	55 to 20	101	2	0
I-395 - South - EB Seminary Road On-Ramp	1	640	20 to 55	614	6	20
I-395 - South - Seminary Road SB Rotory On-Ramp	1	29	20 to 55	28	0	1
I-395 South - Between Seminary Road and Duke Street †						
I-395 - South - General Purpose Lanes	4	4,376	56	4,201	39	136
I-395 - South - Reversable HOV Lanes	2	1,347	70	1,470	27	0
I-395 South - Duke Street Interchange †						
I-395 - South - General Purpose Lanes	3	3,763	55	3,613	34	117
I-395 - South - Quantrell Avenue Off-Ramp Off-Ramp	1	140	55 to 20	134	1	4
I-395 - South - 236 Turnpike Off-Ramp	1	560	55 to 20	538	5	17
I-395 - South - EB Duke Street Loop Off-Ramp	1	394	55 to 20	378	4	12
I-395 - South - WB Duke Street Loop On-Ramp	1	339	20 to 55	325	3	10
I-395 - South - EB Duke Street On-Ramp	1	527	20 to 55	506	5	16

†Source: Parsons, 2013.
‡Source: VDOT, 2012.

Table C-4. Build (2035) Modeled Traffic Volumes (continued)

Description of Traffic Lane	Number of Lanes	Total Peak Hour Traffic Volumes	Travel Speeds, mph	Volumes by Vehicle Type		
				Cars	Medium Trucks	Heavy Trucks
Local Traffic						
Seminary Road Interchange †						
WB - Seminary Road West of I-395	3	1,358	35	1,324	12	22
WB - Seminary Road after HOV Entrance (Overpass)	2	373	35	364	3	6
WB - Seminary Road before HOV Entrance (Overpass)	2	419	35	408	4	7
WB - Seminary Road (Rotary Bypass and SB Off-Ramp)	2	967	35	943	9	15
WB - SB I-395 Seminary Rd Off-Ramp (free right turn)	1	413	35	396	4	13
WB - Seminary Road (Rotary Bypass)	2	599	35	584	5	10
WB - Seminary Road East of I-395 (Rotary Bypass)	2	74	35	72	1	1
EB - Seminary Road West of I-395	3	1,917	35	1,869	17	31
EB - Seminary Road before HOV Entrance (Overpass)	2	722	35	704	6	12
EB - Seminary Road after HOV Entrance (Overpass)	2	298	35	290	3	5
EB - Seminary Road (Rotary Bypass and SB On-Ramp)	2	1,251	35	1,220	11	20
EB - SB I-395 Seminary Rd On-Ramp (free right turn)	1	640	35	614	6	20
EB - Seminary Road (Rotary Bypass)	2	596	35	581	5	10
EB - Seminary Road East of I-395 (Rotary Bypass)	2	258	35	252	2	4
NB - Seminary Road (Rotary)	2	814	35	782	7	25
SB - Seminary Road (Rotary)	2	95	35	91	1	3
North Van Dorn Street †						
NB - Duke Street to Richenbacher Avenue	2	368	34	365	3	0
SB - Richenbacher Avenue to Duke Street	2	952	29	943	9	0
NB - Richenbacher Avenue to Seminary Road	2	411	34	407	4	0
SB - Seminary Road to Richenbacher Avenue	2	1,019	28	1,010	9	0
Duke Street Interchange ‡						
EB - Duke Street	2	1,924	40	1,882	33	9
WB - Duke Street	2	1,523	40	1,491	22	10

†Source: Parsons, 2013.
‡Source: VDOT, 2012.

Appendix D Predicted Future Noise Levels and Noise Barrier Analysis

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Table D-1. Future Peak Hour Traffic Noise Levels and Noise Barrier Analysis

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R1.1.1	R1.1	Carmel Apts.	MFR	B (67)	2	NONE	Yes	62	63	63	0
R1.1.2	R1.1	Carmel Apts.	MFR	B (67)	2	NONE	Yes	65	65	65	0
R1.1.3	R1.1	Carmel Apts.	MFR	B (67)	2	A/E	No	66	66	66	0
R1.1.4	R1.1	Carmel Apts.	MFR	B (67)	2	A/E	No	66	67	67	0
R1.1.5	R1.1	Carmel Apts.	MFR	B (67)	2	A/E	No	66	67	67	0
R1.1.6	R1.1	Carmel Apts.	MFR	B (67)	2	A/E	No	67	67	67	0
R1.1.7	R1.1	Carmel Apts.	MFR	B (67)	2	A/E	No	67	67	67	0
R1.1.8	R1.1	Carmel Apts.	MFR	B (67)	2	A/E	No	67	67	67	0
R1.2.1	R1.2	Carmel Apts.	MFR	B (67)	2	NONE	Yes	63	63	63	0
R1.2.2	R1.2	Carmel Apts.	MFR	B (67)	2	NONE	Yes	65	65	65	0
R1.2.3	R1.2	Carmel Apts.	MFR	B (67)	2	A/E	No	65	66	66	0
R1.2.4	R1.2	Carmel Apts.	MFR	B (67)	2	A/E	No	66	66	66	0
R1.2.5	R1.2	Carmel Apts.	MFR	B (67)	2	A/E	No	66	67	67	0
R1.2.6	R1.2	Carmel Apts.	MFR	B (67)	2	A/E	No	66	67	67	0
R1.2.7	R1.2	Carmel Apts.	MFR	B (67)	2	A/E	No	66	67	67	0
R1.2.8	R1.2	Carmel Apts.	MFR	B (67)	2	A/E	No	66	67	67	0
R1.3.2	R1.3	Carmel Apts.	MFR	B (67)	1	A/E	Yes	66	66	60	6
R1.3.3	R1.3	Carmel Apts.	MFR	B (67)	1	A/E	Yes	67	68	67	1
R1.3.4	R1.3	Carmel Apts.	MFR	B (67)	1	A/E	No	68	68	68	0
R1.4.2	R1.4	Carmel Apts.	MFR	B (67)	2	NONE	Yes	61	62	54	8
R1.4.3	R1.4	Carmel Apts.	MFR	B (67)	2	NONE	Yes	63	64	60	4
R1.4.4	R1.4	Carmel Apts.	MFR	B (67)	2	NONE	No	64	65	64	1
R1.5.1	R1.5	Carmel Apts.	MFR	B (67)	2	NONE	Yes	52	53	50	3
R1.5.2	R1.5	Carmel Apts.	MFR	B (67)	2	NONE	Yes	57	58	52	6
R1.5.3	R1.5	Carmel Apts.	MFR	B (67)	2	NONE	Yes	60	61	55	6
R1.5.4	R1.5	Carmel Apts.	MFR	B (67)	2	NONE	No	62	62	60	2
R1.5.5	R1.5	Carmel Apts.	MFR	B (67)	2	NONE	No	63	63	62	1

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R1.5.6	R1.5	Carmel Apts.	MFR	B (67)	2	NONE	No	63	64	63	1
R1.5.7	R1.5	Carmel Apts.	MFR	B (67)	2	NONE	No	64	64	64	0
R1.5.8	R1.5	Carmel Apts.	MFR	B (67)	2	NONE	No	65	65	65	0
R1.6.1	R1.6	Carmel Apts.	MFR	B (67)	1	NONE	Yes	51	52	49	3
R1.6.2	R1.6	Carmel Apts.	MFR	B (67)	1	NONE	Yes	56	57	51	6
R1.6.3	R1.6	Carmel Apts.	MFR	B (67)	1	NONE	Yes	59	60	53	7
R1.6.4	R1.6	Carmel Apts.	MFR	B (67)	1	NONE	No	61	62	58	4
R1.6.5	R1.6	Carmel Apts.	MFR	B (67)	1	NONE	No	62	62	61	1
R1.6.6	R1.6	Carmel Apts.	MFR	B (67)	1	NONE	No	62	63	62	1
R1.6.7	R1.6	Carmel Apts.	MFR	B (67)	1	NONE	No	63	64	63	1
R1.6.8	R1.6	Carmel Apts.	MFR	B (67)	1	NONE	No	64	65	64	1
R1.7.1	R1.7	Carmel Apts.	MFR	B (67)	1	NONE	Yes	51	52	50	2
R1.7.2	R1.7	Carmel Apts.	MFR	B (67)	1	NONE	Yes	55	56	51	5
R1.7.3	R1.7	Carmel Apts.	MFR	B (67)	1	NONE	Yes	58	59	52	7
R1.7.4	R1.7	Carmel Apts.	MFR	B (67)	1	NONE	No	60	61	56	5
R1.7.5	R1.7	Carmel Apts.	MFR	B (67)	1	NONE	No	61	62	59	3
R1.7.6	R1.7	Carmel Apts.	MFR	B (67)	1	NONE	No	62	63	61	2
R1.7.7	R1.7	Carmel Apts.	MFR	B (67)	1	NONE	No	63	63	63	0
R1.7.8	R1.7	Carmel Apts.	MFR	B (67)	1	NONE	No	63	64	64	0
R1.8.1	R1.8	Carmel Apts.	MFR	B (67)	1	NONE	Yes	52	53	52	1
R1.8.2	R1.8	Carmel Apts.	MFR	B (67)	1	NONE	Yes	55	56	52	4
R1.8.3	R1.8	Carmel Apts.	MFR	B (67)	1	NONE	Yes	57	59	53	6
R1.8.4	R1.8	Carmel Apts.	MFR	B (67)	1	NONE	No	60	60	55	5
R1.8.5	R1.8	Carmel Apts.	MFR	B (67)	1	NONE	No	61	61	58	3
R1.8.6	R1.8	Carmel Apts.	MFR	B (67)	1	NONE	No	62	62	61	1
R1.8.7	R1.8	Carmel Apts.	MFR	B (67)	1	NONE	No	62	63	62	1
R1.8.8	R1.8	Carmel Apts.	MFR	B (67)	1	NONE	No	63	64	63	1
R1.9	R1.9	Carmel Apts.	REC	C (67)	1	A/E	Yes	68	68	57	11
R1.10	R1.10	Quantrell Mews	MFR	B (67)	3	NONE	Yes	62	62	53	9

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R1.11	R1.11	Quantrell Mews	MFR	B (67)	3	NONE	Yes	53	53	52	1
R1.12	R1.12	Quantrell Mews	MFR	B (67)	2	NONE	Yes	55	55	55	0
R1.13	R1.13	Quantrell Mews	MFR	B (67)	5	NONE	Yes	50	51	50	1
R1.14	R1.14	Quantrell Mews	MFR	B (67)	2	NONE	Yes	55	55	55	0
R1.15	R1.15	Quantrell Mews	MFR	B (67)	3	NONE	Yes	54	54	53	1
R1.16	R1.16	Quantrell Mews	MFR	B (67)	2	NONE	Yes	61	62	55	7
R1.17	R1.17	Quantrell Mews	MFR	B (67)	3	NONE	Yes	57	58	52	6
R1.18	R1.18	Quantrell Mews	MFR	B (67)	2	NONE	Yes	54	54	52	2
R1.19	R1.19	Quantrell Mews	MFR	B (67)	3	NONE	Yes	55	55	54	1
R1.20	R1.20	Quantrell Mews	MFR	B (67)	2	NONE	Yes	54	54	51	3
R1.21	R1.21	Quantrell Mews	MFR	B (67)	2	NONE	Yes	56	57	53	4
R1.22	R1.22	Quantrell Mews	MFR	B (67)	3	NONE	Yes	59	60	52	8
R1.23	R1.23	Quantrell Mews	MFR	B (67)	2	A/E	Yes	66	66	64	2
R1.24	R1.24	Quantrell Mews	MFR	B (67)	4	NONE	Yes	48	48	46	2
R1.25	R1.25	Quantrell Mews	MFR	B (67)	4	NONE	Yes	42	43	43	0
R1.26	R1.26	Quantrell Mews	MFR	B (67)	4	NONE	Yes	47	48	48	0
R1.27	R1.27	Quantrell Mews	MFR	B (67)	4	NONE	Yes	56	57	50	7
R1.28	R1.28	Quantrell Mews	MFR	B (67)	4	NONE	Yes	46	47	47	0
R1.29	R1.29	Quantrell Mews	MFR	B (67)	4	NONE	Yes	48	49	47	2
R1.30	R1.30	Quantrell Mews	MFR	B (67)	4	NONE	Yes	53	53	49	4
R1.31	R1.31	Quantrell Mews	MFR	B (67)	4	NONE	Yes	47	49	48	1
R1.32	R1.32	Quantrell Mews	MFR	B (67)	3	NONE	Yes	56	57	53	4
R1.33.1	R1.33	Tower 2000 Apts.	MFR	B (67)	1	NONE	Yes	52	53	51	2
R1.33.2	R1.33	Tower 2000 Apts.	MFR	B (67)	1	NONE	Yes	53	54	51	3
R1.33.3	R1.33	Tower 2000 Apts.	MFR	B (67)	1	NONE	Yes	55	56	53	3
R1.33.4	R1.33	Tower 2000 Apts.	MFR	B (67)	1	NONE	No	56	57	54	3
R1.33.5	R1.33	Tower 2000 Apts.	MFR	B (67)	1	NONE	No	59	60	58	2
R1.33.6	R1.33	Tower 2000 Apts.	MFR	B (67)	1	NONE	No	61	62	61	1
R1.33.7	R1.33	Tower 2000 Apts.	MFR	B (67)	1	NONE	No	63	63	63	0

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R1.33.8	R1.33	Tower 2000 Apts.	MFR	B (67)	1	NONE	No	64	64	64	0
R1.33.15	R1.33	Tower 2000 Apts.	MFR	B (67)	1	A/E	No	67	68	68	0
R1.34.1	R1.34	Tower 2000 Apts.	MFR	B (67)	1	NONE	Yes	55	56	52	4
R1.34.2	R1.34	Tower 2000 Apts.	MFR	B (67)	1	NONE	Yes	56	57	53	4
R1.34.3	R1.34	Tower 2000 Apts.	MFR	B (67)	1	NONE	Yes	57	58	54	4
R1.34.4	R1.34	Tower 2000 Apts.	MFR	B (67)	1	NONE	No	58	59	56	3
R1.34.5	R1.34	Tower 2000 Apts.	MFR	B (67)	1	NONE	No	60	60	58	2
R1.34.6	R1.34	Tower 2000 Apts.	MFR	B (67)	1	NONE	No	61	62	60	2
R1.34.7	R1.34	Tower 2000 Apts.	MFR	B (67)	1	NONE	No	62	62	62	0
R1.34.8	R1.34	Tower 2000 Apts.	MFR	B (67)	1	NONE	No	63	63	63	0
R1.34.15	R1.34	Tower 2000 Apts.	MFR	B (67)	1	A/E	No	67	68	68	0
R2.1.1	R2.1	The Seasons Apts.	MFR	B (67)	1	A/E	Yes	68	69	58	11
R2.1.2	R2.1	The Seasons Apts.	MFR	B (67)	1	A/E	Yes	71	71	59	12
R2.1.3	R2.1	The Seasons Apts.	MFR	B (67)	1	A/E	Yes	72	72	62	10
R2.1.4	R2.1	The Seasons Apts.	MFR	B (67)	1	A/E	No	72	72	68	4
R2.1.5	R2.1	The Seasons Apts.	MFR	B (67)	1	A/E	No	72	73	71	2
R2.1.6	R2.1	The Seasons Apts.	MFR	B (67)	1	A/E	No	72	73	72	1
R2.1.7	R2.1	The Seasons Apts.	MFR	B (67)	1	A/E	No	72	73	72	1
R2.2.1	R2.2	The Seasons Apts.	MFR	B (67)	2	A/E	Yes	68	69	58	11
R2.2.2	R2.2	The Seasons Apts.	MFR	B (67)	2	A/E	Yes	71	71	59	12
R2.2.3	R2.2	The Seasons Apts.	MFR	B (67)	2	A/E	Yes	72	72	61	11
R2.2.4	R2.2	The Seasons Apts.	MFR	B (67)	2	A/E	Yes	72	73	67	6
R2.2.5	R2.2	The Seasons Apts.	MFR	B (67)	2	A/E	No	72	73	71	2
R2.2.6	R2.2	The Seasons Apts.	MFR	B (67)	2	A/E	No	72	73	72	1
R2.2.7	R2.2	The Seasons Apts.	MFR	B (67)	2	A/E	No	72	73	72	1
R2.3.1	R2.3	The Seasons Apts.	MFR	B (67)	2	A/E	Yes	69	69	58	11
R2.3.2	R2.3	The Seasons Apts.	MFR	B (67)	2	A/E	Yes	71	72	59	13
R2.3.3	R2.3	The Seasons Apts.	MFR	B (67)	2	A/E	Yes	72	72	62	10
R2.3.4	R2.3	The Seasons Apts.	MFR	B (67)	2	A/E	Yes	72	73	66	7

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R2.3.5	R2.3	The Seasons Apts.	MFR	B (67)	2	A/E	No	72	73	71	2
R2.3.6	R2.3	The Seasons Apts.	MFR	B (67)	2	A/E	No	72	73	72	1
R2.3.7	R2.3	The Seasons Apts.	MFR	B (67)	2	A/E	No	72	73	72	1
R2.4.1	R2.4	The Seasons Apts.	MFR	B (67)	1	A/E	Yes	69	69	58	11
R2.4.2	R2.4	The Seasons Apts.	MFR	B (67)	1	A/E	Yes	71	72	60	12
R2.4.3	R2.4	The Seasons Apts.	MFR	B (67)	1	A/E	Yes	72	72	62	10
R2.4.4	R2.4	The Seasons Apts.	MFR	B (67)	1	A/E	Yes	72	73	66	7
R2.4.5	R2.4	The Seasons Apts.	MFR	B (67)	1	A/E	No	72	73	70	3
R2.4.6	R2.4	The Seasons Apts.	MFR	B (67)	1	A/E	No	72	73	72	1
R2.4.7	R2.4	The Seasons Apts.	MFR	B (67)	1	A/E	No	72	73	72	1
R2.5.1	R2.5	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	46	47	46	1
R2.5.2	R2.5	The Seasons Apts.	MFR	B (67)	1	NONE	No	48	48	48	0
R2.5.3	R2.5	The Seasons Apts.	MFR	B (67)	1	NONE	No	49	50	49	1
R2.5.4	R2.5	The Seasons Apts.	MFR	B (67)	1	NONE	No	51	51	51	0
R2.5.5	R2.5	The Seasons Apts.	MFR	B (67)	1	NONE	No	53	53	53	0
R2.5.6	R2.5	The Seasons Apts.	MFR	B (67)	1	NONE	No	54	54	53	1
R2.5.7	R2.5	The Seasons Apts.	MFR	B (67)	1	NONE	No	55	56	55	1
R2.6.1	R2.6	The Seasons Apts.	MFR	B (67)	4	NONE	Yes	46	46	46	0
R2.6.2	R2.6	The Seasons Apts.	MFR	B (67)	4	NONE	Yes	48	48	48	0
R2.6.3	R2.6	The Seasons Apts.	MFR	B (67)	4	NONE	No	48	49	48	1
R2.6.4	R2.6	The Seasons Apts.	MFR	B (67)	4	NONE	No	51	51	50	1
R2.6.5	R2.6	The Seasons Apts.	MFR	B (67)	4	NONE	No	54	54	53	1
R2.6.6	R2.6	The Seasons Apts.	MFR	B (67)	4	NONE	No	55	55	54	1
R2.6.7	R2.6	The Seasons Apts.	MFR	B (67)	4	NONE	No	56	56	55	1
R2.7.1	R2.7	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	51	51	47	4
R2.7.2	R2.7	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	52	52	48	4
R2.7.3	R2.7	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	53	53	49	4
R2.7.4	R2.7	The Seasons Apts.	MFR	B (67)	1	NONE	No	54	54	51	3
R2.7.5	R2.7	The Seasons Apts.	MFR	B (67)	1	NONE	No	56	56	55	1

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R2.7.6	R2.7	The Seasons Apts.	MFR	B (67)	1	NONE	No	58	59	56	3
R2.7.7	R2.7	The Seasons Apts.	MFR	B (67)	1	NONE	No	59	59	57	2
R2.8.1	R2.8	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	64	65	56	9
R2.8.2	R2.8	The Seasons Apts.	MFR	B (67)	1	A/E	Yes	67	68	59	9
R2.8.3	R2.8	The Seasons Apts.	MFR	B (67)	1	A/E	No	68	69	64	5
R2.8.4	R2.8	The Seasons Apts.	MFR	B (67)	1	A/E	No	69	69	67	2
R2.8.5	R2.8	The Seasons Apts.	MFR	B (67)	1	A/E	No	69	70	69	1
R2.8.6	R2.8	The Seasons Apts.	MFR	B (67)	1	A/E	No	69	70	69	1
R2.8.7	R2.8	The Seasons Apts.	MFR	B (67)	1	A/E	No	69	70	70	0
R2.9.1	R2.9	The Seasons Apts.	MFR	B (67)	2	NONE	Yes	64	64	56	8
R2.9.2	R2.9	The Seasons Apts.	MFR	B (67)	2	A/E	Yes	66	67	58	9
R2.9.3	R2.9	The Seasons Apts.	MFR	B (67)	2	A/E	No	67	68	63	5
R2.9.4	R2.9	The Seasons Apts.	MFR	B (67)	2	A/E	No	68	68	66	2
R2.9.5	R2.9	The Seasons Apts.	MFR	B (67)	2	A/E	No	68	69	68	1
R2.9.6	R2.9	The Seasons Apts.	MFR	B (67)	2	A/E	No	68	69	68	1
R2.9.7	R2.9	The Seasons Apts.	MFR	B (67)	2	A/E	No	68	69	69	0
R2.10.1	R2.10	The Seasons Apts.	MFR	B (67)	2	NONE	Yes	61	61	55	6
R2.10.2	R2.10	The Seasons Apts.	MFR	B (67)	2	NONE	Yes	63	64	57	7
R2.10.3	R2.10	The Seasons Apts.	MFR	B (67)	2	NONE	No	65	65	61	4
R2.10.4	R2.10	The Seasons Apts.	MFR	B (67)	2	A/E	No	65	66	64	2
R2.10.5	R2.10	The Seasons Apts.	MFR	B (67)	2	A/E	No	66	66	66	0
R2.10.6	R2.10	The Seasons Apts.	MFR	B (67)	2	A/E	No	66	67	66	1
R2.10.7	R2.10	The Seasons Apts.	MFR	B (67)	2	A/E	No	66	67	67	0
R2.11.1	R2.11	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	57	58	52	6
R2.11.2	R2.11	The Seasons Apts.	MFR	B (67)	1	NONE	No	59	60	54	6
R2.11.3	R2.11	The Seasons Apts.	MFR	B (67)	1	NONE	No	61	61	57	4
R2.11.4	R2.11	The Seasons Apts.	MFR	B (67)	1	NONE	No	61	62	60	2
R2.11.5	R2.11	The Seasons Apts.	MFR	B (67)	1	NONE	No	62	63	62	1
R2.11.6	R2.11	The Seasons Apts.	MFR	B (67)	1	NONE	No	63	64	63	1

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R2.11.7	R2.11	The Seasons Apts.	MFR	B (67)	1	NONE	No	63	64	63	1
R2.12.1	R2.12	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	47	48	48	0
R2.12.2	R2.12	The Seasons Apts.	MFR	B (67)	1	NONE	No	48	50	50	0
R2.12.3	R2.12	The Seasons Apts.	MFR	B (67)	1	NONE	No	48	50	50	0
R2.12.4	R2.12	The Seasons Apts.	MFR	B (67)	1	NONE	No	49	50	50	0
R2.12.5	R2.12	The Seasons Apts.	MFR	B (67)	1	NONE	No	50	51	51	0
R2.12.6	R2.12	The Seasons Apts.	MFR	B (67)	1	NONE	No	51	52	52	0
R2.12.7	R2.12	The Seasons Apts.	MFR	B (67)	1	NONE	No	53	54	54	0
R2.13.1	R2.13	The Seasons Apts.	MFR	B (67)	4	NONE	No	45	46	46	0
R2.13.2	R2.13	The Seasons Apts.	MFR	B (67)	4	NONE	No	46	47	47	0
R2.13.3	R2.13	The Seasons Apts.	MFR	B (67)	4	NONE	No	47	48	47	1
R2.13.4	R2.13	The Seasons Apts.	MFR	B (67)	4	NONE	No	48	49	48	1
R2.13.5	R2.13	The Seasons Apts.	MFR	B (67)	4	NONE	No	49	50	49	1
R2.13.6	R2.13	The Seasons Apts.	MFR	B (67)	4	NONE	No	51	51	51	0
R2.13.7	R2.13	The Seasons Apts.	MFR	B (67)	4	NONE	No	53	54	53	1
R2.14.1	R2.14	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	56	57	51	6
R2.14.2	R2.14	The Seasons Apts.	MFR	B (67)	1	NONE	No	57	57	51	6
R2.14.3	R2.14	The Seasons Apts.	MFR	B (67)	1	NONE	No	57	57	53	4
R2.14.4	R2.14	The Seasons Apts.	MFR	B (67)	1	NONE	No	57	58	55	3
R2.14.5	R2.14	The Seasons Apts.	MFR	B (67)	1	NONE	No	57	58	56	2
R2.14.6	R2.14	The Seasons Apts.	MFR	B (67)	1	NONE	No	58	58	57	1
R2.14.7	R2.14	The Seasons Apts.	MFR	B (67)	1	NONE	No	58	59	57	2
R2.15.1	R2.15	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	65	65	56	9
R2.15.2	R2.15	The Seasons Apts.	MFR	B (67)	1	A/E	Yes	66	67	58	9
R2.15.3	R2.15	The Seasons Apts.	MFR	B (67)	1	A/E	No	66	67	60	7
R2.15.4	R2.15	The Seasons Apts.	MFR	B (67)	1	A/E	No	67	67	63	4
R2.15.5	R2.15	The Seasons Apts.	MFR	B (67)	1	A/E	No	67	68	65	3
R2.15.6	R2.15	The Seasons Apts.	MFR	B (67)	1	A/E	No	68	69	67	2
R2.15.7	R2.15	The Seasons Apts.	MFR	B (67)	1	A/E	No	68	69	67	2

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R2.16.1	R2.16	The Seasons Apts.	MFR	B (67)	2	NONE	Yes	62	63	55	8
R2.16.2	R2.16	The Seasons Apts.	MFR	B (67)	2	NONE	Yes	63	64	56	8
R2.16.3	R2.16	The Seasons Apts.	MFR	B (67)	2	NONE	No	64	64	59	5
R2.16.4	R2.16	The Seasons Apts.	MFR	B (67)	2	NONE	No	64	65	61	4
R2.16.5	R2.16	The Seasons Apts.	MFR	B (67)	2	A/E	No	65	66	63	3
R2.16.6	R2.16	The Seasons Apts.	MFR	B (67)	2	A/E	No	67	67	65	2
R2.16.7	R2.16	The Seasons Apts.	MFR	B (67)	2	A/E	No	67	67	66	1
R2.17.1	R2.17	The Seasons Apts.	MFR	B (67)	2	NONE	Yes	60	60	52	8
R2.17.2	R2.17	The Seasons Apts.	MFR	B (67)	2	NONE	No	61	61	54	7
R2.17.3	R2.17	The Seasons Apts.	MFR	B (67)	2	NONE	No	61	62	56	6
R2.17.4	R2.17	The Seasons Apts.	MFR	B (67)	2	NONE	No	62	62	58	4
R2.17.5	R2.17	The Seasons Apts.	MFR	B (67)	2	NONE	No	62	63	60	3
R2.17.6	R2.17	The Seasons Apts.	MFR	B (67)	2	A/E	No	65	66	64	2
R2.17.7	R2.17	The Seasons Apts.	MFR	B (67)	2	A/E	No	66	66	64	2
R2.18.1	R2.18	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	58	58	51	7
R2.18.2	R2.18	The Seasons Apts.	MFR	B (67)	1	NONE	No	59	60	53	7
R2.18.3	R2.18	The Seasons Apts.	MFR	B (67)	1	NONE	No	60	60	54	6
R2.18.4	R2.18	The Seasons Apts.	MFR	B (67)	1	NONE	No	60	61	56	5
R2.18.5	R2.18	The Seasons Apts.	MFR	B (67)	1	NONE	No	61	61	58	3
R2.18.6	R2.18	The Seasons Apts.	MFR	B (67)	1	NONE	No	64	64	62	2
R2.18.7	R2.18	The Seasons Apts.	MFR	B (67)	1	NONE	No	65	65	63	2
R2.19.1	R2.19	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	60	60	50	10
R2.19.2	R2.19	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	61	61	51	10
R2.19.3	R2.19	The Seasons Apts.	MFR	B (67)	1	NONE	No	62	62	53	9
R2.19.4	R2.19	The Seasons Apts.	MFR	B (67)	1	NONE	No	62	62	56	6
R2.19.5	R2.19	The Seasons Apts.	MFR	B (67)	1	NONE	No	62	62	59	3
R2.19.6	R2.19	The Seasons Apts.	MFR	B (67)	1	NONE	No	62	62	61	1
R2.19.7	R2.19	The Seasons Apts.	MFR	B (67)	1	NONE	No	62	62	61	1
R2.20.1	R2.20	The Seasons Apts.	MFR	B (67)	2	NONE	Yes	55	55	47	8

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R2.20.2	R2.20	The Seasons Apts.	MFR	B (67)	2	NONE	Yes	56	56	48	8
R2.20.3	R2.20	The Seasons Apts.	MFR	B (67)	2	NONE	No	57	57	50	7
R2.20.4	R2.20	The Seasons Apts.	MFR	B (67)	2	NONE	No	57	58	52	6
R2.20.5	R2.20	The Seasons Apts.	MFR	B (67)	2	NONE	No	58	58	55	3
R2.20.6	R2.20	The Seasons Apts.	MFR	B (67)	2	NONE	No	58	59	57	2
R2.20.7	R2.20	The Seasons Apts.	MFR	B (67)	2	NONE	No	59	59	58	1
R2.21.1	R2.21	The Seasons Apts.	MFR	B (67)	2	NONE	Yes	52	52	46	6
R2.21.2	R2.21	The Seasons Apts.	MFR	B (67)	2	NONE	No	53	54	47	7
R2.21.3	R2.21	The Seasons Apts.	MFR	B (67)	2	NONE	No	54	55	48	7
R2.21.4	R2.21	The Seasons Apts.	MFR	B (67)	2	NONE	No	55	55	50	5
R2.21.5	R2.21	The Seasons Apts.	MFR	B (67)	2	NONE	No	55	56	52	4
R2.21.6	R2.21	The Seasons Apts.	MFR	B (67)	2	NONE	No	55	56	54	2
R2.21.7	R2.21	The Seasons Apts.	MFR	B (67)	2	NONE	No	55	56	55	1
R2.22.1	R2.22	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	49	50	45	5
R2.22.2	R2.22	The Seasons Apts.	MFR	B (67)	1	NONE	No	50	51	45	6
R2.22.3	R2.22	The Seasons Apts.	MFR	B (67)	1	NONE	No	51	52	45	7
R2.22.4	R2.22	The Seasons Apts.	MFR	B (67)	1	NONE	No	52	52	47	5
R2.22.5	R2.22	The Seasons Apts.	MFR	B (67)	1	NONE	No	52	53	48	5
R2.22.6	R2.22	The Seasons Apts.	MFR	B (67)	1	NONE	No	52	53	50	3
R2.22.7	R2.22	The Seasons Apts.	MFR	B (67)	1	NONE	No	53	53	51	2
R2.23.1	R2.23	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	54	54	51	3
R2.23.2	R2.23	The Seasons Apts.	MFR	B (67)	1	NONE	No	55	55	52	3
R2.23.3	R2.23	The Seasons Apts.	MFR	B (67)	1	NONE	No	56	57	54	3
R2.23.4	R2.23	The Seasons Apts.	MFR	B (67)	1	NONE	No	57	58	56	2
R2.23.5	R2.23	The Seasons Apts.	MFR	B (67)	1	NONE	No	58	58	57	1
R2.23.6	R2.23	The Seasons Apts.	MFR	B (67)	1	NONE	No	58	59	58	1
R2.23.7	R2.23	The Seasons Apts.	MFR	B (67)	1	NONE	No	59	60	59	1
R2.24.1	R2.24	The Seasons Apts.	MFR	B (67)	2	NONE	No	53	54	50	4
R2.24.2	R2.24	The Seasons Apts.	MFR	B (67)	2	NONE	No	54	54	50	4

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R2.24.3	R2.24	The Seasons Apts.	MFR	B (67)	2	NONE	No	55	55	52	3
R2.24.4	R2.24	The Seasons Apts.	MFR	B (67)	2	NONE	No	55	55	53	2
R2.24.5	R2.24	The Seasons Apts.	MFR	B (67)	2	NONE	No	55	56	54	2
R2.24.6	R2.24	The Seasons Apts.	MFR	B (67)	2	NONE	No	56	57	55	2
R2.24.7	R2.24	The Seasons Apts.	MFR	B (67)	2	NONE	No	57	58	57	1
R2.25.1	R2.25	The Seasons Apts.	MFR	B (67)	2	NONE	Yes	54	54	50	5*
R2.25.2	R2.25	The Seasons Apts.	MFR	B (67)	2	NONE	No	55	55	50	5
R2.25.3	R2.25	The Seasons Apts.	MFR	B (67)	2	NONE	No	55	56	52	4
R2.25.4	R2.25	The Seasons Apts.	MFR	B (67)	2	NONE	No	56	56	53	3
R2.25.5	R2.25	The Seasons Apts.	MFR	B (67)	2	NONE	No	56	56	54	2
R2.25.6	R2.25	The Seasons Apts.	MFR	B (67)	2	NONE	No	56	57	56	1
R2.25.7	R2.25	The Seasons Apts.	MFR	B (67)	2	NONE	No	57	58	56	2
R2.26.1	R2.26	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	55	55	50	5
R2.26.2	R2.26	The Seasons Apts.	MFR	B (67)	1	NONE	No	55	56	51	5
R2.26.3	R2.26	The Seasons Apts.	MFR	B (67)	1	NONE	No	56	57	53	4
R2.26.4	R2.26	The Seasons Apts.	MFR	B (67)	1	NONE	No	56	57	54	3
R2.26.5	R2.26	The Seasons Apts.	MFR	B (67)	1	NONE	No	56	57	55	2
R2.26.6	R2.26	The Seasons Apts.	MFR	B (67)	1	NONE	No	57	57	56	1
R2.26.7	R2.26	The Seasons Apts.	MFR	B (67)	1	NONE	No	57	58	57	1
R2.27.1	R2.27	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	46	47	47	0
R2.27.2	R2.27	The Seasons Apts.	MFR	B (67)	1	NONE	No	46	48	48	0
R2.27.3	R2.27	The Seasons Apts.	MFR	B (67)	1	NONE	No	47	48	48	0
R2.27.4	R2.27	The Seasons Apts.	MFR	B (67)	1	NONE	No	47	48	48	0
R2.27.5	R2.27	The Seasons Apts.	MFR	B (67)	1	NONE	No	48	49	48	1
R2.27.6	R2.27	The Seasons Apts.	MFR	B (67)	1	NONE	No	49	50	49	1
R2.27.7	R2.27	The Seasons Apts.	MFR	B (67)	1	NONE	No	51	52	51	1
R2.28.1	R2.28	The Seasons Apts.	MFR	B (67)	4	NONE	Yes	40	41	40	1
R2.28.2	R2.28	The Seasons Apts.	MFR	B (67)	4	NONE	No	41	42	42	0
R2.28.3	R2.28	The Seasons Apts.	MFR	B (67)	4	NONE	No	41	42	42	0

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R2.28.4	R2.28	The Seasons Apts.	MFR	B (67)	4	NONE	No	42	43	42	1
R2.28.5	R2.28	The Seasons Apts.	MFR	B (67)	4	NONE	No	42	43	43	0
R2.28.6	R2.28	The Seasons Apts.	MFR	B (67)	4	NONE	No	42	43	43	0
R2.28.7	R2.28	The Seasons Apts.	MFR	B (67)	4	NONE	No	44	44	44	0
R2.29.1	R2.29	The Seasons Apts.	MFR	B (67)	1	NONE	Yes	38	39	38	1
R2.29.2	R2.29	The Seasons Apts.	MFR	B (67)	1	NONE	No	39	40	40	0
R2.29.3	R2.29	The Seasons Apts.	MFR	B (67)	1	NONE	No	40	41	40	1
R2.29.4	R2.29	The Seasons Apts.	MFR	B (67)	1	NONE	No	41	41	41	0
R2.29.5	R2.29	The Seasons Apts.	MFR	B (67)	1	NONE	No	41	41	41	0
R2.29.6	R2.29	The Seasons Apts.	MFR	B (67)	1	NONE	No	43	43	43	0
R2.29.7	R2.29	The Seasons Apts.	MFR	B (67)	1	NONE	No	44	45	44	1
R2.30.1	R2.30	The Seasons Apts.	MFR	B (67)	2	NONE	Yes	50	50	45	5
R2.30.2	R2.30	The Seasons Apts.	MFR	B (67)	2	NONE	No	51	51	46	5
R2.30.3	R2.30	The Seasons Apts.	MFR	B (67)	2	NONE	No	52	52	46	6
R2.30.4	R2.30	The Seasons Apts.	MFR	B (67)	2	NONE	No	52	53	48	5
R2.30.5	R2.30	The Seasons Apts.	MFR	B (67)	2	NONE	No	53	54	50	4
R2.30.6	R2.30	The Seasons Apts.	MFR	B (67)	2	NONE	No	55	55	53	2
R2.30.7	R2.30	The Seasons Apts.	MFR	B (67)	2	NONE	No	58	59	57	2
R2.31	R2.31	The Seasons Apts.	REC	C (67)	1	NONE	Yes	57	58	50	8
R3.1.0	R3.1	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	68	69	58	11
R3.1.1	R3.1	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	71	71	60	11
R3.1.2	R3.1	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	71	72	62	10
R3.1.3	R3.1	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	71	72	65	7
R3.2.0	R3.2	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	69	70	58	12
R3.2.1	R3.2	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	70	71	59	12
R3.2.2	R3.2	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	71	71	62	9
R3.2.3	R3.2	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	71	72	65	7
R3.3.0	R3.3	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	70	70	58	12
R3.3.1	R3.3	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	71	71	59	12

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R3.3.2	R3.3	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	71	71	62	9
R3.3.3	R3.3	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	71	72	66	6
R3.4.1	R3.4	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	49	50	47	3
R3.4.2	R3.4	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	51	51	49	2
R3.4.3	R3.4	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	52	53	50	3
R3.5.1	R3.5	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	50	52	50	2
R3.5.2	R3.5	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	51	52	50	2
R3.5.3	R3.5	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	53	54	52	2
R3.6.1	R3.6	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	49	52	51	1
R3.6.2	R3.6	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	51	53	52	1
R3.6.3	R3.6	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	53	55	53	2
R3.7.0	R3.7	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	69	69	57	12
R3.7.1	R3.7	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	70	71	58	13
R3.7.2	R3.7	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	71	71	60	11
R3.7.3	R3.7	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	71	72	63	9
R3.8.0	R3.8	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	67	68	57	11
R3.8.1	R3.8	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	69	70	57	13
R3.8.2	R3.8	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	70	70	59	11
R3.8.3	R3.8	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	70	71	62	9
R3.9.0	R3.9	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	67	67	56	11
R3.9.1	R3.9	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	68	69	56	13
R3.9.2	R3.9	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	69	69	58	11
R3.9.3	R3.9	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	69	70	62	8
R3.10.1	R3.10	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	49	50	48	2
R3.10.2	R3.10	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	51	53	51	2
R3.10.3	R3.10	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	53	55	53	2
R3.11.1	R3.11	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	50	51	49	2
R3.11.2	R3.11	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	51	53	51	2
R3.11.3	R3.11	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	54	56	54	2

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R3.12.1	R3.12	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	51	52	48	4
R3.12.2	R3.12	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	52	54	51	3
R3.12.3	R3.12	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	56	57	54	3
R3.13.0	R3.13	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	66	66	58	8
R3.13.1	R3.13	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	70	70	59	11
R3.13.2	R3.13	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	71	71	60	11
R3.13.3	R3.13	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	72	72	61	11
R3.14.0	R3.14	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	68	66	58	8
R3.14.1	R3.14	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	69	70	59	11
R3.14.2	R3.14	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	71	71	59	12
R3.14.3	R3.14	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	72	72	61	11
R3.15.0	R3.15	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	67	66	56	10
R3.15.1	R3.15	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	68	68	56	12
R3.15.2	R3.15	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	70	70	57	13
R3.15.3	R3.15	Bennington Crossings Apts.	MFR	B (67)	2	A/E	Yes	71	71	59	12
R3.16.1	R3.16	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	56	57	51	6
R3.16.2	R3.16	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	58	59	52	7
R3.16.3	R3.16	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	61	61	53	8
R3.17.1	R3.17	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	53	54	48	6
R3.17.2	R3.17	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	55	56	49	7
R3.17.3	R3.17	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	57	58	51	7
R3.18.1	R3.18	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	53	54	48	6
R3.18.2	R3.18	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	55	56	49	7
R3.18.3	R3.18	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	57	57	51	6
R3.19	R3.19	Bennington Crossings Apts.	REC	C (67)	1	A/E	Yes	68	66	57	9
R3.20.0	R3.20	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	59	60	54	6
R3.20.1	R3.20	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	61	62	55	7
R3.20.2	R3.20	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	62	63	57	6
R3.20.3	R3.20	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	63	64	59	5

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R3.21.0	R3.21	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	57	58	53	5
R3.21.1	R3.21	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	59	60	55	5
R3.21.2	R3.21	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	61	61	57	5*
R3.21.3	R3.21	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	62	63	58	5
R3.22.0	R3.22	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	57	58	51	7
R3.22.1	R3.22	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	58	59	53	6
R3.22.2	R3.22	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	60	61	55	6
R3.22.3	R3.22	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	62	62	58	5*
R3.23.0	R3.23	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	56	56	50	6
R3.23.1	R3.23	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	56	57	51	6
R3.23.2	R3.23	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	58	58	53	5
R3.23.3	R3.23	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	59	60	57	3
R3.24.1	R3.24	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	44	45	43	2
R3.24.2	R3.24	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	47	47	46	1
R3.24.3	R3.24	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	49	49	47	2
R3.25.1	R3.25	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	45	46	44	2
R3.25.2	R3.25	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	46	46	45	1
R3.25.3	R3.25	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	48	49	47	2
R3.26.1	R3.26	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	44	45	43	2
R3.26.2	R3.26	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	45	46	44	2
R3.26.3	R3.26	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	47	48	46	2
R3.27.1	R3.27	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	45	46	45	1
R3.27.2	R3.27	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	46	49	48	1
R3.27.3	R3.27	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	48	51	50	1
R3.28.0	R3.28	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	55	56	50	6
R3.28.1	R3.28	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	57	58	52	6
R3.28.2	R3.28	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	59	60	55	5
R3.28.3	R3.28	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	62	63	58	5
R3.29.0	R3.29	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	53	54	49	5

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R3.29.1	R3.29	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	55	56	51	5
R3.29.2	R3.29	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	58	58	53	5
R3.29.3	R3.29	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	61	61	57	5*
R3.30.0	R3.30	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	52	52	48	5*
R3.30.1	R3.30	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	54	54	49	5
R3.30.2	R3.30	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	56	57	52	5
R3.30.3	R3.30	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	60	61	57	4
R3.31.1	R3.31	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	43	44	42	2
R3.31.2	R3.31	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	45	46	44	2
R3.31.3	R3.31	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	47	48	46	2
R3.32.1	R3.32	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	43	44	43	1
R3.32.2	R3.32	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	45	45	43	2
R3.32.3	R3.32	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	47	48	46	2
R3.33.1	R3.33	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	44	45	44	1
R3.33.2	R3.33	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	45	46	44	2
R3.33.3	R3.33	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	47	48	47	1
R3.34.0	R3.34	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	51	51	46	5
R3.34.1	R3.34	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	52	52	47	5
R3.34.2	R3.34	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	54	55	50	5
R3.34.3	R3.34	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	58	58	54	4
R3.35.0	R3.35	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	50	51	46	5
R3.35.1	R3.35	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	51	51	46	5
R3.35.2	R3.35	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	53	53	49	4
R3.35.3	R3.35	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	56	57	54	3
R3.36.0	R3.36	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	47	49	47	2
R3.36.1	R3.36	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	48	52	51	1
R3.36.2	R3.36	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	53	55	53	2
R3.36.3	R3.36	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	56	57	55	2
R3.37.1	R3.37	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	46	47	44	3

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R3.37.2	R3.37	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	49	49	47	2
R3.37.3	R3.37	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	50	50	47	3
R3.38.1	R3.38	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	47	48	45	3
R3.38.2	R3.38	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	48	49	46	3
R3.38.3	R3.38	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	50	51	48	3
R3.39.1	R3.39	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	47	48	46	2
R3.39.2	R3.39	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	48	48	46	2
R3.39.3	R3.39	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	48	49	46	3
R3.40.0	R3.40	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	55	56	48	8
R3.40.1	R3.40	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	57	58	50	8
R3.40.2	R3.40	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	60	60	53	7
R3.40.3	R3.40	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	63	64	58	6
R3.41.0	R3.41	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	56	57	49	8
R3.41.1	R3.41	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	58	58	51	7
R3.41.2	R3.41	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	60	61	55	6
R3.41.3	R3.41	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	63	64	59	5
R3.42.0	R3.42	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	53	53	47	6
R3.42.1	R3.42	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	55	55	49	6
R3.42.2	R3.42	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	58	59	54	5
R3.42.3	R3.42	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	62	63	59	4
R3.43.1	R3.43	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	47	48	44	4
R3.43.2	R3.43	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	49	50	46	4
R3.43.3	R3.43	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	51	51	48	3
R3.44.1	R3.44	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	47	48	44	4
R3.44.2	R3.44	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	49	49	46	3
R3.44.3	R3.44	Bennington Crossings Apts.	MFR	B (67)	2	NONE	No	51	51	48	3
R3.45.1	R3.45	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	46	47	43	4
R3.45.2	R3.45	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	47	48	45	3
R3.45.3	R3.45	Bennington Crossings Apts.	MFR	B (67)	2	NONE	Yes	49	49	46	3

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R3.46.0	R3.46	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	60	62	52	10
R3.46.1	R3.46	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	62	63	52	11
R3.46.2	R3.46	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	65	65	54	11
R3.46.3	R3.46	Saxony Square Apts.	MFR	B (67)	1	A/E	Yes	66	67	58	9
R3.47.0	R3.47	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	59	60	53	7
R3.47.1	R3.47	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	61	62	54	8
R3.47.2	R3.47	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	63	64	55	9
R3.47.3	R3.47	Saxony Square Apts.	MFR	B (67)	2	A/E	Yes	66	66	60	6
R3.48.0	R3.48	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	61	61	55	6
R3.48.1	R3.48	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	63	63	56	7
R3.48.2	R3.48	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	64	64	57	7
R3.48.3	R3.48	Saxony Square Apts.	MFR	B (67)	1	A/E	Yes	66	67	59	8
R3.49.1	R3.49	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	51	51	46	5
R3.49.2	R3.49	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	53	53	47	6
R3.49.3	R3.49	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	54	54	48	6
R3.50.1	R3.50	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	49	50	45	5
R3.50.2	R3.50	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	52	52	47	5
R3.50.3	R3.50	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	53	54	48	6
R3.51.0	R3.51	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	61	62	55	7
R3.51.1	R3.51	Saxony Square Apts.	MFR	B (67)	1	A/E	Yes	66	66	57	9
R3.51.2	R3.51	Saxony Square Apts.	MFR	B (67)	1	A/E	Yes	69	69	58	11
R3.51.3	R3.51	Saxony Square Apts.	MFR	B (67)	1	A/E	Yes	71	72	59	13
R3.52.0	R3.52	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	60	60	54	6
R3.52.1	R3.52	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	65	65	55	10
R3.52.2	R3.52	Saxony Square Apts.	MFR	B (67)	2	A/E	Yes	68	68	57	11
R3.52.3	R3.52	Saxony Square Apts.	MFR	B (67)	2	A/E	Yes	70	71	58	13
R3.53.0	R3.53	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	60	60	55	5
R3.53.1	R3.53	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	63	64	57	7
R3.53.2	R3.53	Saxony Square Apts.	MFR	B (67)	2	A/E	Yes	66	66	57	9

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R3.53.3	R3.53	Saxony Square Apts.	MFR	B (67)	2	A/E	Yes	69	69	58	11
R3.54.0	R3.54	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	60	61	55	6
R3.54.1	R3.54	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	63	63	56	7
R3.54.2	R3.54	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	65	65	57	8
R3.54.3	R3.54	Saxony Square Apts.	MFR	B (67)	1	A/E	Yes	67	68	58	10
R3.55.1	R3.55	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	61	59	52	7
R3.55.2	R3.55	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	63	64	53	11
R3.55.3	R3.55	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	64	64	53	11
R3.56.1	R3.56	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	56	59	49	10
R3.56.2	R3.56	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	59	60	50	10
R3.56.3	R3.56	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	61	61	51	10
R3.57.1	R3.57	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	56	57	51	6
R3.57.2	R3.57	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	58	58	52	6
R3.57.3	R3.57	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	60	61	53	8
R3.58.0	R3.58	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	61	62	55	7
R3.58.1	R3.58	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	64	64	56	8
R3.58.2	R3.58	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	65	65	57	8
R3.58.3	R3.58	Saxony Square Apts.	MFR	B (67)	1	A/E	Yes	65	66	58	8
R3.59.0	R3.59	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	61	62	54	8
R3.59.1	R3.59	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	63	64	54	10
R3.59.2	R3.59	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	64	64	55	9
R3.59.3	R3.59	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	64	65	57	8
R3.60.0	R3.60	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	55	55	47	8
R3.60.1	R3.60	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	56	57	47	10
R3.60.2	R3.60	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	57	58	48	10
R3.60.3	R3.60	Saxony Square Apts.	MFR	B (67)	2	NONE	Yes	58	58	50	8
R3.61.0	R3.61	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	54	54	46	8
R3.61.1	R3.61	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	55	55	46	9
R3.61.2	R3.61	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	56	56	48	8

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R3.61.3	R3.61	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	57	57	50	7
R3.62.1	R3.62	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	56	56	48	8
R3.62.2	R3.62	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	58	58	49	9
R3.62.3	R3.62	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	60	60	50	10
R3.63.1	R3.63	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	56	56	48	8
R3.63.2	R3.63	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	57	58	49	9
R3.63.3	R3.63	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	59	59	50	9
R3.64.1	R3.64	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	54	54	47	7
R3.64.2	R3.64	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	56	56	48	8
R3.64.3	R3.64	Saxony Square Apts.	MFR	B (67)	1	NONE	Yes	57	58	51	7
R3.65.1	R3.65	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	61	61	54	7
R3.65.2	R3.65	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	66	66	57	9
R3.65.3	R3.65	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	70	70	58	12
R3.65.4	R3.65	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	72	72	60	12
R3.65.5	R3.65	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	72	73	62	11
R3.66.1	R3.66	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	65	64	56	8
R3.66.2	R3.66	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	69	69	59	10
R3.66.3	R3.66	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	73	73	60	13
R3.66.4	R3.66	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	73	73	62	11
R3.66.5	R3.66	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	73	73	65	8
R3.67.1	R3.67	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	60	61	55	6
R3.67.2	R3.67	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	61	62	56	6
R3.67.3	R3.67	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	62	63	57	6
R3.67.4	R3.67	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	63	64	59	5
R3.67.5	R3.67	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	64	64	60	5*
R3.68.1	R3.68	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	61	61	55	6
R3.68.2	R3.68	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	62	63	57	6
R3.68.3	R3.68	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	63	63	58	5
R3.68.4	R3.68	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	63	63	59	4

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R3.68.5	R3.68	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	63	64	60	4
R3.69.1	R3.69	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	65	66	57	9
R3.69.2	R3.69	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	67	67	58	9
R3.69.3	R3.69	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	68	69	59	10
R3.69.4	R3.69	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	68	69	60	9
R3.69.5	R3.69	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	68	69	62	7
R3.70.1	R3.70	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	63	64	56	8
R3.70.2	R3.70	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	65	65	57	8
R3.70.3	R3.70	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	66	67	58	9
R3.70.4	R3.70	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	67	67	59	8
R3.70.5	R3.70	Woodmont Park Apts.	MFR	B (67)	2	A/E	Yes	67	68	60	8
R3.71.1	R3.71	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	56	57	49	8
R3.71.2	R3.71	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	58	59	49	10
R3.71.3	R3.71	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	60	61	50	11
R3.71.4	R3.71	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	61	61	52	9
R3.71.5	R3.71	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	62	62	54	8
R3.72.1	R3.72	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	53	54	47	7
R3.72.2	R3.72	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	56	56	48	8
R3.72.3	R3.72	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	57	58	48	10
R3.72.4	R3.72	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	58	59	50	9
R3.72.5	R3.72	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	59	60	51	9
R3.73.1	R3.73	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	59	60	51	9
R3.73.2	R3.73	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	61	62	52	10
R3.73.3	R3.73	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	63	64	53	11
R3.73.4	R3.73	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	64	64	54	10
R3.73.5	R3.73	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	64	64	55	9
R3.74.1	R3.74	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	55	56	48	8
R3.74.2	R3.74	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	57	57	48	9
R3.74.3	R3.74	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	60	60	49	11

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R3.74.4	R3.74	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	60	61	50	11
R3.74.5	R3.74	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	60	61	51	10
R3.75.1	R3.75	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	54	54	47	7
R3.75.2	R3.75	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	56	56	48	8
R3.75.3	R3.75	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	59	59	48	11
R3.75.4	R3.75	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	60	60	50	10
R3.75.5	R3.75	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	60	61	52	9
R3.76.1	R3.76	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	52	52	45	7
R3.76.2	R3.76	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	55	55	45	10
R3.76.3	R3.76	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	57	57	46	11
R3.76.4	R3.76	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	57	58	47	11
R3.76.5	R3.76	Woodmont Park Apts.	MFR	B (67)	2	NONE	Yes	58	58	49	9
R4.1.1	R4.1	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	68	69	60	9
R4.1.2	R4.1	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	71	71	62	9
R4.2.1	R4.2	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	66	66	58	8
R4.2.2	R4.2	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	69	69	60	9
R4.3.0	R4.3	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	63	64	56	8
R4.3.1	R4.3	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	66	66	57	9
R4.3.2	R4.3	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	67	67	59	8
R4.4.0	R4.4	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	62	62	55	7
R4.4.1	R4.4	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	64	65	56	9
R4.4.2	R4.4	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	65	66	58	8
R4.5.1	R4.5	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	66	66	59	7
R4.5.2	R4.5	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	69	69	60	9
R4.6.1	R4.6	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	64	64	57	7
R4.6.2	R4.6	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	67	67	58	9
R4.7.0	R4.7	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	50	51	47	4
R4.7.1	R4.7	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	51	52	47	5
R4.7.2	R4.7	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	55	55	51	4

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R4.8.0	R4.8	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	53	53	49	5*
R4.8.1	R4.8	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	53	54	49	5
R4.8.2	R4.8	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	56	56	51	5
R4.9.1	R4.9	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	66	66	58	8
R4.9.2	R4.9	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	69	70	60	10
R4.10.1	R4.10	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	63	63	56	7
R4.10.2	R4.10	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	66	67	58	9
R4.11.0	R4.11	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	64	65	58	7
R4.11.1	R4.11	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	67	68	60	8
R4.11.2	R4.11	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	68	68	62	6
R4.12.0	R4.12	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	61	62	56	6
R4.12.1	R4.12	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	64	65	57	8
R4.12.2	R4.12	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	66	66	59	7
R4.13.1	R4.13	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	69	69	61	8
R4.13.2	R4.13	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	71	71	63	8
R4.14.1	R4.14	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	66	66	58	8
R4.14.2	R4.14	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	68	68	60	8
R4.15.0	R4.15	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	59	60	54	6
R4.15.1	R4.15	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	63	63	55	8
R4.15.2	R4.15	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	64	65	58	7
R4.16.0	R4.16	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	57	58	52	6
R4.16.1	R4.16	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	60	60	53	7
R4.16.2	R4.16	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	62	63	55	8
R4.17.0	R4.17	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	63	63	56	7
R4.17.1	R4.17	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	65	66	57	9
R4.17.2	R4.17	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	66	67	58	9
R4.18.0	R4.18	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	62	62	55	7
R4.18.1	R4.18	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	64	64	56	8
R4.18.2	R4.18	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	65	66	57	9

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R4.19.0	R4.19	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	60	60	55	5
R4.19.1	R4.19	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	62	63	56	7
R4.19.2	R4.19	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	64	64	57	7
R4.20.0	R4.20	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	58	59	54	5
R4.20.1	R4.20	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	61	61	55	6
R4.20.2	R4.20	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	62	63	56	7
R4.21.0	R4.21	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	59	59	54	5
R4.21.1	R4.21	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	62	62	55	7
R4.21.2	R4.21	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	64	64	56	8
R4.22.0	R4.22	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	57	57	53	5*
R4.22.1	R4.22	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	60	60	54	6
R4.22.2	R4.22	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	62	62	55	7
R4.23.1	R4.23	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	64	64	56	8
R4.23.2	R4.23	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	67	68	58	10
R4.24.1	R4.24	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	59	60	53	7
R4.24.2	R4.24	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	63	63	55	8
R4.25.0	R4.25	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	49	49	46	3
R4.25.1	R4.25	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	49	50	46	4
R4.25.2	R4.25	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	53	53	50	3
R4.26.0	R4.26	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	48	49	46	3
R4.26.1	R4.26	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	48	49	46	3
R4.26.2	R4.26	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	52	52	49	3
R4.27.1	R4.27	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	67	67	58	9
R4.27.2	R4.27	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	70	71	60	11
R4.28.1	R4.28	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	65	65	56	9
R4.28.2	R4.28	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	68	68	57	11
R4.29.1	R4.29	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	61	61	53	8
R4.29.2	R4.29	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	63	64	54	10
R4.30.0	R4.30	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	59	59	54	5

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R4.30.1	R4.30	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	63	63	56	7
R4.30.2	R4.30	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	64	64	58	6
R4.31.0	R4.31	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	55	56	51	5
R4.31.1	R4.31	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	60	60	53	7
R4.31.2	R4.31	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	62	62	55	7
R4.32.0	R4.32	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	52	53	48	5
R4.32.1	R4.32	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	57	57	50	7
R4.32.2	R4.32	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	59	60	52	8
R4.33.1	R4.33	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	66	66	57	9
R4.33.2	R4.33	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	68	69	58	11
R4.34.1	R4.34	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	62	62	54	8
R4.34.2	R4.34	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	65	66	55	11
R4.35.1	R4.35	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	57	57	51	6
R4.35.2	R4.35	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	61	61	51	10
R4.36.0	R4.36	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	61	60	53	7
R4.36.1	R4.36	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	63	63	54	9
R4.36.2	R4.36	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	65	65	57	8
R4.37.0	R4.37	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	57	57	51	6
R4.37.1	R4.37	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	59	59	51	8
R4.37.2	R4.37	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	61	61	53	8
R4.38.0	R4.38	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	56	56	50	6
R4.38.1	R4.38	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	58	58	52	6
R4.38.2	R4.38	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	59	60	54	6
R4.39.1	R4.39	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	64	64	58	6
R4.39.2	R4.39	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	66	66	60	6
R4.40.1	R4.40	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	58	59	53	6
R4.40.2	R4.40	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	61	61	55	6
R4.41.0	R4.41	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	64	64	55	9
R4.41.1	R4.41	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	65	66	57	9

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R4.41.2	R4.41	Mark Center Apts.	MFR	B (67)	1	A/E	Yes	66	67	61	6
R4.42.0	R4.42	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	59	60	52	8
R4.42.1	R4.42	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	61	62	54	8
R4.42.2	R4.42	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	64	64	58	6
R4.43.1	R4.43	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	63	63	59	4
R4.43.2	R4.43	Mark Center Apts.	MFR	B (67)	1	NONE	No	65	65	62	3
R4.44.1	R4.44	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	57	57	54	3
R4.44.2	R4.44	Mark Center Apts.	MFR	B (67)	1	NONE	No	60	61	57	4
R4.45.0	R4.45	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	58	59	53	6
R4.45.1	R4.45	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	60	60	54	6
R4.45.2	R4.45	Mark Center Apts.	MFR	B (67)	1	NONE	No	62	62	60	2
R4.46.0	R4.46	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	54	55	50	5
R4.46.1	R4.46	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	56	56	51	5
R4.46.2	R4.46	Mark Center Apts.	MFR	B (67)	1	NONE	No	59	59	56	3
R4.47.0	R4.47	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	54	54	50	4
R4.47.1	R4.47	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	56	56	51	5
R4.47.2	R4.47	Mark Center Apts.	MFR	B (67)	1	NONE	Yes	59	59	53	6
R5.1	R5.1	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	62	62	62	0
R5.2	R5.2	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	60	61	61	0
R5.3	R5.3	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	62	63	63	0
R5.4	R5.4	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	63	63	62	1
R5.5	R5.5	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	62	62	62	0
R5.6	R5.6	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	61	61	60	1
R5.7	R5.7	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	63	63	61	2
R5.8	R5.8	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	64	64	61	3
R5.9	R5.9	Winkler Botanical Preserve	REC	C (67)	1	A/E	Yes	66	66	61	5
R5.10	R5.10	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	65	64	55	9
R5.11	R5.11	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	63	63	55	8
R5.12	R5.12	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	61	61	54	7

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R5.13	R5.13	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	62	62	55	7
R5.14	R5.14	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	64	64	56	8
R5.15	R5.15	Winkler Botanical Preserve	REC	C (67)	1	A/E	Yes	66	66	56	10
R5.16	R5.16	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	59	60	60	0
R5.17	R5.17	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	57	57	56	1
R5.18	R5.18	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	57	57	55	2
R5.19	R5.19	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	58	57	54	3
R5.20	R5.20	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	58	58	53	5
R5.21	R5.21	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	59	59	54	5
R5.22	R5.22	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	61	61	54	7
R5.23	R5.23	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	61	61	53	8
R5.24	R5.24	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	62	62	54	8
R5.25	R5.25	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	61	61	53	8
R5.26	R5.26	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	61	60	53	7
R5.27	R5.27	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	61	61	53	8
R5.28	R5.28	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	64	63	54	9
R5.29	R5.29	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	65	65	55	10
R5.30	R5.30	Winkler Botanical Preserve	REC	C (67)	1	A/E	Yes	67	67	55	12
R5.31	R5.31	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	47	47	46	1
R5.32	R5.32	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	49	49	47	2
R5.33	R5.33	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	49	48	46	2
R5.34	R5.34	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	54	54	50	4
R5.35	R5.35	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	56	56	51	5
R5.36	R5.36	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	57	57	52	5
R5.37	R5.37	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	56	56	51	5
R5.38	R5.38	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	56	55	50	5
R5.39	R5.39	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	60	60	52	8
R5.40	R5.40	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	59	58	51	7
R5.41	R5.41	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	59	59	51	8

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R5.42	R5.42	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	62	61	52	9
R5.43	R5.43	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	63	62	53	9
R5.44	R5.44	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	65	65	54	11
R5.45	R5.45	Winkler Botanical Preserve	REC	C (67)	1	A/E	Yes	66	66	54	12
R5.46	R5.46	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	43	42	41	1
R5.47	R5.47	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	44	43	42	1
R5.48	R5.48	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	43	43	40	3
R5.49	R5.49	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	47	46	45	1
R5.50	R5.50	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	49	48	46	2
R5.51	R5.51	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	50	50	47	3
R5.52	R5.52	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	49	49	46	3
R5.53	R5.53	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	51	51	47	4
R5.54	R5.54	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	55	55	49	6
R5.55	R5.55	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	57	57	50	7
R5.56	R5.56	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	59	59	51	8
R5.57	R5.57	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	60	60	52	8
R5.58	R5.58	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	62	62	52	10
R5.59	R5.59	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	64	64	53	11
R5.60	R5.60	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	64	64	53	11
R5.61	R5.61	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	48	46	45	1
R5.62	R5.62	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	48	46	45	1
R5.63	R5.63	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	48	46	44	2
R5.64	R5.64	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	47	45	43	2
R5.65	R5.65	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	53	52	48	4
R5.66	R5.66	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	54	54	48	6
R5.67	R5.67	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	54	54	48	6
R5.68	R5.68	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	55	55	49	6
R5.69	R5.69	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	56	55	49	6
R5.70	R5.70	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	56	55	49	6

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R5.71	R5.71	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	58	58	50	8
R5.72	R5.72	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	61	61	51	10
R5.73	R5.73	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	60	60	51	9
R5.74	R5.74	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	53	53	48	5
R5.75	R5.75	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	55	55	49	6
R5.76	R5.76	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	53	51	49	2
R5.77	R5.77	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	53	52	49	3
R5.78	R5.78	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	53	52	48	4
R5.79	R5.79	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	54	53	49	5*
R5.80	R5.80	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	56	55	49	6
R5.81	R5.81	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	56	55	48	7
R5.82	R5.82	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	56	55	49	6
R5.83	R5.83	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	55	56	49	7
R5.84	R5.84	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	55	55	48	7
R5.85	R5.85	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	51	50	47	3
R5.86	R5.86	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	49	48	45	3
R5.87	R5.87	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	51	51	46	5
R5.88	R5.88	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	50	50	46	5*
R5.89	R5.89	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	52	53	48	5
R5.90	R5.90	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	55	54	51	3
R5.91	R5.91	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	55	54	50	4
R5.92	R5.92	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	56	55	50	5
R5.93	R5.93	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	56	55	49	6
R5.94	R5.94	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	57	56	49	7
R5.95	R5.95	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	57	56	49	7
R5.96	R5.96	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	57	56	49	7
R5.97	R5.97	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	57	57	49	8
R5.98	R5.98	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	54	53	47	6
R5.99	R5.99	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	50	49	46	3

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R5.100	R5.100	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	49	48	45	3
R5.101	R5.101	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	49	49	45	4
R5.102	R5.102	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	52	52	47	5
R5.103	R5.103	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	57	56	51	5
R5.104	R5.104	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	57	56	50	6
R5.105	R5.105	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	56	56	49	7
R5.106	R5.106	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	57	57	50	7
R5.107	R5.107	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	57	57	49	8
R5.108	R5.108	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	57	57	49	8
R5.109	R5.109	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	57	57	48	9
R5.110	R5.110	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	54	53	48	5
R5.111	R5.111	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	49	48	45	3
R5.112	R5.112	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	49	48	44	4
R5.113	R5.113	Winkler Botanical Preserve	REC	C (67)	1	NONE	Yes	51	51	46	5
R6.1	R6.1	Wyndham Hotel	HOT	E (72)	1	NONE	Yes	67	66	65	1
R6.2	R6.2	Place One (Tennis Courts)	REC	C (67)	1	NONE	Yes	61	61	58	3
R7.1	R7.1	Brookville Apts.	MFR	B (67)	4	NONE	Yes	62	61	59	2
R7.2	R7.2	Brookville Apts.	MFR	B (67)	2	NONE	Yes	59	58	57	5*
R7.3	R7.3	Brookville Apts.	MFR	B (67)	4	NONE	Yes	56	55	53	5*
R7.4	R7.4	Brookville Apts.	MFR	B (67)	3	NONE	Yes	52	53	52	1
R7.5	R7.5	Brookville Apts.	MFR	B (67)	1	NONE	Yes	47	47	44	3
R7.6	R7.6	Brookville Apts.	MFR	B (67)	2	NONE	Yes	59	58	53	5
R7.7	R7.7	Brookville Apts.	MFR	B (67)	2	NONE	Yes	63	62	58	4
R7.8	R7.8	Brookville Apts.	MFR	B (67)	1	NONE	Yes	65	64	62	2
R7.9	R7.9	Brookville Apts.	MFR	B (67)	2	NONE	Yes	63	62	58	4
R7.10	R7.10	Brookville Apts.	MFR	B (67)	3	NONE	Yes	60	58	53	5
R7.11	R7.11	Brookville Apts.	MFR	B (67)	4	NONE	Yes	56	55	49	6
R7.12	R7.12	Brookville Apts.	MFR	B (67)	1	NONE	Yes	64	64	60	4
R7.13	R7.13	Brookville Apts.	MFR	B (67)	2	NONE	Yes	64	62	59	3

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R7.14	R7.14	Brookville Apts.	MFR	B (67)	3	NONE	Yes	60	58	53	5
R7.15	R7.15	Brookville Apts.	MFR	B (67)	4	NONE	Yes	56	55	49	6
R7.16	R7.16	Brookville Apts.	MFR	B (67)	1	A/E	Yes	67	66	63	3
R7.17	R7.17	Brookville Apts.	MFR	B (67)	2	NONE	Yes	64	63	59	4
R7.18	R7.18	Brookville Apts.	MFR	B (67)	3	NONE	Yes	60	60	54	6
R7.19	R7.19	Brookville Apts.	MFR	B (67)	4	NONE	Yes	57	57	50	7
R7.20	R7.20	Brookville Apts.	MFR	B (67)	1	NONE	Yes	66	65	61	4
R7.21	R7.21	Brookville Apts.	MFR	B (67)	2	NONE	Yes	64	63	59	4
R7.22	R7.22	Brookville Apts.	MFR	B (67)	3	NONE	Yes	61	60	54	6
R7.23	R7.23	Brookville Apts.	MFR	B (67)	4	NONE	Yes	58	57	50	7
R7.24	R7.24	Brookville Apts.	MFR	B (67)	1	A/E	Yes	66	66	62	4
R7.25	R7.25	Brookville Apts.	MFR	B (67)	2	NONE	Yes	64	64	59	5
R7.26	R7.26	Brookville Apts.	MFR	B (67)	3	NONE	Yes	60	60	54	6
R7.27	R7.27	Brookville Apts.	MFR	B (67)	4	NONE	Yes	56	56	50	6
R7.28	R7.28	Brookville Apts.	MFR	B (67)	1	NONE	Yes	66	65	61	4
R7.29	R7.29	Brookville Apts.	MFR	B (67)	2	NONE	Yes	64	64	59	5
R7.30	R7.30	Brookville Apts.	MFR	B (67)	3	NONE	Yes	60	60	54	6
R7.31	R7.31	Brookville Apts.	MFR	B (67)	4	NONE	Yes	56	57	50	7
R7.32	R7.32	Brookville Apts.	MFR	B (67)	2	NONE	Yes	58	57	53	5*
R7.33	R7.33	Brookville Apts.	MFR	B (67)	2	NONE	Yes	53	53	48	5
R7.34	R7.34	Brookville Apts.	MFR	B (67)	2	NONE	Yes	56	56	49	7
R7.35	R7.35	Brookville Apts.	MFR	B (67)	3	NONE	Yes	56	56	49	7
R7.36	R7.36	Brookville Apts.	MFR	B (67)	3	NONE	Yes	55	55	49	6
R7.37	R7.37	Brookville Apts.	MFR	B (67)	2	NONE	Yes	54	54	48	6
R7.38	R7.38	Brookville Apts.	MFR	B (67)	2	NONE	Yes	49	48	45	3
R7.39	R7.39	Brookville Apts.	MFR	B (67)	2	NONE	Yes	49	49	46	3
R7.40	R7.40	Brookville Apts.	MFR	B (67)	2	NONE	Yes	49	49	45	4
R7.41	R7.41	Brookville Apts.	MFR	B (67)	2	NONE	Yes	48	49	45	4
R7.42	R7.42	Brookville Apts.	MFR	B (67)	2	NONE	Yes	49	49	45	4

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R7.43	R7.43	Brookville Apts.	MFR	B (67)	2	NONE	Yes	49	49	44	5
R7.44	R7.44	Brookville Apts.	MFR	B (67)	2	NONE	Yes	56	55	48	7
R7.45	R7.45	Brookville Apts.	MFR	B (67)	2	NONE	Yes	52	51	48	3
R7.46	R7.46	Brookville Apts.	MFR	B (67)	2	NONE	Yes	54	54	47	7
R7.47	R7.47	Brookville Apts.	MFR	B (67)	2	NONE	Yes	51	51	47	4
R7.48	R7.48	Brookville Apts.	MFR	B (67)	2	NONE	Yes	53	53	46	7
R7.49	R7.49	Brookville Apts.	MFR	B (67)	2	NONE	Yes	53	53	53	0
R7.50	R7.50	Brookville Apts.	MFR	B (67)	2	NONE	Yes	52	52	50	2
R7.51	R7.51	Brookville Apts.	MFR	B (67)	2	NONE	Yes	61	60	56	5*
R7.52	R7.52	Brookville Apts.	MFR	B (67)	2	NONE	Yes	58	58	52	6
R7.53	R7.53	Brookville Apts.	MFR	B (67)	3	NONE	Yes	56	55	49	6
R7.54	R7.54	Brookville Apts.	MFR	B (67)	3	NONE	Yes	55	54	48	6
R7.55	R7.55	Brookville Apts.	MFR	B (67)	3	NONE	Yes	54	53	47	6
R7.56	R7.56	Brookville Apts.	MFR	B (67)	5	NONE	Yes	52	52	46	6
R8.1.1	R8.1	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	61	61	55	6
R8.1.2	R8.1	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	65	63	56	7
R8.1.3	R8.1	Willow Run Apts.	MFR	B (67)	1	A/E	Yes	68	66	57	9
R8.2.1	R8.2	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	61	61	54	7
R8.2.2	R8.2	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	64	63	55	8
R8.2.3	R8.2	Willow Run Apts.	MFR	B (67)	1	A/E	Yes	66	66	59	7
R8.3.1	R8.3	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	57	56	50	6
R8.3.2	R8.3	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	60	58	51	7
R8.3.3	R8.3	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	63	62	56	6
R8.4.1	R8.4	Willow Run Apts.	MFR	B (67)	3	NONE	Yes	55	54	49	5
R8.4.2	R8.4	Willow Run Apts.	MFR	B (67)	3	NONE	Yes	57	56	50	6
R8.4.3	R8.4	Willow Run Apts.	MFR	B (67)	3	NONE	Yes	60	60	54	6
R8.5.2	R8.5	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	67	65	60	5
R8.5.3	R8.5	Willow Run Apts.	MFR	B (67)	1	A/E	Yes	69	67	61	6
R8.6.2	R8.6	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	60	58	53	5

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R8.6.3	R8.6	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	62	60	54	6
R8.7.2	R8.7	Willow Run Apts.	MFR	B (67)	1	A/E	Yes	70	68	62	6
R8.7.3	R8.7	Willow Run Apts.	MFR	B (67)	1	A/E	Yes	72	71	63	8
R8.8.2	R8.8	Willow Run Apts.	MFR	B (67)	1	A/E	Yes	69	68	63	5
R8.8.3	R8.8	Willow Run Apts.	MFR	B (67)	1	A/E	Yes	72	70	63	7
R8.9.1	R8.9	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	47	48	44	5*
R8.9.2	R8.9	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	51	51	46	5
R8.9.3	R8.9	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	53	54	49	5
R8.10.1	R8.10	Willow Run Apts.	MFR	B (67)	4	NONE	Yes	47	48	43	5
R8.10.2	R8.10	Willow Run Apts.	MFR	B (67)	4	NONE	Yes	51	51	46	5
R8.10.3	R8.10	Willow Run Apts.	MFR	B (67)	4	NONE	Yes	54	54	49	5
R8.11.1	R8.11	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	47	48	44	4
R8.11.2	R8.11	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	50	51	46	5
R8.11.3	R8.11	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	53	54	49	5
R8.12.1	R8.12	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	53	54	51	3
R8.12.2	R8.12	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	54	55	51	4
R8.12.3	R8.12	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	57	58	53	5
R8.13.1	R8.13	Willow Run Apts.	MFR	B (67)	4	NONE	Yes	52	52	48	5*
R8.13.2	R8.13	Willow Run Apts.	MFR	B (67)	4	NONE	Yes	53	53	48	5
R8.13.3	R8.13	Willow Run Apts.	MFR	B (67)	4	NONE	Yes	57	58	54	4
R8.14.1	R8.14	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	51	52	47	5
R8.14.2	R8.14	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	52	53	48	5
R8.14.3	R8.14	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	57	57	53	4
R8.15.2	R8.15	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	47	47	45	2
R8.15.3	R8.15	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	51	51	48	3
R8.16.2	R8.16	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	48	49	47	2
R8.16.3	R8.16	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	52	53	50	3
R8.17.1	R8.17	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	65	63	57	6
R8.17.2	R8.17	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	67	65	58	7

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R8.17.3	R8.17	Willow Run Apts.	MFR	B (67)	2	A/E	Yes	69	68	59	9
R8.18.1	R8.18	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	61	60	53	7
R8.18.2	R8.18	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	64	62	55	7
R8.18.3	R8.18	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	66	65	57	8
R8.19.2	R8.19	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	65	64	58	6
R8.19.3	R8.19	Willow Run Apts.	MFR	B (67)	1	A/E	Yes	68	68	59	9
R8.20.2	R8.20	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	62	62	55	7
R8.20.3	R8.20	Willow Run Apts.	MFR	B (67)	1	A/E	Yes	66	67	57	10
R8.21.1	R8.21	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	48	48	45	3
R8.21.2	R8.21	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	50	50	47	3
R8.21.3	R8.21	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	53	53	50	3
R8.22.2	R8.22	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	56	56	50	6
R8.22.3	R8.22	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	59	59	54	5
R8.23.2	R8.23	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	56	57	51	6
R8.23.3	R8.23	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	57	57	51	6
R8.24.2	R8.24	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	56	57	53	4
R8.24.3	R8.24	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	57	57	54	3
R8.25.2	R8.25	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	57	57	51	6
R8.25.3	R8.25	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	60	60	55	5
R8.26.1	R8.26	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	52	53	51	2
R8.26.2	R8.26	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	54	55	53	2
R8.26.3	R8.26	Willow Run Apts.	MFR	B (67)	2	NONE	Yes	57	58	55	3
R8.27.2	R8.27	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	59	60	53	7
R8.27.3	R8.27	Willow Run Apts.	MFR	B (67)	1	NONE	Yes	64	64	55	9
R9.1	R9.1	Holland Towne	MFR	B (67)	1	A/E	Yes	67	66	62	5*
R9.2	R9.2	Holland Towne	MFR	B (67)	2	NONE	Yes	64	64	58	6
R9.3	R9.3	Holland Towne	MFR	B (67)	2	NONE	Yes	61	61	54	7
R9.4	R9.4	Holland Towne	MFR	B (67)	3	NONE	Yes	59	58	51	7
R9.5	R9.5	Holland Towne	MFR	B (67)	2	NONE	Yes	52	53	48	5

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R9.6	R9.6	Holland Towne	MFR	B (67)	3	NONE	Yes	52	53	48	5
R9.7	R9.7	Holland Towne	MFR	B (67)	2	NONE	Yes	52	53	48	5
R9.8	R9.8	Holland Towne	MFR	B (67)	2	NONE	Yes	57	57	51	6
R9.9	R9.9	Holland Towne	MFR	B (67)	2	NONE	Yes	56	56	51	5
R9.10	R9.10	Holland Towne	MFR	B (67)	2	NONE	Yes	58	57	52	5
R9.11	R9.11	Holland Towne	MFR	B (67)	2	NONE	Yes	62	61	55	6
R9.12	R9.12	Holland Towne	MFR	B (67)	1	NONE	Yes	66	64	58	6
R9.13	R9.13	Holland Towne	MFR	B (67)	2	NONE	Yes	62	61	55	6
R9.14	R9.14	Holland Towne	MFR	B (67)	2	NONE	Yes	60	60	52	8
R9.15	R9.15	Holland Towne	MFR	B (67)	3	NONE	Yes	58	58	51	7
R9.16	R9.16	Holland Towne	MFR	B (67)	3	NONE	Yes	56	57	50	7
R9.17	R9.17	Holland Towne	MFR	B (67)	3	NONE	Yes	54	54	48	6
R9.18	R9.18	Holland Towne	MFR	B (67)	4	NONE	Yes	47	47	44	3
R9.19	R9.19	Holland Towne	MFR	B (67)	4	NONE	Yes	47	48	44	4
R9.20	R9.20	Holland Towne	MFR	B (67)	8	NONE	Yes	50	51	49	2
R9.21	R9.21	Holland Towne	MFR	B (67)	2	NONE	Yes	57	57	52	5
R9.22	R9.22	Holland Towne	MFR	B (67)	6	NONE	Yes	54	54	48	6
R9.23	R9.23	Holland Towne	MFR	B (67)	3	A/E	Yes	68	67	61	6
R9.24	R9.24	Holland Towne	MFR	B (67)	3	NONE	Yes	63	62	54	8
R9.25	R9.25	Holland Towne	MFR	B (67)	2	NONE	Yes	58	59	50	9
R9.26	R9.26	Holland Towne	MFR	B (67)	3	NONE	Yes	57	57	49	8
R9.27	R9.27	Holland Towne	MFR	B (67)	3	NONE	Yes	65	65	58	7
R9.28	R9.28	Holland Towne	MFR	B (67)	5	NONE	Yes	59	60	51	9
R9.29	R9.29	Holland Towne	MFR	B (67)	3	NONE	Yes	56	57	51	6
R9.30	R9.30	Holland Towne	MFR	B (67)	2	NONE	Yes	55	56	49	7
R9.31	R9.31	Holland Towne	MFR	B (67)	2	NONE	Yes	55	56	50	6
R9.32	R9.32	Holland Towne	MFR	B (67)	3	A/E	Yes	68	68	62	6
R9.33	R9.33	Holland Towne	MFR	B (67)	3	A/E	Yes	69	68	63	5
R9.34	R9.34	Holland Towne	MFR	B (67)	4	NONE	Yes	48	48	45	3

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R9.35	R9.35	Holland Towne	MFR	B (67)	4	NONE	Yes	48	48	46	2
R9.36	R9.36	Holland Towne	MFR	B (67)	2	A/E	Yes	67	68	61	7
R9.37	R9.37	Holland Towne	MFR	B (67)	3	NONE	Yes	64	65	58	7
R9.38	R9.38	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	51	52	49	3
R9.39	R9.39	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	56	56	52	4
R9.40	R9.40	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	58	57	53	4
R9.41	R9.41	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	46	46	42	4
R9.42	R9.42	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	44	45	42	3
R9.43	R9.43	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	51	51	49	2
R9.44	R9.44	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	51	52	47	5
R9.45	R9.45	Parkside Townhomes	MFR	B (67)	8	NONE	Yes	43	44	41	3
R9.46	R9.46	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	42	42	41	1
R9.47	R9.47	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	60	61	54	7
R9.48	R9.48	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	57	58	50	8
R9.49	R9.49	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	54	55	48	7
R9.50	R9.50	Parkside Townhomes	MFR	B (67)	3	NONE	Yes	64	64	58	6
R9.51	R9.51	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	61	61	54	7
R9.52	R9.52	Parkside Townhomes	MFR	B (67)	3	NONE	Yes	57	57	51	6
R9.53	R9.53	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	62	63	56	7
R9.54	R9.54	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	59	60	53	7
R9.55	R9.55	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	56	57	50	7
R9.56	R9.56	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	54	55	49	6
R9.57	R9.57	Parkside Townhomes	MFR	B (67)	2	A/E	Yes	66	66	60	6
R9.58	R9.58	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	62	62	56	6
R9.59	R9.59	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	59	58	52	6
R9.60	R9.60	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	55	55	50	5
R9.61	R9.61	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	63	63	57	6
R9.62	R9.62	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	58	59	52	7
R9.63	R9.63	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	56	56	50	6

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R9.64	R9.64	Parkside Townhomes	MFR	B (67)	3	A/E	Yes	67	67	61	6
R9.65	R9.65	Parkside Townhomes	MFR	B (67)	3	NONE	Yes	63	64	57	7
R9.66	R9.66	Parkside Townhomes	MFR	B (67)	3	NONE	Yes	61	61	55	6
R9.67	R9.67	Parkside Townhomes	MFR	B (67)	3	NONE	Yes	60	60	54	6
R9.68	R9.68	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	52	53	47	6
R9.69	R9.69	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	51	52	47	5
R9.70	R9.70	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	60	61	56	5
R9.71	R9.71	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	53	54	51	3
R9.72	R9.72	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	58	58	54	4
R9.73	R9.73	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	54	54	50	5*
R9.74	R9.74	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	54	54	50	5*
R10.1	R10.1	Parkside Townhomes	MFR	B (67)	4	A/E	Yes	67	67	62	5
R10.2	R10.2	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	62	62	57	5
R10.3	R10.3	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	57	58	53	5
R10.4	R10.4	Parkside Townhomes	MFR	B (67)	6	NONE	Yes	53	54	50	4
R10.5	R10.5	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	60	61	55	6
R10.6	R10.6	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	55	55	52	3
R10.7	R10.7	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	52	55	52	3
R10.8	R10.8	Parkside Townhomes	MFR	B (67)	1	A/E	Yes	67	68	61	7
R10.9	R10.9	Parkside Townhomes	MFR	B (67)	2	A/E	Yes	67	68	61	7
R10.10	R10.10	Parkside Townhomes	MFR	B (67)	2	A/E	Yes	69	70	63	7
R10.11	R10.11	Parkside Townhomes	MFR	B (67)	2	A/E	Yes	70	71	64	7
R10.12	R10.12	Parkside Townhomes	MFR	B (67)	1	A/E	Yes	70	71	65	6
R10.13	R10.13	Parkside Townhomes	MFR	B (67)	6	NONE	Yes	53	52	50	2
R10.14	R10.14	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	54	54	52	2
R10.15	R10.15	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	53	53	52	1
R10.16	R10.16	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	64	63	58	5
R10.17	R10.17	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	54	54	52	2
R10.18	R10.18	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	55	55	53	2

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R10.19	R10.19	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	56	56	54	2
R10.20	R10.20	Parkside Townhomes	MFR	B (67)	8	NONE	Yes	46	46	45	1
R10.21	R10.21	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	48	47	47	0
R10.22	R10.22	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	47	47	47	0
R10.23	R10.23	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	49	49	49	0
R10.24	R10.24	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	50	50	50	0
R10.25	R10.25	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	47	47	44	3
R10.26	R10.26	Parkside Townhomes	MFR	B (67)	8	NONE	Yes	49	50	47	3
R10.27	R10.27	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	52	52	49	3
R10.28	R10.28	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	53	53	50	3
R10.29	R10.29	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	52	52	52	0
R10.30	R10.30	Parkside Townhomes	MFR	B (67)	6	NONE	Yes	52	52	52	0
R10.31	R10.31	Parkside Townhomes	MFR	B (67)	1	A/E	Yes	69	69	63	6
R10.32	R10.32	Parkside Townhomes	MFR	B (67)	2	A/E	Yes	65	66	60	6
R10.33	R10.33	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	62	62	58	5*
R10.34	R10.34	Parkside Townhomes	MFR	B (67)	1	A/E	Yes	70	71	64	7
R10.35	R10.35	Parkside Townhomes	MFR	B (67)	2	A/E	Yes	70	71	64	7
R10.36	R10.36	Parkside Townhomes	MFR	B (67)	2	A/E	Yes	70	70	64	6
R10.37	R10.37	Parkside Townhomes	MFR	B (67)	2	A/E	Yes	70	70	64	6
R10.38	R10.38	Parkside Townhomes	MFR	B (67)	1	A/E	Yes	70	69	64	5
R10.39	R10.39	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	59	60	56	4
R10.40	R10.40	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	48	49	48	1
R10.41	R10.41	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	49	49	49	0
R10.42	R10.42	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	49	49	48	1
R10.43	R10.43	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	54	55	52	3
R10.44	R10.44	Parkside Townhomes	REC	C (67)	1	NONE	Yes	60	58	54	4
R10.45	R10.45	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	61	58	54	4
R10.46	R10.46	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	63	61	56	5
R10.47	R10.47	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	48	48	45	3

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R10.48	R10.48	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	55	53	49	4
R10.49	R10.49	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	54	54	52	2
R10.50	R10.50	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	52	51	49	2
R10.51	R10.51	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	54	51	49	2
R10.52	R10.52	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	52	50	49	1
R10.53	R10.53	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	51	51	47	4
R10.54	R10.54	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	47	47	45	2
R10.55	R10.55	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	61	60	54	6
R10.56	R10.56	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	59	58	53	5
R10.57	R10.57	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	57	56	52	4
R10.58	R10.58	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	55	54	50	4
R10.59	R10.59	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	52	51	47	4
R10.60	R10.60	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	44	44	44	0
R10.61	R10.61	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	43	43	43	0
R10.62	R10.62	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	66	65	62	3
R10.63	R10.63	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	65	63	60	3
R10.64	R10.64	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	63	62	58	4
R10.65	R10.65	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	62	60	56	4
R10.66	R10.66	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	60	58	55	3
R10.67	R10.67	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	58	57	53	4
R10.68	R10.68	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	64	63	58	5
R10.69	R10.69	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	60	60	54	6
R10.70	R10.70	Parkside Townhomes	MFR	B (67)	4	NONE	Yes	57	57	52	5
R10.71	R10.71	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	55	55	51	4
R10.72	R10.72	Parkside Townhomes	MFR	B (67)	3	NONE	Yes	52	53	49	4
R10.73	R10.73	Parkside Townhomes	MFR	B (67)	3	NONE	Yes	50	50	48	2
R10.74	R10.74	Parkside Townhomes	MFR	B (67)	3	A/E	Yes	67	66	63	3
R10.75	R10.75	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	65	63	61	2
R10.76	R10.76	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	63	61	59	2

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R10.77	R10.77	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	59	58	55	3
R10.78	R10.78	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	58	57	54	3
R10.79	R10.79	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	58	56	53	3
R10.80	R10.80	Parkside Townhomes	MFR	B (67)	1	NONE	Yes	52	50	49	1
R10.81	R10.81	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	60	61	57	4
R10.82	R10.82	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	55	56	52	4
R10.83	R10.83	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	52	53	49	4
R10.84	R10.84	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	51	52	48	4
R10.85	R10.85	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	51	51	48	3
R10.86	R10.86	Parkside Townhomes	MFR	B (67)	2	NONE	Yes	49	50	47	3
R10.87.0	R10.87	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	66	65	60	5
R10.87.1	R10.87	Seminary Hill Apts.	MFR	B (67)	2	A/E	Yes	68	68	61	7
R10.87.2	R10.87	Seminary Hill Apts.	MFR	B (67)	2	A/E	Yes	70	69	64	5
R10.88.0	R10.88	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	59	60	55	5
R10.88.1	R10.88	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	63	63	56	7
R10.88.2	R10.88	Seminary Hill Apts.	MFR	B (67)	2	A/E	Yes	65	66	59	7
R10.89.0	R10.89	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	53	53	50	3
R10.89.1	R10.89	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	57	57	52	5
R10.89.2	R10.89	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	59	60	54	6
R10.90.0	R10.90	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	50	51	48	3
R10.90.1	R10.90	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	54	54	49	5
R10.90.2	R10.90	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	57	57	51	6
R10.91.1	R10.91	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	59	60	56	4
R10.91.2	R10.91	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	62	62	57	5
R10.92.1	R10.92	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	57	57	54	3
R10.92.2	R10.92	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	59	59	55	4
R10.93.1	R10.93	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	54	54	52	2
R10.93.2	R10.93	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	56	57	53	4
R10.94.1	R10.94	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	53	53	50	3

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R10.94.2	R10.94	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	55	55	52	3
R10.95.1	R10.95	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	53	53	50	3
R10.95.2	R10.95	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	55	56	52	4
R10.96.1	R10.96	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	56	57	53	4
R10.96.2	R10.96	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	59	59	54	5
R10.97.1	R10.97	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	58	58	54	4
R10.97.2	R10.97	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	61	61	56	5
R10.98.1	R10.98	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	55	56	51	5
R10.98.2	R10.98	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	57	57	53	4
R10.99.0	R10.99	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	43	44	41	3
R10.99.1	R10.99	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	42	43	41	2
R10.99.2	R10.99	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	43	45	43	2
R10.100.0	R10.100	Seminary Hill Apts.	MFR	B (67)	4	NONE	Yes	44	44	41	3
R10.100.1	R10.100	Seminary Hill Apts.	MFR	B (67)	4	NONE	Yes	42	42	39	3
R10.100.2	R10.100	Seminary Hill Apts.	MFR	B (67)	4	NONE	Yes	47	48	45	3
R10.101.0	R10.101	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	37	40	39	1
R10.101.1	R10.101	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	40	41	40	1
R10.101.2	R10.101	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	42	43	42	1
R10.102.1	R10.102	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	42	43	43	0
R10.102.2	R10.102	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	42	43	43	0
R10.102.3	R10.102	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	48	49	49	0
R10.102.4	R10.102	Seminary Hill Apts.	MFR	B (67)	2	NONE	No	57	58	57	1
R11.1.2	R11.1	Seminary Towers Apts.	MFR	B (67)	1	A/E	Yes	67	68	62	6
R11.1.4	R11.1	Seminary Towers Apts.	MFR	B (67)	1	A/E	No	71	71	66	5
R11.1.8	R11.1	Seminary Towers Apts.	MFR	B (67)	1	A/E	No	71	71	71	0
R11.1.13	R11.1	Seminary Towers Apts.	MFR	B (67)	1	A/E	No	71	71	71	0
R11.2.2	R11.2	Seminary Towers Apts.	MFR	B (67)	2	NONE	Yes	64	64	58	6
R11.2.4	R11.2	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	68	68	61	7
R11.2.8	R11.2	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	69	69	68	1

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R11.2.13	R11.2	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	68	69	69	0
R11.3.2	R11.3	Seminary Towers Apts.	MFR	B (67)	2	NONE	Yes	62	62	56	6
R11.3.4	R11.3	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	65	65	58	7
R11.3.8	R11.3	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	67	68	66	2
R11.3.13	R11.3	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	67	67	67	0
R11.4.2	R11.4	Seminary Towers Apts.	MFR	B (67)	1	NONE	Yes	60	61	56	5
R11.4.4	R11.4	Seminary Towers Apts.	MFR	B (67)	1	NONE	No	64	64	57	7
R11.4.8	R11.4	Seminary Towers Apts.	MFR	B (67)	1	A/E	No	67	67	65	2
R11.4.13	R11.4	Seminary Towers Apts.	MFR	B (67)	1	A/E	No	67	67	67	0
R11.5.2	R11.5	Seminary Towers Apts.	MFR	B (67)	2	NONE	Yes	59	59	55	5*
R11.5.4	R11.5	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	63	63	56	7
R11.5.8	R11.5	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	66	66	64	2
R11.5.13	R11.5	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	67	67	66	1
R11.6.2	R11.6	Seminary Towers Apts.	MFR	B (67)	4	NONE	Yes	41	41	41	0
R11.6.4	R11.6	Seminary Towers Apts.	MFR	B (67)	4	NONE	No	42	42	42	0
R11.6.8	R11.6	Seminary Towers Apts.	MFR	B (67)	4	NONE	No	44	43	43	0
R11.6.13	R11.6	Seminary Towers Apts.	MFR	B (67)	4	NONE	No	54	53	53	0
R11.7.2	R11.7	Seminary Towers Apts.	MFR	B (67)	2	NONE	Yes	60	61	59	2
R11.7.4	R11.7	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	63	63	61	2
R11.7.8	R11.7	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	66	66	65	1
R11.7.13	R11.7	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	66	67	66	1
R11.8.2	R11.8	Seminary Towers Apts.	MFR	B (67)	1	NONE	Yes	61	61	59	2
R11.8.4	R11.8	Seminary Towers Apts.	MFR	B (67)	1	NONE	No	63	64	61	3
R11.8.8	R11.8	Seminary Towers Apts.	MFR	B (67)	1	A/E	No	66	66	65	1
R11.8.13	R11.8	Seminary Towers Apts.	MFR	B (67)	1	A/E	No	67	67	67	0
R11.9.2	R11.9	Seminary Towers Apts.	MFR	B (67)	2	NONE	Yes	61	62	60	2
R11.9.4	R11.9	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	64	65	62	3
R11.9.8	R11.9	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	67	67	66	1
R11.9.13	R11.9	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	67	67	67	0

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R11.10.2	R11.10	Seminary Towers Apts.	MFR	B (67)	2	NONE	Yes	64	64	61	3
R11.10.4	R11.10	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	67	67	63	4
R11.10.8	R11.10	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	68	69	68	1
R11.10.13	R11.10	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	68	69	69	0
R11.11.2	R11.11	Seminary Towers Apts.	MFR	B (67)	1	A/E	Yes	67	68	63	5
R11.11.4	R11.11	Seminary Towers Apts.	MFR	B (67)	1	A/E	No	70	71	67	4
R11.11.8	R11.11	Seminary Towers Apts.	MFR	B (67)	1	A/E	No	71	71	71	0
R11.11.13	R11.11	Seminary Towers Apts.	MFR	B (67)	1	A/E	No	71	71	71	0
R11.12.2	R11.12	Seminary Towers Apts.	MFR	B (67)	2	NONE	Yes	61	62	62	0
R11.12.4	R11.12	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	63	63	63	0
R11.12.8	R11.12	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	66	66	66	0
R11.12.13	R11.12	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	67	67	67	0
R11.13.2	R11.13	Seminary Towers Apts.	MFR	B (67)	2	NONE	Yes	61	62	60	2
R11.13.4	R11.13	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	64	64	62	2
R11.13.8	R11.13	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	67	67	66	1
R11.13.13	R11.13	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	67	67	67	0
R11.14.2	R11.14	Seminary Towers Apts.	MFR	B (67)	2	NONE	Yes	60	61	59	2
R11.14.4	R11.14	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	63	63	61	2
R11.14.8	R11.14	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	66	66	65	1
R11.14.13	R11.14	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	67	67	67	0
R11.15.2	R11.15	Seminary Towers Apts.	MFR	B (67)	2	NONE	Yes	60	60	58	2
R11.15.4	R11.15	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	62	63	60	3
R11.15.8	R11.15	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	65	66	65	1
R11.15.13	R11.15	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	66	66	66	0
R11.16.2	R11.16	Seminary Towers Apts.	MFR	B (67)	2	NONE	Yes	60	61	59	2
R11.16.4	R11.16	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	62	63	60	3
R11.16.8	R11.16	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	65	65	64	1
R11.16.13	R11.16	Seminary Towers Apts.	MFR	B (67)	2	A/E	No	66	66	66	0
R11.17.2	R11.17	Seminary Towers Apts.	MFR	B (67)	2	NONE	Yes	39	39	39	0

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R11.17.4	R11.17	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	41	42	41	1
R11.17.8	R11.17	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	45	45	44	1
R11.17.13	R11.17	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	55	54	54	0
R11.18.2	R11.18	Seminary Towers Apts.	MFR	B (67)	1	NONE	Yes	47	48	48	0
R11.18.4	R11.18	Seminary Towers Apts.	MFR	B (67)	1	NONE	No	48	49	49	0
R11.18.8	R11.18	Seminary Towers Apts.	MFR	B (67)	1	NONE	No	49	50	50	0
R11.18.13	R11.18	Seminary Towers Apts.	MFR	B (67)	1	NONE	No	56	55	55	0
R11.19.2	R11.19	Seminary Towers Apts.	MFR	B (67)	3	NONE	Yes	43	44	44	0
R11.19.4	R11.19	Seminary Towers Apts.	MFR	B (67)	3	NONE	No	44	45	45	0
R11.19.8	R11.19	Seminary Towers Apts.	MFR	B (67)	3	NONE	No	45	46	46	0
R11.19.13	R11.19	Seminary Towers Apts.	MFR	B (67)	3	NONE	No	49	50	50	0
R11.20.2	R11.20	Seminary Towers Apts.	MFR	B (67)	2	NONE	Yes	52	54	54	0
R11.20.4	R11.20	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	53	54	54	0
R11.20.8	R11.20	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	53	54	54	0
R11.20.13	R11.20	Seminary Towers Apts.	MFR	B (67)	2	NONE	No	56	57	57	0
R11.21.2	R11.21	Seminary Towers Apts.	MFR	B (67)	3	NONE	Yes	51	52	52	0
R11.21.4	R11.21	Seminary Towers Apts.	MFR	B (67)	3	NONE	No	51	53	53	0
R11.21.8	R11.21	Seminary Towers Apts.	MFR	B (67)	3	NONE	No	51	53	53	0
R11.21.13	R11.21	Seminary Towers Apts.	MFR	B (67)	3	NONE	No	54	54	54	0
R11.22.2	R11.22	Seminary Towers Apts.	MFR	B (67)	1	NONE	Yes	57	58	58	0
R11.22.4	R11.22	Seminary Towers Apts.	MFR	B (67)	1	NONE	No	57	58	58	0
R11.22.8	R11.22	Seminary Towers Apts.	MFR	B (67)	1	NONE	No	58	59	59	0
R11.22.13	R11.22	Seminary Towers Apts.	MFR	B (67)	1	NONE	No	61	61	61	0
R11.23	R11.23	Seminary Towers Apts.	REC	C (67)	1	NONE	Yes	64	65	63	2
R11.24.2	R11.24	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	50	51	48	3
R11.24.3	R11.24	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	52	53	49	4
R11.25.2	R11.25	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	52	52	49	3
R11.25.3	R11.25	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	53	54	50	4
R11.26.2	R11.26	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	53	53	51	2

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R11.26.3	R11.26	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	53	54	52	2
R11.27.2	R11.27	Seminary Hill Apts.	MFR	B (67)	4	NONE	Yes	49	50	48	2
R11.27.3	R11.27	Seminary Hill Apts.	MFR	B (67)	4	NONE	Yes	50	51	49	2
R11.28.2	R11.28	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	49	50	49	1
R11.28.3	R11.28	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	51	51	51	0
R11.29.2	R11.29	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	50	51	51	0
R11.29.3	R11.29	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	52	53	53	0
R11.30.2	R11.30	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	52	53	53	0
R11.30.3	R11.30	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	53	54	54	0
R11.31.2	R11.31	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	44	46	46	0
R11.31.3	R11.31	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	47	48	48	0
R11.32.2	R11.32	Seminary Hill Apts.	MFR	B (67)	4	NONE	Yes	44	45	45	0
R11.32.3	R11.32	Seminary Hill Apts.	MFR	B (67)	4	NONE	Yes	45	46	46	0
R11.33.2	R11.33	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	62	63	63	0
R11.33.3	R11.33	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	62	63	63	0
R11.34.2	R11.34	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	61	63	63	0
R11.34.3	R11.34	Seminary Hill Apts.	MFR	B (67)	2	NONE	Yes	61	63	63	0
R12.1	R12.1	CourtYard Marriot	HOT	E (72)	1	NONE	Yes	67	67	--	--
R12.2	R12.2	CourtYard Marriot	HOT	E (72)	1	NONE	Yes	67	67	--	--
R12.3	R12.3	Commercial	COM	E (72)	1	NONE	Yes	59	59	--	--
R12.4	R12.4	Professional	COM	E (72)	1	NONE	Yes	57	58	--	--
R12.5	R12.5	Strip Mall	COM	E (72)	1	NONE	Yes	55	56	--	--
R13.1	R13.1	Mark Center	COM	E (72)	1	NONE	Yes	54	53	47	6
R13.2	R13.2	Mark Center	COM	E (72)	1	NONE	Yes	44	44	--	--
R13.3	R13.3	Mark Center	COM	E (72)	1	NONE	Yes	66	67	--	--
R13.4	R13.4	Mark Center	COM	E (72)	1	NONE	Yes	64	65	--	--
R14.1.2	R14.1	Southern Towers Apts.	MFR	B (67)	1	NONE	Yes	65	65	--	--
R14.1.4	R14.1	Southern Towers Apts.	MFR	B (67)	1	A/E	No	68	68	--	--
R14.1.8	R14.1	Southern Towers Apts.	MFR	B (67)	1	A/E	No	70	70	--	--

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R14.1.15	R14.1	Southern Towers Apts.	MFR	B (67)	1	A/E	No	70	70	--	--
R14.2.2	R14.2	Southern Towers Apts.	MFR	B (67)	2	NONE	Yes	63	62	--	--
R14.2.4	R14.2	Southern Towers Apts.	MFR	B (67)	2	NONE	No	65	65	--	--
R14.2.8	R14.2	Southern Towers Apts.	MFR	B (67)	2	A/E	No	67	67	--	--
R14.2.15	R14.2	Southern Towers Apts.	MFR	B (67)	2	A/E	No	68	67	--	--
R14.3.2	R14.3	Southern Towers Apts.	MFR	B (67)	1	NONE	Yes	63	63	--	--
R14.3.4	R14.3	Southern Towers Apts.	MFR	B (67)	1	NONE	No	66	65	--	--
R14.3.8	R14.3	Southern Towers Apts.	MFR	B (67)	1	A/E	No	67	67	--	--
R14.3.15	R14.3	Southern Towers Apts.	MFR	B (67)	1	A/E	No	68	67	--	--
R14.4.2	R14.4	Southern Towers Apts.	MFR	B (67)	1	NONE	Yes	63	61	--	--
R14.4.4	R14.4	Southern Towers Apts.	MFR	B (67)	1	NONE	No	65	64	--	--
R14.4.8	R14.4	Southern Towers Apts.	MFR	B (67)	1	A/E	No	68	68	--	--
R14.4.15	R14.4	Southern Towers Apts.	MFR	B (67)	1	A/E	No	69	68	--	--
R14.5.2	R14.5	Southern Towers Apts.	MFR	B (67)	2	NONE	Yes	59	59	--	--
R14.5.4	R14.5	Southern Towers Apts.	MFR	B (67)	2	NONE	No	62	61	--	--
R14.5.8	R14.5	Southern Towers Apts.	MFR	B (67)	2	NONE	No	65	65	--	--
R14.5.15	R14.5	Southern Towers Apts.	MFR	B (67)	2	A/E	No	66	66	--	--
R14.6.2	R14.6	Southern Towers Apts.	MFR	B (67)	1	NONE	Yes	60	60	--	--
R14.6.4	R14.6	Southern Towers Apts.	MFR	B (67)	1	NONE	No	62	62	--	--
R14.6.8	R14.6	Southern Towers Apts.	MFR	B (67)	1	NONE	No	65	64	--	--
R14.6.15	R14.6	Southern Towers Apts.	MFR	B (67)	1	A/E	No	66	66	--	--
R14.7.2	R14.7	Southern Towers Apts.	MFR	B (67)	1	NONE	Yes	53	54	--	--
R14.7.4	R14.7	Southern Towers Apts.	MFR	B (67)	1	NONE	No	54	55	--	--
R14.7.8	R14.7	Southern Towers Apts.	MFR	B (67)	1	NONE	No	54	55	--	--
R14.7.15	R14.7	Southern Towers Apts.	MFR	B (67)	1	NONE	No	54	55	--	--
R14.8.2	R14.8	Southern Towers Apts.	MFR	B (67)	2	NONE	Yes	49	50	--	--
R14.8.4	R14.8	Southern Towers Apts.	MFR	B (67)	2	NONE	No	50	51	--	--
R14.8.8	R14.8	Southern Towers Apts.	MFR	B (67)	2	NONE	No	50	51	--	--
R14.8.15	R14.8	Southern Towers Apts.	MFR	B (67)	2	NONE	No	51	52	--	--

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R14.9.2	R14.9	Southern Towers Apts.	MFR	B (67)	1	NONE	Yes	49	49	--	--
R14.9.4	R14.9	Southern Towers Apts.	MFR	B (67)	1	NONE	No	51	51	--	--
R14.9.8	R14.9	Southern Towers Apts.	MFR	B (67)	1	NONE	No	51	51	--	--
R14.9.15	R14.9	Southern Towers Apts.	MFR	B (67)	1	NONE	No	52	52	--	--
R14.10.2	R14.10	Southern Towers Apts.	MFR	B (67)	1	NONE	Yes	57	57	--	--
R14.10.4	R14.10	Southern Towers Apts.	MFR	B (67)	1	NONE	No	58	59	--	--
R14.10.8	R14.10	Southern Towers Apts.	MFR	B (67)	1	NONE	No	60	60	--	--
R14.10.15	R14.10	Southern Towers Apts.	MFR	B (67)	1	NONE	No	62	62	--	--
R14.11.2	R14.11	Southern Towers Apts.	MFR	B (67)	2	NONE	Yes	55	55	--	--
R14.11.4	R14.11	Southern Towers Apts.	MFR	B (67)	2	NONE	No	56	56	--	--
R14.11.8	R14.11	Southern Towers Apts.	MFR	B (67)	2	NONE	No	58	57	--	--
R14.11.15	R14.11	Southern Towers Apts.	MFR	B (67)	2	NONE	No	59	59	--	--
R14.12.2	R14.12	Southern Towers Apts.	MFR	B (67)	1	NONE	Yes	54	54	--	--
R14.12.4	R14.12	Southern Towers Apts.	MFR	B (67)	1	NONE	No	56	56	--	--
R14.12.8	R14.12	Southern Towers Apts.	MFR	B (67)	1	NONE	No	58	58	--	--
R14.12.15	R14.12	Southern Towers Apts.	MFR	B (67)	1	NONE	No	60	60	--	--
R14.13.2	R14.13	Southern Towers Apts.	MFR	B (67)	1	NONE	Yes	59	59	--	--
R14.13.4	R14.13	Southern Towers Apts.	MFR	B (67)	1	NONE	No	60	60	--	--
R14.13.8	R14.13	Southern Towers Apts.	MFR	B (67)	1	NONE	No	61	61	--	--
R14.13.15	R14.13	Southern Towers Apts.	MFR	B (67)	1	NONE	No	62	62	--	--
R14.14.2	R14.14	Southern Towers Apts.	MFR	B (67)	2	NONE	Yes	57	58	--	--
R14.14.4	R14.14	Southern Towers Apts.	MFR	B (67)	2	NONE	No	58	59	--	--
R14.14.8	R14.14	Southern Towers Apts.	MFR	B (67)	2	NONE	No	59	60	--	--
R14.14.15	R14.14	Southern Towers Apts.	MFR	B (67)	2	NONE	No	61	61	--	--
R14.15.2	R14.15	Southern Towers Apts.	MFR	B (67)	1	NONE	Yes	59	59	--	--
R14.15.4	R14.15	Southern Towers Apts.	MFR	B (67)	1	NONE	No	59	60	--	--
R14.15.8	R14.15	Southern Towers Apts.	MFR	B (67)	1	NONE	No	60	60	--	--
R14.15.15	R14.15	Southern Towers Apts.	MFR	B (67)	1	NONE	No	61	61	--	--
R14.16.2	R14.16	Southern Towers Apts.	MFR	B (67)	1	NONE	Yes	53	53	--	--

Receiver ID[1]	Figure 1 Location ID	Community Name	Land Use[2]	Activity Category (NAC)	Represented Dwelling Units	Impact Type[3]	At or Below Evaluation Limit?[4]	Existing Noise Level, dBA	Build Noise Level, dBA	Build Noise Level with Barrier, dBA	Barrier I.L., dB[5]
R14.16.4	R14.16	Southern Towers Apts.	MFR	B (67)	1	NONE	No	54	55	--	--
R14.16.8	R14.16	Southern Towers Apts.	MFR	B (67)	1	NONE	No	54	55	--	--
R14.16.15	R14.16	Southern Towers Apts.	MFR	B (67)	1	NONE	No	54	54	--	--
R14.17.2	R14.17	Southern Towers Apts.	MFR	B (67)	2	NONE	Yes	45	45	--	--
R14.17.4	R14.17	Southern Towers Apts.	MFR	B (67)	2	NONE	No	47	47	--	--
R14.17.8	R14.17	Southern Towers Apts.	MFR	B (67)	2	NONE	No	47	48	--	--
R14.17.15	R14.17	Southern Towers Apts.	MFR	B (67)	2	NONE	No	47	48	--	--
R14.18.2	R14.18	Southern Towers Apts.	MFR	B (67)	1	NONE	Yes	46	46	--	--
R14.18.4	R14.18	Southern Towers Apts.	MFR	B (67)	1	NONE	No	48	49	--	--
R14.18.8	R14.18	Southern Towers Apts.	MFR	B (67)	1	NONE	No	48	49	--	--
R14.18.15	R14.18	Southern Towers Apts.	MFR	B (67)	1	NONE	No	49	49	--	--
R14.19	R14.19	Southern Towers Apts.	REC	B (67)	1	NONE	Yes	60	60	--	--
R14.20	R14.20	Southern Towers Apts.	REC	B (67)	1	NONE	Yes	57	57	--	--

Notes:

1 – Receptors are coded by: Receptor/CNE#/Location#/Floor# (e.g. Receptor in CNE 2 at Location 2 on Floor 5 = R2.2.5).

2 – Land Use: COM – commercial; HOT – hotel; SFR - single-family residence; MFR - multi-family residence; REC - recreational.

3 – NONE = No Impact; A/E = Approach or Exceed NAC.

4 – Only multi-story multi-family residential balconies at or below a maximum 30-foot high noise barrier at potential abatement locations are eligible to be counted for feasibility and reasonableness calculations.

5 – Barrier Insertion Loss.

* – All noise levels are rounded to the nearest decibel for presentation purposes. Receptors with an insertion loss of at least 4.5 dB are shown as 5 dB.

Legend:

- Impacted and 5 or 6 dB Insertion Loss
- Impacted and 7 dB or more Insertion Loss
- Impacted and Not Benefited
- Benefited with 5 dB or more Insertion Loss
- Not Benefited or Impacted
- Impacted and Above Evaluation Limit

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Appendix E Proposed Barrier Top of Wall Elevations

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Table E-1. Proposed Top of Wall Elevations
Noise Barrier 1

Barrier No. Barrier Location/ Hwy. Side	Approximate Barrier Station[1]	Northing, ft	Easting, ft	Bottom of Barrier Elevation, ft	Top of Barrier Elevation[2], ft	Barrier Height, ft
Barrier 1 Right-of-Way / Southbound	260+00	3669287.8	421869.7	244.0	259.0	15
	260+67	3669362.6	421867.1	245.0	260.0	15
	261+22	3669428.2	421860.1	246.0	261.0	15
	261+76	3669493.9	421853.1	246.0	261.0	15
	262+08	3669529.8	421852.4	246.0	261.0	15
	Approximate Length: 243 ft					
	Approximate Surface Area: 3,641 ft					

Notes:

1 - Stations correspond to that of the NB Mainline unless otherwise noted.

2 - Top of barrier elevations shall take precedence over specified barrier heights for design and construction purposes.

3 - Barrier segment is perpendicular to or does not run parallel with the controlling stationing.

4 - Barrier follows SB I-395 Mainline stationing.

5 - Barrier follows NB I-395 Seminary Road Off-Ramp stationing.

Table E-2. Proposed Top of Wall Elevations
Noise Barrier 2

Barrier No. Barrier Location/ Hwy. Side	Approximate Barrier Station[1]	Northing, ft	Easting, ft	Bottom of Barrier Elevation, ft	Top of Barrier Elevation[2], ft	Barrier Height, ft
Barrier 2 Shoulder / Southbound	266+89 [3]	3669912.5	422158.5	218.0	238.0	20
	267+12 [3]	3669949.0	422127.8	215.2	235.2	20
	267+36 [3]	3669989.5	422102.4	212.8	232.8	20
	267+68 [3]	3670033.8	422086.6	210.5	230.5	20
	268+08	3670080.8	422080.8	208.4	228.4	20
	268+52	3670127.8	422084.8	206.8	226.8	20
	269+00	3670171.5	422102.1	206.0	226.0	20
	270+00	3670258.5	422144.2	202.5	222.5	20
	271+00	3670343.5	422191.2	198.6	218.6	20
	272+00	3670428.5	422238.2	195.0	215.0	20
	273+00	3670512.3	422287.2	191.2	211.2	20
	274+00	3670596.5	422336.3	188.0	208.0	20
	274+00	3670596.5	422336.3	188.0	203.0	15
	275+00	3670680.3	422386.4	184.4	199.4	15
	276+00	3670762.5	422439.0	180.8	195.8	15
	277+00	3670842.3	422495.4	177.4	192.4	15
	278+00	3670922.0	422551.9	174.2	189.2	15
	279+00	3670998.8	422612.2	170.1	185.1	15
	280+00	3671074.3	422674.1	166.1	181.1	15
	281+00	3671147.5	422738.7	162.1	177.1	15
	282+00	3671219.5	422804.8	157.6	172.6	15
	283+00	3671290.5	422872.0	153.4	168.4	15
	284+00	3671361.3	422939.2	149.4	164.4	15
	285+00	3671433.0	423007.5	145.8	160.8	15
	286+00	3671505.5	423076.5	142.3	157.3	15
	287+00	3671577.5	423146.0	138.1	153.1	15
	288+00	3671648.0	423216.8	134.1	149.1	15
	289+00	3671719.3	423287.0	130.1	145.1	15
	290+00	3671790.5	423357.2	126.3	141.3	15

Notes:

1 - Stations correspond to that of the NB Mainline unless otherwise noted.

2 - Top of barrier elevations shall take precedence over specified barrier heights for design and construction purposes.

3 - Barrier segment is perpendicular to or does not run parallel with the controlling stationing.

4 - Barrier follows SB I-395 Mainline stationing.

5 - Barrier follows NB I-395 Seminary Road Off-Ramp stationing.

Table E-3. Proposed Top of Wall Elevations
Noise Barrier 2 (continued)

Barrier No. Barrier Location/ Hwy. Side	Approximate Barrier Station[1]	Northing, ft	Easting, ft	Bottom of Barrier Elevation, ft	Top of Barrier Elevation[2], ft	Barrier Height, ft
Barrier 2 (continued) Shoulder / Southbound	290+00	3671790.5	423357.2	126.3	138.3	12
	291+00	3671860.8	423428.3	122.4	134.4	12
	292+00	3671931.0	423499.4	118.8	130.8	12
	293+00	3672001.5	423570.5	116.2	128.2	12
	294+00	3672071.8	423641.6	113.9	125.9	12
	295+00	3672142.0	423712.7	112.1	124.1	12
	296+00	3672212.5	423783.8	110.3	122.3	12
	297+00	3672282.8	423854.9	110.2	122.2	12
	298+00	3672344.3	423934.7	110.3	122.3	12
	299+00	3672416.5	424013.7	111.5	123.5	12
	300+00	3672482.8	424079.0	113.5	125.5	12
	301+00	3672564.5	424138.9	116.5	128.5	12
	302+00	3672635.3	424209.4	120.0	132.0	12
	303+00	3672706.0	424280.4	124.0	136.0	12
	304+00	3672777.3	424350.9	127.2	139.2	12
	305+00	3672849.5	424420.5	130.0	142.0	12
	306+00	3672920.3	424491.5	133.8	145.8	12
	307+00	3672993.3	424560.3	137.3	149.3	12
	308+00	3673066.0	424629.1	140.0	152.0	12
	309+00	3673140.0	424696.9	144.0	156.0	12
	310+00	3673214.0	424764.6	147.4	159.4	12
	311+00	3673289.0	424831.3	150.4	162.4	12
	312+00	3673363.8	424898.0	154.0	166.0	12
	Approximate Length: 4,550 ft					
	Approximate Surface Area: 65,484 ft					

Notes:
1 - Stations correspond to that of the NB Mainline unless otherwise noted.
2 - Top of barrier elevations shall take precedence over specified barrier heights for design and construction purposes.
3 - Barrier segment is perpendicular to or does not run parallel with the controlling stationing.
4 - Barrier follows SB I-395 Mainline stationing.
5 - Barrier follows NB I-395 Seminary Road Off-Ramp stationing.

Table E-4. Proposed Top of Wall Elevations
Noise Barrier 3

Barrier No. Barrier Location/ Hwy. Side	Approximate Barrier Station[1]	Northing, ft	Easting, ft	Bottom of Barrier Elevation, ft	Top of Barrier Elevation[2], ft	Barrier Height, ft
Barrier 3 Shoulder / Southbound	621+50 [4]	3674085.5	425521.1	187.2	204.2	17
	622+00 [4]	3674125.3	425551.7	188.5	205.5	17
	622+50 [4]	3674169.5	425577.9	190.0	207.0	17
	623+00 [4]	3674213.0	425602.2	190.9	207.9	17
	624+00 [4]	3674294.3	425661.1	194.0	211.0	17
	625+00 [4]	3674374.8	425721.1	198.0	215.0	17
	625+00 [4]	3674374.8	425721.1	198.0	213.0	15
	626+00 [4]	3674456.0	425780.1	200.8	215.8	15
	627+00 [4]	3674538.3	425837.5	204.4	219.4	15
	628+00 [4]	3674620.5	425895.0	208.0	223.0	15
	629+00 [4]	3674702.8	425952.4	210.4	225.4	15
	630+00 [4]	3674785.0	426009.8	214.0	229.0	15
	631+00 [4]	3674867.5	426067.2	216.0	231.0	15
	632+00 [4]	3674949.0	426126.0	218.0	233.0	15
	633+00 [4]	3675031.5	426183.0	220.0	235.0	15
	634+00 [4]	3675114.3	426240.2	222.0	237.0	15
	Approximate Length: 1,256 ft					
	Approximate Surface Area: 19,541 ft					

Notes:

1 - Stations correspond to that of the NB Mainline unless otherwise noted.

2 - Top of barrier elevations shall take precedence over specified barrier heights for design and construction purposes.

3 - Barrier segment is perpendicular to or does not run parallel with the controlling stationing.

4 - Barrier follows SB I-395 Mainline stationing.

5 - Barrier follows NB I-395 Seminary Road Off-Ramp stationing.

Table E-5. Proposed Top of Wall Elevations
Noise Barrier 4

Barrier No. Barrier Location/ Hwy. Side	Approximate Barrier Station[1]	Northing, ft	Easting, ft	Bottom of Barrier Elevation, ft	Top of Barrier Elevation[2], ft	Barrier Height, ft
Barrier 4 Shoulder / Northbound	288+00	3671779.0	423088.3	133.8	148.8	15
	289+00	3671848.8	423158.9	130.0	145.0	15
	290+00	3671919.0	423230.0	126.3	141.3	15
	291+00	3671989.5	423301.1	122.6	137.6	15
	292+00	3672059.8	423372.1	119.1	134.1	15
	293+00	3672130.0	423443.2	116.0	131.0	15
	294+00	3672200.5	423514.3	113.6	128.6	15
	294+31	3672223.0	423537.0	113.0	128.0	15
	295+00	3672271.0	423585.0	111.7	126.7	15
	296+00	3672341.5	423656.1	111.1	126.1	15
	297+00	3672411.8	423727.2	110.7	125.7	15
	297+50	3672447.0	423762.9	110.6	125.6	15
	298+00	3672481.8	423798.7	110.8	125.8	15
	299+00	3672552.0	423869.7	111.6	126.6	15
	300+00	3672622.5	423940.8	113.5	128.5	15
	301+00	3672692.8	424011.9	115.7	130.7	15
	302+00	3672763.3	424082.9	118.5	133.5	15
	303+00	3672833.5	424153.5	121.3	136.3	15
	304+00	3672904.5	424223.0	125.2	140.2	15
	305+00	3672976.0	424292.2	128.5	143.5	15
	306+00	3673048.3	424360.7	131.1	146.1	15
	306+80	3673106.0	424414.7	133.8	148.8	15
	307+30	3673144.0	424447.9	136.1	151.1	15
	308+00	3673195.3	424494.7	139.1	154.1	15
	309+00	3673269.5	424561.2	142.4	157.4	15
	310+00	3673344.0	424627.0	146.2	161.2	15
	311+00	3673419.3	424692.1	149.2	164.2	15
	312+00	3673495.0	424756.5	153.0	168.0	15
	313+00	3673571.5	424820.2	156.6	171.6	15
	314+00	3673648.5	424883.2	159.8	174.8	15
	315+00	3673726.0	424945.8	162.8	177.8	15
	316+00	3673804.0	425008.0	166.3	181.3	15
	316+50	3673843.3	425038.9	167.9	182.9	15
	317+00	3673882.3	425069.8	169.6	184.6	15
	Approximate Length: 2,892 ft					
	Approximate Surface Area: 43,386 ft					

Notes:
1 - Stations correspond to that of the NB Mainline unless otherwise noted.
2 - Top of barrier elevations shall take precedence over specified barrier heights for design and construction purposes.
3 - Barrier segment is perpendicular to or does not run parallel with the controlling stationing.
4 - Barrier follows SB I-395 Mainline stationing.
5 - Barrier follows NB I-395 Seminary Road Off-Ramp stationing.

Table E-6. Proposed Top of Wall Elevations
Noise Barrier 5

Barrier No. Barrier Location/ Hwy. Side	Approximate Barrier Station[1]	Northing, ft	Easting, ft	Bottom of Barrier Elevation, ft	Top of Barrier Elevation[2], ft	Barrier Height[2], ft
Barrier 5 Top of Cut / Northbound	316+32	3673834.5	425020.5	170.0	185.0	15
	316+80	3673877.0	425044.9	173.0	188.0	15
	317+15	3673907.0	425062.2	175.0	190.0	15
	317+82	3673962.5	425099.5	178.0	193.0	15
	318+34	3674004.3	425130.5	180.0	195.0	15
	319+31	3674083.3	425186.1	185.0	200.0	15
	319+80	3674123.0	425214.1	187.0	202.0	15
	320+48	3674178.5	425253.0	190.0	205.0	15
	321+00	3674221.0	425282.9	191.0	206.0	15
	321+44	3674256.8	425308.1	191.0	206.0	15
	322+41	3674335.5	425363.7	192.1	207.1	15
	323+35	3674412.8	425417.7	195.0	210.0	15
	323+97	3674463.5	425451.7	197.0	212.0	15
	324+92	3674542.3	425503.5	200.0	215.0	15
	325+81	3674616.5	425552.0	205.0	220.0	15
	400+26 [5]	3674725.5	425623.0	210.1	225.1	15
	401+50 [5]	3674828.0	425689.5	215.0	230.0	15
	402+98 [5]	3674951.5	425767.4	220.0	235.0	15
	404+31 [5]	3675063.0	425837.5	225.0	240.0	15
	405+33 [5]	3675148.5	425891.8	230.0	245.0	15
	405+05 [5]	3675209.3	425930.1	232.3	247.3	15
	406+89 [5]	3675278.8	425974.1	235.0	250.0	15
	406+89 [5]	3675278.8	425974.1	235.0	252.0	17
	407+68 [5]	3675346.0	426017.0	237.0	254.0	17
	408+44 [5]	3675410.0	426057.3	239.0	256.0	17
	409+24 [5]	3675481.0	426093.7	240.0	257.0	17
	410+15 [5]	3675563.5	426132.5	240.2	257.2	17
	410+15 [5]	3675563.5	426132.5	240.2	260.2	20
	411+14 [5]	3675649.0	426181.6	240.7	260.7	20
	412+12 [5]	3675733.8	426231.9	240.8	260.8	20
	413+11 [5]	3675819.0	426281.9	240.4	260.4	20
	413+82 [5]	3675879.8	426317.8	240.0	260.0	20
	414+36 [5]	3675926.5	426344.9	240.0	260.0	20
	414+79 [5]	3675964.3	426366.1	240.0	260.0	20
	415+08 [5]	3675990.3	426379.4	240.0	260.0	20
	415+49 [5]	3676026.5	426397.9	240.0	260.0	20
	Approximate Length: 2,591 ft					
	Approximate Surface Area: 42,192 ft					

Notes:
1 - Stations correspond to that of the NB Mainline unless otherwise noted.
2 - Top of barrier elevations shall take precedence over specified barrier heights for design and construction purposes.
3 - Barrier segment is perpendicular to or does not run parallel with the controlling stationing.
4 - Barrier follows SB I-395 Mainline stationing.
5 - Barrier follows NB I-395 Seminary Road Off-Ramp stationing.

Appendix F Warranted, Feasible, and Reasonable Worksheets

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Warranted, Feasible, and Reasonable Worksheet

Note: the answers provided in the worksheet may differ between preliminary and final design. This worksheet is available in a protected digital format upon request.

Date:	11/05/2013
Project No. and UPC:	0395-100-722,736; 96261,102437
County:	City of Alexandria
Facility:	Interstate-395
Barrier System ID:	Noise Barrier 1
Noise Abatement Category(s)	NAC Categories B and C
Community Name and/or CNE#	CNE 1

Design phase: ☑ Preliminary Design ☐ Final Design

Warranted

1. Community Documentation (if applicable)
   a. Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued). N/A
   b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI): N/A
   c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate." ☑ Yes ☐ No

2. Criteria requiring consideration of noise abatement
   a. Project causes design year noise levels to approach or exceed the Noise Abatement Criteria? ☑ Yes ☐ No
   b. Project causes a substantial noise increase of 10 dBA or more? ☐ Yes ☑ No

Feasibility

1. Impacted receptor units
   a. Number of impacted receptor units: 3
   b. Number of impacted receptor units receiving 5 dBA or more insertion loss (IL): 2
   c. Percentage of impacted receptor units receiving 5 dB(A) or more IL 66%
   d. Is the percentage 50 or greater? ☑ Yes ☐ No

2	Will placement of the noise barrier cause engineering or safety conflicts, e.g. drainage or site distance issues?	☐ Yes	☑ No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	☐ Yes	☑ No
4	Will placement of the noise barrier conflict with existing utility locations?	☐ Yes	☑ No

Reasonableness

1. Cost-Benefit Factors
   a. Surface Area (Total square foot) of the proposed noise barrier. (ft^2) — 3,641
   b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more. — 2
   c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more. — 21
   d. Total number of benefited receptors. — 23
   e. Surface Area per benefited receptor unit. (ft^2/BR) — 158
   f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600? — Yes
   g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year? — Yes

2. Community Desires Related to the Barrier
   a. Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the im pacted receptor unit owners do not desire the barrier." — ☐ Yes ☐ No

3. Additional Noise Barrier Details
   a. Length of the proposed noise barrier — 243
   b Height range of the proposed noise barrier — 15
   c. Average height of the proposed noise barrier — 15
   d Cost per square foot. ($/$ft^2$) — 37
   e. Total Barrier Cost ($) — $134,735
   f. Additional comments (if applicable) —
   g. Barrier material — ☑ Absorptive ☐ Reflective

Decision

Is the Noise Barrier(s) WARRANTED?	☑ Yes	☐ No
Is the Noise Barrier(s) FEASIBLE?	☑ Yes	☐ No
Is the Noise Barrier(s) REASONABLE?	☑ Yes	☐ No

Additional Reasons for Decision:

Warranted, Feasible, and Reasonable Worksheet

Note: the answers provided in the worksheet may differ between preliminary and final design. This worksheet is available in a protected digital format upon request.

Date:	11/05/2013
Project No. and UPC:	0395-100-722,736; UPC No. 96261, 102437
County:	City of Alexandria
Facility:	Interstate-395
Barrier System ID:	Noise Barrier 2
Noise Abatement Category(s)	NAC Categories B and C
Community Name and/or CNE#	CNE's 1, 2, 3, and 4

Design phase: ☑ Preliminary Design ☐ Final Design

Warranted

1. Community Documentation (if applicable)
   a. Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued). N/A
   b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI): N/A
   c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate." ☑ Yes ☐ No

2. Criteria requiring consideration of noise abatement
   a. Project causes design year noise levels to approach or exceed the Noise Abatement Criteria? ☑ Yes ☐ No
   b. Project causes a substantial noise increase of 10 dBA or more? ☐ Yes ☑ No

Feasibility

1. Impacted receptor units
   a. Number of impacted receptor units: 182
   b. Number of impacted receptor units receiving 5 dBA or more insertion loss (IL): 182
   c. Percentage of impacted receptor units receiving 5 dB(A) or more IL 100%
   d. Is the percentage 50 or greater? ☑ Yes ☐ No

2	Will placement of the noise barrier cause engineering or safety conflicts, e.g. drainage or site distance issues?	☐ Yes	☑ No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	☐ Yes	☑ No
4	Will placement of the noise barrier conflict with existing utility locations?	☐ Yes	☑ No

Reasonableness

1. Cost-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	65,484
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	182
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	331
d. Total number of benefited receptors.	513
e. Surface Area per benefited receptor unit. (ft^2/BR)	128
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	Yes
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2. Community Desires Related to the Barrier

a. Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the im pacted receptor unit owners do not desire the barrier." ☐ Yes ☐ No

3. Additional Noise Barrier Details

a. Length of the proposed noise barrier	4,550
b Height range of the proposed noise barrier	12 - 20
c. Average height of the proposed noise barrier	15
d Cost per square foot. ($/$ft^2$)	37
e. Total Barrier Cost ($)	$2,422,908
f. Additional comments (if applicable)	
g. Barrier material	☑ Absorptive ☐ Reflective

Decision

Is the Noise Barrier(s) WARRANTED?	☑ Yes	☐ No
Is the Noise Barrier(s) FEASIBLE?	☑ Yes	☐ No
Is the Noise Barrier(s) REASONABLE?	☑ Yes	☐ No

Additional Reasons for Decision: _____

Warranted, Feasible, and Reasonable Worksheet

Note: the answers provided in the worksheet may differ between preliminary and final design. This worksheet is available in a protected digital format upon request.

Date:	11/05/2013
Project No. and UPC:	0395-100-722,736; UPC No. 96261, 102437
County:	City of Alexandria
Facility:	Interstate-395
Barrier System ID:	Noise Barrier 3
Noise Abatement Category(s)	NAC Categories C and E
Community Name and/or CNE#	CNE 5 and CNE 13

Design phase: ☑ Preliminary Design ☐ Final Design

Warranted

1. Community Documentation (if applicable)
   a. Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued). N/A
   b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI): N/A
   c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate." ☑ Yes ☐ No

2. Criteria requiring consideration of noise abatement
   a. Project causes design year noise levels to approach or exceed the Noise Abatement Criteria? ☑ Yes ☐ No
   b. Project causes a substantial noise increase of 10 dBA or more? ☐ Yes ☑ No

Feasibility

1. Impacted receptor units
   a. Number of impacted receptor units: 4
   b. Number of impacted receptor units receiving 5 dBA or more insertion loss (IL): 4
   c. Percentage of impacted receptor units receiving 5 dB(A) or more IL 100%
   d. Is the percentage 50 or greater? ☑ Yes ☐ No

2	Will placement of the noise barrier cause engineering or safety conflicts, e.g. drainage or site distance issues?	☐ Yes	☑ No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	☐ Yes	☑ No
4	Will placement of the noise barrier conflict with existing utility locations?	☐ Yes	☑ No

Reasonableness

1. Cost-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	19,541
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	4
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	69
d. Total number of benefited receptors.	73
e. Surface Area per benefited receptor unit. (ft^2/BR)	268
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	Yes
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2. Community Desires Related to the Barrier

a. Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the im pacted receptor unit owners do not desire the barrier." ☐ Yes ☐ No

3. Additional Noise Barrier Details

a. Length of the proposed noise barrier	1,256
b Height range of the proposed noise barrier	15 - 17
c. Average height of the proposed noise barrier	16
d Cost per square foot. ($/$ft^2$)	37
e. Total Barrier Cost ($)	$723,017
f. Additional comments (if applicable)	
g. Barrier material	☑ Absorptive ☐ Reflective

Decision

Is the Noise Barrier(s) WARRANTED?	☑ Yes	☐ No
Is the Noise Barrier(s) FEASIBLE?	☑ Yes	☐ No
Is the Noise Barrier(s) REASONABLE?	☑ Yes	☐ No

Additional Reasons for Decision: _____

Warranted, Feasible, and Reasonable Worksheet

Note: the answers provided in the worksheet may differ between preliminary and final design. This worksheet is available in a protected digital format upon request.

Date:	11/05/2013
Project No. and UPC:	0395-100-722,736; UPC No. 96261, 102437
County:	City of Alexandria
Facility:	Interstate-395
Barrier System ID:	Noise Barriers 4 and 5
Noise Abatement Category(s)	NAC Categories B, C, and E
Community Name and/or CNE#	CNE's 7, 8, 9, 10, and 11

Design phase: ☑ Preliminary Design ☐ Final Design

Warranted

1. Community Documentation (if applicable)
   a. Date community was permitted. (Per 23CFR 772 this is the date the building permit was issued). N/A
   b. Date of approval for the Categorical Exclusion (CE), Record of Decision (ROD), or Finding of No Significant Impact (FONSI): N/A
   c. Does the date in 1.a precede the date in 1.b? If yes, proceed to Warranted Item 2. If no, consideration of noise abatement is not warranted. Proceed to "Decision" block and answer "no" to warranted question. As the reason for this decision, state that "Community was permitted after the date of approval of CE, ROD, or FONSI, as appropriate." ☑ Yes ☐ No

2. Criteria requiring consideration of noise abatement
   a. Project causes design year noise levels to approach or exceed the Noise Abatement Criteria? ☑ Yes ☐ No
   b. Project causes a substantial noise increase of 10 dBA or more? ☐ Yes ☑ No

Feasibility

1. Impacted receptor units
   a. Number of impacted receptor units: 64
   b. Number of impacted receptor units receiving 5 dBA or more insertion loss (IL): 59
   c. Percentage of impacted receptor units receiving 5 dB(A) or more IL 92%
   d. Is the percentage 50 or greater? ☑ Yes ☐ No

2	Will placement of the noise barrier cause engineering or safety conflicts, e.g. drainage or site distance issues?	☐ Yes	☑ No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	☐ Yes	☑ No
4	Will placement of the noise barrier conflict with existing utility locations?	☐ Yes	☑ No

Reasonableness

1. Cost-Benefit Factors

a. Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	85,578 (Barriers 4 and 5)
b. Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	59
c. Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	358
d. Total number of benefited receptors.	417
e. Surface Area per benefited receptor unit. (ft^2/BR)	205
f. Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	Yes
g. Does the barrier provide an IL of at least 7 dB(A) for at least one impacted receptor in the design year?	Yes

2. Community Desires Related to the Barrier

a. Do at least 50 percent of the benefited receptor unit owner(s) and renters desire the noise barrier? If yes, continue to "decision" block. If no, the barrier can be considered not to be reasonable. Proceed to "decision" block and answer "no" to reasonableness question. As the reason for this decision, state that "The majority of the im pacted receptor unit owners do not desire the barrier." ☐ Yes ☐ No

3. Additional Noise Barrier Details

a. Length of the proposed noise barrier	5,484 (Barriers 4 and 5)
b Height range of the proposed noise barrier	15 - 20
c. Average height of the proposed noise barrier	15
d Cost per square foot. ($/$ft^2$)	37
e. Total Barrier Cost ($)	$3,166,368
f. Additional comments (if applicable)	
g. Barrier material	☑ Absorptive ☐ Reflective

Decision

Is the Noise Barrier(s) WARRANTED?	☑ Yes	☐ No
Is the Noise Barrier(s) FEASIBLE?	☑ Yes	☐ No
Is the Noise Barrier(s) REASONABLE?	☑ Yes	☐ No

Additional Reasons for Decision: _____

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VIRGINIA DEPARTMENT OF TRANSPORTATION
NOISE REPORT GUIDANCE AND ACCOUNTABILITY CHECKLIST

VERSION 1.0

This checklist is not an inclusive document that accounts for all projects. However this guidance checklist outlines the most common items that will be reviewed during VDOT's review process. This checklist follows guidance set forth in VDOT's Highway Traffic Noise Manual.

Checked Items are Required		Preliminary	Final Design				
				UPC:	96261; 102437	✘	This Item has been verified by the document writer
				Completed By:	Jason Ogden	N/A	This item is "Not/Applicable" to this project
				Date:	11/05/2013	D	This Item is Project Dependent

1.0	**TITLE PAGE**			
1.1	X	✓	✓	- Report is Appropriately Named, with Correct Project Limits, Project Number(s), UPC(s) (Universal Project Code), and Submission Date
1.2	X	✓	✓	- Person Performing the Noise Analysis is Prequalified in the State of Virginia
2.0	**TABLE OF CONTENTS (TOC)**			
2.1	X	✓	✓	- Items listed in TOC are Accurately Numbered, Including the Report Sections, Tables, Figures, Graphics, and Appendices
3.0	**EXECUTIVE SUMMARY**			
3.1	X	✓	✓	- Brief Project Description provided with Project Location Information
3.2	X	✓	✓	- Summary of the Number (and sound level ranges) of Impacts for Existing, No-Build (if applicable), and the Future Design Year
3.3	X	✓	✓	- Noise Abatement Summary and Barrier Analyses Summary - (If Future Design Year Impacts are Predicted)
3.4	N/A	✓		- "Conversely . . . " Statement Added
3.5	X	✓	✓	- Construction Noise Summary
3.6	N/A	✓		- Discussion of Futher Noise Abatement Considerations during Final Design - eg. Rail noise, Aviation noise, Reflected Noise from Existing or Proposed Barriers / Retaining Walls, Commitments for further evaluation based on new design information, Alternatives to proposed noise barrier placement. . .
4.0	**INTRODUCTION**			
4.1	X	✓	✓	- Discussion of the Project Description of the Proposed Project. Should include the Project Limits, Number of Proposed Lanes and/or Proposed Modification, Lane Widths etc . . .
4.2	X	✓	✓	- Discussion of the History of the Project, Background, Future Design Year, Specific Pertanent Project Details, Including the Preferred Alternative and other Road Improvements.

Checked Items are Required		Preliminary	Final Design	UPC: 96261; 102437 Completed By: Jason Ogden Date: 11/05/2013	✔ This Item has been verified by the document writer N/A This item is "Not/Applicable" to this project D This Item is Project Dependent

4.3	X	✔	✔	- Project Location Figure (See VDOT's Noise Report Development and Guidance Document)
4.4	N/A	D	D	- Additional NEPA documentation (If Necessary - Documents to support an older ROD or Date of Public Knowledge)
5.0	**METHODOLOGY**			
5.1	X	✔	✔	- FHWA and State Policy Discussion and Compliance Regulations
5.2	X	✔	✔	- Sound Level Metrics Defined
5.3	X	✔	✔	- NAC Defined
5.4	X	✔	✔	- Definiton of Noise Impact
5.5	X	✔	✔	- Analysis Proceedure Defined
5.6	X	✔	✔	- TNM Model Version Defined and Program Overview Description given
	Source of Model Inputs Documented			
5.7	X	✔	✔	- Discussion of the Source of Design Files / Typical Sections/ Profiles / Cross Sections, or Study Corridor Limits if Engineering is not Available
5.8	X	✔	✔	- Discussion of Traffic Volumes / Speeds / Truck %'s
5.9	X	✔	✔	- Document the Source of Survey Information
5.10	X	D	D	- Additional Data (Existng or Proposed Retaining Walls, Existing Noise Barriers or Berms, GIS Layers and/or Supplemental Elevation Data)
6.0	**EXISTING NOISE ENVIRONMENT**			
6.1	**NOISE MONITORING**			
6.1.1	X	✔	✔	- Noise Monitoring Methodology is Clearly Defined
6.1.2	X	✔	✔	- The Date(s) of Monitoring are Documented
6.1.3	X	✔	✔	- Type of Meter is Noted and Pertainent Calibration Information is Included
6.1.4	X	✔	✔	- Number of Sites (Short-term or Long-term) are Identified and Located on Figure

Checked Items are Required		Preliminary	Final Design	UPC: 96261; 102437 Completed By: Jason Ogden Date: 11/05/2013	✘ This Item has been verified by the document writer N/A This item is "Not/Applicable" to this project D This Item is Project Dependent

6.1.5	X	✓	✓	- Documentation of Noise Monitoring Data Sheets and other monitoring factors such sampling interval, weather . . .
6.1.6	X	✓	✓	- Table and Discussion of Ambient Noise Monitoring Results and Required Sample Text Regarding Monitoring
6.1.7	X	✓	✓	- Table and Discussion of Noise Validation Results
6.2	**UNDEVELOPED LANDS AND PERMITTED DEVELOPMENTS**			
6.2.1	N/A	✓	✓	- "Undeveloped Lands and Permitted Developments" Sample Text Added
6.2.2	N/A	✓	✓	- Documentation of the Coordination Dates and Contact Information for the Undeveloped Lands and Permitted Developments Search
6.3	**COMMON NOISE ENVIRONMENT (CNE) DETERMINATION**			
6.3.1	X	✓	✓	- Are all Noise Sensitive Receptors within at least 500 feet of the Proposed Edge of Pavement Considered for Evaluation?
6.3.2	X	✓	✓	- Discussion of Existing Land Uses for each CNE
6.3.3	X	✓	✓	- Are all non noise sensitive land uses addressed in the report (reasons why they are not noise sensitive)?
6.3.4	X	✓	✓	- CNE's Boundaries Located on Figure
6.4	**WORST NOISE HOUR**			
6.4.1	X	✓	✓	- The Worst Noise Hour selected needs to be the same for ALL roadways. Review to ensure this is accurate.
6.4.2	X	✓	✓	- Discussion of the Selection of the Worst Noise Hour
6.4.3	X	✓	✓	- Was 24-Hour (Long Term Monitoring) Utilized to Determine the Worst Noise Hour
6.4.4	X	D	D	- State if Multiple Sets of TNM runs were Created / Modeled to Determine the Worst Noise Hour (or were there dual worst noise hours)
6.4.5	X	D	D	- Were other Factors Considered for the Selection of the Worst Noise Hour
6.5	**RECEPTOR IDENTIFICATION AND NAC CATEGORIZATION**			
	If NAC A's are present, is the Criteria met and the Items Listed Below are Discussed:			
6.5.1	N/A	D	D	- Are these Lands on which Serenity and Quiet are of Extraordinary Significance
6.5.2	N/A	D	D	- Do these Lands Serve an Important Public Need

Checked Items are Required		Preliminary	Final Design	UPC: 96261; 102437 Completed By: Jason Ogden Date: 11/05/2013	✘ This Item has been verified by the document writer N/A This item is "Not/Applicable" to this project D This Item is Project Dependent

6.5.3	N/A	**D**	**D**	- Is the Preservation of these Qualities Essential for the Area to Continue to Serve its Intended Purpose
6.5.4	N/A	**D**	**D**	- Is the FHWA Supporting Documentation Included
	If NAC B's are present, is the Criteria met and the Items Listed Below are Discussed:			
6.5.5	X	**D**	**D**	- Are the Number of Receptors Equal to or Representative to a Number of Dwelling Units
6.5.6	X	**D**	**D**	- Are there Multi-floor Residential Units and do they have Outdoor Use Areas
6.5.7	X	**D**	**D**	- Are Outdoor Use Areas (Balconies) Identified and Discussed
	If NAC C's are present, is the Criteria met and the Items Listed Below are Discussed:			
6.5.8	X	**D**	**D**	- Are the Outdoor Use Areas Documented for Each of the Identified Receptors
6.5.9	X	**D**	**D**	- Was the "Grid system" Used and Shown on Figures for Recreational Areas, Trails, Campgrounds, Cemeteries, etc. . .
	If NAC D's are present, is the Criteria met and the Item Listed Below is Discussed:			
6.5.10	N/A	**D**	**D**	- Discuss the Building Materials and Interior Reduction Factor for each Identified Receptor
	If NAC E's are present, is the Criteria met and the Item Listed Below is Discussed:			
6.5.11	X	**D**	**D**	- Are Outdoor Use Areas Identified and Discussed
6.5.12	X	**D**	**D**	- If "No", Text Should be Provided that the Land Use was Identified but not Evaluated due to the Lack of Outdoor Use
	Historic Properties			
6.5.13	N/A	**D**	**D**	- Discuss if any Section 106 (Historic) Properties were Identified
6.5.14	N/A	**D**	**D**	- Discuss if any Section 4(f) Properties were Identified
6.5.15	N/A	**D**	**D**	- If Section 4(f) Properties are Identified, Does it Constitute a "Constructive Use" Determination

6.6 MODELED EXISTING ENVIRONMENT

6.6.1	X	✓	**D**	- Are Existing and Future Design Years Stated

Checked Items are Required		Preliminary	Final Design				
				UPC:	96261; 102437	✘	This Item has been verified by the document writer
				Completed By:	Jason Ogden	N/A	This item is "Not/Applicable" to this project
				Date:	11/05/2013	D	This Item is Project Dependent

6.6.2	N/A	D	D	- Are Existing Noise Barriers Present within the Proposed Project Area
6.6.3	N/A	D	D	- If Existing Noise Barriers are Present, Does the Project Involve In-Kind Barrier Replacement
6.6.4	X	✓	✓	- Discussion of the Overall Numbers of Existing Condition Impacts and Sound Level Ranges (all CNEs)
6.6.5	X	✓	✓	- Discussion of the Determination and Identification of Noise Impacts (by CNE under Existing Condition)
6.6.6	X	✓	D	- Existing Noise Environment discussion
7.0	**FUTURE NOISE ENVIRONMENT**			
7.1	**MODELED FUTURE ENVIRONMENT**			
7.1.1	X	✓	✓	- Is there Documentation why a No-Build Condition evaluation was/wasn't warranted?
7.1.2	X	D	D	- Discussion of the Overall Numbers of No-Build Condition Impacts and Sound Level Ranges (all CNEs)
7.1.3	X	D	D	- Discussion of the Determination and Identification of Noise Impacts (by CNE under No-Build Condition)
7.1.4	X	✓	✓	- Discussion of the Overall Numbers of Build Condition Impacts and Sound Level Ranges (all CNEs)
7.1.5	X	✓	✓	- Discussion of the Determination and Identification of Noise Impacts (by CNE under Build Condition)
7.1.6	X	✓	D	- Comparison of existing and future total noise levels for all identified receptors
7.1.7	X	✓	✓	- Future Noise Environment Discussion
7.1.8	X	✓	✓	- Table of Predicted Noise Levels (By CNE)
7.2	**NOISE ABATEMENT DETERMINATION**			
7.2.1	X	✓	✓	- Alternative Abatement Measures Discussion
	WARRANTED CRITERIA			
7.2.2	X	✓	✓	- NAC Impact Definition ("Approach or Exceed") Provided
7.2.3	X	✓	✓	- Substantial Increase Impact Definiton Provided

Checked Items are Required		Preliminary	Final Design				
				UPC:	96261; 102437	✘	This Item has been verified by the document writer
				Completed By:	Jason Ogden	N/A	This item is "Not/Applicable" to this project
				Date:	11/05/2013	D	This Item is Project Dependent

7.2.4	X	✓	✓	- Has the NAC for Each Evaluated Land Use Category been Defined
	FEASIBILITY CRITERIA			
7.2.5	X	✓	✓	- Is Feasibility Defined
	REASONABLENESS CRITERIA			
7.2.6	X	✓	✓	- Is Reasonableness Defined
	NOISE REDUCTION GOALS			
7.2.7	X	✓	✓	- Are Noise Reduction Goals Defined
	NOISE BARRIER EVALUATION			
7.2.8	X	✓	✓	- Barrier Documentation should Include: Discussion of Total Number of Impacts, Benefitted Impacts, Additional Benefits, Total Benefits, Feasibility, Reasonablity, Barrier Length, Range of Panel Heights, Barrier Location, Ground or Structure Mounted, Barrier Systems, etc. . .
7.2.9	X	✓	✓	- Reason for Barrier Placement, Barrier Termini, Barrier Location etc. . .
7.2.10	X	✓	✓	- All Evaluated Barrriers shown on Figures
7.2.11	X		✓	- Barriers were Optimized to Maximize Benefits while Minimizing Cost (Diminishing Returns)
7.2.12	X	✓	✓	- Table was included that shows the Barrier name, Insertion Loss, Panel Height Range, Total Length, Total Surface Area, Total Benefits, Total sq.ft. / no. of benefits, Cost (for Planning Purposes Only)
7.2.13	X	✓	✓	- Table that shows the Sound Levels, Barrier Insertion Loss for each Receptor included in the Barrier Analysis
7.2.14	X	D	✓	- Table that shows the Approximate Stationing, Northing, Easting, Bottom and Top of barrier, Panel Heights by Segment
7.2.15	X	D	D	- Does the Barrier (System) Work Independently or is it Dependent on Another Barrier (Existing or Proposed)
8.0	**CONSTRUCTION NOISE**			
8.1	X	✓	✓	- Construction Noise Discussion

Checked Items are Required		Preliminary	Final Design	UPC:	96261; 102437	✘	This Item has been verified by the document writer
				Completed By:	Jason Ogden	N/A	This item is "Not/Applicable" to this project
				Date:	11/05/2013	D	This Item is Project Dependent

9.0 PUBLIC INVOLVEMENT PROCESS

9.1 NOISE COMPATIBLE CONTOURS

9.1.1	X	✓	✓	- 66 dBA Contour Discussion and Shown on Figure(s)
9.1.2	X	D	D	- Discussion of Public Involvement Efforts (including Community Information Meetings, Individual Meetings, and Special Coordination)

9.2 VOTING PROCEEDURES

9.2.1	X	✓	✓	- Voting Process Defined?
9.2.2	N/A		✓	- How many / when were Certified Letters Sent?
9.2.3	N/A		✓	- What were the Voting Results Related to Desire for a Barrier?
9.2.4	N/A		✓	- Summary of Barrier Survey Results and Comments?
9.2.5	N/A		✓	- How many Surveys were Unresponsive or Undeliverable?
9.2.6	N/A		✓	- Voting Graphic showing the Results of the Barrier Survey?
9.2.7	N/A		✓	- Were there any Special Abatement Commitments / Acoustic Profiles/ Aesthetics Considerations
9.2.8	N/A		✓	- Is this an Addendum Report with Revised Impact / Barrier Results

10.0 OTHER CONSIDERATIONS

10.1	X	D	D	- Absorptive or Reflective Noise Barriers Proposed?
10.2	X	D	D	- Was Reflection Noise Considered?
10.3	X	D	D	- Was Structure Noise Considered?
10.4	N/A	D	D	- Was Rail or Aviation Noise Considered?

11.0 APPENDICES

11.1	X	✓	✓	- List of References
11.2	X	✓	✓	- List of Preparers / Reviewers

Checked Items are Required		Preliminary	Final Design	UPC: 96261; 102437 Completed By: Jason Ogden Date: 11/05/2013	✔ This Item has been verified by the document writer N/A This item is "Not/Applicable" to this project D This Item is Project Dependent
11.3	X	✔	✔	- Traffic Data	
11.4	X	✔	✔	- Noise Monitoring Field Logs	
11.5	X	✔	✔	- Warranted, Feasible, Reasonable, Worksheets	
11.6	X	✔	✔	- Alternative Mitigation Measures Response Form from Project Manager	
11.7	X	✔	✔	- Other Site Sketches of Monitored Locations, Noise Meter Printouts, Noise Meter Calibration Reports, Pertinent Correspondance	
11.8	N/A	✔	✔	- TNM Certification Certificates	
11.9	X	✔	✔	- Noise Report Guidance and Accountability Form	
12.0	**TNM RUNS**				
12.1	X	✔	✔	- Actual TNM Runs (Electronic Files) must be Submitted for Review with Report, TNM Output Tables are Not Required for Inclusion into the Report, However a Copy of the Printed Modeling Information shall be Supplied Upon Request	
13.0	**GENERAL**				
13.1	X	✔	✔	- Figures were Developed in Accordance with VDOT's Noise Report Development and Guidance Document	

Appendix H Response to Alternative Abatement Measures (HB 2577)

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COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION
1401 EAST BROAD STREET
RICHMOND, VIRGINIA 23219-2000

Gregory A. Whirley
Commissioner

September 27, 2012

MEMORANDUM

TO: Susan Shaw, Project Manager
Robert Iosco, Environmental Contact

FROM: Christopher Menge (Harris Miller Miller & Hanson Inc.), Noise Abatement Engineer

SUBJECT: UPC 99580, I-395 NB Auxiliary Lane
Virginia House Bill 2577 on Alternative noise abatement measures

The 2009 General Assembly passed Chapter 120 (HB 2577, as amended by HB2025), which amends the Code of Virginia by adding in Article 15 of Chapter 1 of Title 33.1 a section numbered 33.1-223.2:21, relating to highway noise abatement.

House Bill 2025 States: Requires that whenever the Commonwealth Transportation Board or the Department plan for or undertake any highway construction or improvement project and such project includes or may include the requirement for the mitigation of traffic noise impacts, first consideration should be given to the use of noise reducing design and low noise pavement materials and techniques in lieu of construction of noise walls or sound barriers. Vegetative screening, such as the planting of appropriate conifers, in such a design would be utilized to act as a visual screen if visual screening is required.

In an effort to honor the intent of HB 2025 we are asking for your input (per Chapter VI of Materials Division's Manual of Instruction and Section 2B-3 Determination of Roadway Design of the VDOT Road Design manual (pages 2B-5 and 2B-6)). As part of the Noise Technical Report and technical files, we are seeking your professional opinion by providing comments for the project noted above. Please distribute this memorandum to the appropriate District staff and combine all responses into one response.

Should you have any questions, please contact me at me at (781) 229-0707 x3153, or you can reach Paul Kohler, VDOT's Noise Abatement Section Manager at (804) 371-6766. Thank you for your time and consideration regarding this request.

Comment: Is noise reducing design feasible in lieu of construction of noise walls or sound barriers? For example, the roadway alignment can be shifted away from noise sensitive receptors or the roadway can be placed in deep cut (Location & Design to address)

Response: This project is to extend an auxiliary lane on I-395 between the existing terminus and taper at Route 236 (Duke Street) to an existing terminus and taper at Seminary Road. The existing roadway is located within an approximately 300-foot wide right of way in a developed urbanized area. Given the existing constraints, there is no opportunity to adjust the existing roadway alignment horizontally or vertically for the purpose of reducing noise, without incurring high cost and additional environmental impacts. (Susan Shaw, NOVA Design-Build Program Manager)

Comment: Can the project support the use of low noise pavement in lieu of construction of noise walls or sound barriers? (Materials Division to address)

Response: The Virginia Department of Transportation is not authorized by the Federal Highway Administration to use "quiet pavement" at this time as a form of noise mitigation. Upon completion of the Quiet Pavement Pilot Program and approval from FHWA, the use of "quiet pavement" will be given additional consideration.

Comment: Can landscaping be utilized to act as a visual screen if visual screening is required? (Location & Design to address)

Response: Landscaping can be provided in some areas. Landscape plans will be developed during the design phase of the design-build project. The current technical requirements of the Request for Proposals include a requirement to provide approximately 30,000 square feet of landscaping for the Auxiliary Lane project (Susan Shaw, NOVA Design-Build Program Manager).

Note: Please provide the name of each responder.

HARRIS MILLER MILLER & HANSON INC.
77 South Bedford Street
Burlington, MA 01803
T 781.229.0707
F 781.229.7939
W www.hmmh.com

MEMORANDUM

To: Sid A. P. E. Siddiqui, VDOT Senior Project manager
Robert C. Iosco, VDOT Environmental Manager
From: Christopher Menge
Subject: UPC 96261, I-395 HOV Ramp at Seminary Road
Virginia House Bill 2577 on Alternative noise abatement measures
Reference: HMMH No. 304800.001
Date: December 1, 2011

Harris Miller Miller & Hanson Inc. is conducting the noise analysis for UPC 96261, the I-395 HOV Ramp at Seminary Road project. This memo includes a survey for your office to complete, which I must include in my noise analysis report on the project.

The 2009 General Assembly passed Chapter 120 (HB 2577, as amended by HB2025), which amends the Code of Virginia by adding in Article 15 of Chapter 1 of Title 33.1 a section numbered 33.1-223.2:21, relating to highway noise abatement.

House Bill 2025 States: Requires that whenever the Commonwealth Transportation Board or the Department plan for or undertake any highway construction or improvement project and such project includes or may include the requirement for the mitigation of traffic noise impacts, first consideration should be given to the use of noise reducing design and low noise pavement materials and techniques in lieu of construction of noise walls or sound barriers. Vegetative screening, such as the planting of appropriate conifers, in such a design would be utilized to act as a visual screen if visual screening is required.

In an effort to honor the intent of HB 2025 we are asking for your input (per Chapter VI of Materials Division's Manual of Instruction and Section 2B-3 Determination of Roadway Design of the VDOT Road Design manual (pages 2B-5 and 2B-6)). As part of the Noise Technical Report and technical files, we are seeking your professional opinion by providing comments for the project noted above. Please distribute this memorandum to the appropriate District staff and combine all responses into one response.

Should you have any questions, please contact me at (781) 229-0707 x3153, or you can reach Paul Kohler, VDOT's Noise Abatement Section Manager at (804) 371-6766.

Thank you for your time and consideration regarding this request.

Comment: Is noise reducing design feasible in lieu of construction of noise walls or sound barriers? For example, the roadway alignment can be shifted away from noise sensitive receptors or the roadway can be placed in deep cut (Location & Design to address)

Response: Other design options, such as shifting the alignment away from noise receptors or lowering the roadway sufficiently to provide meaningful noise reduction are not feasible considering the location and existing conditions of the project site (Sid Siddiqui)

Comment: Can the project support the use of low noise pavement in lieu of construction of noise walls or sound barriers? (Materials Division to address)

Response: The Virginia Department of Transportation is not authorized by the Federal Highway Administration to use "quiet pavement" at this time as a form of noise mitigation. Upon completion of the Quiet Pavement Pilot Program and approval from FHWA, the use of "quiet pavement" will be given additional consideration.

Comment: Can landscaping be utilized to act as a visual screen if visual screening is required? (Location & Design to address)

Response: The proposed ramp ties in at the third level of an existing 3 level interchange. The use of landscaping as a visual screen for the entire project would not be feasible due to the height of the ramp and existing Seminary Road Bridge structure. There are existing trees along I-395 northbound and efforts will be made to minimize impact to these as part of this project. Additional landscaping will be evaluated by the Design Build Team. (Sid Siddiqui)

Note: Please provide the name of each responder.