Virginia Department of Transportation
I-66 HOV+SOV Widening from Route 15 to Route 29

State Project: 0066-076-003, P101, R201, C501, B674, B675: UPC 93577

From: 0.5 miles west of Route 15
To: 0.43 miles west of Route 29 Bypass
Prince William County and the Towns of Haymarket and Gainesville

PRELIMINARY NOISE ANALYSIS

Submitted to:

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August 2011

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I. Executive Summary

As a means to promote safe and efficient traffic flow within this area, the Federal Highway Administration (FHWA) and the Virginia Department of Transportation (VDOT) are proposing the addition of bi-directional High Occupancy Vehicle Lane (HOV) + Single Occupancy Vehicle Lane (SOV) along the shoulder of Interstate 66 (I-66). The project study corridor begins approximately 0.5 miles west of Route 15 in Prince William County, proceeds eastward along existing I-66, and ends approximately 0.43 miles west of Route 29 Bypass near Gainesville. As a result of this study, the preliminary noise analysis in this document will focus solely on the Common Noise Environments (CNEs) from Route 15 (exit 40) to the eastern project limit. Noise sensitive receptors within 500 feet of the construction limits were considered for this evaluation.

This report documents the Existing (2011) and Design Year (2036) noise levels associated with the I-66 HOV + SOV Widening Project. Noise monitoring was performed at eight locations, while noise modeling was conducted for 21 additional sites to gain a thorough understanding of the existing noise environment and to determine how the proposed improvements will change the noise levels throughout the project area. A project field view was performed to examine the project area, as well as document major sources of acoustic shielding (e.g., terrain lines, building rows, etc.) adjacent to the project corridor. For reporting purposes, the project was divided into areas of common noise environment, referred to as CNEs. Noise modeling was completed for Existing (2011), Design Year No-Build (2036) and Design Year Build (2036) conditions. Due to high existing traffic volumes along I-66, existing (2011) worst-case noise levels exceed FHWA/VDOT Noise Abatement Criteria (NAC) at seven of the front-row receptors in the project area representing 58 existing residences, six future, planned residences, and one football field. Design Year No-Build (2036) noise levels are projected to approach or exceed the FHWA/VDOT NAC at 13 of the 29 noise monitoring/modeling sites, representing 89 residences, 20 future residences, one football field, and one playground. Design Year Build (2036) noise levels were predicted at each monitored and modeled receptor site under the proposed improvements. As identified in ***Table 2***, by the shaded spaces in ***Column 9***, Design Year Build (2036) noise levels are projected to approach or exceed the FHWA/VDOT NAC at 16 of the 26 noise monitoring/modeling sites, representing 117 residences, 20 future, planned residences, one football field, one playground, and one sport court. Since Design Year Build (2036) noise levels are projected to exceed the NAC for several Category B and Category C land uses, consideration of noise abatement is warranted. Noise abatement evaluations concluded that noise abatement is feasible and cost effective for CNE B, CNE C, CNE D, and CNE E as per VDOT Maximum Square Foot per Benefited Receptor.

These findings are based on conceptual design information and are not considered final. All barriers are under consideration and all areas will be reevaluated during the Final Design phase of the project.

II. Introduction

Impacts associated with noise are often a prime concern when evaluating roadway improvement projects. Roadway construction at a new location or improvements to the existing transportation network may cause impacts to the noise-sensitive environment located adjacent to the project corridor. For this reason, FHWA and VDOT have established a noise analysis methodology and associated noise level criteria to assess the potential noise impacts associated with the construction and use of transportation projects.

FHWA and VDOT are currently proposing the addition of bi-directional HOV and SOV lanes along I-66 to improve traffic flow and congestion during peak travel periods. The project study corridor begins approximately 0.5 miles west of Route 15 in Prince William County, proceeds eastward along existing I-66, and ends approximately 0.43 miles west of Route 29 Bypass near Gainesville. The project area can be referenced in ***Figure 1-Regional Location Map***. As previously explained, this noise analysis only evaluates potential impacts to the noise-sensitive land uses within the project limits.

This report details the steps involved in the preliminary noise analysis for the I-66 HOV+SOV Widening Project, including noise monitoring/modeling methodologies, results, impact evaluation, and potential abatement considerations.

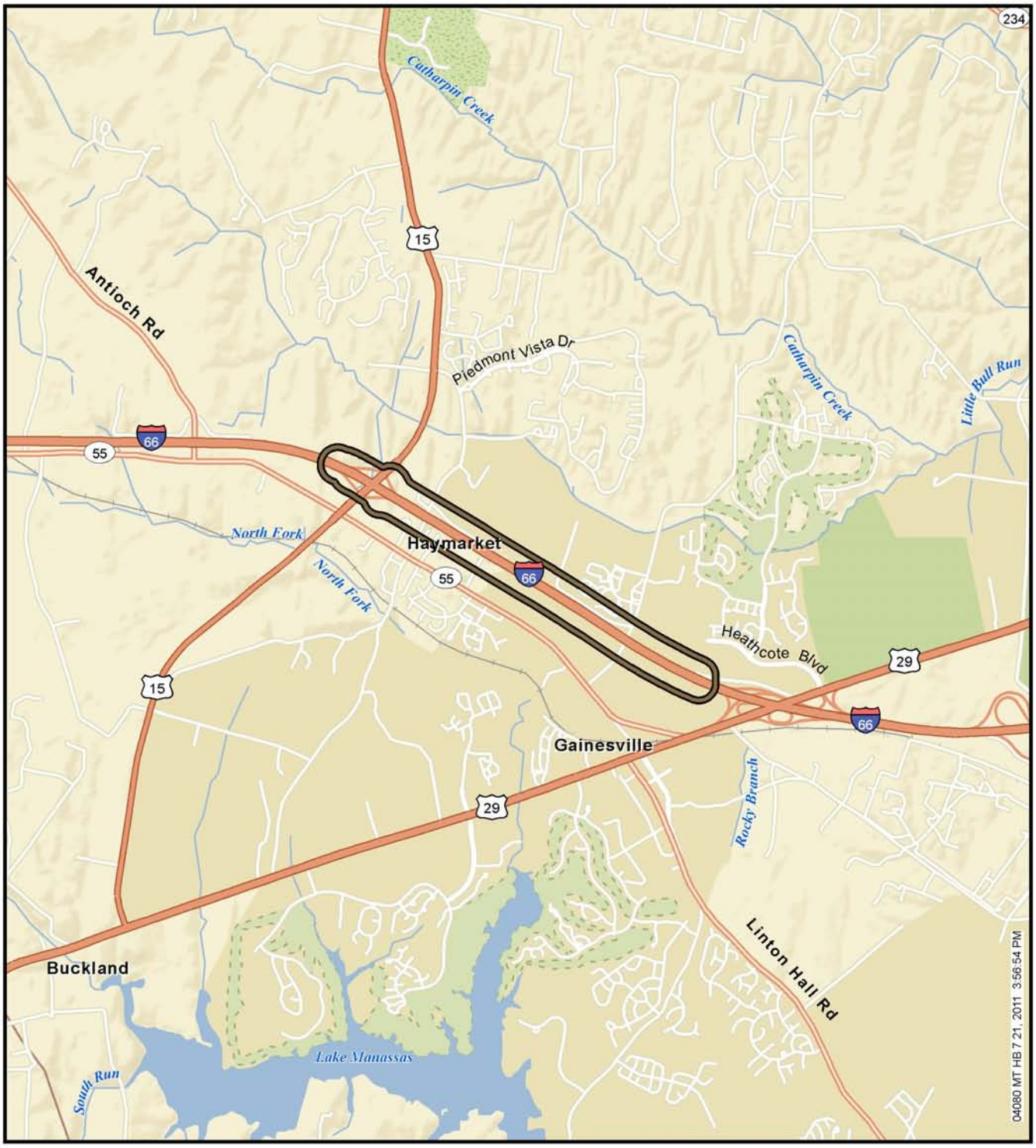

Figure 1

Regional Location Map

Project Study Area

Interstate 66 - HOV + SOV Widening Project
Prince William County and the Towns of
Haymarket and Gainesville
Preliminary Noise Analysis

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III. Noise Analysis Methodology and Criteria

The methodologies applied to the noise analysis for the I-66 HOV+SOV Widening Project are in accordance with VDOT's "*State Noise Abatement Policy",* effective July 13, 2011. VDOT guidelines are based on the updated U.S. Department of Transportation, Federal Aid Policy Guide 23 CFR 772, U.S. Government Printing Office.

To determine the degree of highway noise impact, the Noise Abatement Criteria (NAC) has been established for a number of different land use categories. ***Table 1*** documents the NAC for the associated activity land use category shown in the adjacent column. The majority of the land uses within this project corridor are considered Category B; however, six Category C land uses are also present. Category B receptors are comprised of and limited to residential areas, while Category C land uses represent the following: Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, public meeting rooms, public or non-profit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings. Although limited within the corridor, Category G land uses (undeveloped lands that are not permitted) are present and have been considered as part of this analysis. Category C and Category D land uses exist within the general area; however, there are not present within the 500 foot analysis buffer zone on I-66.

TABLE 1
I-66 HOV + SOV Widening Project
FHWA/VDOT Noise Abatement Criteria
Hourly-A-Weighted Sound Level in Decibels (dB(A)) [1]

Activity Category	Activity L_{eq} (h)*	Criteria[2] L10 (h)	Evaluation Location	Description of Activity Category
A	57	60	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the pres¬ervation 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, public meeting rooms, public or non-profit 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 non-profit 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 of 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 Leq (h) or L10 (h) (but not both) may be used on a project.
[2] The Leq (h) and L10 (h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measure.
* VDOT utilizes the Leq (h) designation
[3] Includes undeveloped lands permitted for this Activity Criteria.

The NAC are given in terms of an hourly, A-weighted, equivalent sound level. The A-weighted sound level frequency is used for human use areas because it is comprised of the sound level frequencies that are most easily distinguished by the human ear, out of the entire sound level spectrum. Highway traffic noise is categorized as a linear noise source, where varying noise levels occur at a fixed point during a single vehicle pass by. It is acceptable to characterize these fluctuating noise levels with a single number known as the equivalent noise level (L_{eq}). The L_{eq} is the value of a steady sound level that would represent the same sound energy as the actual time-varying sound evaluated over the same time period. For highway noise assessments, L_{eq} is typically evaluated over a one-hour period.

Noise Monitoring Methodology

The identification of noise-sensitive land uses and the location of existing I-66 guided the selection of noise monitoring locations along the project corridor. In order to determine the existing noise conditions within the project area, noise monitoring was conducted at eight representative noise sensitive receptor sites. ***Figures 2A and 2B*** identify the project area and the locations of the eight noise monitoring sites. Additional monitoring sites were selected to be included in the analysis; however, some existing site conditions (e.g., construction) would not allow for the natural ambient conditions to be measured.

Monitoring was performed at each of the selected noise sensitive receptors using Metrosonics dB-3080 dosimeters. Readings were taken on the A-weighted scale and reported in decibels (dB(A)). Prior to noise monitoring, noise meters were calibrated using a Metrosonics cl-304 acoustical calibrator. The noise monitoring equipment meets all requirements of the American National Standard Specifications for Sound Level Meters, ANSI S1.4-1983 (R1991), Type 2 and meet all requirements, as defined by FHWA. Noise monitoring was conducted in accordance with the methodologies contained in FHWA-PD-96-046, *Measurement of Highway-Related Noise* (FHWA, May 1996).

Noise Modeling Methodology

Computer modeling is the accepted technique for predicting Existing and Design Year noise levels associated with traffic-induced noise. Currently, the FHWA Traffic Noise Model (TNM) 2.5 computer-modeling program is the approved highway noise prediction model. The TNM has been established as a reliable tool for representing noise generated by highway traffic. The information applied to the modeling effort includes the following: highway design files (existing and proposed conceptual design), traffic data, roadway cross-sections, and surveying of terrain. Base mapping, aerial photography, and field views were used to identify noise-sensitive land uses within the corridor and any terrain features that may shield roadway noise. The majority of the land uses in the project area is residential, thus will be categorized as Category B land uses. However, one playground and five sport complexes exist within the project corridor, representing Category C land uses (reference ***Table 1***).

The modeling process begins with model validation, as per VDOT requirements. This is accomplished by comparing the monitored noise levels with noise levels generated by the computer model, using the traffic volume, speeds and composition that were witnessed during

the monitoring effort. This comparison ensures that reported changes in noise levels between Existing and Design Year conditions are due to changes in traffic conditions and not to discrepancies between monitoring and modeling techniques. A difference of three decibels (3 dB(A)) or less between the monitored and modeled level is considered acceptable, since this is the limit of change detectable by the typical human ear. ***Table 2*** provides a summary of the model validation for the Existing (2011) monitored conditions. ***Column 5*** represents the difference between the monitored level (***Column 3***) and the modeled level produced by the noise model (***Column 4***).

Since most of the analyzed receptors show less than a 3 dB(A) difference between the monitored and modeled noise levels, the model is considered an accurate representation of actual existing conditions throughout the project area. Second-row monitoring receptor sites R2 and R5 were not validated as a result of insect noise during the monitoring period. The annual cicada "song" significantly increased the ambient noise levels at these sites. Following validation of the existing conditions model, 21 additional modeling sites were added to thoroughly predict existing noise levels throughout the project corridor.

Noise Abatement Determination and Methodology

Noise abatement determination is based on VDOT's three-phase approach. The first phase (**Phase 1**) distinguishes if a sensitive receptor, within a project corridor, warrants highway traffic noise abatement. The following describes the **Phase 1** warranted criterion, as discussed in VDOT policy. Receptors that satisfy either condition warrants consideration of highway traffic noise abatement.

- Predicted highway traffic noise levels (for the design year) approach or exceed the highway traffic noise abatement criteria in ***Table 1***. "Approach" has been defined by VDOT as 1 dB(A) below the noise abatement criteria.

~or~

- A substantial noise increase has been defined by VDOT as a 10 dB(A) increase above existing noise levels for all noise-sensitive exterior activity categories. A 10 dB(A) increase in noise reflects the generally accepted range of a perceived doubling of the loudness.

Phase 2 and **Phase 3** of the three-phase approach will be discussed in the noise abatement evaluation, located in following sections of this report (**Section VII**).

IV. Noise Monitoring and Existing Conditions

Noise monitoring was conducted on July 13, 2011. The receptor sites were selected based on their proximity to the existing I-66, the dominant noise source in the project area. Traffic volumes on I-66 mainline are generally consistent throughout the day, thus a 24-hour monitoring period was not selected to determine a worst-case peak hour period. Placing the noise meters as close to the existing I-66 as possible, allows for minimal influence from ambient noise sources. Traffic volumes on I-66 mainline are generally consistent throughout the day, thus a 24-hour monitoring period was not selected to determine a worst-case peak hour period. Noise monitoring was conducted during the "off-peak" hours. Noise levels were recorded at 10-second intervals for the 15-minute duration of each test. Data collected by the sound analyzers included time, average noise level (L_{av}), maximum noise level (L_{max}), and instantaneous peak noise level (L_{pk}) for each 10-second interval. Additional data collected at each monitoring location included atmospheric conditions, wind speed, background noise sources, and unusual atypical noise events. Traffic data (vehicle volume and speed) were also recorded on all roadways, which were visible from or otherwise influenced the monitoring sites and substantially contributed to the overall noise levels. Traffic was grouped into one of three categories: cars, medium trucks, and heavy trucks, as per VDOT procedures.

The following is a discussion of the monitored noise environment for each CNE that was evaluated for the I-66 HOV+SOV Widening Project. CNEs are groupings of receptor sites that, by location, form distinct communities within the project area and have a common noise environment. These areas are used to evaluate traffic noise impacts and potential noise abatement options to residential developments or communities as a whole, as well as for consideration of feasibility and reasonableness of possible noise abatement measures for specific communities. Where residential communities or groupings of common noise environments exist, both noise monitoring and noise modeling-*only* sites were grouped into a CNE.

CNE A

Common Noise Environment A (CNE A) is located in the north-eastern portion of the project area, just west of the Old Carolina Road. CNE A is comprised of residences along Walter Robinson Lane. CNE A contains one monitoring site (R1), which represents three residences, as shown in ***Figure 2A.*** The existing (2011) monitored noise level is 65 dB(A) as shown in ***Column 3*** of ***Table 2***.

Following a discussion with the Town of Haymarket administration on August 10, 2011 it was determined that an approved subdivision plan exists in the area of Walter Robinson Lane; however, building permits are not yet active at the time of this analysis. Since, construction permits are not active for the planned community of Robinson's Paradise, the noise analysis only focuses on the existing built structures adjacent to I-66. Therefore, this community will be included in the noise analysis and qualifies for consideration of noise abatement. A re-evaluation of additional construction permits within this area will be compared with the date of public knowledge. The date of public knowledge will be used to determine if any additional areas qualify for future noise abatement considerations during the final design noise assessment.

CNE B

Common Noise Environment B (CNE B) spans from Old Carolina Road in the west to Catharpin Road to the east, between Heathcote Boulevard and the I-66 westbound travel lanes. CNE B contains five monitoring sites (R2 through R6), which represent 93 residences and two sport courts primarily along Stourcliffe Lane, Keavy Ridge Court, Hampton Bay Lane, Macon Grove Lane, Village Stream Place, and Legend Glen Court, as shown on ***Figure 2A***. Existing (2011) monitored noise levels within CNE B range from 61 to 64 dB(A), as shown in ***Column 3*** of ***Table 2***. However, the monitoring levels at sites R2 and R5 was strongly influenced by insect (cicada) noise and air conditioning units, thus model validation was not successfully obtained, due to the higher (non-roadway) background noise levels. Additional monitoring and validation will occur during the final design phase of the project.

CNE C

Common Noise Environment C (CNE C) is located east of Catharpin Road and consists of the current, planned development of Heritage Hunt, along the I-66 westbound travel lanes, as shown in ***Figure 2B***. This development consists of mixed Category B, D, and E land uses under a complete build out scenario. CNE C represents approximately 21 future residences in the planned Heathcote Commons Community and is considered part of Phase II, Section I of the development plan. This area does not contain monitoring sites, due to final site determination and assumed future grading changes to the existing landscape. Numerous attempts were made to discuss future grading plans with the developer, but were unsuccessful. Conceptual mapping of the area was not available; however, receptor site distance was presumed. A worst-case condition was modeled for the Heathcote Commons Development. Modeling-*only* sites (M19, M20, and M21) have been added to determine preliminary, worst-case existing noise levels in the area.

Following a discussion with the Prince William County Planning Department on August 9, 2011 it was determined that active construction permits do exist for this planned residential community. The entire Heritage Hunt development will be constructed under a multi-phased plan. Since, active permits only exist in the Heathcote Commons Residential Community, the noise analysis focuses on this area. Therefore, this community will be included in the noise analysis and qualifies for consideration of noise abatement. As mentioned, the entire development is being constructed in multiple phases, thus it is recommended that a re-evaluation of additional construction permits within the development be compared with the date of public knowledge. The date of public knowledge will be used to determine if any additional areas qualify for future noise abatement considerations during the final design noise assessment.

CNE D

Common Noise Environment D (CNE D) is located just west of the Jefferson Street, along the I-66 eastbound travel lanes, as shown in ***Figure 2A***. CNE D represents a new, planned development (The Sherwood Forest Community) along existing Fayette Street. CNE D does not contain monitoring sites, due to active construction at the site during the monitoring phase of the project. However, modeling-*only* sites (M9 and M10) have been added to predict worst-case

existing noise levels in the area. Worst-case existing and future noise levels will be discussed for this location in following sections of this report.

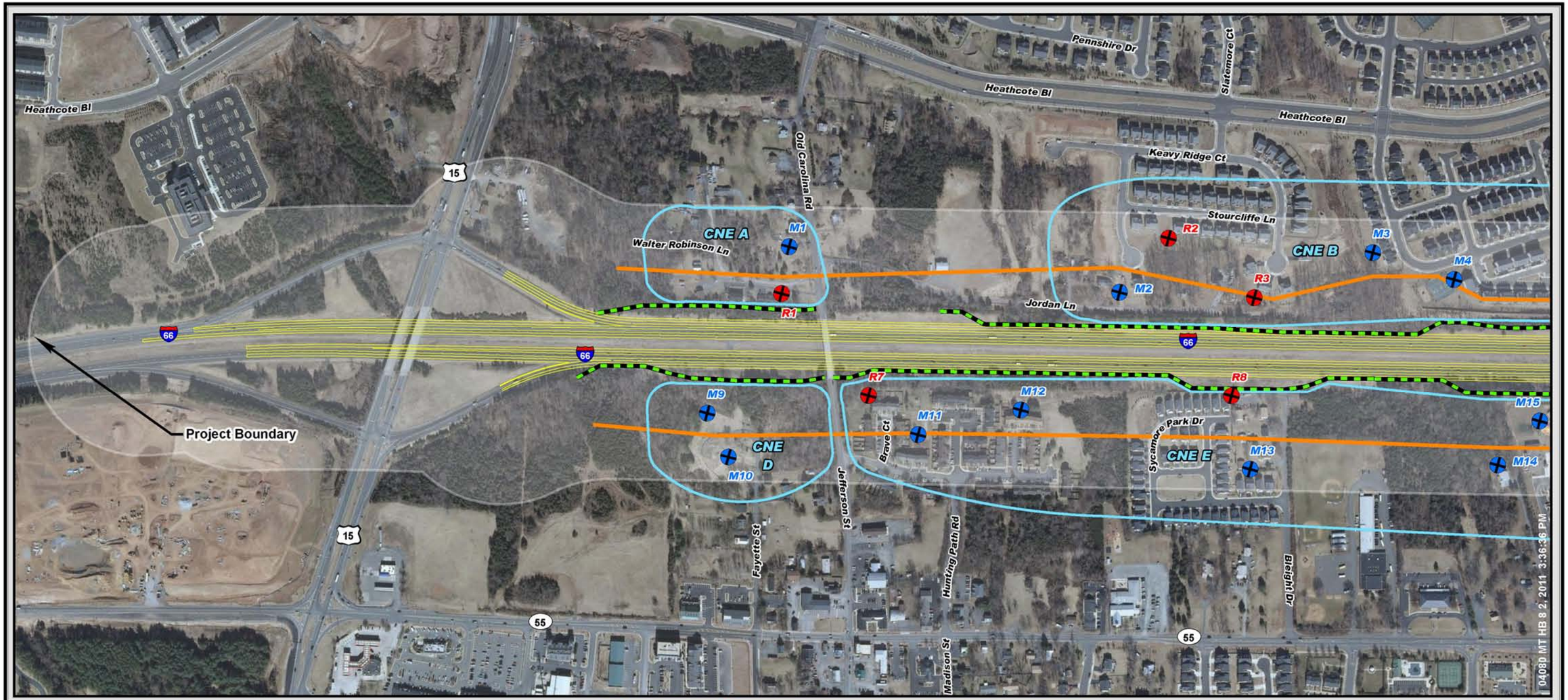
Following a discussion with the Prince William County Planning Department on August 5, 2011, confirmation of an accepted construction permit was obtained for the Sherwood Forest Development. The construction permit application was submitted to the Town of Haymarket on May 24, 2011 and approved on August 3, 2011. Therefore, this community will be included in the noise analysis and qualifies for consideration of noise abatement.

CNE E

Common Noise Environment F (CNE E) is located just east of Jefferson Street/Old Carolina Road, between Washington Street (VA Route 55) and the eastbound travel lanes of I-66. CNE E contains two monitoring sites (R7 and R8), which represent approximately 27 residences along Brave Court and Sycamore Park Drive and Bleight Drive, as shown on ***Figure 2A***. Existing (2011) monitored noise levels within CNE E are 64 dB(A), as shown in ***Column 3*** of ***Table 2***.

Planned Commercial Development

Located in the southwest section of the project area, adjacent to the I-66 northbound off ramp to Rt. 15, commercial (Category E) land uses are planned for future development. The Market Center at Haymarket is currently under conceptual design and final plans were not available during this phase of the project. Since, outdoor use areas can not be quantified at this stage of the project; The Market Center at Haymarket was not included during the preliminary design phase of the project. However, during the final design phase of the project, final plans (if available) will be referenced to determine if any outdoor use areas exist on the development plan.



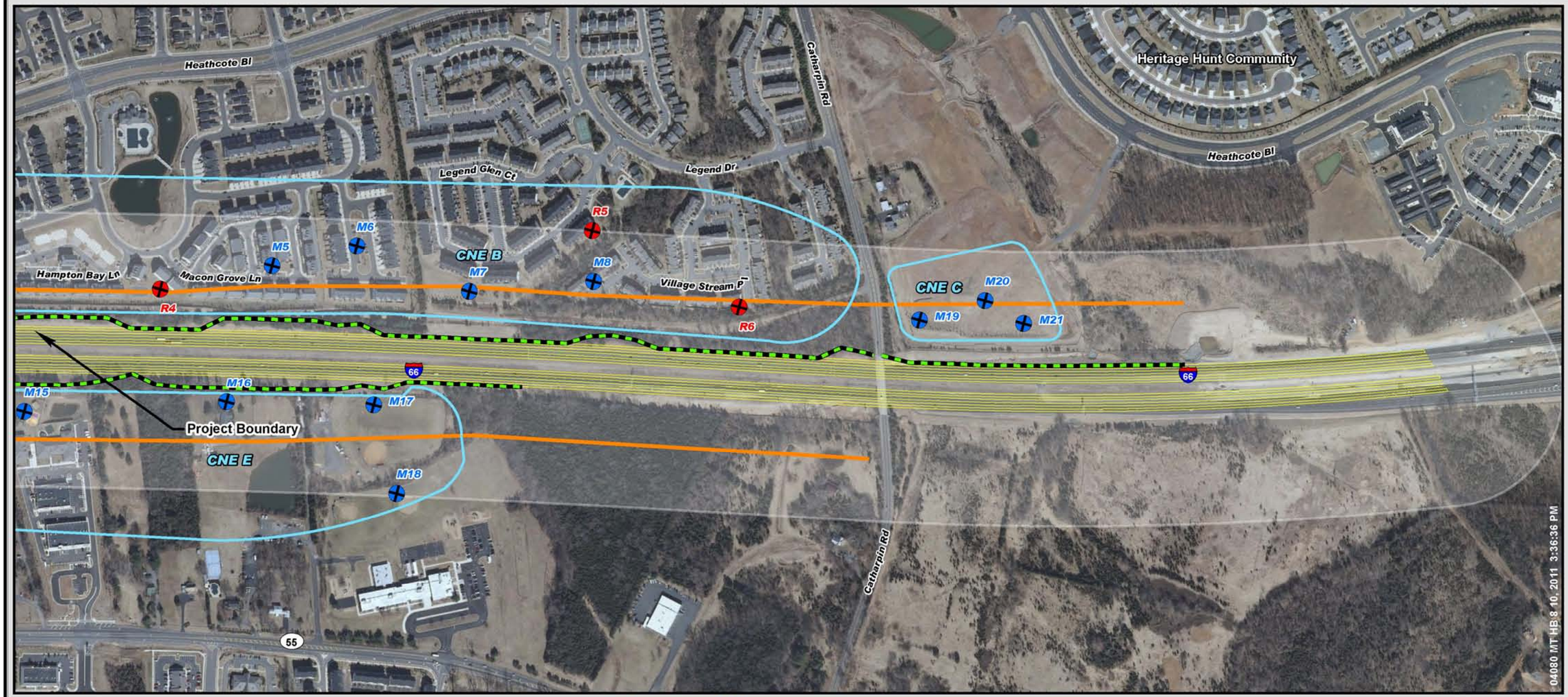
Modeling and Monitoring Receivers
Modeling Only Receivers
CNE Boundary
66dBA Contour Line
Noise Barrier Under Consideration
Proposed New Alignment

0 400 800 Feet
0 48 96 144 192 240 Meters

Interstate 66 - HOV + SOV Widening Project
Prince William County and the Towns of Haymarket and Gainesville
Preliminary Noise Analysis

Figure 2A

Aerial Source: VBMP 2009 Preliminary Imagery



Modeling and Monitoring Receivers
Modeling Only Receivers
CNE Boundary
66dBA Contour Line
Noise Barrier Under Consideration
Proposed New Alignment

0 400 800 Feet
0 48 96 144 192 240 Meters

Interstate 66 - HOV + SOV Widening Project
Prince William County and the Towns of Haymarket and Gainesville
Preliminary Noise Analysis

Figure 2B

Aerial Source: VBMP 2009 Preliminary Imagery

Table 2
I-66 HOV+SOV Widening from Route 15 to Route 29
Sound Level Summary in dB(A)

CNE	1 Receptor Site	2 Site Designation	3 Monitored (2011) Noise Level	4 Modeled Noise Level	5 Difference (Mon.-Mod.)	6 Criteria	7 Existing Worst-Case (2011) Noise Level	8 Design Year (2036) No-Build Noise Level	9 Design Year (2036) Build Noise Level
A	R1	3 Residences	64.6	63.5	1.1	66	65	**67**	**71**
	M1	2 Residences	--	--	--	66	57	58	62
B	R2	8 Residences	63.2	55.9	7.3	66	57	58	61
	R3	6 Residences	60.8	61.2	-0.4	66	62	63	**66**
	M2	3 Residences	--	--	--	66	65	**66**	**70**
	R4	44 Residences 1 Sport Court	61.1	62.1	-1.0	66	63	64	64
	M3	2 Residences	--	--	--	66	59	60	63
	M4	4 Residences 1 Sport Court	--	--	--	66	63	64	**67**
	M5	8 Residences	--	--	--	66	63	64	64
	M6	14 Residences	--	--	--	66	60	61	61
	R5	10 Residences	63.5	58.1	6.0	66	60	61	59
	R6	25 Residences	61.4	63.6	-2.2	66	65	**67**	**67**
	M7	18 Residences	--	--	--	66	**66**	**67**	**67**
	M8	14 Residences	--	--	--	66	64	65	62
C	M19	7 Future Residences	--	--	--	66	65	**67**	**67**
	M20	7 Future Residences	--	--	--	66	64	65	65
	M21	7 Future Residences	--	--	--	66	65	**67**	**66**
D	M9	6 Future Residences	--	--	--	66	**66**	**67**	**69**
	M10	4 Future Residences	--	--	--	66	60	62	63
E	R7	15 Residences	63.9	**66.1**	-2.2	66	**68**	**70**	**72**
	R8	12 Residences	64.1	**65.5**	-2.0	66	**67**	**68**	**70**
	M11	18 Residences	--	--	--	66	61	63	**66**
	M12	12 Residences	--	--	--	66	**66**	**67**	**70**
	M13	15 Residences	--	--	--	66	57	58	61
	M14	1 Residence	--	--	--	66	58	60	64
	M15	School Playground	--	--	--	66	65	**66**	**70**
	M16	1 Residence	--	--	--	66	**68**	**70**	**73**
	M17	Football Field	--	--	--	66	**66**	**68**	**72**
	M18	2 Baseball Fields	--	--	--	66	56	57	61

* **Criteria based on levels "approaching" the absolute criteria or that meets the "substantial increase" criterion.**

Noise levels approach or exceed the FHWA/VDOT Noise Abatement Criteria.

Non - calibration site due to insect/cicada noise during monitoring period.

V. Noise Modeling and Existing Conditions

Following the validation of the existing conditions noise model, additional noise modeling was performed to predict worst-case existing conditions using traffic data supplied by traffic engineers (reference ***Appendix D***). This modeling step was performed to evaluate existing "worst-case" conditions associated with existing worst-case traffic volumes and composition. ***Column 7*** of ***Table 2*** provides a summary of worst-case existing noise levels, based on supplied worst-case existing traffic volumes. Based on these existing noise levels, the noise impact criterion was determined at each receptor site (***Column 6 of Table 2***), based on either the "absolute" criteria shown in ***Table 1*** or VDOT's "substantial increase" above existing conditions criterion.

Traffic noise levels were predicted at all noise-sensitive land uses along the existing I-66, using the latest version of the FHWA TNM 2.5. Existing worst-case (2011) noise levels were determined by incorporating field reconnaissance of the existing transportation network into the noise model. Major and secondary roadways in close proximity to receptor sites that carry considerable traffic volumes were added to the noise model. For the purposes of this noise analysis, it was determined through field verification that I-66 is the dominant noise source for the majority of the project area.

Traffic data, including volumes, speeds and composition, supplied by traffic engineers was added to the noise model to predict existing noise levels throughout the project corridor. Posted roadway speeds were identified during the field view and were also incorporated into the noise model. AM Free flow, hourly traffic volumes and composition were used for the noise analysis, as shown in ***Appendix D***.

A summary of existing, worst-case sound levels for this project is contained in ***Column 7*** of ***Table 2.***

VI. Evaluation of Design Year Noise Levels & Noise Impact Assessment

Following the development of the existing conditions model and the prediction of Existing (worst-case) noise levels, the assessment continued with the projection of Design Year (2036) noise levels. This task was accomplished by accounting for the proposed conceptual improvements and applying Design Year (2036) traffic volumes and composition to the validated computer model. Design Year (2036) Build noise levels were predicted with the proposed improvements in place and in use.

Design Year (2036) noise levels were modeled for the No-Build alternative to provide a comparison to Build conditions. The No-Build alternative was modeled with the assumption that the roadway improvements proposed, as part of the VDOT project, would not be in place in the Design Year (2036) of the project, but the existing roadways would carry Design Year traffic volumes, speeds and composition. The noise levels associated with the No-Build modeling analysis are summarized in ***Column 8*** of ***Table 2***. As shown, No-Build noise levels are projected to approach or exceed the FHWA/VDOT NAC at 13 of the 29 noise modeling sites, representing approximately 89 residences, 20 future residences, one school playground, and one football field.

Design Year (2036) No-Build noise levels are similar to build conditions as a result of the same traffic modeled under each scenario. The only difference between No-Build and Build conditions is the addition of bi-directional HOV and SOV Lanes.

The next step in the noise analysis is to project Design Year (2036) Build noise levels and to determine if receptors will approach or exceed the NAC. If the criteria are approached or exceeded at any receptor, noise abatement would be considered and evaluated in an attempt to reduce Design Year noise levels. The noise levels associated with the Build modeling analysis are summarized in ***Column 9*** of ***Table 2***. As shown, Design Year (2036) Build noise levels are projected to approach or exceed the NAC at 16 of the 29 noise modeling sites, representing approximately 117 residential properties, 20 future residential properties, one school playground, one sport court and three sport fields.

The information applied to the Design Year modeling effort includes the following: proposed conceptual roadway improvements and traffic data derived from modeling efforts for Design Year Build (2036) conditions. Base mapping and field views were used to further identify noise-sensitive land uses and terrain that shields noise levels considerably within the project corridor. The Design Year Build (2036) conditions model was created by adding the proposed roadway improvements to the existing computer model and accounting for proposed roadway changes in vertical and horizontal alignment.

Design Year (2036) traffic volumes, vehicle composition, and speeds were assigned to all existing and proposed roadways. All traffic data used in the noise analyses were derived from traffic engineering studies for the project.

The following discussion presents a summary of the Design Year noise levels throughout the project corridor.

CNE A

Column 7 of ***Table 2*** shows that existing (2011) worst-case noise levels within CNE A range from 57 to 65 dB(A). As shown in ***Column 8*** of ***Table 2***, Design Year No-Build (2036) modeled noise levels within this CNE are predicted to range from 58 to 67 dB(A). Design Year Build (2036) modeled noise levels within CNE A are predicted to range from 62 to 71 dB(A), as shown in ***Column 9*** of ***Table 2***. Design Year (2036) noise levels exceed the NAC at one receptor site, representing three residences. Since Design Year (2036) noise levels exceed the NAC, a noise abatement evaluation is warranted for CNE A and will be discussed in following sections of this report.

CNE B

Column 7 of ***Table 2*** shows that existing (2011) worst-case noise levels within CNE B range from 57 to 66 dB(A). As shown in ***Column 8*** of ***Table 2***, Design Year No-Build (2036) modeled noise levels within this CNE are predicted to range from 58 to 67 dB(A). Design Year Build (2036) modeled noise levels within CNE B are predicted to range from 59 to 70 dB(A), as shown in ***Column 9*** of ***Table 2***. The future Build (2036) noise levels at sites R5 and M8 show a reduction compared to the future No-Build volumes, due to future conceptual design changes in the terrain lines adjacent to I-66. Design Year (2036) noise levels exceed the NAC at five

receptor sites, representing 56 residences and one sport court. Since Design Year (2036) noise levels exceed the NAC, a noise abatement evaluation is warranted for CNE B and will be discussed in following sections of this report.

CNE C

Column 7 of ***Table 2*** shows that existing (2011) worst-case noise levels within CNE C range from 64 to 65 dB(A). As shown in ***Column 8*** of ***Table 2***, Design Year No-Build (2036) modeled noise levels within this CNE are predicted to range from 65 to 67 dB(A). Design Year Build (2036) modeled noise levels within CNE C are predicted to range from 65 to 67 dB(A), as shown in ***Column 9*** of ***Table 2***. Design Year (2036) Build noise levels exceed the NAC at two receptor sites, representing approximately 14 planned residences. Since Design Year (2036) noise levels exceed the NAC, a noise abatement evaluation is warranted for CNE C and will be discussed in following sections of this report. This area will be re-evaluated during the final design phase of the project and once a detailed development plan can be obtained.

CNE D

Column 7 of ***Table 2*** shows that existing (2011) worst-case noise levels within CNE D range from 60 to 66 dB(A). As shown in ***Column 8*** of ***Table 2***, Design Year No-Build (2036) modeled noise levels within this CNE are predicted to range from 62 to 67 dB(A). Design Year Build (2036) modeled noise levels within CNE D are predicted to range from 63 to 69 dB(A), as shown in ***Column 9*** of ***Table 2***. Design Year (2036) noise levels exceed the NAC at one receptor site, representing six future residences in a new development. Since Design Year (2036) noise levels exceed the NAC, a noise abatement evaluation is warranted for CNE D and will be discussed in following sections of this report.

CNE E

Column 7 of ***Table 2*** shows that existing (2011) worst-case noise levels within CNE E range from 56 to 68 dB(A). As shown in ***Column 8*** of ***Table 2***, Design Year No-Build (2036) modeled noise levels within this CNE are predicted to range from 57 to 70 dB(A). Design Year Build (2036) modeled noise levels within CNE E are predicted to range from 61 to 73 dB(A), as shown in ***Column 9*** of ***Table 2***. Design Year (2036) noise levels exceed the NAC at seven receptor sites, representing 58 residences, one pre-school playground, and one school football field. Since Design Year (2036) noise levels exceed the NAC, a noise abatement evaluation is warranted for CNE E and will be discussed in following sections of this report.

VII. Noise Abatement Evaluation

Design Year (2036) noise levels are projected to approach or exceed the FHWA/VDOT Noise Abatement Criteria (NAC) at all seven CNEs throughout the project corridor. Therefore, as per FHWA/VDOT procedures, noise abatement considerations are warranted, as discussed in **Phase 1**, for the impacted properties within each CNE.

Phase 2 and **Phase 3** of VDOT's three-phased approach to considering noise abatement and determining the feasibility and reasonableness of noise barriers is discussed below in detail.

Phase 2: Feasibility Criteria for Noise Barriers

- *at least a 5 dB(A) 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(A) of reduction. VDOT requires that fifty percent (50%) or more of the impacted receptors experience 5 dB(A) 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).*

FHWA and VDOT guidelines recommend a variety of abatement measures which 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 abatement, additional abatement measures exist which have the potential to provide considerable noise reductions, under certain circumstances. 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:

- Construction of noise barriers, including acquisition of property rights, either within or outside the highway right-of-way. Landscaping is not a viable noise abatement measure.

- Traffic management measures including, but not limited to, traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations.

- Alteration of horizontal and vertical alignments.

- Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise. This measure may be included in Type I projects only.

- Noise insulation of Activity Category D land use facilities listed in ***Table 1***. Post-installation maintenance and operational costs for noise insulation are not eligible for Federal-aid funding.

Due to the project need and the nature of the proposed improvements, traffic control measures were not considered an appropriate solution. Property acquisition to provide noise abatement was not necessary or supported by the analysis. Therefore, noise barriers and/or earth berms were considered the only form of abatement having the potential to reduce Design Year noise levels.

Noise walls and earth berms are often implemented into the highway design in response to identified noise impacts. The effectiveness of a free-standing (post and panel) noise barrier and an earth berm of equivalent height are relatively consistent; however, an earth berm is often perceived as a more aesthetically pleasing option. Therefore, where possible, earth berms are typically the preferred form of noise abatement. The use of earth berms is not always an option, however, due to the excessive space they require adjacent to the roadway corridor. At a standard slope of 2:1, every one foot of berm height would require approximately four feet of horizontal width. This requirement becomes more complex on roadway improvement projects, where residential properties often abut the proposed roadway corridor. In these situations, implementation of earth berms can require considerable property acquisition to accommodate noise abatement. Due to limited right-of-way throughout the proposed roadway corridor and the potential impact (and acquisition) to adjacent residential properties and local roadways that would be required to provide berms, earth berms were not considered a viable abatement option for this project. Therefore, noise barriers were evaluated in an attempt to reduce Design Year (2036) noise levels below criteria.

Phase 3: Reasonableness Criteria for Noise Barriers

A determination of noise barrier reasonableness will include the consideration of the parameters listed below. The parameters used during the NEPA process are also used during the Final Design Phase when making a determination of noise barrier reasonableness. When performing a reasonableness analysis for the NEPA document, some parameters (e.g., desires of the impacted community) will not yet be quantifiable. All of the reasonableness factors must collectively be achieved in order for a noise abatement measure to be deemed reasonable.

- **Viewpoints of the benefited receptors.**
  VDOT shall solicit the viewpoints of all benefited receptors through certified mailings and obtain enough responses to document a decision as to whether or not there is a desire for the proposed noise abatement measure. Fifty percent (50%) or more of the respondents shall be required to favor the noise abatement measure in determining reasonableness.

- **Cost-effectiveness**
  VDOT's noise barrier cost effectiveness value is based upon a Maximum Square Footage of Abatement per Benefited Receptor (MaxSF/BR) value of 1,600 sq. ft. This MaxSF/BR

criterion shall be applied as part of the noise barrier reasonableness determination. It replaces the previously used "Cost per Benefited Receptor" criteria.

- **Noise Reduction Design Goals**
  The design goal is a reasonableness factor indicating a specific reduction in noise levels that VDOT uses to identify that a noise abatement measure effectively reduces noise. The design goal establishes a criterion, selected by VDOT that noise abatement must achieve. The design goal is not the same as acoustic feasibility, which is the minimum level of effectiveness of a noise abatement measure. Acoustic feasibility indicates that the noise abatement measure can, at a minimum, achieve a discernible reduction in noise levels.

The effectiveness of a noise barrier is measured by examining the barrier's capability to reduce Design Year noise levels. Noise reduction is measured by comparing Design Year pre-and post-barrier noise levels. This difference between unabated and abated noise levels is known as "insertion loss" (IL). It is important to optimize the noise barrier design to achieve the most effective noise barrier in terms of both noise reduction (insertion losses) and cost. Although at least a 5 dB(A) reduction is required to meet the feasibility criteria, the following tiered noise barrier abatement goals should be used to govern barrier design and optimization.

- Reduction of future highway traffic noise by 7dB(A) at one (1) or more of the impacted receptor sites (required criterion).

- Reduction of future highway traffic noise levels to the low-60-decibel range when practical (desirable).

- Reduction of future highway traffic noise levels to existing noise levels when practical (desirable).

The following discussion presents potential abatement alternatives for all eight (CNE A through CNE E) CNEs within the I-66 Project corridor. Where a noise barrier was evaluated, the effectiveness was measured in terms of achievable IL (reference ***Table 3*****).**

The following is a preliminary discussion of the evaluated noise barrier system for each of the impacted CNEs. Noise abatement was evaluated where noise impacts are predicted to occur. The noise evaluation is preliminary and a more detailed review will be completed during the final design stage. As such, noise barriers that are found to be feasible and reasonable during the preliminary noise analysis may not be found to be feasible and reasonable during the final design noise analysis. Conversely, noise barriers that were not considered feasible and reasonable may meet the established criteria and be recommended for construction. ***Appendix J*** provides completed warranted, feasible, and reasonable worksheets.

CNE A

Design Year Build (2036) noise levels have been predicted to approach or exceed the FHWA/VDOT NAC at three impacted properties within CNE A, primarily along Walter Robinson Lane. A continuous post and panel noise barrier was evaluated along the I-66 westbound lanes, west of Old Carolina Road, with several transitions to the top of the cut-slope at heights ranging from 10 to 18 feet (reference ***Figure 2A***). As shown in ***Table 3***, the

preliminary noise barrier evaluated for this area satisfies the feasibility criteria at a height of 10 feet. The preliminary barrier has a length of 956 feet, which yields a total area of 9,650 ft^2 and a total estimated cost of $347,400 (based on $36/$ft^2$). The preliminary barrier for CNE A has a MaxSF per benefited residence of 3,217 ft^2, which exceeds the VDOT limit of 1,600 ft^2 per benefited residence. Considering these factors, noise abatement for CNE A is not reasonable at this time. However, this area of the project will be re-evaluated during the final design phase of the project.

CNE B

Design Year Build (2036) noise levels have been predicted to approach or exceed the FHWA/VDOT NAC at 57 impacted land uses within CNE B. These land uses include 56 Category B land uses and one outdoor sport use area, which represents a Category C land use.

During the initial abatement evaluation for this CNE, it was determined that the logical mitigation termini are located west of CNE B, approximately 800 feet east of Old Carolina Road, and the Catharpin Road overpass.

A continuous post and panel noise barrier was evaluated along the I-66 westbound lanes, with several transitions from the edge of shoulder to the top of the cut-slope (reference ***Figure 2A and 2B***). As shown in ***Table 3***, the preliminary noise barrier for CNE B satisfies the feasibility criteria at a height of 16 feet. As shown in ***Table 4***, the noise barrier evaluated for this area has a length of 6,428 feet and a total estimated cost of $3,702,528 (based on $36/$ft^2$). The preliminary noise barrier for CNE B is approximately 16 feet in height, which yields a total area of 102,848 ft^2 and benefits 158 qualifying, sensitive land uses. Therefore, the preliminary CNE B barrier has a MaxSF per benefited residence of 651 ft^2, which is well within the VDOT limit of 1,600 ft^2 per benefited residence. This noise barrier would benefit approximately 156 residences and two sport courts. The two Category C sport courts were considered in the Category B barrier calculation for CNE B, due to the high volume of Category B receptors in the area. Based on the reasonableness calculation for Category C land uses in Appendix E of the VDOT policy, each sport court was considered as one benefit per use area.

Considering these factors, the MaxSF per benefited residence would be approximately 651 ft^2, which makes the CNE B barrier warranted, feasible and reasonable at this time. Therefore, this barrier is recommended for further consideration and will be re-evaluated during the final design phase of the project.

CNE C

Design Year Build (2036) noise levels have been predicted to approach or exceed the FHWA/VDOT NAC at 14 impacted residential land uses within CNE C, in the front row receptors along I-66, in the Heritage Hunt Community. CNE C represents a community based on a conceptual design plan. A current engineered plot plan was not available at the time of this analysis. An absolute worst-case situation was considered for the preliminary noise analysis at this site. Once community design plans are obtained, CNE C (Heritage Hunt Community) will be further studied in its entirety.

A continuous post and panel noise barrier was evaluated along the I-66 westbound lanes, between Catharpin Street and an existing storm water retention pond. This barrier runs along the edge of shoulder once it transitions from the Catharpin Street overpass to its termini (reference ***Figure 2B***). As shown in ***Table 3***, the preliminary noise barrier for CNE C satisfies the feasibility criteria at a height of 16 feet. As shown in ***Table 4***, the noise barrier evaluated for this area has a length of 1,325 ft and a total estimated cost of $763,200 (based on $36/ft^2). The preliminary noise barrier for CNE C is approximately 16 feet in height, which yields a total area of 21,200 ft^2 and benefits 21 qualifying, sensitive land uses. Therefore, the preliminary CNE C barrier has a MaxSF per benefited residence of 1,010 ft^2, which is within the VDOT limit of 1,600 ft^2 per benefited residence. Considering these factors, the CNE C barrier is warranted, feasible and reasonable at this time. Therefore, this barrier is recommended for further consideration and will be re-evaluated during the final design phase of the project.

CNE D

Design Year Build (2036) noise levels have been predicted to approach or exceed the FHWA/VDOT NAC at six impacted residential land uses within CNE D, along Fayette Street. A continuous post and panel noise barrier was evaluated along the I-66 eastbound lanes, between the I-66 eastbound on-ramp for Rt. 15 and the Jefferson Street overpass. This barrier exhibits several transitions to the top of the cut-slope (reference ***Figure 2A***). As shown in ***Table 3***, the preliminary noise barrier for CNE D satisfies the feasibility criteria at a height of 14 feet. As shown in ***Table 4***, the noise barrier evaluated for this area has a length of 1,110 feet and a total estimated cost of $3,702,528 (based on $36/ft^2). The preliminary noise barrier for CNE D is approximately 14 feet in height, which yields a total area of 15,540 ft^2 and benefits 10 qualifying, sensitive land uses. Therefore, the preliminary CNE D barrier has a MaxSF per benefited residence of 1,554 ft^2, which is within the VDOT limit of 1,600 ft^2 per benefited residence. This noise barrier would benefit approximately 10 future planned residences. Considering these factors, the CNE D barrier is warranted, feasible and reasonable at this time. Therefore, this barrier is recommended for further consideration and will be re-evaluated during the final design phase of the project.

CNE E

Design Year Build (2036) noise levels have been predicted to approach or exceed the FHWA/VDOT NAC at 60 impacted land uses within CNE E. These land uses include 58 Category B land uses and two Category C land uses (one football field and one pre-school playground). The two Category C land uses were considered in the Category B barrier calculation for CNE E, due to the high volume of Category B receptors in the area. Based on the reasonableness calculation for Category C land uses in Appendix E of the VDOT policy, the football field was considered as four benefits and the playground as one benefit.

During the initial abatement evaluation for this CNE, it was determined that the logical mitigation termini be located at the eastern side of the Jefferson Street overpass to approximately 800 feet east of the Tyler Elementary football field (M17).

A continuous post and panel noise barrier was evaluated along the I-66 eastbound lanes, with several transitions to the top of the cut-slope (reference ***Figure 2A and 2B***). As shown in

Table 3, the preliminary noise barrier for CNE E satisfies the feasibility criteria at a height of 16 feet. As shown in ***Table 4***, the noise barrier evaluated for this area has a length of 5,339 feet and a total estimated cost of $3,075,264 (based on $36/ft^2). The preliminary noise barrier for CNE E is approximately 16 feet in height, which yields a total area of 85,424 ft^2 and benefits 82 qualifying, sensitive land uses. Therefore, the preliminary CNE E barrier has a MaxSF per benefit of 1,042 ft^2, which is within the VDOT limit of 1,600 ft^2 per benefit. Considering these factors, the CNE E barrier is warranted, feasible and reasonable at this time. Therefore, this barrier is recommended for further consideration and will be re-evaluated during the final design phase of the project.

Table 3
I-66 HOV+SOV Widening from Route 15 to Route 29
Summary Noise Mitigation Evaluation in dB(A)

Preliminary Optimized Barrier Height	Receptor Site	Site Representation	Future Build Noise Level 2036	Mitigated Noise Level	Insertion Loss (IL)
Barrier Height 10 Feet	**CNE A - Barrier**				
	R1	3 Residences	71	64	7
	M1	2 Residence	62	60	2
Barrier Height 14 Feet	**CNE D - Barrier**				
	M9	6 Future Residences	69	59	9
	M10	4 Future Residences	63	58	5
Barrier Height 16 Feet	**CNE B - Barrier**				
	R2	8 Residences	61	55	6
	R3	6 Residences	66	59	7
	R4	44 Residences 1 Sport Court	64	56	8
	R5	10 Residences	59	53	6
	R6	25 Residence	67	58	8
	M2	3 Residences	70	61	10
	M3	2 Residences	63	55	7
	M4	4 Residences 1 Sport Court	67	58	9
	M5	8 Residences	64	56	8
	M6	14 Residences	61	54	7
	M7	18 Residence	67	59	8
	M8	14 Residence	62	55	7
	CNE C - Barrier				
	M19	7 Future Res.	67	60	7
	M20	7 Future Res.	65	58	7
	M21	7 Future Res.	66	59	7
	CNE E - Barrier				
	R7	15 Residences	72	63	9
	R8	12 Residences	70	59	11
	M11	18 Residences	66	58	8
	M12	12 Residences	70	59	11
	M13	15 Residences	61	54	6
	M14	1 Residence	64	55	9
	M15	School Playground	70	60	10
	M16	1 Residence	73	60	13
	M17	Football Field	72	60	12
	M18	2 Baseball Fields	61	55	6

Impacted receptor > 66 dBA

Protected receptor= receives a 5 dBA or greater reduction

Table 4
I-66 HOV+SOV Widening from Route 15 to Route 29
Noise Abatement Feasibility and Reasonableness Evaluation

	Number of Benefited Residences	Combined Noise Barrier Length (ft.)	Average Noise Barrier Height (ft.)	Maximum Square Footage (MaxSF)	MaxSF per Benefited Residence	Barrier Cost ($36/sq. ft.)	Feasible?	Reasonable?
CNE A Barrier	3	965	10	9,650	3,217	$347,400	YES	NO
CNE B Barrier	158	6,428	16	102,848	651	$3,702,528	YES	YES
CNE C Barrier	21	1,325	16	21,200	1,010	$763,200	YES	YES
CNE D Barrier	10	1,110	14	15,540	1,554	$559,440	YES	YES
CNE E Barrier	82	5,339	16	85,424	1,042	$3,075,264	YES	YES

VIII. Construction Noise

VDOT is also concerned with noise generated during the construction phase of the proposed project. The degree of 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.

Based on a review of the project area, no considerable, long-term construction-related noise impacts are anticipated. Any 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.

The following will be utilized to help minimize potential construction-related noise impacts. A detailed discussion of VDOT's construction noise policy can be viewed in Section 107.16(b) 3 Noise, VDOT's Road and Bridge Specifications (VDOT, 2007).

- 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 P.M. and 6 A.M. 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.

IX. Noise Compatible Land Use Planning

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 and federal participation in Type II projects (noise abatement only). This section of the report provides that information, as well as information about VDOT's noise abatement program.

VDOT's current noise policy outlines VDOT's approach to communication with local officials and provides 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

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 Noise Abatement Criteria sound levels are determined through interpolation. Distances vary in the project corridor due to changes in traffic volumes, or terrain features. These distances are given for this project in ***Table 5***. Any noise sensitive sites within these zones should be considered noise impacted if no barrier is present to reduce sound levels.

X. Noise Contours

Noise level contours are lines of equal noise exposure that typically parallel roadway alignments. Highway traffic noise is considered a linear noise source and sound levels can drop considerably over distance. The degree that sound levels decrease can vary based on a number of different factors including objects that shield the roadway noise, terrain features and ground cover type (e.g., pavement, grass or snow). The use of noise level contours have become increasingly popular over the last several years, as they have been implemented in planning programs for undeveloped areas with roadway noise influence. Through conscious planning efforts and noise contour generation, municipal officials can restrict future development inside the noise impact zone (i.e., the area within the 66-dB(A) noise contour). ***Figures 2A*** and ***Figure 2B*** show the approximate 66-dB(A) noise level contours when considering the improvements made to I-66 and the Design Year (2036) traffic volumes, speeds and composition. ***Table 5*** shows the approximate distance of the 66 dB(A) contour line from the center line of the proposed conceptual design a designated receptor sites throughout the project.

Table 5
CNE - Specific Noise Contours
Distance from Edge-of-Shoulder (feet)*

Design Year (2036) Noise Level Contours
66 dBA

Receptor Site	Distance
R3	155
M7	215
M21	190
M11	275
M14	300

* From nearest roadway edge-of-shoulder

XI. Conclusion

In summary, the results of the noise analysis for the I-66 HOV+SOV Widening Project indicate that Design Year (2036) Build noise levels are anticipated to approach or exceed the FHWA/VDOT Noise Abatement Criteria at 16 sites that represent 117 existing residences, 20 future residences, one sport court, one sport field, and one playground. Subsequent noise abatement evaluations concluded that noise abatement is within the VDOT MaxSF per benefited receptor (reasonable) as per VDOT policy for CNE B, CNE C, CNE D, and CNE E and will yield an approximate total of 261 Category B land uses (including 230 existing residences and 31 future residences) and six Category C land uses that will benefit from mitigation. Therefore, the results of the noise analysis indicate that noise abatement is reasonable and is recommended for further consideration for these areas. During the Final Design Phase, highway traffic noise abatement shall be reconsidered in light of more exact designs and refined project alignment, re-analysis of the roadway/noise receptor relationships, and expanded community input.

APPENDICES

Appendix A – Noise Meter and Acoustical Calibrator Calibration Certificates
Appendix B – Noise Monitoring Data Forms
Appendix C – Noise Monitoring Data (2011) Metrosonics Printouts
Appendix D – Traffic Data Summary
Appendix E – TNM Noise Levels – Calibration (2011)
Appendix F – TNM Modeled Existing (2011) Noise Levels
Appendix G – TNM Modeled Design Year No-Build (2036) Noise Levels
Appendix H – TNM Modeled Design Year Build (2036) Noise Levels
Appendix I – TNM Noise Barrier Analysis (2036) Noise Levels
Appendix J – Warranted, Feasible, and Reasonable Worksheet
Appendix K – References
Appendix L – List of Preparers/Reviewers

APPENDIX A

NOISE METER AND ACOUSTICAL CALIBRATOR CALIBRATION CERTIFICATES

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

ACOUSTICAL CALIBRATOR

Manufactured by:	**METROSONICS**
Model No:	**CL304**
Serial No:	**7271**
Calibration Recall No:	**20813**

Submitted By:

Customer:	**JACK CRAMER**
Company:	**McCORMICK TAYLOR, INC.**
Address:	**5 CAPITAL DRIVE**
	HARRISBURG PA 17110

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. CL304 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached Report of Calibration.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

FC

Calibration Date: **20-May-11**

Certificate No: **20813 - 6**

Felix Christopher
Quality Manager

QA Doc. #1051 Rev. 2.0 10/1/01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

Calibration Traceable
To N. I. S. T.

ACCREDITATION ISO/IEC 17025
ACCREDITED
153401

Phone: (585) 586-3900 Fax.: (585) 586-4327

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

METROLOGGER

Manufactured by:	**METROSONICS**
Model No:	**db-3080**
Serial No:	**2555**
Calibration Recall No:	**20965**

Submitted By:

Customer:	**CHUCK WEAVER**
Company:	**MCCORMICK TAYLOR**
Address:	**509 S EXETER STREET/ 4TH FLOOR**
	BALTIMORE MD 21202

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db-3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached Report of Calibration.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the following requirements, ISO 10012-1 MIL STD 45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025

Note: With this Certificate, Report of Calibration is included.

Calibration Date: **27-Jun-11**

Certificate No: **20965 - 1**

Approved by:

Felix Christopher
Quality Manager

QA Doc. #1051 Rev. 2.0 10/1/01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

Calibration Traceable To N. I. S. T.

ACCREDITATION ISO/IEC 17025 ACCREDITED 1633.01

Phone: (585) 586-3900 Fax.: (585) 586-4327

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db-3080**
Serial No:	**3903**
Calibration Recall No:	**20813**

Submitted By:

Customer:	**JACK CRAMER**
Company:	**McCORMICK TAYLOR, INC.**
Address:	**5 CAPITAL DRIVE**
	HARRISBURG PA 17110

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db-3080 METR

Upon receipt for Calibration, the instrument was found to be:

Outside (X) see attached Report of Calibration.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

Calibration Date: **20-May-11**

Certificate No: **20813 - 1**

Felix Christopher
Quality Manager

QA Doc. #1051 Rev. 2.0 10/1/01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

Calibration Traceable To N. I. S. T.

ACCREDITATION ISO/IEC 17025 ACCREDITED 1533.01

Phone: (585) 586-3900 Fax.: (585) 586-4327

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db-3080**
Serial No:	**3904**
Calibration Recall No:	**20813**

Submitted By:

Customer:	**JACK CRAMER**
Company:	**McCORMICK TAYLOR, INC.**
Address:	**5 CAPITAL DRIVE**
	HARRISBURG PA 17110

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db-3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached Report of Calibration.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Calibration Date: **20-May-11**

Certificate No: **20813 - 2**

Approved by:

FC

Felix Christopher
Quality Manager

QA Doc. #1051 Rev. 2.0 10/1/01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

Calibration Traceable
To N. I. S. T.

ACCREDITATION ISO/IEC 17025 ACCREDITED 1033.01

Phone: (585) 586-3900 Fax.: (585) 586-4327

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db-3080**
Serial No:	**3905**
Calibration Recall No:	**20813**

Submitted By:

Customer:	**JACK CRAMER**
Company:	**McCORMICK TAYLOR, INC.**
Address:	**5 CAPITAL DRIVE**
	HARRISBURG PA 17110

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db-3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached Report of Calibration.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

Calibration Date: **20-May-11**

Certificate No: **20813 - 3**

Felix Christopher
Quality Manager

QA Doc. #1051 Rev. 2.0 10/1/01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

Calibration Traceable To N. I. S. T.

Phone: (585) 586-3900 Fax.: (585) 586-4327

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PERMISSIBLE SOUND LEVEL METER

Manufactured by:	**METROSONICS**
Model No:	**db-3080**
Serial No:	**3908**
Calibration Recall No:	**20813**

Submitted By:

Customer:	**JACK CRAMER**
Company:	**McCORMICK TAYLOR, INC.**
Address:	**5 CAPITAL DRIVE**
	HARRISBURG PA 17110

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. db-3080 METR

Upon receipt for Calibration, the instrument was found to be:

Within (X) see attached Report of Calibration.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

Calibration Date: **20-May-11**

Certificate No: **20813 - 5**

FC

Felix Christopher
Quality Manager

QA Doc. #1051 Rev. 2.0 10/1/01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

Calibration Traceable
To N. I. S. T.

ACCREDITATION ISO/IEC 17025 ACCREDITED 1833.01

Phone: (585) 586-3900 Fax.: (585) 586-4327

APPENDIX B
NOISE MONITORING DATA FORMS

I-66 Widening, Haymarket to Gainesville

Site # R1 **Description :** 6566 Walter Robinson Street

Done By: JCL

Meter: → 2555

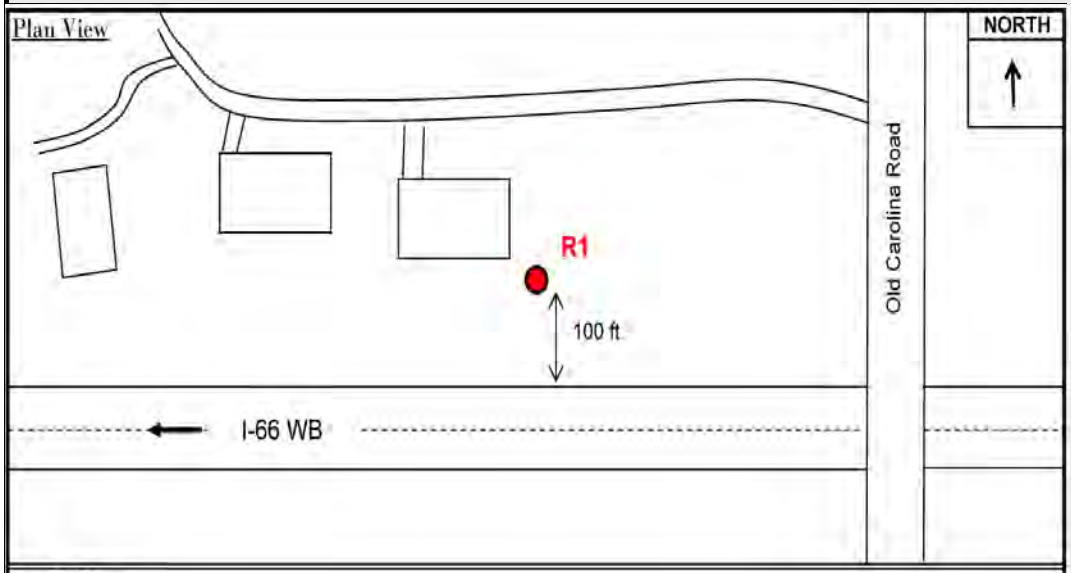
Monitoring Data:	AM Peak	Off-Peak	PM Peak
Date	7/13/11		
Start Time	8:30 AM		
End Time	8:45 AM		
Duration	15 MIN	MIN	MIN
Leq.			

Atmospheric Data
Wind Speed (mph) **Calm**
Temp. (°F) **85**
Humidity (%) **90**

Traffic Data	I-66 EB		I-66 WB		Old Carolina	
Direction						
Traffic Total:	550	0	278	0	0	0
Cars	514		257			
MT	7		9			
HT	29		12			
Weather Conditions						

Site Data: Site Surface (alpha): _____ Shielding Factor : _____ Pavement Type : _____

Plan View



Profile View:

Monitoring Notes

AM Peak:

Cichada insects are really loud.

Old Carolina Road does not influence the sound level at this site.

A few rumble strip hits near meter from I-66

Off-Peak:

PM Peak

McCormick Taylor, Inc

I-66 Widening, Haymarket to Gainesville

Site # R2 **Description :** 6612 Stourcliffe Lane

Done By: JJW

Meter: → 3904

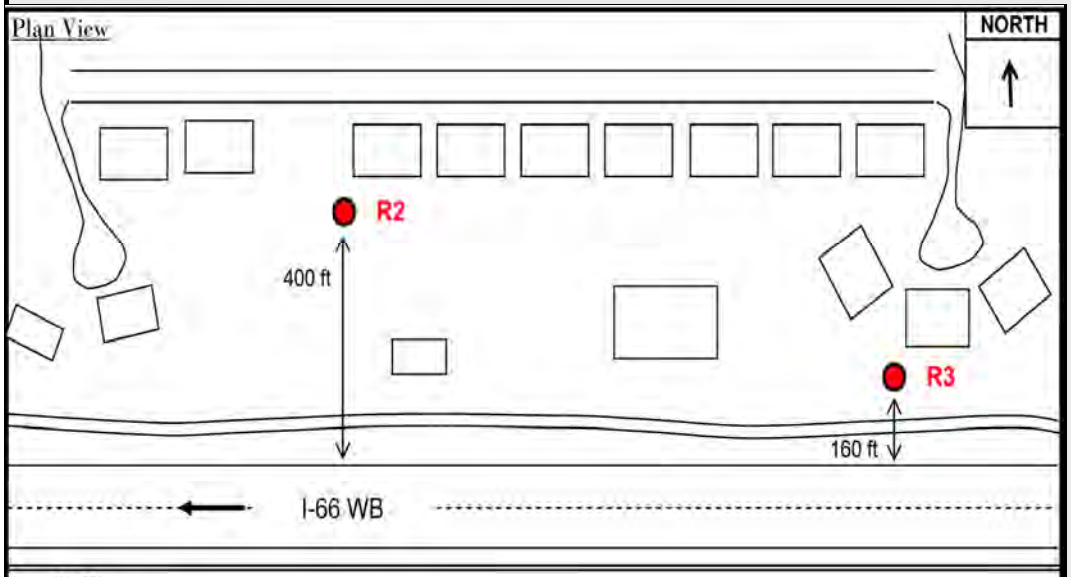
Monitoring Data:	AM Peak	Off-Peak	PM Peak
Date	7/13/11		
Start Time	8:30 AM		
End Time	8:45 AM		
Duration	15 MIN	MIN	MIN
Leq.			

Atmospheric Data
Wind Speed (mph) **Calm**
Temp. (°F) **85**
Humidity (%) **90**

Traffic Data	I-66 EB		I-66 WB		Old Carolina	
Direction						
Traffic Total:	550	0	278	0	0	0
Cars	514		257			
MT	7		9			
HT	29		12			
Weather Conditions						

Site Data: Site Surface (alpha): _____ Shielding Factor : _____ Pavement Type : _____

Plan View



Profile View:

Monitoring Notes

AM Peak:

Off-Peak:

PM Peak

McCormick Taylor, Inc

I-66 Widening, Haymarket to Gainesville

Site # R3 **Description :** 14700 Keavy Ridge Lane

Done By: JJW

Meter: → 3903

Monitoring Data:	AM Peak	Off-Peak	PM Peak
Date	7/13/11		
Start Time	8:30 AM		
End Time	8:45 AM		
Duration	15 MIN	MIN	MIN
Leq.			

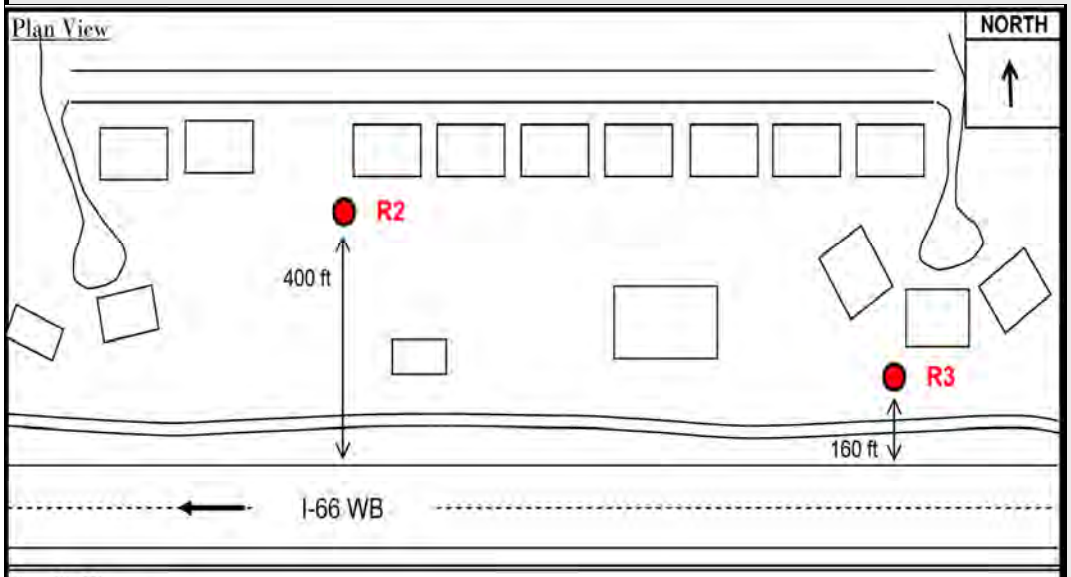
Atmospheric Data
Wind Speed (mph) **Calm**
Temp. (°F) **85**
Humidity (%) **90**

Traffic Data	I-66 EB		I-66 WB		Old Carolina	
Direction						
Traffic Total:	550	0	278	0	0	0
Cars	514		257			
MT	7		9			
HT	29		12			

Weather Conditions

Site Data: Site Surface (alpha): ____ Shielding Factor : ____ Pavement Type : ____

Plan View



Profile View:

Monitoring Notes

AM Peak:
Large 5' berm between 66 and R3

Cichads noise is 57 dba when no roadway noise is present.

Off-Peak:

PM Peak

McCormick Taylor, Inc

I-66 Widening, Haymarket to Gainesville

Site # R4 **Description :** 6757 Hampton Bay Lane

Done By: RVH

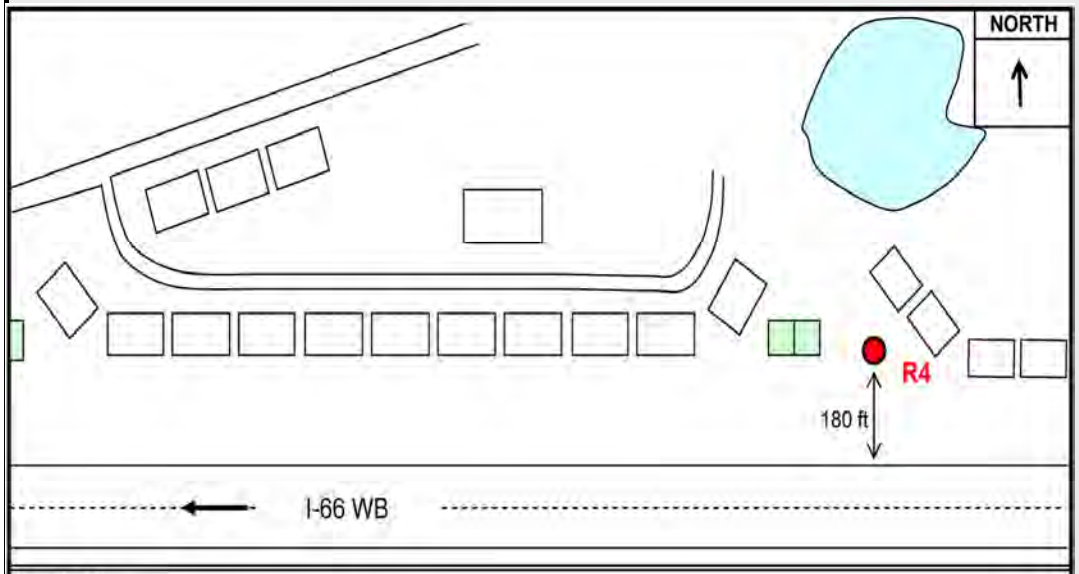
Meter: → 3908

Monitoring Data:	AM Peak	Off-Peak	PM Peak
Date	7/13/11		
Start Time	8:30 AM		
End Time	8:45 AM		
Duration	15 MIN	MIN	MIN
Leq.			

Atmospheric Data
Wind Speed (mph) **Calm**
Temp. (°F) **85**
Humidity (%) **90**

Traffic Data	I-66 EB		I-66 WB		Old Carolina	
Direction						
Traffic Total:	550	0	278	0	0	0
Cars	514		257			
MT	7		9			
HT	29		12			
Weather Conditions						

Site Data: Site Surface (alpha): _____ Shielding Factor : _____ Pavement Type : _____



Profile View:

Monitoring Notes

AM Peak:

No view of I-66, but the noise dominates.

Off-Peak:

PM Peak

McCormick Taylor, Inc

I-66 Widening, Haymarket to Gainesville

Site # R5 **Description :** 14213 Legend Glen Court

Done By: JC

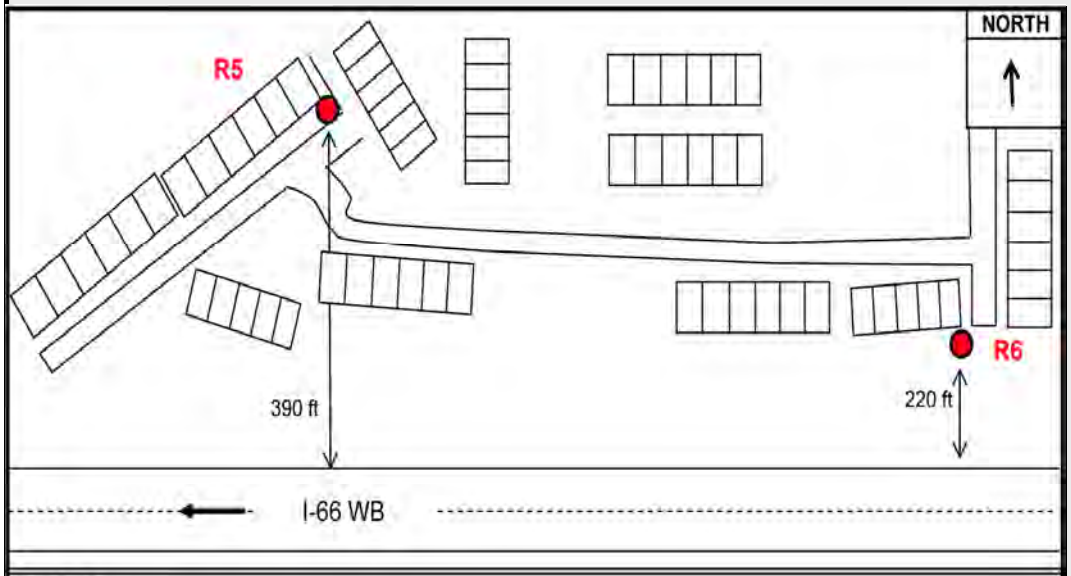
Meter: → 3905

Monitoring Data:	AM Peak	Off-Peak	PM Peak
Date	7/13/11		
Start Time	8:30 AM		
End Time	8:45 AM		
Duration	15 MIN	MIN	MIN
Leq.			

Atmospheric Data
Wind Speed (mph) **Calm**
Temp. (°F) **85**
Humidity (%) **90**

Traffic Data	I-66 EB		I-66 WB		Old Carolina	
Direction						
Traffic Total:	550	0	278	0	0	0
Cars	514		257			
MT	7		9			
HT	29		12			
Weather Conditions						

Site Data: Site Surface (alpha): _____ Shielding Factor : _____ Pavement Type : _____



Profile View:

Monitoring Notes

AM Peak:

Off-Peak:

PM Peak

McCormick Taylor, Inc

I-66 Widening, Haymarket to Gainesville

Site # R6 **Description :** 6945 Village Stream Place

Done By: JC

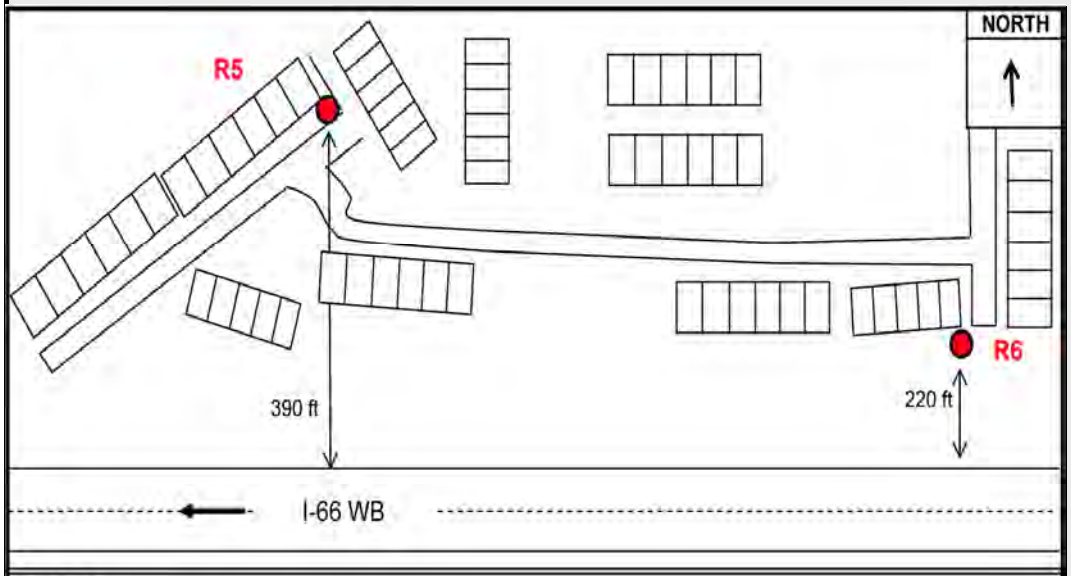
Meter: → 3905

Monitoring Data:	AM Peak	Off-Peak	PM Peak
Date	7/13/11		
Start Time	8:30 AM		
End Time	8:45 AM		
Duration	15 MIN	MIN	MIN
Leq.			

Atmospheric Data
Wind Speed (mph) **Calm**
Temp. (°F) **85**
Humidity (%) **90**

Traffic Data	I-66 EB		I-66 WB		Old Carolina	
Direction						
Traffic Total:	550	0	278	0	0	0
Cars	514		257			
MT	7		9			
HT	29		12			
Weather Conditions						

Site Data: Site Surface (alpha): _____ Shielding Factor : _____ Pavement Type : _____



Profile View:

Monitoring Notes

AM Peak:

Off-Peak:

PM Peak

McCormick Taylor, Inc

I-66 Widening, Haymarket to Gainesville

Site # R7 **Description :** 6605 Brave Court

Done By: Rvh

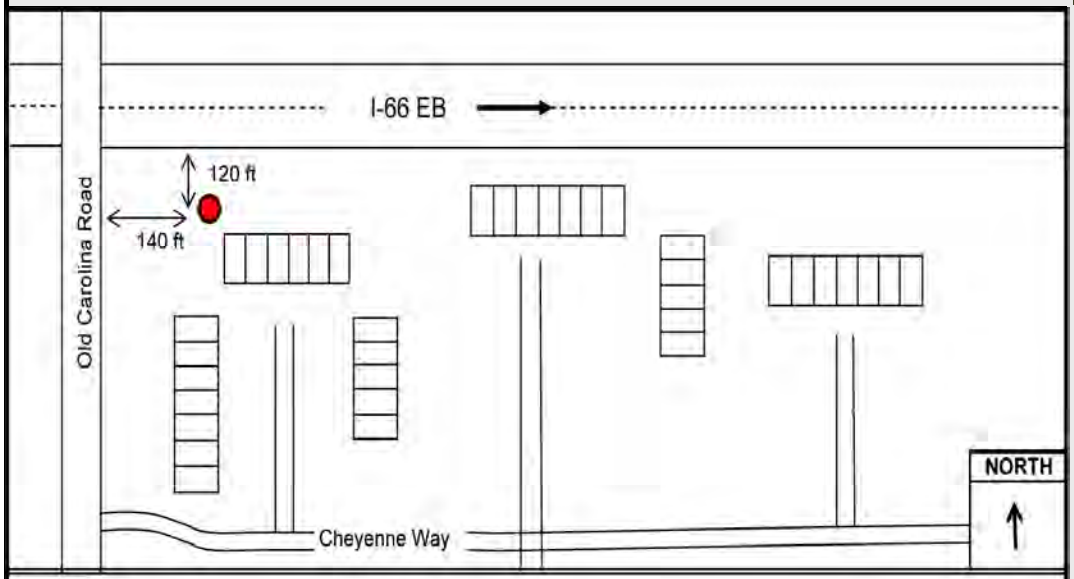
Meter: → 3908

Monitoring Data:	AM Peak	Off-Peak	PM Peak
Date	7/13/11		
Start Time	9:25 AM		
End Time	9:40 AM		
Duration	15 MIN	MIN	MIN
Leq.			

Atmospheric Data
Wind Speed (mph) **Calm**
Temp. (°F) **87**
Humidity (%) **90+**

Traffic Data	I-66 EB		I-66 WB		Old Carolina	
Direction						
Traffic Total:	481	0	250	0	0	0
Cars	450		228			
MT	2		6			
HT	29		16			
Weather Conditions						

Site Data: Site Surface (alpha): _____ Shielding Factor : _____ Pavement Type : _____



Profile View:

Monitoring Notes

AM Peak:

Off-Peak:

PM Peak

McCormick Taylor, Inc

I-66 Widening, Haymarket to Gainesville

Site # R8 **Description :** 6700 Bleight Drive

Done By: JJW

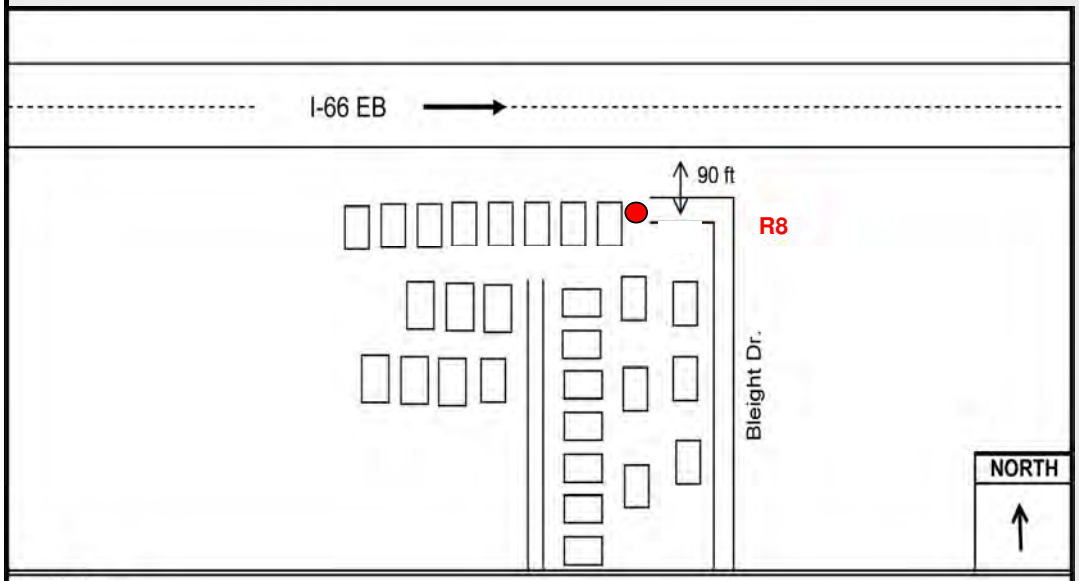
Meter: → 2555

Monitoring Data:	AM Peak	Off-Peak	PM Peak
Date	7/13/11		
Start Time	9:25 AM		
End Time	9:40 AM		
Duration	15 MIN	MIN	MIN
Leq.			

Atmospheric Data
Wind Speed (mph) **Calm**
Temp. (°F) **87**
Humidity (%) **90+**

Traffic Data	I-66 EB		I-66 WB		Old Carolina	
Direction						
Traffic Total:	481	0	250	0	0	0
Cars	450		228			
MT	2		6			
HT	29		16			
Weather Conditions						

Site Data: Site Surface (alpha): _____ Shielding Factor : _____ Pavement Type : _____



Profile View:

Monitoring Notes

AM Peak:

I-66 in 10' of cut

Off-Peak:

PM Peak

McCormick Taylor, Inc

APPENDIX C

NOISE MONITORING DATA (2011)

METROSONICS PRINTOUTS

****

Filename.....2555
Test Location.....I-66
Employee Name.....JCL
Employee Number.....
Department.....NOISE

Calibrator Type.....7271
Calibrator Cal. Date...May 2011

****

METROSONICS db-3080 V1.11 SERIAL # 2555
REPORT PRINTED ON 07/14/11 at 07:52:50

User ID: _____

LOGGING STARTED.....07/13/11 at 08:30:00
TOTAL LOGGING TIME...0 DAYS 00:15:00
LOGGING STOPPED.....07/13/11 at 08:45:00
TOTAL INTERVALS.....90
INTERVAL LENGTH.....00:00:10

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....07/13/11 AT 08:06:07
PRE-TEST CALIBRATION RANGE...39.9 TO 139.9 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 2 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 64.6dB
Lav (80)..... 39.9dB
Lav (90)..... 39.9dB
SEL..... 94.1dB

TWA..... 49.6dB
TWA (80)..... 39.9dB
TWA (90)..... 39.9dB

Lmax..... 74.8dB 07/13/11 at 08:33:18
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 2 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
07/13/11					
08:30:00	64.4	66.0	UNDER	65.9	63.9
08:30:10	65.6	66.2	UNDER	66.9	63.9
08:30:20	67.3	70.0	UNDER	69.9	63.9
08:30:30	65.2	66.8	UNDER	65.9	63.9
08:30:40	66.5	68.5	UNDER	68.9	63.9
08:30:50	63.2	65.6	UNDER	64.9	61.9
08:31:00	63.7	65.1	UNDER	64.9	61.9
08:31:10	64.5	66.5	UNDER	66.9	61.9
08:31:20	65.2	66.2	UNDER	66.9	63.9
08:31:30	67.2	68.8	UNDER	68.9	64.9
08:31:40	64.0	65.1	UNDER	64.9	63.9
08:31:50	65.4	66.8	UNDER	66.9	64.9
08:32:00	64.1	65.2	UNDER	64.9	63.9
08:32:10	64.0	65.6	UNDER	65.9	62.9
08:32:20	62.9	64.4	UNDER	64.9	61.9
08:32:30	63.6	64.3	UNDER	64.9	62.9
08:32:40	64.3	65.4	UNDER	65.9	62.9
08:32:50	64.9	66.7	UNDER	65.9	63.9
08:33:00	63.9	64.8	UNDER	64.9	62.9
08:33:10	70.0	74.8	UNDER	74.9	62.9
08:33:20	67.0	71.9	UNDER	70.9	62.9
08:33:30	65.2	66.6	UNDER	66.9	62.9
08:33:40	63.4	64.4	UNDER	64.9	61.9
08:33:50	67.5	69.9	UNDER	69.9	62.9
08:34:00	66.2	67.7	UNDER	67.9	63.9
08:34:10	66.7	68.8	UNDER	68.9	62.9
08:34:20	62.6	65.7	UNDER	64.9	60.9
08:34:30	65.3	67.9	UNDER	67.9	61.9
08:34:40	63.2	64.7	UNDER	64.9	60.9
08:34:50	64.2	65.1	UNDER	65.9	62.9
08:35:00	65.9	69.1	UNDER	68.9	60.9
08:35:10	64.9	68.3	UNDER	67.9	60.9
08:35:20	62.4	64.3	UNDER	64.9	59.9
08:35:30	62.2	64.1	UNDER	63.9	61.9
08:35:40	63.3	65.5	UNDER	64.9	61.9
08:35:50	64.2	65.9	UNDER	65.9	62.9
08:36:00	62.8	65.3	UNDER	65.9	61.9
08:36:10	63.3	64.0	UNDER	63.9	62.9
08:36:20	63.5	66.2	UNDER	64.9	62.9
08:36:30	66.3	69.6	UNDER	69.9	61.9
08:36:40	65.4	66.8	UNDER	66.9	62.9
08:36:50	64.1	66.7	UNDER	65.9	61.9
08:37:00	65.0	67.5	UNDER	67.9	61.9
08:37:10	63.9	65.1	UNDER	65.9	62.9
08:37:20	64.0	65.9	UNDER	65.9	62.9
08:37:30	64.7	66.7	UNDER	66.9	61.9
08:37:40	63.5	64.8	UNDER	64.9	61.9
08:37:50	66.2	68.5	UNDER	68.9	63.9
08:38:00	63.2	64.4	UNDER	64.9	61.9
08:38:10	62.3	66.9	UNDER	65.9	59.9
08:38:20	66.5	68.4	UNDER	68.9	64.9
08:38:30	66.0	67.1	UNDER	66.9	64.9

08:38:40	63.0	64.6	UNDER	64.9	61.9
08:38:50	63.6	64.7	UNDER	64.9	62.9
08:39:00	62.3	63.3	UNDER	62.9	61.9
08:39:10	64.3	68.1	UNDER	67.9	61.9
08:39:20	62.4	63.0	UNDER	62.9	61.9
08:39:30	63.9	65.1	UNDER	64.9	62.9
08:39:40	64.9	67.3	UNDER	66.9	62.9
08:39:50	66.5	68.5	UNDER	68.9	64.9
08:40:00	63.1	65.6	UNDER	64.9	61.9
08:40:10	65.9	67.6	UNDER	67.9	64.9
08:40:20	64.1	67.3	UNDER	66.9	62.9
08:40:30	65.0	67.5	UNDER	67.9	61.9
08:40:40	63.9	65.5	UNDER	64.9	61.9
08:40:50	65.1	66.4	UNDER	66.9	61.9
08:41:00	63.7	67.2	UNDER	65.9	61.9
08:41:10	63.2	63.6	UNDER	63.9	62.9
08:41:20	64.2	66.2	UNDER	66.9	62.9
08:41:30	64.8	68.0	UNDER	67.9	60.9
08:41:40	62.0	65.2	UNDER	63.9	59.9
08:41:50	63.2	64.7	UNDER	64.9	60.9
08:42:00	65.5	67.1	UNDER	66.9	62.9
08:42:10	65.2	67.9	UNDER	67.9	61.9
08:42:20	64.3	65.6	UNDER	65.9	62.9
08:42:30	65.4	67.1	UNDER	66.9	63.9
08:42:40	62.0	63.8	UNDER	63.9	60.9
08:42:50	65.8	67.5	UNDER	67.9	62.9
08:43:00	63.2	65.1	UNDER	64.9	62.9
08:43:10	64.4	65.4	UNDER	65.9	63.9
08:43:20	64.0	64.9	UNDER	64.9	63.9
08:43:30	62.0	64.4	UNDER	63.9	60.9
08:43:40	62.2	63.6	UNDER	63.9	61.9
08:43:50	62.2	64.3	UNDER	64.9	60.9
08:44:00	62.5	63.6	UNDER	63.9	61.9
08:44:10	61.8	63.2	UNDER	62.9	60.9
08:44:20	63.1	63.9	UNDER	63.9	62.9
08:44:30	63.9	65.7	UNDER	65.9	61.9
08:44:40	65.2	66.4	UNDER	66.9	63.9
08:44:50	64.3	65.1	UNDER	64.9	63.9

****

Filename.....3904
Test Location.....I-66
Employee Name.....JCL
Employee Number.....
Department.....NOISE

Calibrator Type.....7271
Calibrator Cal. Date...May 2011

****

METROSONICS db-3080 V1.12 SERIAL # 3904
REPORT PRINTED ON 07/14/11 at 07:56:48

User ID: _____

LOGGING STARTED.....07/13/11 at 08:30:00
TOTAL LOGGING TIME...0 DAYS 00:15:00
LOGGING STOPPED.....07/13/11 at 08:45:00
TOTAL INTERVALS.....90
INTERVAL LENGTH.....00:00:10

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....07/13/11 AT 08:07:36
PRE-TEST CALIBRATION RANGE...39.3 TO 139.3 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 2 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 63.2dB
Lav (80)..... 39.3dB
Lav (90)..... 39.3dB
SEL..... 92.6dB

TWA..... 48.2dB
TWA (80)..... 39.3dB
TWA (90)..... 39.3dB

Lmax..... 68.8dB 07/13/11 at 08:30:56
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 2 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
07/13/11					
08:30:00	65.0	67.3	UNDER	67.3	63.3
08:30:10	64.5	65.7	UNDER	65.3	63.3
08:30:20	65.2	67.1	UNDER	67.3	64.3
08:30:30	66.1	67.9	UNDER	67.3	63.3
08:30:40	64.7	67.0	UNDER	65.3	63.3
08:30:50	67.2	68.8	UNDER	68.3	64.3
08:31:00	64.4	66.2	UNDER	65.3	62.3
08:31:10	65.4	67.8	UNDER	67.3	62.3
08:31:20	64.5	66.2	UNDER	65.3	63.3
08:31:30	64.0	65.1	UNDER	64.3	62.3
08:31:40	65.5	66.4	UNDER	66.3	64.3
08:31:50	63.9	66.2	UNDER	65.3	61.3
08:32:00	63.7	65.0	UNDER	65.3	61.3
08:32:10	64.1	65.0	UNDER	64.3	63.3
08:32:20	64.1	64.8	UNDER	64.3	63.3
08:32:30	63.8	64.5	UNDER	64.3	62.3
08:32:40	65.3	67.4	UNDER	67.3	62.3
08:32:50	64.2	66.8	UNDER	65.3	63.3
08:33:00	65.6	67.5	UNDER	67.3	62.3
08:33:10	63.5	67.0	UNDER	65.3	62.3
08:33:20	65.3	67.8	UNDER	67.3	61.3
08:33:30	64.0	67.3	UNDER	65.3	61.3
08:33:40	63.8	65.8	UNDER	65.3	61.3
08:33:50	63.6	66.2	UNDER	66.3	60.3
08:34:00	63.7	65.6	UNDER	65.3	61.3
08:34:10	62.4	65.0	UNDER	64.3	61.3
08:34:20	62.8	63.4	UNDER	63.3	61.3
08:34:30	62.7	65.4	UNDER	64.3	60.3
08:34:40	65.1	66.5	UNDER	66.3	62.3
08:34:50	64.1	65.8	UNDER	65.3	61.3
08:35:00	65.1	67.0	UNDER	66.3	61.3
08:35:10	64.9	67.4	UNDER	67.3	61.3
08:35:20	64.8	67.0	UNDER	66.3	61.3
08:35:30	60.3	61.8	UNDER	61.3	58.3
08:35:40	62.2	63.8	UNDER	63.3	60.3
08:35:50	63.0	64.5	UNDER	64.3	59.3
08:36:00	62.5	64.1	UNDER	63.3	59.3
08:36:10	64.0	65.3	UNDER	64.3	62.3
08:36:20	62.3	65.3	UNDER	64.3	59.3
08:36:30	63.7	65.8	UNDER	65.3	60.3
08:36:40	63.3	66.1	UNDER	65.3	57.3
08:36:50	60.4	62.2	UNDER	61.3	56.3
08:37:00	62.9	64.9	UNDER	64.3	58.3
08:37:10	62.7	65.0	UNDER	64.3	58.3
08:37:20	58.3	61.8	UNDER	60.3	55.3
08:37:30	59.8	62.6	UNDER	61.3	57.3
08:37:40	59.3	60.7	UNDER	60.3	56.3
08:37:50	58.5	60.2	UNDER	59.3	56.3
08:38:00	59.9	62.2	UNDER	62.3	55.3
08:38:10	57.6	59.4	UNDER	58.3	55.3
08:38:20	58.6	60.6	UNDER	59.3	57.3
08:38:30	58.9	60.4	UNDER	60.3	57.3

08:38:40	59.4	61.0	UNDER	60.3	58.3
08:38:50	60.1	62.6	UNDER	61.3	57.3
08:39:00	60.7	63.8	UNDER	62.3	57.3
08:39:10	61.7	64.3	UNDER	64.3	57.3
08:39:20	59.6	62.6	UNDER	61.3	58.3
08:39:30	61.2	62.5	UNDER	62.3	59.3
08:39:40	59.9	63.0	UNDER	62.3	58.3
08:39:50	60.3	61.7	UNDER	61.3	58.3
08:40:00	59.6	61.7	UNDER	61.3	57.3
08:40:10	62.6	65.2	UNDER	65.3	57.3
08:40:20	63.6	66.4	UNDER	66.3	59.3
08:40:30	62.6	65.0	UNDER	64.3	59.3
08:40:40	62.9	66.2	UNDER	65.3	59.3
08:40:50	64.3	67.0	UNDER	65.3	60.3
08:41:00	63.8	67.1	UNDER	67.3	61.3
08:41:10	64.8	66.8	UNDER	66.3	61.3
08:41:20	63.2	66.9	UNDER	66.3	60.3
08:41:30	63.3	65.8	UNDER	65.3	59.3
08:41:40	64.1	67.0	UNDER	66.3	59.3
08:41:50	61.4	63.0	UNDER	62.3	59.3
08:42:00	61.8	65.5	UNDER	65.3	57.3
08:42:10	62.6	66.2	UNDER	65.3	57.3
08:42:20	62.6	66.2	UNDER	64.3	58.3
08:42:30	62.9	65.7	UNDER	65.3	57.3
08:42:40	63.7	65.9	UNDER	65.3	61.3
08:42:50	63.9	64.6	UNDER	64.3	61.3
08:43:00	62.3	65.0	UNDER	64.3	58.3
08:43:10	62.6	64.6	UNDER	64.3	59.3
08:43:20	61.9	64.3	UNDER	63.3	59.3
08:43:30	61.8	63.0	UNDER	62.3	60.3
08:43:40	62.3	65.0	UNDER	64.3	57.3
08:43:50	61.8	65.0	UNDER	64.3	59.3
08:44:00	62.6	65.1	UNDER	64.3	59.3
08:44:10	63.1	64.1	UNDER	63.3	61.3
08:44:20	63.4	64.5	UNDER	64.3	62.3
08:44:30	63.4	64.5	UNDER	64.3	62.3
08:44:40	62.7	64.1	UNDER	63.3	61.3
08:44:50	62.0	63.7	UNDER	63.3	59.3

****

Filename.....3903
Test Location.....I-66
Employee Name.....JCL
Employee Number.....
Department.....NOISE

Calibrator Type.....7271
Calibrator Cal. Date...May 2011

****

METROSONICS db-3080 V1.12 SERIAL # 3903
REPORT PRINTED ON 07/14/11 at 07:54:28

User ID: _____

LOGGING STARTED.....07/13/11 at 08:30:00
TOTAL LOGGING TIME...0 DAYS 00:15:00
LOGGING STOPPED.....07/13/11 at 08:45:00
TOTAL INTERVALS.....90
INTERVAL LENGTH.....00:00:10

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....07/13/11 AT 08:06:49
PRE-TEST CALIBRATION RANGE...39.5 TO 139.5 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 2 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 60.8dB
Lav (80)..... 39.5dB
Lav (90)..... 39.5dB
SEL..... 90.2dB

TWA..... 45.8dB
TWA (80)..... 39.5dB
TWA (90)..... 39.5dB

Lmax..... 66.8dB 07/13/11 at 08:40:54
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 2 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
07/13/11					
08:30:00	61.6	64.8	UNDER	64.5	59.5
08:30:10	62.2	64.8	UNDER	64.5	60.5
08:30:20	61.4	63.2	UNDER	62.5	60.5
08:30:30	61.1	63.3	UNDER	63.5	58.5
08:30:40	59.7	61.5	UNDER	61.5	57.5
08:30:50	60.5	62.6	UNDER	62.5	58.5
08:31:00	59.1	61.2	UNDER	60.5	57.5
08:31:10	61.8	63.5	UNDER	62.5	60.5
08:31:20	62.2	63.6	UNDER	63.5	60.5
08:31:30	61.4	62.6	UNDER	62.5	60.5
08:31:40	62.4	63.6	UNDER	63.5	60.5
08:31:50	61.5	62.8	UNDER	62.5	59.5
08:32:00	60.5	64.0	UNDER	63.5	59.5
08:32:10	61.6	64.0	UNDER	63.5	58.5
08:32:20	58.2	58.8	UNDER	58.5	57.5
08:32:30	60.4	61.7	UNDER	61.5	58.5
08:32:40	60.2	61.6	UNDER	61.5	58.5
08:32:50	60.9	62.1	UNDER	62.5	59.5
08:33:00	62.0	63.1	UNDER	62.5	61.5
08:33:10	63.0	64.8	UNDER	64.5	59.5
08:33:20	60.5	62.8	UNDER	62.5	57.5
08:33:30	61.2	62.4	UNDER	62.5	60.5
08:33:40	61.2	62.8	UNDER	62.5	58.5
08:33:50	57.8	58.7	UNDER	58.5	57.5
08:34:00	62.6	65.2	UNDER	65.5	57.5
08:34:10	59.9	63.9	UNDER	62.5	57.5
08:34:20	57.8	58.5	UNDER	58.5	57.5
08:34:30	58.7	59.5	UNDER	59.5	57.5
08:34:40	58.4	59.2	UNDER	58.5	58.5
08:34:50	61.4	62.4	UNDER	62.5	59.5
08:35:00	59.9	61.3	UNDER	60.5	59.5
08:35:10	58.6	60.1	UNDER	59.5	58.5
08:35:20	59.5	62.0	UNDER	60.5	58.5
08:35:30	61.4	63.5	UNDER	63.5	57.5
08:35:40	57.8	60.0	UNDER	58.5	57.5
08:35:50	59.7	60.4	UNDER	60.5	59.5
08:36:00	59.8	60.9	UNDER	60.5	59.5
08:36:10	59.9	61.4	UNDER	61.5	57.5
08:36:20	58.6	62.0	UNDER	60.5	57.5
08:36:30	62.5	65.2	UNDER	65.5	58.5
08:36:40	62.8	65.7	UNDER	65.5	58.5
08:36:50	63.8	65.2	UNDER	65.5	60.5
08:37:00	63.4	66.0	UNDER	65.5	60.5
08:37:10	62.6	64.8	UNDER	64.5	60.5
08:37:20	62.0	64.9	UNDER	64.5	59.5
08:37:30	59.9	63.3	UNDER	61.5	57.5
08:37:40	60.2	62.0	UNDER	61.5	58.5
08:37:50	58.6	60.4	UNDER	59.5	57.5
08:38:00	60.3	61.2	UNDER	61.5	58.5
08:38:10	62.2	63.2	UNDER	63.5	60.5
08:38:20	60.4	61.2	UNDER	61.5	59.5
08:38:30	59.9	60.8	UNDER	60.5	59.5

08:38:40	62.0	62.8	UNDER	62.5	59.5
08:38:50	61.7	62.8	UNDER	62.5	60.5
08:39:00	59.9	60.4	UNDER	60.5	59.5
08:39:10	60.1	60.8	UNDER	60.5	59.5
08:39:20	60.4	61.3	UNDER	61.5	59.5
08:39:30	59.0	60.2	UNDER	59.5	58.5
08:39:40	61.2	61.8	UNDER	61.5	60.5
08:39:50	61.2	61.6	UNDER	61.5	60.5
08:40:00	60.5	61.6	UNDER	61.5	59.5
08:40:10	61.0	61.6	UNDER	61.5	60.5
08:40:20	60.6	61.2	UNDER	61.5	59.5
08:40:30	63.1	65.8	UNDER	65.5	59.5
08:40:40	60.1	61.6	UNDER	61.5	59.5
08:40:50	63.9	66.8	UNDER	66.5	59.5
08:41:00	60.5	61.6	UNDER	61.5	59.5
08:41:10	60.0	61.6	UNDER	61.5	58.5
08:41:20	60.5	63.2	UNDER	62.5	58.5
08:41:30	60.9	62.4	UNDER	62.5	58.5
08:41:40	58.9	60.4	UNDER	59.5	57.5
08:41:50	64.7	66.5	UNDER	66.5	60.5
08:42:00	58.7	61.1	UNDER	59.5	57.5
08:42:10	58.9	60.3	UNDER	59.5	58.5
08:42:20	59.6	61.1	UNDER	60.5	58.5
08:42:30	58.9	61.6	UNDER	61.5	57.5
08:42:40	60.9	62.0	UNDER	61.5	58.5
08:42:50	61.4	62.5	UNDER	62.5	59.5
08:43:00	59.3	62.0	UNDER	61.5	56.5
08:43:10	59.7	61.6	UNDER	61.5	56.5
08:43:20	57.4	58.0	UNDER	58.5	56.5
08:43:30	59.5	60.8	UNDER	60.5	56.5
08:43:40	59.5	60.4	UNDER	60.5	58.5
08:43:50	60.6	62.2	UNDER	61.5	59.5
08:44:00	60.8	62.8	UNDER	62.5	57.5
08:44:10	58.4	59.6	UNDER	59.5	57.5
08:44:20	60.6	61.6	UNDER	61.5	59.5
08:44:30	59.1	60.1	UNDER	60.5	58.5
08:44:40	59.3	60.0	UNDER	60.5	58.5
08:44:50	58.8	60.0	UNDER	60.5	58.5

****

Filename.....3908
Test Location.....I-66
Employee Name.....JCL
Employee Number.....
Department.....NOISE

Calibrator Type.....7271
Calibrator Cal. Date...May 2011

****

METROSONICS db-3080 V1.12 SERIAL # 3908
REPORT PRINTED ON 07/14/11 at 07:57:32

User ID: _____

LOGGING STARTED.....07/13/11 at 08:30:00
TOTAL LOGGING TIME...0 DAYS 00:15:00
LOGGING STOPPED.....07/13/11 at 08:45:00
TOTAL INTERVALS.....90
INTERVAL LENGTH.....00:00:10

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....07/13/11 AT 08:06:15
PRE-TEST CALIBRATION RANGE...38.9 TO 138.9 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 3 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 61.1dB
Lav (80)..... 38.9dB
Lav (90)..... 38.9dB
SEL..... 90.5dB

TWA..... 46.1dB
TWA (80)..... 38.9dB
TWA (90)..... 38.9dB

Lmax..... 69.8dB 07/13/11 at 08:30:31
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 3 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
07/13/11					
08:30:00	62.7	63.5	UNDER	63.9	61.9
08:30:10	60.6	61.7	UNDER	61.9	59.9
08:30:20	63.0	68.0	UNDER	65.9	60.9
08:30:30	65.6	69.8	UNDER	69.9	59.9
08:30:40	63.3	65.2	UNDER	65.9	60.9
08:30:50	60.8	62.2	UNDER	61.9	59.9
08:31:00	59.6	61.3	UNDER	60.9	58.9
08:31:10	61.0	61.4	UNDER	61.9	60.9
08:31:20	61.5	62.6	UNDER	62.9	61.9
08:31:30	62.2	63.3	UNDER	63.9	61.9
08:31:40	61.4	63.0	UNDER	62.9	61.9
08:31:50	61.3	62.1	UNDER	61.9	60.9
08:32:00	60.3	61.4	UNDER	61.9	59.9
08:32:10	62.6	65.0	UNDER	64.9	59.9
08:32:20	59.7	63.3	UNDER	62.9	57.9
08:32:30	58.2	58.7	UNDER	58.9	57.9
08:32:40	62.2	64.3	UNDER	63.9	58.9
08:32:50	61.4	63.5	UNDER	63.9	60.9
08:33:00	61.6	65.4	UNDER	63.9	59.9
08:33:10	63.0	66.0	UNDER	65.9	59.9
08:33:20	59.9	60.9	UNDER	60.9	59.9
08:33:30	59.3	59.5	UNDER	59.9	59.9
08:33:40	60.0	63.0	UNDER	60.9	59.9
08:33:50	63.7	65.0	UNDER	64.9	63.9
08:34:00	61.7	63.8	UNDER	63.9	59.9
08:34:10	58.4	59.0	UNDER	58.9	57.9
08:34:20	58.1	59.6	UNDER	59.9	56.9
08:34:30	60.8	62.9	UNDER	62.9	58.9
08:34:40	62.0	66.9	UNDER	65.9	58.9
08:34:50	61.1	61.6	UNDER	61.9	60.9
08:35:00	60.4	61.1	UNDER	61.9	59.9
08:35:10	65.0	67.1	UNDER	67.9	61.9
08:35:20	60.2	63.8	UNDER	62.9	58.9
08:35:30	59.4	60.3	UNDER	60.9	58.9
08:35:40	60.0	60.8	UNDER	60.9	59.9
08:35:50	57.9	59.4	UNDER	59.9	56.9
08:36:00	58.9	59.8	UNDER	59.9	58.9
08:36:10	59.4	60.2	UNDER	59.9	58.9
08:36:20	59.9	61.0	UNDER	60.9	58.9
08:36:30	62.9	65.0	UNDER	64.9	59.9
08:36:40	62.2	63.8	UNDER	63.9	60.9
08:36:50	60.9	62.3	UNDER	62.9	59.9
08:37:00	59.4	60.3	UNDER	60.9	58.9
08:37:10	60.8	61.4	UNDER	61.9	60.9
08:37:20	61.4	62.6	UNDER	62.9	60.9
08:37:30	63.3	64.1	UNDER	63.9	61.9
08:37:40	60.1	61.8	UNDER	60.9	59.9
08:37:50	61.6	63.3	UNDER	63.9	59.9
08:38:00	59.1	59.8	UNDER	59.9	58.9
08:38:10	59.8	62.8	UNDER	61.9	58.9
08:38:20	63.8	64.5	UNDER	64.9	62.9
08:38:30	64.9	66.6	UNDER	66.9	63.9

08:38:40	62.4	63.4	UNDER	63.9	59.9
08:38:50	60.1	61.5	UNDER	61.9	58.9
08:39:00	61.8	62.7	UNDER	62.9	60.9
08:39:10	59.4	61.4	UNDER	60.9	58.9
08:39:20	60.2	61.8	UNDER	61.9	57.9
08:39:30	60.7	61.8	UNDER	61.9	59.9
08:39:40	59.5	60.2	UNDER	60.9	58.9
08:39:50	59.3	60.1	UNDER	59.9	58.9
08:40:00	61.0	62.4	UNDER	62.9	58.9
08:40:10	59.9	61.0	UNDER	60.9	59.9
08:40:20	60.4	61.0	UNDER	61.9	59.9
08:40:30	58.3	59.2	UNDER	59.9	57.9
08:40:40	60.1	61.4	UNDER	61.9	58.9
08:40:50	59.7	60.3	UNDER	60.9	59.9
08:41:00	59.3	59.9	UNDER	59.9	58.9
08:41:10	61.1	62.1	UNDER	61.9	59.9
08:41:20	60.4	61.4	UNDER	61.9	58.9
08:41:30	62.1	64.8	UNDER	64.9	59.9
08:41:40	60.7	63.5	UNDER	62.9	59.9
08:41:50	59.9	60.3	UNDER	60.9	59.9
08:42:00	60.3	60.7	UNDER	60.9	59.9
08:42:10	60.1	61.4	UNDER	61.9	57.9
08:42:20	59.4	61.4	UNDER	60.9	57.9
08:42:30	58.9	59.8	UNDER	59.9	57.9
08:42:40	57.6	58.4	UNDER	58.9	56.9
08:42:50	57.5	59.0	UNDER	58.9	56.9
08:43:00	59.4	60.8	UNDER	60.9	58.9
08:43:10	61.8	64.2	UNDER	64.9	59.9
08:43:20	60.7	63.7	UNDER	62.9	59.9
08:43:30	60.6	61.5	UNDER	61.9	60.9
08:43:40	62.5	63.4	UNDER	63.9	61.9
08:43:50	61.6	62.6	UNDER	62.9	60.9
08:44:00	62.6	64.1	UNDER	63.9	60.9
08:44:10	59.8	62.0	UNDER	61.9	58.9
08:44:20	57.3	59.0	UNDER	58.9	55.9
08:44:30	60.2	60.6	UNDER	60.9	59.9
08:44:40	60.3	61.0	UNDER	61.9	59.9
08:44:50	61.3	63.0	UNDER	62.9	59.9

****

Filename.....3905
Test Location.....I-66
Employee Name.....JCL
Employee Number.....
Department.....NOISE

Calibrator Type.....7271
Calibrator Cal. Date...May 2011

****

METROSONICS db-3080 V1.20 SERIAL # 3905
REPORT PRINTED ON 07/14/11 at 07:57:06

User ID: _____

LOGGING STARTED.....07/13/11 at 08:30:00
TOTAL LOGGING TIME...0 DAYS 00:15:00
LOGGING STOPPED.....07/13/11 at 08:45:00
TOTAL INTERVALS.....90
INTERVAL LENGTH.....00:00:10

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....07/13/11 AT 08:07:50
PRE-TEST CALIBRATION RANGE...42.2 TO 142.2 dB
POST-TEST CALIBRATION TIME...07/13/11 AT 09:53:09
POST-TEST CALIBRATION RANGE...41.8 TO 141.8
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 63.5dB
Lav (80)..... 42.2dB
Lav (90)..... 42.2dB
SEL..... 92.9dB

TWA..... 48.5dB
TWA (80)..... 42.2dB
TWA (90)..... 42.2dB

Lmax..... 67.1dB 07/13/11 at 08:32:58
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
07/13/11					
08:30:00	57.9	59.0	UNDER	58.2	56.2
08:30:10	59.0	61.0	UNDER	60.2	55.2
08:30:20	57.2	59.6	UNDER	57.2	55.2
08:30:30	60.2	62.3	UNDER	62.2	55.2
08:30:40	57.5	60.7	UNDER	59.2	55.2
08:30:50	65.6	67.0	UNDER	66.2	60.2
08:31:00	65.5	66.3	UNDER	66.2	64.2
08:31:10	65.2	66.3	UNDER	66.2	62.2
08:31:20	61.8	63.1	UNDER	62.2	60.2
08:31:30	61.5	63.2	UNDER	63.2	59.2
08:31:40	62.7	64.0	UNDER	63.2	61.2
08:31:50	62.2	63.1	UNDER	62.2	61.2
08:32:00	64.4	65.6	UNDER	65.2	62.2
08:32:10	63.9	64.7	UNDER	64.2	63.2
08:32:20	64.3	64.8	UNDER	64.2	63.2
08:32:30	65.2	67.1	UNDER	66.2	63.2
08:32:40	63.7	65.9	UNDER	64.2	63.2
08:32:50	65.2	67.1	UNDER	67.2	63.2
08:33:00	64.6	66.2	UNDER	65.2	63.2
08:33:10	63.2	63.9	UNDER	63.2	62.2
08:33:20	63.8	64.3	UNDER	64.2	63.2
08:33:30	64.8	65.9	UNDER	65.2	63.2
08:33:40	65.1	66.4	UNDER	66.2	63.2
08:33:50	63.8	64.7	UNDER	64.2	62.2
08:34:00	63.8	65.1	UNDER	65.2	62.2
08:34:10	62.7	63.5	UNDER	63.2	62.2
08:34:20	64.2	64.9	UNDER	64.2	63.2
08:34:30	64.0	64.7	UNDER	64.2	63.2
08:34:40	64.2	64.8	UNDER	64.2	63.2
08:34:50	63.4	64.7	UNDER	64.2	62.2
08:35:00	63.2	64.3	UNDER	63.2	62.2
08:35:10	63.7	64.4	UNDER	64.2	61.2
08:35:20	62.8	63.5	UNDER	63.2	61.2
08:35:30	62.9	63.5	UNDER	63.2	62.2
08:35:40	63.4	64.3	UNDER	64.2	62.2
08:35:50	63.0	64.0	UNDER	63.2	61.2
08:36:00	63.2	63.6	UNDER	63.2	62.2
08:36:10	64.5	65.1	UNDER	65.2	63.2
08:36:20	63.8	64.3	UNDER	64.2	63.2
08:36:30	63.8	64.3	UNDER	64.2	63.2
08:36:40	62.9	63.3	UNDER	63.2	62.2
08:36:50	62.9	63.7	UNDER	63.2	62.2
08:37:00	62.9	63.5	UNDER	63.2	61.2
08:37:10	62.9	63.2	UNDER	63.2	62.2
08:37:20	63.2	63.9	UNDER	63.2	62.2
08:37:30	63.1	64.4	UNDER	64.2	62.2
08:37:40	63.3	64.7	UNDER	64.2	62.2
08:37:50	63.9	64.3	UNDER	64.2	63.2
08:38:00	64.1	65.4	UNDER	65.2	62.2
08:38:10	64.4	65.4	UNDER	65.2	63.2
08:38:20	65.3	66.3	UNDER	65.2	64.2

08:38:30	64.3	65.7	UNDER	65.2	63.2
08:38:40	63.3	63.9	UNDER	63.2	62.2
08:38:50	63.4	63.9	UNDER	63.2	62.2
08:39:00	63.5	64.3	UNDER	64.2	63.2
08:39:10	63.1	63.5	UNDER	63.2	62.2
08:39:20	62.6	63.1	UNDER	63.2	61.2
08:39:30	62.4	63.1	UNDER	62.2	61.2
08:39:40	61.6	62.2	UNDER	62.2	61.2
08:39:50	62.2	63.1	UNDER	63.2	61.2
08:40:00	62.5	63.1	UNDER	62.2	61.2
08:40:10	63.2	63.7	UNDER	63.2	62.2
08:40:20	63.0	63.5	UNDER	63.2	62.2
08:40:30	62.0	62.7	UNDER	62.2	61.2
08:40:40	62.9	63.7	UNDER	63.2	62.2
08:40:50	62.9	63.9	UNDER	63.2	62.2
08:41:00	63.9	64.3	UNDER	64.2	63.2
08:41:10	64.6	65.5	UNDER	65.2	63.2
08:41:20	63.2	64.2	UNDER	64.2	62.2
08:41:30	63.9	64.4	UNDER	64.2	62.2
08:41:40	63.2	63.5	UNDER	63.2	62.2
08:41:50	62.4	63.1	UNDER	63.2	61.2
08:42:00	63.2	64.3	UNDER	64.2	62.2
08:42:10	62.8	63.5	UNDER	63.2	62.2
08:42:20	63.5	64.2	UNDER	64.2	62.2
08:42:30	63.2	63.9	UNDER	63.2	62.2
08:42:40	62.7	63.3	UNDER	63.2	61.2
08:42:50	62.5	63.2	UNDER	63.2	61.2
08:43:00	62.6	63.7	UNDER	63.2	61.2
08:43:10	63.3	63.9	UNDER	63.2	62.2
08:43:20	63.6	64.7	UNDER	64.2	62.2
08:43:30	63.1	64.2	UNDER	63.2	62.2
08:43:40	64.1	65.0	UNDER	64.2	62.2
08:43:50	64.4	66.8	UNDER	66.2	62.2
08:44:00	65.9	66.7	UNDER	66.2	65.2
08:44:10	65.4	66.0	UNDER	65.2	64.2
08:44:20	64.5	64.9	UNDER	64.2	64.2
08:44:30	64.0	65.5	UNDER	65.2	62.2
08:44:40	63.9	65.9	UNDER	65.2	62.2
08:44:50	63.4	65.1	UNDER	64.2	62.2

****

Filename.....2559
Test Location.....I-66
Employee Name.....JCL
Employee Number.....
Department.....NOISE

Calibrator Type.....7271
Calibrator Cal. Date...May 2011

****

METROSONICS db-3080 V1.11 SERIAL # 2559
REPORT PRINTED ON 07/14/11 at 07:54:07

User ID: _____

LOGGING STARTED.....07/13/11 at 08:30:00
TOTAL LOGGING TIME...0 DAYS 00:15:00
LOGGING STOPPED.....07/13/11 at 08:45:00
TOTAL INTERVALS.....90
INTERVAL LENGTH.....00:00:10

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....07/13/11 AT 08:08:00
PRE-TEST CALIBRATION RANGE...38.4 TO 138.4 dB
POST-TEST CALIBRATION TIME...07/13/11 AT 09:53:29
POST-TEST CALIBRATION RANGE...38.5 TO 138.5
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 1 OF 1 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 61.5dB
Lav (80)..... 38.4dB
Lav (90)..... 38.4dB
SEL..... 90.9dB

TWA..... 46.5dB
TWA (80)..... 38.4dB
TWA (90)..... 38.4dB

Lmax..... 69.6dB 07/13/11 at 08:36:06
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 1 OF 1 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
07/13/11					
08:30:00	61.4	65.0	UNDER	64.4	56.4
08:30:10	62.4	64.9	UNDER	64.4	60.4
08:30:20	60.3	62.1	UNDER	61.4	57.4
08:30:30	60.6	62.5	UNDER	62.4	57.4
08:30:40	61.1	62.9	UNDER	62.4	59.4
08:30:50	62.5	64.5	UNDER	64.4	60.4
08:31:00	61.5	63.7	UNDER	63.4	58.4
08:31:10	62.7	64.5	UNDER	64.4	60.4
08:31:20	62.4	63.7	UNDER	63.4	61.4
08:31:30	62.1	63.7	UNDER	63.4	61.4
08:31:40	62.7	63.1	UNDER	63.4	62.4
08:31:50	60.6	62.1	UNDER	62.4	58.4
08:32:00	62.7	64.5	UNDER	64.4	60.4
08:32:10	58.1	60.0	UNDER	58.4	56.4
08:32:20	63.8	66.4	UNDER	66.4	58.4
08:32:30	58.4	59.3	UNDER	59.4	57.4
08:32:40	61.6	65.7	UNDER	65.4	57.4
08:32:50	63.2	65.8	UNDER	65.4	60.4
08:33:00	59.2	61.2	UNDER	60.4	57.4
08:33:10	65.0	68.2	UNDER	68.4	61.4
08:33:20	61.5	67.3	UNDER	65.4	58.4
08:33:30	64.3	68.0	UNDER	67.4	57.4
08:33:40	60.4	62.0	UNDER	61.4	58.4
08:33:50	58.2	59.8	UNDER	59.4	57.4
08:34:00	65.4	68.9	UNDER	68.4	59.4
08:34:10	59.8	60.9	UNDER	60.4	57.4
08:34:20	60.6	63.4	UNDER	63.4	57.4
08:34:30	56.4	58.1	UNDER	57.4	55.4
08:34:40	61.9	67.7	UNDER	66.4	58.4
08:34:50	64.3	68.5	UNDER	68.4	58.4
08:35:00	61.2	63.0	UNDER	62.4	58.4
08:35:10	59.3	61.5	UNDER	61.4	56.4
08:35:20	66.2	68.9	UNDER	68.4	61.4
08:35:30	59.1	62.5	UNDER	62.4	56.4
08:35:40	61.7	64.9	UNDER	64.4	56.4
08:35:50	60.9	64.8	UNDER	64.4	57.4
08:36:00	66.1	69.6	UNDER	69.4	58.4
08:36:10	59.9	64.5	UNDER	62.4	57.4
08:36:20	63.7	66.1	UNDER	66.4	58.4
08:36:30	59.7	64.1	UNDER	62.4	57.4
08:36:40	62.7	65.2	UNDER	64.4	59.4
08:36:50	65.3	68.4	UNDER	68.4	59.4
08:37:00	61.1	64.1	UNDER	63.4	57.4
08:37:10	58.1	60.5	UNDER	59.4	56.4
08:37:20	63.9	66.9	UNDER	66.4	58.4
08:37:30	57.3	59.1	UNDER	58.4	56.4
08:37:40	61.4	62.8	UNDER	62.4	59.4
08:37:50	60.7	63.7	UNDER	63.4	56.4
08:38:00	60.4	61.7	UNDER	61.4	58.4
08:38:10	62.0	64.1	UNDER	64.4	59.4
08:38:20	57.0	59.4	UNDER	58.4	56.4

08:38:30	62.9	64.7	UNDER	64.4	58.4
08:38:40	62.3	63.4	UNDER	63.4	60.4
08:38:50	62.3	64.7	UNDER	64.4	60.4
08:39:00	58.3	60.9	UNDER	60.4	56.4
08:39:10	62.4	64.5	UNDER	64.4	57.4
08:39:20	58.8	61.3	UNDER	59.4	58.4
08:39:30	61.9	64.8	UNDER	64.4	58.4
08:39:40	62.4	64.8	UNDER	64.4	58.4
08:39:50	60.0	63.7	UNDER	62.4	56.4
08:40:00	62.8	64.9	UNDER	64.4	61.4
08:40:10	60.8	65.0	UNDER	64.4	58.4
08:40:20	57.6	60.5	UNDER	59.4	55.4
08:40:30	58.9	60.6	UNDER	60.4	57.4
08:40:40	58.1	59.7	UNDER	59.4	56.4
08:40:50	57.7	58.8	UNDER	58.4	56.4
08:41:00	58.2	60.1	UNDER	60.4	55.4
08:41:10	60.3	62.5	UNDER	62.4	58.4
08:41:20	61.2	63.2	UNDER	62.4	58.4
08:41:30	58.8	62.5	UNDER	61.4	56.4
08:41:40	62.2	64.0	UNDER	63.4	57.4
08:41:50	61.7	64.0	UNDER	62.4	60.4
08:42:00	60.9	64.6	UNDER	64.4	56.4
08:42:10	60.0	60.5	UNDER	60.4	58.4
08:42:20	58.8	61.6	UNDER	60.4	56.4
08:42:30	60.2	63.0	UNDER	62.4	56.4
08:42:40	61.0	63.7	UNDER	63.4	57.4
08:42:50	58.3	59.8	UNDER	59.4	56.4
08:43:00	58.9	62.4	UNDER	60.4	57.4
08:43:10	60.7	63.3	UNDER	63.4	57.4
08:43:20	59.3	60.4	UNDER	60.4	58.4
08:43:30	59.7	60.4	UNDER	60.4	58.4
08:43:40	59.2	59.7	UNDER	59.4	58.4
08:43:50	60.1	61.9	UNDER	61.4	58.4
08:44:00	58.5	59.7	UNDER	59.4	58.4
08:44:10	61.7	63.7	UNDER	63.4	58.4
08:44:20	63.4	64.5	UNDER	64.4	62.4
08:44:30	61.6	64.2	UNDER	63.4	59.4
08:44:40	62.3	63.7	UNDER	63.4	61.4
08:44:50	60.2	61.0	UNDER	60.4	59.4

****

Filename.....3908
Test Location.....I-66
Employee Name.....JCL
Employee Number.....
Department.....NOISE

Calibrator Type.....7271
Calibrator Cal. Date...May 2011

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METROSONICS db-3080 V1.12 SERIAL # 3908
REPORT PRINTED ON 07/14/11 at 07:57:45

User ID: _____

LOGGING STARTED.....07/13/11 at 09:25:00
TOTAL LOGGING TIME...0 DAYS 00:15:00
LOGGING STOPPED.....07/13/11 at 09:40:00
TOTAL INTERVALS.....90
INTERVAL LENGTH.....00:00:10

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....07/13/11 AT 08:06:15
PRE-TEST CALIBRATION RANGE...38.9 TO 138.9 dB
POST-TEST CALIBRATION NOT DONE
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 2 OF 3 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 64.1dB
Lav (80)..... 38.9dB
Lav (90)..... 38.9dB
SEL..... 93.5dB

TWA..... 49.1dB
TWA (80)..... 38.9dB
TWA (90)..... 38.9dB

Lmax..... 71.0dB 07/13/11 at 09:32:11
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 2 OF 3 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
07/13/11					
09:25:00	67.4	70.0	UNDER	68.9	65.9
09:25:10	63.4	65.3	UNDER	64.9	61.9
09:25:20	64.2	65.8	UNDER	65.9	61.9
09:25:30	66.0	68.6	UNDER	68.9	62.9
09:25:40	63.8	65.0	UNDER	64.9	61.9
09:25:50	64.4	66.1	UNDER	65.9	60.9
09:26:00	64.7	67.4	UNDER	67.9	61.9
09:26:10	63.9	67.4	UNDER	66.9	60.9
09:26:20	63.3	65.4	UNDER	65.9	61.9
09:26:30	66.0	67.4	UNDER	67.9	64.9
09:26:40	64.0	65.4	UNDER	65.9	61.9
09:26:50	65.8	67.7	UNDER	67.9	61.9
09:27:00	63.0	64.6	UNDER	64.9	61.9
09:27:10	64.8	66.2	UNDER	65.9	63.9
09:27:20	66.5	67.8	UNDER	67.9	65.9
09:27:30	65.0	66.2	UNDER	66.9	64.9
09:27:40	64.6	65.8	UNDER	65.9	63.9
09:27:50	65.0	66.2	UNDER	66.9	63.9
09:28:00	66.1	67.0	UNDER	67.9	64.9
09:28:10	67.2	70.5	UNDER	70.9	63.9
09:28:20	66.7	70.1	UNDER	69.9	64.9
09:28:30	66.8	68.2	UNDER	68.9	64.9
09:28:40	66.0	67.0	UNDER	66.9	64.9
09:28:50	66.1	67.1	UNDER	67.9	64.9
09:29:00	65.4	66.2	UNDER	65.9	64.9
09:29:10	64.4	65.8	UNDER	65.9	63.9
09:29:20	64.7	67.5	UNDER	66.9	62.9
09:29:30	66.5	70.2	UNDER	69.9	60.9
09:29:40	67.6	69.0	UNDER	68.9	64.9
09:29:50	64.5	65.4	UNDER	65.9	63.9
09:30:00	63.5	64.6	UNDER	64.9	61.9
09:30:10	62.4	64.2	UNDER	63.9	61.9
09:30:20	63.8	65.0	UNDER	64.9	62.9
09:30:30	63.7	65.8	UNDER	65.9	61.9
09:30:40	63.7	64.6	UNDER	64.9	61.9
09:30:50	61.4	62.1	UNDER	61.9	60.9
09:31:00	63.0	64.2	UNDER	64.9	60.9
09:31:10	64.8	67.0	UNDER	66.9	61.9
09:31:20	63.7	65.5	UNDER	65.9	61.9
09:31:30	61.4	63.7	UNDER	63.9	60.9
09:31:40	65.9	68.6	UNDER	68.9	62.9
09:31:50	62.6	63.8	UNDER	63.9	61.9
09:32:00	63.6	69.3	UNDER	66.9	60.9
09:32:10	67.0	71.0	UNDER	70.9	59.9
09:32:20	60.6	63.8	UNDER	62.9	58.9
09:32:30	63.4	64.6	UNDER	64.9	60.9
09:32:40	63.7	64.8	UNDER	64.9	60.9
09:32:50	61.9	64.5	UNDER	64.9	58.9
09:33:00	65.1	68.2	UNDER	68.9	58.9
09:33:10	64.3	67.8	UNDER	66.9	62.9
09:33:20	64.2	66.2	UNDER	66.9	61.9
09:33:30	63.6	66.2	UNDER	65.9	61.9

09:33:40	59.4	61.4	UNDER	60.9	58.9
09:33:50	63.0	65.8	UNDER	65.9	59.9
09:34:00	60.7	62.2	UNDER	62.9	59.9
09:34:10	62.6	63.8	UNDER	63.9	61.9
09:34:20	62.0	63.8	UNDER	63.9	60.9
09:34:30	61.1	63.5	UNDER	62.9	58.9
09:34:40	62.5	63.8	UNDER	63.9	60.9
09:34:50	62.5	65.0	UNDER	64.9	60.9
09:35:00	62.8	64.8	UNDER	63.9	60.9
09:35:10	64.1	66.6	UNDER	66.9	61.9
09:35:20	62.4	63.8	UNDER	63.9	61.9
09:35:30	61.4	62.3	UNDER	62.9	59.9
09:35:40	62.0	63.0	UNDER	62.9	61.9
09:35:50	61.9	66.1	UNDER	64.9	60.9
09:36:00	65.8	67.0	UNDER	66.9	64.9
09:36:10	65.8	69.5	UNDER	69.9	59.9
09:36:20	62.5	63.8	UNDER	63.9	61.9
09:36:30	65.0	67.4	UNDER	67.9	60.9
09:36:40	59.4	60.8	UNDER	60.9	57.9
09:36:50	59.9	61.6	UNDER	61.9	56.9
09:37:00	62.5	63.4	UNDER	63.9	60.9
09:37:10	61.1	63.6	UNDER	63.9	57.9
09:37:20	63.6	66.5	UNDER	66.9	58.9
09:37:30	59.8	61.0	UNDER	60.9	58.9
09:37:40	63.4	66.1	UNDER	65.9	59.9
09:37:50	63.1	64.5	UNDER	64.9	60.9
09:38:00	61.7	63.8	UNDER	63.9	59.9
09:38:10	61.1	63.8	UNDER	63.9	58.9
09:38:20	61.6	65.6	UNDER	64.9	57.9
09:38:30	64.9	69.0	UNDER	67.9	62.9
09:38:40	65.6	69.2	UNDER	68.9	62.9
09:38:50	64.4	65.3	UNDER	65.9	62.9
09:39:00	63.0	65.0	UNDER	64.9	59.9
09:39:10	60.1	63.0	UNDER	62.9	57.9
09:39:20	62.4	63.9	UNDER	63.9	60.9
09:39:30	62.7	64.2	UNDER	63.9	61.9
09:39:40	62.5	64.6	UNDER	64.9	59.9
09:39:50	62.7	65.3	UNDER	65.9	60.9

****

Filename.....2555
Test Location.....I-66
Employee Name.....JCL
Employee Number.....
Department.....NOISE

Calibrator Type.....7271
Calibrator Cal. Date...May 2011

****

METROSONICS db-3080 V1.11 SERIAL # 2555
REPORT PRINTED ON 07/14/11 at 07:53:47

User ID: _____

LOGGING STARTED.....07/13/11 at 09:25:00
TOTAL LOGGING TIME...0 DAYS 00:15:00
LOGGING STOPPED.....07/13/11 at 09:40:00
TOTAL INTERVALS.....90
INTERVAL LENGTH.....00:00:10

AUTO STOP.....NO
CLOCK SYNCH.....YES
RESPONSE RATE.....SLOW
FILTER.....A WT.

PRE-TEST CALIBRATION TIME....07/13/11 AT 08:06:07
PRE-TEST CALIBRATION RANGE...39.9 TO 139.9 dB
POST-TEST CALIBRATION TIME...07/13/11 AT 09:55:08
POST-TEST CALIBRATION RANGE...39.9 TO 139.9
CUTOFF USED FOR TIME HISTORY Lav...NONE

<<< SUMMARY REPORT FOR TEST NUMBER 2 OF 2 >>>

EXCHANGE RATE.....3dB
CUTOFFS..... 80dB 90dB
CEILING.....115dB
DOSE CRITERION LEVEL... 90dB
DOSE CRITERION LENGTH.. 8 HOURS

Lav..... 64.1dB
Lav (80)..... 39.9dB
Lav (90)..... 39.9dB
SEL..... 93.5dB

TWA..... 49.1dB
TWA (80)..... 39.9dB
TWA (90)..... 39.9dB

Lmax..... 74.1dB 07/13/11 at 09:33:08
Lpk.....UNDER RANGE
TIME OVER 115dB...00:00:00.00

DOSE (80)..... 0.00%
PROJ. DOSE (80).. 0.00%
DOSE (90)..... 0.00%
PROJ. DOSE (90).. 0.00%

<<< TIME HISTORY REPORT FOR TEST NUMBER 2 OF 2 >>>

TIME	Lav dBA	Lmax dBA	Lpk dBC	L(10.0) dBA	L(99.9) dBA
07/13/11					
09:25:00	63.8	65.1	UNDER	64.9	62.9
09:25:10	62.4	63.7	UNDER	63.9	60.9
09:25:20	64.9	67.1	UNDER	66.9	62.9
09:25:30	63.7	65.1	UNDER	64.9	62.9
09:25:40	64.5	70.0	UNDER	67.9	62.9
09:25:50	68.7	70.8	UNDER	70.9	65.9
09:26:00	64.8	69.1	UNDER	68.9	61.9
09:26:10	61.0	63.9	UNDER	62.9	59.9
09:26:20	64.1	66.8	UNDER	66.9	61.9
09:26:30	62.0	65.0	UNDER	63.9	60.9
09:26:40	63.4	66.3	UNDER	66.9	60.9
09:26:50	64.3	65.2	UNDER	64.9	63.9
09:27:00	62.9	63.9	UNDER	63.9	62.9
09:27:10	60.7	62.8	UNDER	62.9	58.9
09:27:20	62.2	63.7	UNDER	63.9	60.9
09:27:30	63.1	64.3	UNDER	64.9	61.9
09:27:40	67.0	68.5	UNDER	68.9	63.9
09:27:50	62.3	65.1	UNDER	63.9	60.9
09:28:00	62.5	63.6	UNDER	63.9	61.9
09:28:10	64.2	66.4	UNDER	66.9	62.9
09:28:20	62.7	65.5	UNDER	64.9	60.9
09:28:30	62.4	63.5	UNDER	63.9	60.9
09:28:40	63.0	64.1	UNDER	63.9	62.9
09:28:50	63.1	66.0	UNDER	65.9	61.9
09:29:00	66.8	69.2	UNDER	69.9	63.9
09:29:10	68.4	69.9	UNDER	69.9	65.9
09:29:20	64.0	66.1	UNDER	65.9	62.9
09:29:30	63.6	66.3	UNDER	66.9	60.9
09:29:40	63.9	65.7	UNDER	65.9	61.9
09:29:50	61.5	63.0	UNDER	62.9	60.9
09:30:00	62.2	64.1	UNDER	63.9	60.9
09:30:10	63.5	64.5	UNDER	64.9	62.9
09:30:20	66.6	69.9	UNDER	69.9	62.9
09:30:30	65.9	69.9	UNDER	69.9	61.9
09:30:40	67.4	69.6	UNDER	69.9	64.9
09:30:50	64.1	65.3	UNDER	65.9	62.9
09:31:00	65.2	66.4	UNDER	66.9	64.9
09:31:10	62.8	65.7	UNDER	64.9	59.9
09:31:20	64.5	65.5	UNDER	65.9	63.9
09:31:30	64.5	65.7	UNDER	65.9	61.9
09:31:40	63.0	64.3	UNDER	64.9	60.9
09:31:50	63.0	64.2	UNDER	63.9	61.9
09:32:00	64.4	67.3	UNDER	66.9	62.9
09:32:10	64.5	67.2	UNDER	66.9	62.9
09:32:20	62.2	63.2	UNDER	63.9	61.9
09:32:30	65.8	68.3	UNDER	68.9	61.9
09:32:40	65.4	68.1	UNDER	67.9	63.9
09:32:50	63.1	64.7	UNDER	64.9	61.9
09:33:00	69.2	74.1	UNDER	73.9	61.9
09:33:10	64.4	71.1	UNDER	67.9	60.9
09:33:20	62.2	63.0	UNDER	62.9	61.9

09:33:30	63.0	64.5	UNDER	64.9	60.9
09:33:40	64.0	65.1	UNDER	64.9	60.9
09:33:50	62.5	64.7	UNDER	64.9	60.9
09:34:00	67.5	70.9	UNDER	70.9	62.9
09:34:10	65.6	67.1	UNDER	66.9	63.9
09:34:20	64.3	65.3	UNDER	65.9	63.9
09:34:30	63.5	65.1	UNDER	64.9	62.9
09:34:40	65.4	68.1	UNDER	68.9	61.9
09:34:50	64.1	66.1	UNDER	65.9	60.9
09:35:00	61.7	63.1	UNDER	62.9	60.9
09:35:10	60.2	61.3	UNDER	61.9	59.9
09:35:20	59.1	60.7	UNDER	60.9	57.9
09:35:30	63.8	65.8	UNDER	65.9	58.9
09:35:40	62.7	63.5	UNDER	63.9	62.9
09:35:50	64.4	66.7	UNDER	66.9	61.9
09:36:00	64.2	66.7	UNDER	66.9	61.9
09:36:10	62.7	63.9	UNDER	63.9	61.9
09:36:20	61.6	63.5	UNDER	63.9	59.9
09:36:30	63.5	64.8	UNDER	64.9	60.9
09:36:40	58.5	60.7	UNDER	60.9	56.9
09:36:50	64.9	67.7	UNDER	67.9	60.9
09:37:00	64.6	68.1	UNDER	67.9	60.9
09:37:10	62.6	64.9	UNDER	64.9	60.9
09:37:20	65.2	68.4	UNDER	67.9	62.9
09:37:30	64.5	68.0	UNDER	67.9	62.9
09:37:40	61.2	62.6	UNDER	62.9	60.9
09:37:50	60.8	62.6	UNDER	62.9	59.9
09:38:00	64.1	66.2	UNDER	65.9	60.9
09:38:10	64.6	67.4	UNDER	67.9	60.9
09:38:20	58.8	61.9	UNDER	60.9	57.9
09:38:30	60.1	65.9	UNDER	64.9	56.9
09:38:40	63.9	66.3	UNDER	66.9	61.9
09:38:50	63.0	65.2	UNDER	65.9	61.9
09:39:00	62.2	64.3	UNDER	63.9	58.9
09:39:10	58.6	60.8	UNDER	60.9	56.9
09:39:20	63.7	66.0	UNDER	65.9	60.9
09:39:30	65.1	68.3	UNDER	68.9	60.9
09:39:40	64.5	66.1	UNDER	65.9	62.9
09:39:50	65.3	66.9	UNDER	66.9	62.9

APPENDIX D

TRAFFIC DATA SUMMARY

		AM Peak													
	Link	% Trucks		Existing (2011)				Design No-Build (2036)				Design Build (2036)			
Loc	Description	%MT	%HT	Total Vol	cars	MT	HT	Total Vol	cars	MT	HT	Total Vol	cars	MT	HT
1	I-66 WB (East of US-15)	6.8%	6.1%	1,090	950	74	66	1,503	1,309	102	92	1,804	1,571	123	110
2	I-66 WB (West of US-15)			681	547	70	64	950	764	96	90	1,251	1,026	117	108
3	I-66 EB (East of US-15)	0.4%	1.7%	2,873	2,813	11	49	3,962	3,879	16	67	4,656	4,558	19	79
4	I-66 EB (West of US-15)			1,695	1,652	0	43	2,383	2,324	1	58	3,077	3,003	4	70
5	US-15 SB (South of I-66)	1.0%	0.4%	792	781	8	3	1,241	1,224	12	5	1,267	1,249	13	5
6	US-15 SB (North of I-66)	1.0%	0.4%	789	778	8	3	1,061	1,046	11	4	1,088	1,073	11	4
7	US-15 NB (South of I-66)	1.0%	0.4%	1,158	1,141	12	5	1,813	1,788	18	7	1,852	1,826	19	7
8	US-15 NB (North of I-66)	1.0%	0.5%	1,157	1,139	12	6	1,556	1,532	16	8	1,596	1,572	16	8
9	I-66 EB Off-Ramp to US-15	1.1%	0.3%	244	240	3	1	609	600	7	2	609	600	7	2
10	I-66 EB On-Ramp from US-15	1.0%	0.5%	1,422	1,401	14	7	2,188	2,155	22	11	2,188	2,155	22	11
11	I-66 WB Off-Ramp to US-15	1.0%	0.4%	530	523	5	2	856	844	9	3	856	844	9	3
12	I-66 WB On-Ramp from US-15	1.0%	0.4%	121	120	1	0	303	299	3	1	303	299	3	1
13	Catharpin Rd.	7.2%	0.2%	465	431	33	1	930	861	67	2	1,007	932	73	2
14	Old Carolina Rd/Jefferson St	1.8%	0.0%	470	462	8	0	671	659	12	0	805	791	14	0
					0	0	0		0	0	0		0	0	0
					0	0	0		0	0	0		0	0	0
					0	0	0		0	0	0		0	0	0

NOTE: Traffic volumes for I-66 west of US 15 were derived by taking ENTRADA volumes for I-66 east of US 15, and adding/subtracting the volumes from the on & off ramps at the I-66/US 15 interchange

		PM Peak													
	Link	% Trucks		Existing (2011)				Design No-Build (2036)				Design Build (2036)			
Loc	Description	%MT	%HT	Total Vol	cars	MT	HT	Total Vol	cars	MT	HT	Total Vol	cars	MT	HT
1	I-66 WB (East of US-15)	3.5%	2.1%	2,915	2,752	102	61	4,021	3,796	141	84	4,825	4,555	169	101
2	I-66 WB (West of US-15)			1,822	1,664	99	59	2,469	2,251	136	82	3,273	3,010	164	99
3	I-66 EB (East of US-15)	0.9%	2.7%	1,339	1,291	12	36	1,848	1,781	17	50	2,171	2,092	20	59
4	I-66 EB (West of US-15)			769	724	10	35	1,071	1,007	15	49	1,394	1,318	18	58
5	US-15 SB (South of I-66)	0.4%	0.2%	1,504	1,495	6	3	2,357	2,343	9	5	2,407	2,392	10	5
6	US-15 SB (North of I-66)	0.4%	0.2%	1,399	1,390	6	3	1,881	1,869	8	4	1,929	1,917	8	4
7	US-15 NB (South of I-66)	0.4%	0.2%	950	944	4	2	1,488	1,479	6	3	1,519	1,510	6	3
8	US-15 NB (North of I-66)	0.4%	0.2%	883	877	4	2	1,187	1,180	5	2	1,218	1,211	5	2
9	I-66 EB Off-Ramp to US-15	0.8%	0.4%	105	104	1	0	261	258	2	1	261	258	2	1
10	I-66 EB On-Ramp from US-15	0.4%	0.2%	675	671	3	1	1,038	1,032	4	2	1,038	1,032	4	2
11	I-66 WB Off-Ramp to US-15	0.4%	0.2%	1,335	1,327	5	3	2,156	2,143	9	4	2,156	2,143	9	4
12	I-66 WB On-Ramp from US-15	0.7%	0.3%	242	239	2	1	604	598	4	2	604	598	4	2
13	Catharpin Rd.	0.3%	0.1%	591	588	2	1	1,182	1,177	4	1	1,281	1,276	4	1
14	Old Carolina Rd/Jefferson St	0.5%	0.0%	628	625	3	0	897	893	4	0	1,076	1,071	5	0
					0	0	0		0	0	0		0	0	0
					0	0	0		0	0	0		0	0	0
					0	0	0		0	0	0		0	0	0

MT = Medium Truck (2 axles with 6 wheels)
HT = Heavy Truck (3 or more axles)

NOTE: Traffic volumes for I-66 west of US 15 were derived by taking ENTRADA volumes for I-66 east of US 15, and adding/subtracting the volumes from the on & off ramps at the I-66/US 15 interchange

APPENDIX E

TNM EXISTING NOISE LEVELS - CALIBRATION (2011)

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	64.6	63.5	66	-1.1	10	----	63.5	0.0	8	-8.0
R2	2	1	63.2	55.9	66	-7.3	10	----	55.9	0.0	8	-8.0
R3	3	1	60.8	61.2	66	0.4	10	----	61.2	0.0	8	-8.0
R4	4	1	61.1	62.1	66	1.0	10	----	62.1	0.0	8	-8.0
R5	5	1	63.5	58.1	66	-5.4	10	----	58.1	0.0	8	-8.0
R6	6	1	61.4	63.6	66	2.2	10	----	63.6	0.0	8	-8.0
M1	12	1	0.0	55.4	66	55.4	10	----	55.4	0.0	8	-8.0
M2	13	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
M3	14	1	0.0	58.1	66	58.1	10	----	58.1	0.0	8	-8.0
M4	15	1	0.0	61.8	66	61.8	10	----	61.8	0.0	8	-8.0
M5	16	1	0.0	60.9	66	60.9	10	----	60.9	0.0	8	-8.0
M6	17	1	0.0	58.3	66	58.3	10	----	58.3	0.0	8	-8.0
M7	18	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0
M8	28	1	0.0	58.3	66	58.3	10	----	58.3	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	14	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R7	7	1	63.9	66.1	66	2.2	10	Snd Lvl	66.1	0.0	8	-8.0
R8	8	1	64.1	65.5	66	1.4	10	----	65.5	0.0	8	-8.0
M9	27	1	0.0	63.8	66	63.8	10	----	63.8	0.0	8	-8.0
M10	28	1	0.0	58.7	66	58.7	10	----	58.7	0.0	8	-8.0
M11	29	1	0.0	59.8	66	59.8	10	----	59.8	0.0	8	-8.0
M12	30	1	0.0	63.8	66	63.8	10	----	63.8	0.0	8	-8.0
M13	31	1	0.0	56.2	66	56.2	10	----	56.2	0.0	8	-8.0
M14	32	1	0.0	57.2	66	57.2	10	----	57.2	0.0	8	-8.0
M15	33	1	0.0	62.7	66	62.7	10	----	62.7	0.0	8	-8.0
M16	34	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
M17	35	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
M18	36	1	0.0	54.1	66	54.1	10	----	54.1	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	12	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX F

TNM MODELED EXISTING (2011)
USING SUPPLIED WORST-CASE EXISTING TRAFFIC

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Existing Worst-Case
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	64.6	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R2	2	1	63.2	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R3	3	1	60.8	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R4	4	1	61.1	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R5	5	1	63.5	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R6	6	1	61.4	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M1	7	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M2	8	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M3	9	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M4	10	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M5	11	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M6	12	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M7	13	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M8	14	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M19	15	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
M20	16	1	0.0	63.7	66	63.7	10	----	63.7	0.0	8	-8.0
M21	17	1	0.0	65.4	66	65.4	10	----	65.4	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	17	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Existing Worst-Case
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	64.6	65.1	66	0.5	10	----	65.1	0.0	8	-8.0
R2	2	1	63.2	56.6	66	-6.6	10	----	56.6	0.0	8	-8.0
R3	3	1	60.8	61.7	66	0.9	10	----	61.7	0.0	8	-8.0
R4	4	1	61.1	63.1	66	2.0	10	----	63.1	0.0	8	-8.0
R5	5	1	63.5	59.8	66	-3.7	10	----	59.8	0.0	8	-8.0
R6	6	1	61.4	65.2	66	3.8	10	----	65.2	0.0	8	-8.0
M1	7	1	0.0	57.0	66	57.0	10	----	57.0	0.0	8	-8.0
M2	8	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
M3	9	1	0.0	58.7	66	58.7	10	----	58.7	0.0	8	-8.0
M4	10	1	0.0	62.8	66	62.8	10	----	62.8	0.0	8	-8.0
M5	11	1	0.0	62.5	66	62.5	10	----	62.5	0.0	8	-8.0
M6	12	1	0.0	59.7	66	59.7	10	----	59.7	0.0	8	-8.0
M7	13	1	0.0	65.5	66	65.5	10	----	65.5	0.0	8	-8.0
M8	14	1	0.0	63.5	66	63.5	10	----	63.5	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	14	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Existing Worst-Case
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R7	1	1	63.9	68.3	66	4.4	10	Snd Lvl	68.3	0.0	8	-8.0
R8	2	1	64.1	66.7	66	2.6	10	Snd Lvl	66.7	0.0	8	-8.0
M9	3	1	0.0	65.8	66	65.8	10	----	65.8	0.0	8	-8.0
M10	4	1	0.0	60.2	66	60.2	10	----	60.2	0.0	8	-8.0
M11	5	1	0.0	61.1	66	61.1	10	----	61.1	0.0	8	-8.0
M12	6	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
M13	7	1	0.0	56.6	66	56.6	10	----	56.6	0.0	8	-8.0
M14	8	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
M15	9	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
M16	10	1	0.0	68.1	66	68.1	10	Snd Lvl	68.1	0.0	8	-8.0
M17	11	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
M18	12	1	0.0	55.5	66	55.5	10	----	55.5	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	12	0.0	0.0	0.0
All Impacted	4	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX G

TNM NO-BUILD NOISE LEVELS - DESIGN YEAR (2036)

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Future No Build
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	64.6	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R2	2	1	63.2	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R3	3	1	60.8	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R4	4	1	61.1	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R5	5	1	63.5	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R6	6	1	61.4	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M1	7	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M2	8	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M3	9	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M4	10	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M5	11	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M6	12	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M7	13	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M8	14	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M19	16	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0
M20	17	1	0.0	65.1	66	65.1	10	----	65.1	0.0	8	-8.0
M21	18	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	17	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Future No Build
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	64.6	66.5	66	1.9	10	Snd Lvl	66.5	0.0	8	-8.0
R2	2	1	63.2	58.0	66	-5.2	10	----	58.0	0.0	8	-8.0
R3	3	1	60.8	63.1	66	2.3	10	----	63.1	0.0	8	-8.0
R4	4	1	61.1	64.6	66	3.5	10	----	64.6	0.0	8	-8.0
R5	5	1	63.5	61.2	66	-2.3	10	----	61.2	0.0	8	-8.0
R6	6	1	61.4	66.6	66	5.2	10	Snd Lvl	66.6	0.0	8	-8.0
M1	7	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
M2	8	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	8	-8.0
M3	9	1	0.0	60.1	66	60.1	10	----	60.1	0.0	8	-8.0
M4	10	1	0.0	64.2	66	64.2	10	----	64.2	0.0	8	-8.0
M5	11	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0
M6	12	1	0.0	61.1	66	61.1	10	----	61.1	0.0	8	-8.0
M7	13	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
M8	14	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	14	0.0	0.0	0.0
All Impacted	4	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Future No Build
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R7	1	1	63.9	69.7	66	5.8	10	Snd Lvl	69.7	0.0	8	-8.0
R8	2	1	64.1	68.1	66	4.0	10	Snd Lvl	68.1	0.0	8	-8.0
M9	3	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	8	-8.0
M10	4	1	0.0	61.6	66	61.6	10	----	61.6	0.0	8	-8.0
M11	5	1	0.0	62.5	66	62.5	10	----	62.5	0.0	8	-8.0
M12	6	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
M13	7	1	0.0	58.0	66	58.0	10	----	58.0	0.0	8	-8.0
M14	8	1	0.0	59.8	66	59.8	10	----	59.8	0.0	8	-8.0
M15	9	1	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	8	-8.0
M16	10	1	0.0	69.5	66	69.5	10	Snd Lvl	69.5	0.0	8	-8.0
M17	11	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	8	-8.0
M18	12	1	0.0	56.8	66	56.8	10	----	56.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	12	0.0	0.0	0.0
All Impacted	7	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX H

TNM BUILD NOISE LEVELS - DESIGN YEAR (2036)

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Build 2036
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	64.6	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R2	2	1	63.2	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R3	3	1	60.8	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R4	4	1	61.1	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R5	5	1	63.5	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
R6	6	1	61.4	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M1	7	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M2	8	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M3	9	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M4	10	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M5	11	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M6	12	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M7	13	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M8	14	1	0.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
M19	24	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
M20	25	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
M21	26	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	17	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: [redacted] Build 2036
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	64.6	70.7	66	6.1	10	Snd Lvl	70.7	0.0	8	-8.0
R2	2	1	63.2	61.3	66	-1.9	10	----	61.3	0.0	8	-8.0
R3	3	1	60.8	65.6	66	4.8	10	----	65.6	0.0	8	-8.0
R4	4	1	61.1	64.3	66	3.2	10	----	64.3	0.0	8	-8.0
R5	5	1	63.5	58.7	66	-4.8	10	----	58.7	0.0	8	-8.0
R6	6	1	61.4	66.7	66	5.3	10	Snd Lvl	66.7	0.0	8	-8.0
M1	7	1	0.0	62.0	66	62.0	10	----	62.0	0.0	8	-8.0
M2	8	1	0.0	70.4	66	70.4	10	Snd Lvl	70.4	0.0	8	-8.0
M3	9	1	0.0	62.6	66	62.6	10	----	62.6	0.0	8	-8.0
M4	10	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
M5	11	1	0.0	64.4	66	64.4	10	----	64.4	0.0	8	-8.0
M6	12	1	0.0	60.9	66	60.9	10	----	60.9	0.0	8	-8.0
M7	13	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	8	-8.0
M8	14	1	0.0	61.9	66	61.9	10	----	61.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	14	0.0	0.0	0.0
All Impacted	5	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: [redacted] Build 2036
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

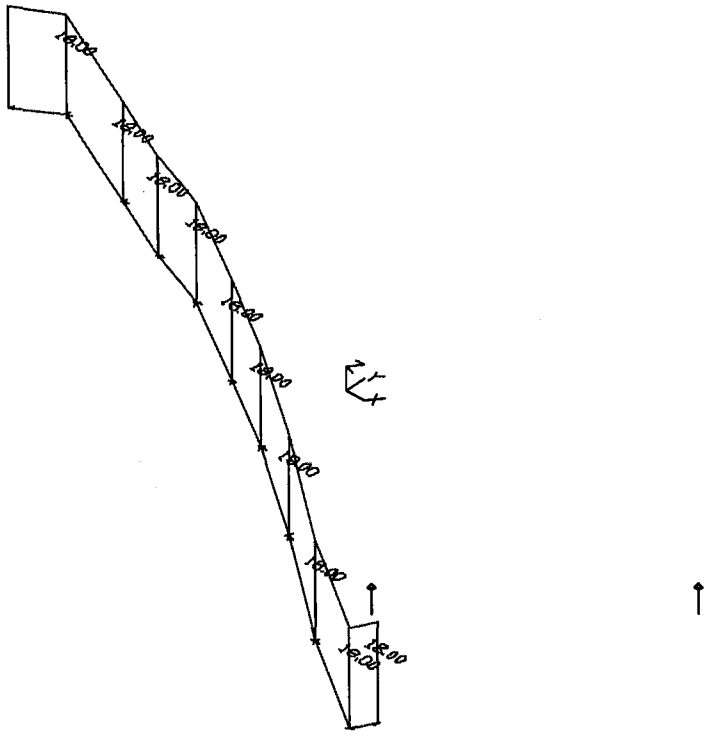
Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R7	1	1	63.9	71.9	66	8.0	10	Snd Lvl	71.9	0.0	8	-8.0
R8	2	1	64.1	69.5	66	5.4	10	Snd Lvl	69.5	0.0	8	-8.0
M9	3	1	0.0	68.5	66	68.5	10	Snd Lvl	68.5	0.0	8	-8.0
M10	4	1	0.0	63.4	66	63.4	10	----	63.4	0.0	8	-8.0
M11	5	1	0.0	65.6	66	65.6	10	----	65.6	0.0	8	-8.0
M12	6	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	8	-8.0
M13	7	1	0.0	60.7	66	60.7	10	----	60.7	0.0	8	-8.0
M14	8	1	0.0	63.8	66	63.8	10	----	63.8	0.0	8	-8.0
M15	9	1	0.0	70.0	66	70.0	10	Snd Lvl	70.0	0.0	8	-8.0
M16	10	1	0.0	72.7	66	72.7	10	Snd Lvl	72.7	0.0	8	-8.0
M17	11	1	0.0	72.4	66	72.4	10	Snd Lvl	72.4	0.0	8	-8.0
M18	12	1	0.0	60.7	66	60.7	10	----	60.7	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	12	0.0	0.0	0.0
All Impacted	7	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX I

TNM NOISE BARRIER ANALYSIS (2036)

CNE A



Calibration		Sheet 1 of 1	2 Aug 2011
		MT	
Barrier View-unsaved		Project/Contract No. JCL	
Run name: Single Barrier		TNM Version 2.5, Feb 2004	
Scale: <DNA - due to perspective>		Analysis By: JCL	
Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	

CNE A

8 Feet

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	64.6	72.6	66	8.0	10	Snd Lvl	65.5	7.1	8	-0.9
M1	7	1	0.0	61.7	66	61.7	10	----	60.5	1.2	8	-6.8

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	2	1.2	4.1	7.1
All Impacted	1	7.1	7.1	7.1
All that meet NR Goal	0	0.0	0.0	0.0

CNEA 10 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	64.6	72.6	66	8.0	10	Snd Lvl	64.0	8.6	8	0.6
M1	7	1	0.0	61.7	66	61.7	10	----	60.4	1.3	8	-6.7

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	2	1.3	4.9	8.6
All Impacted	1	8.6	8.6	8.6
All that meet NR Goal	1	8.6	8.6	8.6

CNEA 12 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	64.6	72.6	66	8.0	10	Snd Lvl	63.0	9.6	8	1.6
M1	7	1	0.0	61.7	66	61.7	10	---	60.4	1.3	8	-6.7

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	2	1.3	5.4	9.6
All Impacted	1	9.6	9.6	9.6
All that meet NR Goal	1	9.6	9.6	9.6

CNEA 14 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	64.6	72.6	66	8.0	10	Snd Lvl	62.2	10.4	8	2.4
M1	7	1	0.0	61.7	66	61.7	10	----	60.3	1.4	8	-6.6

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	2	1.4	5.9	10.4
All Impacted	1	10.4	10.4	10.4
All that meet NR Goal	1	10.4	10.4	10.4

CNEA 16 Feet

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	64.6	72.6	66	8.0	10	Snd Lvl	61.7	10.9	8	2.9
M1	7	1	0.0	61.7	66	61.7	10	----	60.2	1.5	8	-6.5

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	2	1.5	6.2	10.9
All Impacted	1	10.9	10.9	10.9
All that meet NR Goal	1	10.9	10.9	10.9

CNE A 18 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	64.6	72.6	66	8.0	10	Snd Lvl	61.1	11.5	8	3.5
M1	7	1	0.0	61.7	66	61.7	10	----	60.1	1.6	8	-6.4

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	2	1.6	6.6	11.5
All Impacted	1	11.5	11.5	11.5
All that meet NR Goal	1	11.5	11.5	11.5

CNE B 8 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M2	8	1	0.0	70.5	66	70.5	10	Snd Lvl	66.7	3.8	8	-4.2
R2	2	1	63.2	61.2	66	-2.0	10	----	58.0	3.2	8	-4.8
R3	3	1	60.8	65.9	66	5.1	10	----	63.7	2.2	8	-5.8
M4	10	1	0.0	65.3	66	65.3	10	----	61.4	3.9	8	-4.1
R4	4	1	61.1	63.5	66	2.4	10	----	60.7	2.8	8	-5.2
M5	11	1	0.0	61.9	66	61.9	10	----	58.2	3.7	8	-4.3
M6	12	1	0.0	59.7	66	59.7	10	----	56.5	3.2	8	-4.8
M7	13	1	0.0	67.6	66	67.6	10	Snd Lvl	63.9	3.7	8	-4.3
M8	14	1	0.0	60.4	66	60.4	10	----	58.1	2.3	8	-5.7
R5	5	1	63.5	57.5	66	-6.0	10	----	55.6	1.9	8	-6.1
R6	6	1	61.4	66.4	66	5.0	10	Snd Lvl	62.7	3.7	8	-4.3

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	11	1.9	3.1	3.9
All Impacted	3	3.7	3.7	3.8
All that meet NR Goal	0	0.0	0.0	0.0

ONE B 10 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M2	8	1	0.0	70.5	66	70.5	10	Snd Lvl	65.3	5.2	8	-2.8
R2	2	1	63.2	61.2	66	-2.0	10	----	57.7	3.5	8	-4.5
R3	3	1	60.8	65.9	66	5.1	10	----	63.2	2.7	8	-5.3
M4	10	1	0.0	65.3	66	65.3	10	----	60.4	4.9	8	-3.1
R4	4	1	61.1	63.5	66	2.4	10	----	59.6	3.9	8	-4.1
M5	11	1	0.0	61.9	66	61.9	10	----	57.7	4.2	8	-3.8
M6	12	1	0.0	59.7	66	59.7	10	----	56.1	3.6	8	-4.4
M7	13	1	0.0	67.6	66	67.6	10	Snd Lvl	63.1	4.5	8	-3.5
M8	14	1	0.0	60.4	66	60.4	10	----	57.6	2.8	8	-5.2
R5	5	1	63.5	57.5	66	-6.0	10	----	55.3	2.2	8	-5.8
R6	6	1	61.4	66.4	66	5.0	10	Snd Lvl	61.9	4.5	8	-3.5

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	11	2.2	3.8	5.2
All Impacted	3	4.5	4.7	5.2
All that meet NR Goal	0	0.0	0.0	0.0

CNE B 12 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M2	8	1	0.0	70.5	66	70.5	10	Snd Lvl	64.4	6.1	8	-1.9
R2	2	1	63.2	61.2	66	-2.0	10	----	56.9	4.3	8	-3.7
R3	3	1	60.8	65.9	66	5.1	10	----	61.9	4.0	8	-4.0
M4	10	1	0.0	65.3	66	65.3	10	----	59.7	5.6	8	-2.4
R4	4	1	61.1	63.5	66	2.4	10	----	57.7	5.8	8	-2.2
M5	11	1	0.0	61.9	66	61.9	10	----	57.3	4.6	8	-3.4
M6	12	1	0.0	59.7	66	59.7	10	----	55.6	4.1	8	-3.9
M7	13	1	0.0	67.6	66	67.6	10	Snd Lvl	62.4	5.2	8	-2.8
M8	14	1	0.0	60.4	66	60.4	10	----	56.6	3.8	8	-4.2
R5	5	1	63.5	57.5	66	-6.0	10	----	54.6	2.9	8	-5.1
R6	6	1	61.4	66.4	66	5.0	10	Snd Lvl	60.5	5.9	8	-2.1

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	11	2.9	4.8	6.1
All Impacted	3	5.2	5.7	6.1
All that meet NR Goal	0	0.0	0.0	0.0

CNE B 14 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M2	8	1	0.0	70.5	66	70.5	10	Snd Lvl	62.0	8.5	8	0.5
R2	2	1	63.2	61.2	66	-2.0	10	----	55.7	5.5	8	-2.5
R3	3	1	60.8	65.9	66	5.1	10	----	59.8	6.1	8	-1.9
M4	10	1	0.0	65.3	66	65.3	10	----	58.5	6.8	8	-1.2
R4	4	1	61.1	63.5	66	2.4	10	----	57.0	6.5	8	-1.5
M5	11	1	0.0	61.9	66	61.9	10	----	56.4	5.5	8	-2.5
M6	12	1	0.0	59.7	66	59.7	10	----	54.6	5.1	8	-2.9
M7	13	1	0.0	67.6	66	67.6	10	Snd Lvl	59.9	7.7	8	-0.3
M8	14	1	0.0	60.4	66	60.4	10	----	55.6	4.8	8	-3.2
R5	5	1	63.5	57.5	66	-6.0	10	----	53.6	3.9	8	-4.1
R6	6	1	61.4	66.4	66	5.0	10	Snd Lvl	59.0	7.4	8	-0.6

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	11	3.9	6.2	8.5
All Impacted	3	7.4	7.9	8.5
All that meet NR Goal	1	8.5	8.5	8.5

CNE B 16 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M2	8	1	0.0	70.5	66	70.5	10	Snd Lvl	60.8	9.7	8	1.7
R2	2	1	63.2	61.2	66	-2.0	10	----	55.3	5.9	8	-2.1
R3	3	1	60.8	65.9	66	5.1	10	----	59.0	6.9	8	-1.1
M4	10	1	0.0	65.3	66	65.3	10	----	57.8	7.5	8	-0.5
R4	4	1	61.1	63.5	66	2.4	10	----	56.3	7.2	8	-0.8
M5	11	1	0.0	61.9	66	61.9	10	----	55.9	6.0	8	-2.0
M6	12	1	0.0	59.7	66	59.7	10	----	54.2	5.5	8	-2.5
M7	13	1	0.0	67.6	66	67.6	10	Snd Lvl	58.9	8.7	8	0.7
M8	14	1	0.0	60.4	66	60.4	10	----	55.2	5.2	8	-2.8
R5	5	1	63.5	57.5	66	-6.0	10	----	53.2	4.3	8	-3.7
R6	6	1	61.4	66.4	66	5.0	10	Snd Lvl	58.3	8.1	8	0.1

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	11	4.3	6.8	9.7
All Impacted	3	8.1	8.8	9.7
All that meet NR Goal	3	8.1	8.8	9.7

CNE B 18 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

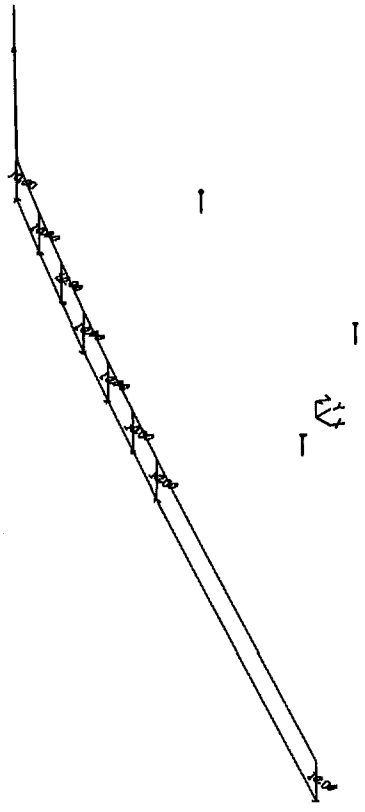
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M2	8	1	0.0	70.5	66	70.5	10	Snd Lvl	59.9	10.6	8	2.6
R2	2	1	63.2	61.2	66	-2.0	10	----	54.9	6.3	8	-1.7
R3	3	1	60.8	65.9	66	5.1	10	----	58.2	7.7	8	-0.3
M4	10	1	0.0	65.3	66	65.3	10	----	57.1	8.2	8	0.2
R4	4	1	61.1	63.5	66	2.4	10	----	55.8	7.7	8	-0.3
M5	11	1	0.0	61.9	66	61.9	10	----	55.5	6.4	8	-1.6
M6	12	1	0.0	59.7	66	59.7	10	----	53.8	5.9	8	-2.1
M7	13	1	0.0	67.6	66	67.6	10	Snd Lvl	58.2	9.4	8	1.4
M8	14	1	0.0	60.4	66	60.4	10	----	54.8	5.6	8	-2.4
R5	5	1	63.5	57.5	66	-6.0	10	----	52.9	4.6	8	-3.4
R6	6	1	61.4	66.4	66	5.0	10	Snd Lvl	57.7	8.7	8	0.7

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	11	4.6	7.4	10.6
All Impacted	3	8.7	9.6	10.6
All that meet NR Goal	4	8.2	9.2	10.6

CNE C



Calibration		Sheet 1 of 1	2 Aug 2011
		MT	
Barrier View-unsaved		Project/Contract No. JCL	
Run name: Hertage Hunt		TNM Version 2.5, Feb 2004	
Scale: <DNA - due to perspective>		Analysis By: JCL	
Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	

8 Feet

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: [redacted] Build 2036
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M19	24	1	0.0	66.2	66	66.2	10	Snd Lvl	62.9	3.3	8	-4.7
M20	25	1	0.0	64.6	66	64.6	10	----	61.1	3.5	8	-4.5
M21	26	1	0.0	65.5	66	65.5	10	----	62.4	3.1	8	-4.9

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	3	3.1	3.3	3.5
All Impacted	1	3.3	3.3	3.3
All that meet NR Goal	0	0.0	0.0	0.0

10 Feet

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M19	24	1	0.0	66.2	66	66.2	10	Snd Lvl	62.3	3.9	8	-4.1
M20	25	1	0.0	64.6	66	64.6	10	----	60.5	4.1	8	-3.9
M21	26	1	0.0	65.5	66	65.5	10	----	61.6	3.9	8	-4.1

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	3	3.9	4.0	4.1
All Impacted	1	3.9	3.9	3.9
All that meet NR Goal	0	0.0	0.0	0.0

12 Feet

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M19	24	1	0.0	66.2	66	66.2	10	Snd Lvl	61.3	4.9	8	-3.1
M20	25	1	0.0	64.6	66	64.6	10	----	59.6	5.0	8	-3.0
M21	26	1	0.0	65.5	66	65.5	10	----	60.0	5.5	8	-2.5

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	3	4.9	5.1	5.5
All Impacted	1	4.9	4.9	4.9
All that meet NR Goal	0	0.0	0.0	0.0

14 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M19	24	1	0.0	66.2	66	66.2	10	Snd Lvl	60.5	5.7	8	-2.3
M20	25	1	0.0	64.6	66	64.6	10	----	58.3	6.3	8	-1.7
M21	26	1	0.0	65.5	66	65.5	10	----	59.0	6.5	8	-1.5

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	3	5.7	6.2	6.5
All Impacted	1	5.7	5.7	5.7
All that meet NR Goal	0	0.0	0.0	0.0

16 Feet

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M19	24	1	0.0	66.2	66	66.2	10	Snd Lvl	60.1	6.1	8	-1.9
M20	25	1	0.0	64.6	66	64.6	10	----	57.8	6.8	8	-1.2
M21	26	1	0.0	65.5	66	65.5	10	----	58.5	7.0	8	-1.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	3	6.1	6.6	7.0
All Impacted	1	6.1	6.1	6.1
All that meet NR Goal	0	0.0	0.0	0.0

18 Feet

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M19	24	1	0.0	66.2	66	66.2	10	Snd Lvl	59.9	6.3	8	-1.7
M20	25	1	0.0	64.6	66	64.6	10	----	57.4	7.2	8	-0.8
M21	26	1	0.0	65.5	66	65.5	10	----	58.1	7.4	8	-0.6

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	3	6.3	7.0	7.4
All Impacted	1	6.3	6.3	6.3
All that meet NR Goal	0	0.0	0.0	0.0

CNE D 8 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M9	3	1	0.0	65.9	66	65.9	10	----	61.7	4.2	8	-3.8
M10	4	1	0.0	62.6	66	62.6	10	----	60.2	2.4	8	-5.6

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	2	2.4	3.3	4.2
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

CNC D 10 Feet

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M9	3	1	0.0	65.9	66	65.9	10	----	60.9	5.0	8	-3.0
M10	4	1	0.0	62.6	66	62.6	10	----	59.4	3.2	8	-4.8

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	2	3.2	4.1	5.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

CNE D 12 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M9	3	1	0.0	65.9	66	65.9	10	----	60.1	5.8	8	-2.2
M10	4	1	0.0	62.6	66	62.6	10	----	58.9	3.7	8	-4.3

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	2	3.7	4.8	5.8
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

CAE D 14 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M9	3	1	0.0	65.9	66	65.9	10	----	59.3	6.6	8	-1.4
M10	4	1	0.0	62.6	66	62.6	10	----	58.4	4.2	8	-3.8

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	2	4.2	5.4	6.6
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

CNE D 16 Feet

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M9	3	1	0.0	65.9	66	65.9	10	----	58.8	7.1	8	-0.9
M10	4	1	0.0	62.6	66	62.6	10	----	58.0	4.6	8	-3.4

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	2	4.6	5.9	7.1
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

ONE D 18 Feet

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M9	3	1	0.0	65.9	66	65.9	10	----	58.3	7.6	8	-0.4
M10	4	1	0.0	62.6	66	62.6	10	----	57.6	5.0	8	-3.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	2	5.0	6.3	7.6
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

CNE E 8 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M18	12	1	0.0	59.3	66	59.3	10	----	57.0	2.3	8	-5.7
M17	11	1	0.0	70.0	66	70.0	10	Snd Lvl	63.5	6.5	8	-1.5
M16	10	1	0.0	71.0	66	71.0	10	Snd Lvl	64.0	7.0	8	-1.0
M15	9	1	0.0	69.1	66	69.1	10	Snd Lvl	64.3	4.8	8	-3.2
M14	8	1	0.0	60.7	66	60.7	10	----	57.1	3.6	8	-4.4
R8	2	1	64.1	71.7	66	7.6	10	Snd Lvl	62.9	8.8	8	0.8
M13	7	1	0.0	59.8	66	59.8	10	----	56.5	3.3	8	-4.7
M12	6	1	0.0	70.2	66	70.2	10	Snd Lvl	64.6	5.6	8	-2.4
M11	5	1	0.0	65.9	66	65.9	10	----	61.5	4.4	8	-3.6
R7	1	1	63.9	71.9	66	8.0	10	Snd Lvl	66.8	5.1	8	-2.9

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	10	2.3	5.1	8.8
All Impacted	6	4.8	6.3	8.8
All that meet NR Goal	1	8.8	8.8	8.8

CNE E 10 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M18	12	1	0.0	59.3	66	59.3	10	----	56.6	2.7	8	-5.3
M17	11	1	0.0	70.0	66	70.0	10	Snd Lvl	62.6	7.4	8	-0.6
M16	10	1	0.0	71.0	66	71.0	10	Snd Lvl	63.0	8.0	8	0.0
M15	9	1	0.0	69.1	66	69.1	10	Snd Lvl	62.8	6.3	8	-1.7
M14	8	1	0.0	60.7	66	60.7	10	----	56.7	4.0	8	-4.0
R8	2	1	64.1	71.7	66	7.6	10	Snd Lvl	61.6	10.1	8	2.1
M13	7	1	0.0	59.8	66	59.8	10	----	56.1	3.7	8	-4.3
M12	6	1	0.0	70.2	66	70.2	10	Snd Lvl	63.2	7.0	8	-1.0
M11	5	1	0.0	65.9	66	65.9	10	----	60.7	5.2	8	-2.8
R7	1	1	63.9	71.9	66	8.0	10	Snd Lvl	66.1	5.8	8	-2.2

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	10	2.7	6.0	10.1
All Impacted	6	5.8	7.4	10.1
All that meet NR Goal	2	8.0	9.0	10.1

CNE D 12 feet

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type	Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc	Impact	LAeq1h	Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M18	12	1	0.0	59.3	66	59.3	10	----	56.0	3.3	8	-4.7
M17	11	1	0.0	70.0	66	70.0	10	Snd Lvl	61.5	8.5	8	0.5
M16	10	1	0.0	71.0	66	71.0	10	Snd Lvl	61.9	9.1	8	1.1
M15	9	1	0.0	69.1	66	69.1	10	Snd Lvl	61.4	7.7	8	-0.3
M14	8	1	0.0	60.7	66	60.7	10	----	56.3	4.4	8	-3.6
R8	2	1	64.1	71.7	66	7.6	10	Snd Lvl	60.5	11.2	8	3.2
M13	7	1	0.0	59.8	66	59.8	10	----	55.6	4.2	8	-3.8
M12	6	1	0.0	70.2	66	70.2	10	Snd Lvl	62.0	8.2	8	0.2
M11	5	1	0.0	65.9	66	65.9	10	----	60.0	5.9	8	-2.1
R7	1	1	63.9	71.9	66	8.0	10	Snd Lvl	64.8	7.1	8	-0.9

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	10	3.3	7.0	11.2
All Impacted	6	7.1	8.6	11.2
All that meet NR Goal	4	8.2	9.2	11.2

CNE E 14 Feet

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M18	12	1	0.0	59.3	66	59.3	10	----	55.4	3.9	8	-4.1
M17	11	1	0.0	70.0	66	70.0	10	Snd Lvl	60.8	9.2	8	1.2
M16	10	1	0.0	71.0	66	71.0	10	Snd Lvl	61.0	10.0	8	2.0
M15	9	1	0.0	69.1	66	69.1	10	Snd Lvl	60.5	8.6	8	0.6
M14	8	1	0.0	60.7	66	60.7	10	----	55.5	5.2	8	-2.8
R8	2	1	64.1	71.7	66	7.6	10	Snd Lvl	59.8	11.9	8	3.9
M13	7	1	0.0	59.8	66	59.8	10	----	54.8	5.0	8	-3.0
M12	6	1	0.0	70.2	66	70.2	10	Snd Lvl	60.4	9.8	8	1.8
M11	5	1	0.0	65.9	66	65.9	10	----	58.7	7.2	8	-0.8
R7	1	1	63.9	71.9	66	8.0	10	Snd Lvl	63.8	8.1	8	0.1

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	10	3.9	7.9	11.9
All Impacted	6	8.1	9.6	11.9
All that meet NR Goal	6	8.1	9.6	11.9

CNE E 16 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M18	12	1	0.0	59.3	66	59.3	10	----	55.1	4.2	8	-3.8
M17	11	1	0.0	70.0	66	70.0	10	Snd Lvl	60.3	9.7	8	1.7
M16	10	1	0.0	71.0	66	71.0	10	Snd Lvl	60.2	10.8	8	2.8
M15	9	1	0.0	69.1	66	69.1	10	Snd Lvl	59.6	9.5	8	1.5
M14	8	1	0.0	60.7	66	60.7	10	----	54.9	5.8	8	-2.2
R8	2	1	64.1	71.7	66	7.6	10	Snd Lvl	58.8	12.9	8	4.9
M13	7	1	0.0	59.8	66	59.8	10	----	54.3	5.5	8	-2.5
M12	6	1	0.0	70.2	66	70.2	10	Snd Lvl	59.1	11.1	8	3.1
M11	5	1	0.0	65.9	66	65.9	10	----	58.0	7.9	8	-0.1
R7	1	1	63.9	71.9	66	8.0	10	Snd Lvl	63.0	8.9	8	0.9

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	10	4.2	8.6	12.9
All Impacted	6	8.9	10.5	12.9
All that meet NR Goal	6	8.9	10.5	12.9

CNE E 18 Feet

RESULTS: SOUND LEVELS JCL

MT
JCL

2 August 2011
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: JCL
RUN: Calibration
BARRIER DESIGN: unsaved

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
M18	12	1	0.0	59.3	66	59.3	10	----	54.9	4.4	8	-3.6
M17	11	1	0.0	70.0	66	70.0	10	Snd Lvl	59.8	10.2	8	2.2
M16	10	1	0.0	71.0	66	71.0	10	Snd Lvl	59.5	11.5	8	3.5
M15	9	1	0.0	69.1	66	69.1	10	Snd Lvl	58.8	10.3	8	2.3
M14	8	1	0.0	60.7	66	60.7	10	----	54.4	6.3	8	-1.7
R8	2	1	64.1	71.7	66	7.6	10	Snd Lvl	58.1	13.6	8	5.6
M13	7	1	0.0	59.8	66	59.8	10	----	53.8	6.0	8	-2.0
M12	6	1	0.0	70.2	66	70.2	10	Snd Lvl	58.3	11.9	8	3.9
M11	5	1	0.0	65.9	66	65.9	10	----	57.5	8.4	8	0.4
R7	1	1	63.9	71.9	66	8.0	10	Snd Lvl	62.5	9.4	8	1.4

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	10	4.4	9.2	13.6
All Impacted	6	9.4	11.1	13.6
All that meet NR Goal	7	8.4	10.8	13.6

APPENDIX J

WARRANTED, FEASIBLE AND REASONABLE WORKSHEETS

VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	27-Jul-11
Project No. and UPC:	0066-076-003, P101, R201, C501, B674, B675: UPC 93557
County:	Prince William County
District:	
Barrier System ID:	CNE A Barrier
Community Name and/or CNE#	CNE A
Noise Abatement Category(s)	
Design phase:	Preliminary 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
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

	Feasibility	
1	Impacted receptor units	
a.	Number of impacted receptor units:	3
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	3
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

	Reasonableness	
1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	15,440 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	3
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	0
d.	Total number of benefited receptors.	3
e.	Surface Area per benefited receptor unit. (ft^2/BR)	5,147 SF/BR
f.	Is (1e) less than or equal to the maximum square feet per benefited receptor (MaxSF/BR) value of 1600?	No
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	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	956 ft
b.	Height range of the proposed noise barrier. (ft)	
c.	Average height of the proposed noise barrier. (ft)	10 ft
d.	Cost per square foot. ($/$ft^2$)	$36/SF
e.	Total Barrier Cost ($)	$555,840
f.	Barrier Material	NA
3	**Community Desires Related to the Barrier** 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 impacted receptor unit owners do not desire the barrier."	

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

Additional Reasons for Decision:

VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	27-Jul-11
Project No. and UPC:	0066-076-003, P101, R201, C501, B674, B675: UPC 93557
County:	Prince William County
District:	
Barrier System ID:	CNE B Barrier
Community Name and/or CNE#	CNE B
Noise Abatement Category(s)	
Design phase:	Preliminary 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
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

	Feasibility	
1	Impacted receptor units	
a.	Number of impacted receptor units:	57
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	57
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

	Reasonableness	
1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	102,848 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	57
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	101
d.	Total number of benefited receptors.	158
e.	Surface Area per benefited receptor unit. (ft^2/BR)	651 SF/BR
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	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	6,428 ft
b.	Height range of the proposed noise barrier. (ft)	-16 ft
c.	Average height of the proposed noise barrier. (ft)	16 ft
d.	Cost per square foot. ($/$ft^2$)	$36/SF
e.	Total Barrier Cost ($)	$3,702,528
f.	Barrier Material	NA
3	**Community Desires Related to the Barrier**	
	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 impacted receptor unit owners do not desire the barrier."	

Decision	
Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	Yes

Additional Reasons for Decision:

VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	27-Jul-11
Project No. and UPC:	0066-076-003, P101, R201, C501, B674, B675: UPC 93557
County:	Prince William County
District:	
Barrier System ID:	CNE C Barrier
Community Name and/or CNE#	CNE C
Noise Abatement Category(s)	
Design phase:	Preliminary 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
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

	Feasibility	
1	Impacted receptor units	
a.	Number of impacted receptor units:	14
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	14
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

	Reasonableness	
1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	21,200 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	14
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	7
d.	Total number of benefited receptors.	21
e.	Surface Area per benefited receptor unit. (ft^2/BR)	1,010 SF/BR
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	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	1,325 ft
b.	Height range of the proposed noise barrier. (ft)	-16 ft
c.	Average height of the proposed noise barrier. (ft)	16 ft
d.	Cost per square foot. ($/$ft^2$)	$36/SF
e.	Total Barrier Cost ($)	$763,200
f.	Barrier Material	NA
3	**Community Desires Related to the Barrier**	
	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 impacted receptor unit owners do not desire the barrier."	

Decision	
Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	Yes

Additional Reasons for Decision:

VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	27-Jul-11
Project No. and UPC:	0066-076-003, P101, R201, C501, B674, B675: UPC 93557
County:	Prince William County
District:	
Barrier System ID:	CNE D Barrier
Community Name and/or CNE#	CNE D
Noise Abatement Category(s)	
Design phase:	Preliminary 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
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

	Feasibility	
1	Impacted receptor units	
a.	Number of impacted receptor units:	6
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	6
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

	Reasonableness	
1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	15,540 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	6
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	4
d.	Total number of benefited receptors.	10
e.	Surface Area per benefited receptor unit. (ft^2/BR)	1,554 SF/BR
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	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	1,110 ft
b.	Height range of the proposed noise barrier. (ft)	-14 ft
c.	Average height of the proposed noise barrier. (ft)	14 ft
d.	Cost per square foot. ($/$ft^2$)	$36/SF
e.	Total Barrier Cost ($)	$559,440
f.	Barrier Material	NA
3	**Community Desires Related to the Barrier**	
	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 impacted receptor unit owners do not desire the barrier."	

Decision	
Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	Yes

Additional Reasons for Decision:

VDOT Highway Traffic Noise Abatement
Warranted, Feasible, and Reasonable Worksheet

Note: Not all questions apply depending on the design phase which may cause differing answers between preliminary and final design phase. Answers to the questions may change depending on the design phase of the project.

Date:	27-Jul-11
Project No. and UPC:	0066-076-003, P101, R201, C501, B674, B675: UPC 93557
County:	Prince William County
District:	
Barrier System ID:	CNE E Barrier
Community Name and/or CNE#	CNE E
Noise Abatement Category(s)	
Design phase:	Preliminary 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
2	Criteria requiring consideration of noise abatement	
a.	Project causes design year noise levels to approach or exceed the Noise Abatement Criteria?	Yes
b.	Project causes a substantial noise increase of 10 dB(A) or more?	No

	Feasibility	
1	Impacted receptor units	
a.	Number of impacted receptor units:	64
b.	Number of impacted receptor units receiving 5 dB(A) or more insertion loss (IL):	64
c.	Percentage of impacted receptor units receiving 5 dB(A) or more IL	100%
d.	Is the percentage 50 or greater?	Yes
2	Will placement of the noise barrier cause engineering or safety conflicts, e.g drainage issues or site distance issues?	No
3	Will placement of the noise barrier restrict access to vehicular or pedestrian travel?	No
4	Will placement of the noise barrier conflict with existing utility locations?	No

	Reasonableness	
1	**Surface Area (Square foot)-Benefit Factors**	
a.	Surface Area (Total square foot) of the proposed noise barrier. (ft^2)	85,424 SF
b.	Impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	64
c.	Non-impacted noise sensitive receptor(s) receiving 5 dB(A) IL or more.	18
d.	Total number of benefited receptors.	82
e.	Surface Area per benefited receptor unit. (ft^2/BR)	1,042 SF/BR
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	**Additional Noise Barrier Details**	
a.	Length of the proposed noise barrier. (ft)	5,339 ft
b.	Height range of the proposed noise barrier. (ft)	-16 ft
c.	Average height of the proposed noise barrier. (ft)	16 ft
d.	Cost per square foot. ($/$ft^2$)	$36/SF
e.	Total Barrier Cost ($)	$3,075,264
f.	Barrier Material	NA
3	**Community Desires Related to the Barrier**	
	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 impacted receptor unit owners do not desire the barrier."	

Decision	
Is the Noise Barrier(s) WARRANTED?	Yes
Is the Noise Barrier(s) FEASIBLE?	Yes
Is the Noise Barrier(s) REASONABLE?	Yes

Additional Reasons for Decision:

APPENDIX K
REFERENCES

References

- Virginia Department of Transportation, State Noise Abatement, approved November 11th, 20, effective January 1st, 1997.
- Virginia Department of Transportation, Section 107.14(b) 3 Noise (VDOT, 2002).
- Federal Highway Administration, Federal Aid Policy Guide 23 CFR 772, U.S. Government Printing Office, updated December 9, 1991.
- U.S. Department of Transportation, Federal Highway Administration "FHWA Traffic Noise Model User's Guide," FHWA Report No. FHWA-PD-96-009, January 1998.
- U.S. Department of Transportation, Federal Highway Administration "Highway Traffic Noise Analysis and Abatement Policy and Guidance," June 1995.

APPENDIX L

LIST OF PREPARERS AND REVIEWERS

List of Preparers / Reviewers

McCormick Taylor, Inc.

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