31 July 2020

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ELP Bethesda at Rock Spring
Phase I Noise Analysis

Montgomery County, Maryland

Report No. 200731
Project No. ELP2001

For: Erickson Living Properties

By: Jeff Ford
Eamon Curley

Acoustical Engineering Solutions.

1 EXECUTIVE SUMMARY

Phoenix Noise & Vibration has conducted an analysis of transportation noise impact upon the proposed ELP Bethesda at Rock Spring development in Montgomery County, Maryland. The proposed site will consist of seven multifamily buildings, one assisted living facility/health center, and an existing parking garage to remain. This study was limited to noise impact from surrounding roadways, primarily the I-270 spur and Fernwood Road, and included:

- 24-hour noise level measurements and computer modeling.
- Determination of projected noise levels.
- Preliminary mitigation recommendations to meet Montgomery County's residential noise regulations.

Noise impact at ELP Bethesda at Rock Spring will vary with height; therefore, impact has been presented at multiple elevations and across all future building facades. Impact is presented in varying levels of noise indicating the future roadway noise level. The noise levels presented are due only to surrounding roadways and do not account for noise from other sources such as construction, mechanical noise, environmental noise, etc.

Calculated noise levels upon the future building facades are "mitigated," accounting for the presence of existing topography, surrounding buildings, and significant structures, as well as all future site buildings. Structures along roadways act as noise barriers, providing protection from noise exposure and reducing the impact and extent of any potential mitigation required, if any, to comply with the noise regulations of Montgomery County.

Future noise levels will be above 65 dBA Ldn at the ground level near the Civic Green and the Linear Park. Depending on the footprint of these outdoor activity areas, they may be exposed to noise levels greater than 65 dBA Ldn. Additionally, the architectural plans for the buildings are not far along enough to show all outdoor amenity areas (courtyards, rooftops, etc.). If there will be outdoor activity areas on Buildings D, E, F, or G that are facing the roadways, they may be exposed to noise levels above 65 dBA Ldn. Mitigation will be required for any outdoor activity area exposed to noise levels greater than 65 dBA Ldn.

Residential units located closest to the I-270 Spur and Fernwood Road in Buildings D, E, F, and G will be exposed to future transportation noise levels greater than 65 dBA Ldn, with noise impact up to 74 dBA Ldn upon the residential units on the west elevation of Building F. Further analysis of these units is necessary to determine the modifications required to maintain interior noise levels below 45 dBA Ldn. This analysis can only be conducted once architectural plans for each building are available, typically after the Design Development drawing submission. If necessary, interior noise levels can be kept below 45 dBA Ldn by selecting exterior building components (primarily windows and doors) with higher STC ratings than proposed components.

The Health Center, remaining residential units in Buildings D, E, F, and G, and all residential units in Buildings A, B, and C, will not be exposed to future transportation noise levels above 65 dBA Ldn. Further analysis of these units is not required. The proposed standard building construction may be used without modification for these units.

2 NOISE TERMINOLOGY

2.1 dB vs. dBA

While the standard unit of measurement for sound is the decibel (dB), discussions of noise impacting the human ear use "dBA." The "A" refers to a frequency weighting network used to simulate the human ear's unequal sensitivity to different frequencies. The A-weighted noise level is therefore more representative of a human's perception of a noise environment than the unweighted overall noise level in dB and is currently used in most environmental noise studies.

2.2 Ldn

The day-night average noise level, or Ldn, is the equivalent sound pressure level averaged over a 24-hour period, obtained by adding 10 dB to sound pressure levels measured from 10:00 p.m. to 7:00 a.m. This 10 dB "penalty" accounts for the added sensitivity caused by noise generated during the nighttime hours.

The Ldn is NOT a measurement of the instantaneous noise level. It is very possible to have several short term events (tractor trailer, emergency vehicle siren, car horn, etc.) which generate a relatively high noise level (e.g. 85 dBA) during a given time period but have a more moderate overall Ldn value (e.g. 65 dBA Ldn).

2.3 Summing Noise Levels

Noise levels from multiple sources do not add arithmetically, i.e. when two noise sources generate 60 dB individually, they do not produce 120 dB when combined. Noise levels are measured using a logarithmic scale; therefore, they must be summed logarithmically. In the decibel scale, two identical, non-coherent noise sources having the same noise level produce a 3 dB increase above the condition of one source alone (i.e. two 80 dB lawnmowers running at the same time generates 83 dB).

Similarly, two different noise sources with a difference of 10 dB in their individual levels results in no measurable increase in noise when they are combined. Put another way, the quieter noise source does not increase the overall noise generated by the louder source, i.e. adding an 80-dB lawnmower into a noise environment where a 90-dB lawnmower is already running does not increase the noise level above 90 dB.

3 NOISE REGULATIONS

Traffic noise impact for proposed residential developments in Montgomery County is governed by Table 2-1 (reprinted in Table 1) on page 8 of the *Staff Guidelines for the Consideration of Transportation Noise Impacts in Land Use Planning and Development* (June 1983). Accompanying this table is Map 2-1 (see Figure 1), indicating outdoor noise level requirements not to be exceeded throughout the County.

Table 1: Maximum Levels for Exterior Noise & Building Line[1] For Noise Sensitive Land Uses (Table 2-1).

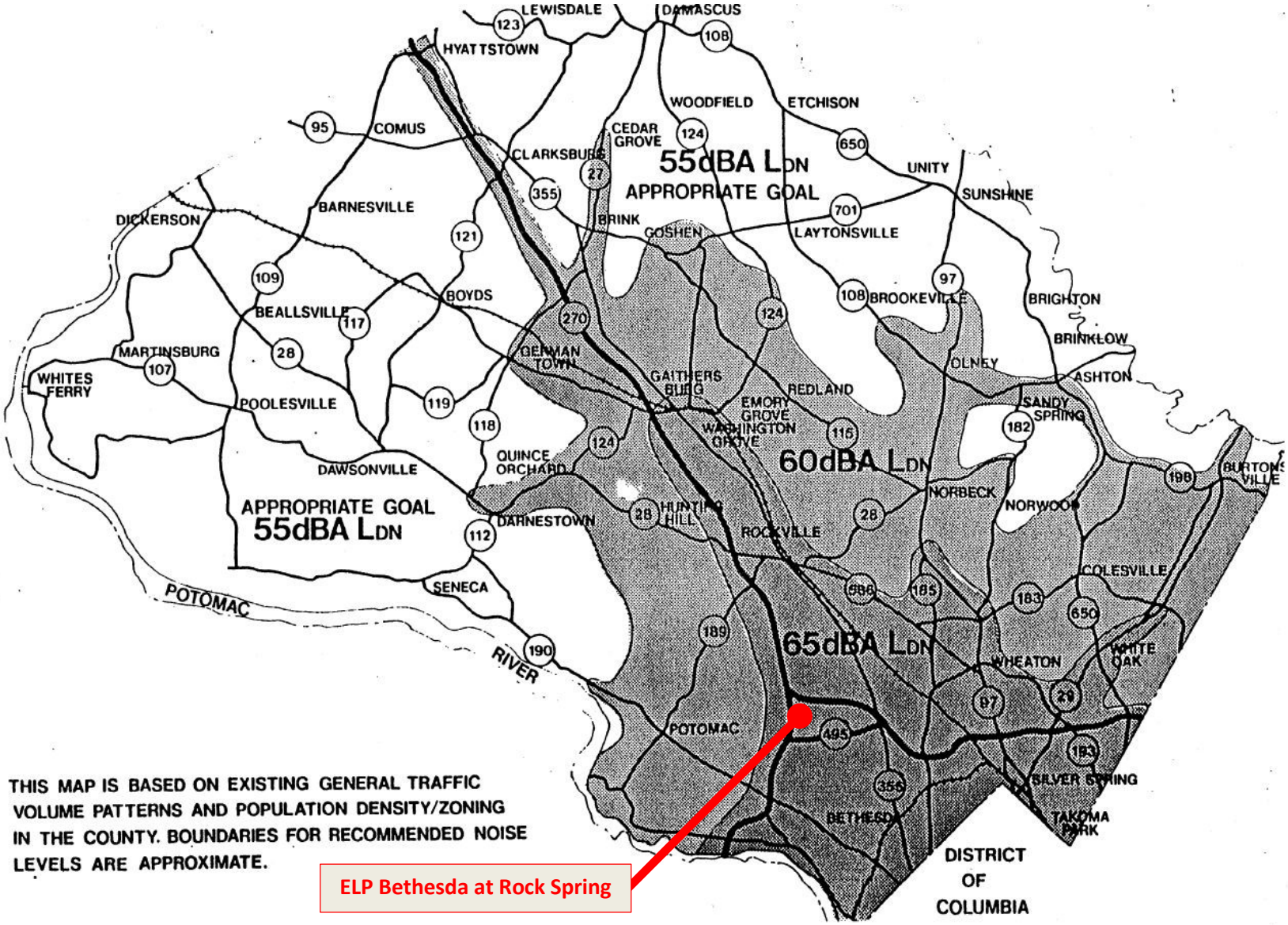
Guideline Value	Area of Application
Ldn = 55 dBA	This guideline is suggested as an appropriate goal in permanent rural areas of the County where residential zoning is for five or more acres per dwelling unit and background levels are low enough to allow maintenance of a 55 dBA Level. This guideline is consistent with Federal, State, and County goals for residential areas.
Ldn = 60 dBA	This is the basic residential noise guideline which will be applied in most areas of the County where suburban densities predominate. Maintenance of this level will protect health and substantially prevent activity interference both interiors and outdoors. Noise attenuation measures will be recommended to allow attainment of this level.
Ldn = 65 dBA	This guideline will generally be applied in the urban ring, freeway, and major highway corridor areas, where ambient levels are such that application of a stricter guideline would be infeasible or inequitable. Significant activity interference will occur outdoors and interiors if windows are partially opened, but available evidence indicates hearing is adequately protected. Noise attenuation measures will be strongly recommended to attain this level.

[1] Building line as used here refers to habitable structures only. It does not include garages, sheds, or recreational accessory buildings.

According to Map 2-1, ELP Bethesda at Rock Spring is located within the 65 dBA Ldn noise zone, indicating that noise levels in the building's outdoor activity areas should be maintained at 65 dBA Ldn. Any outdoor area exposed to future transportation noise levels above 65 dBA Ldn typically requires further analysis to determine the mitigation designs necessary to comply with this requirement.

When outdoor noise levels exceed 65 dBA Ldn, Montgomery County also requires an analysis of interior noise levels in residential buildings. According to Sections 2.2.2 and 2.2.3 of the *Staff Guidelines*, any residential building impacted by noise levels above 65 dBA Ldn must be evaluated to certify that the building structure will be capable of maintaining interior noise levels at 45 dBA Ldn.

Figure 1: Map 2-1 from *Staff Guidelines for the Consideration of Transportation Noise Impacts in Land Use Planning and Development* (June 1983).



4 SITE DESCRIPTION

ELP Bethesda at Rock Spring (shown in Figure 2, building outlines in red) is located to the south of Fernwood Road and to the west of the I-270 Spur. Near the site, Fernwood Road is composed of two eastbound lanes and two westbound lanes, and the I-270 Spur is composed of three northbound lines and three southbound lanes. A ramp from I-270 to Democracy Boulevard runs along the southeast section of the property line of the site.

Figure 2: Existing site (proposed buildings outlined in red) and surroundings. Aerial image dated June 11th, 2020, courtesy of Google Earth.

5 NOISE MEASUREMENTS

On July 7-8, 2020, Phoenix Noise & Vibration conducted an on-site noise measurement survey to determine existing transportation noise levels throughout the site. This involved continuous noise level measurements and monitoring for one 24-hour period. Measurements were made using two Norsonic Type 139 and two Type 118 Precision Integrating Sound Level Meters. All meters were calibrated prior to the survey traceable to National Institute of Standards and Technology (NIST). Each meter meets the ANSI S1.4 standard for Type 1 sound level meters.

During the 24-hour measurement, noise levels were recorded and averaged over five-minute time intervals. Noise measurements were then used to calculate the site's 24-hour average day-night noise level (Ldn) which includes the 10-dBA penalty for noise levels measured during nighttime hours.

Measurement results are presented in Table 2. Noise level measurements were made at the locations shown on Drawing 1 of the Appendix. Figure 3 presents the survey results graphically, showing the noise levels as measured in five-minute increments throughout the survey. Figure 3 indicates the actual measured values over the 24-hour period. While the 10-dBA nighttime penalty is not shown graphically, it was included in the Ldn calculations.

Table 2: 24-hour noise measurement results.

Measurement Location	Height Above Existing Grade (feet)	Measured Noise Level (dBA Ldn)
A	25	66
B	25	74
C	25	69
D	25	60

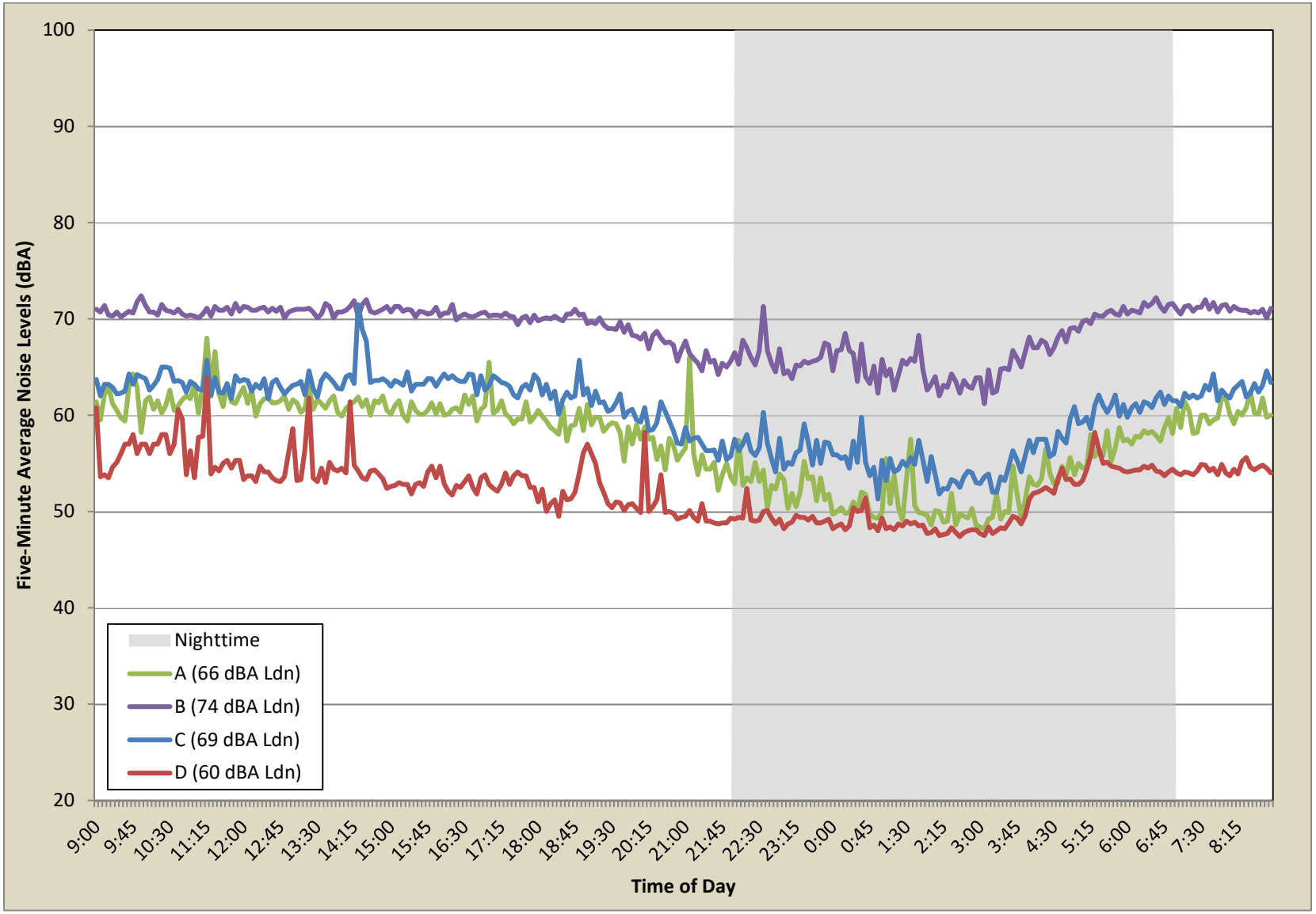
Note that some of the measurement locations contain isolated instances during the 24-hour measurement period at which the noise level appears inconsistent with the rest of the noise profile (i.e. peaks or spikes in the graph). These inconsistencies are typically due to extraneous occurrences, such as emergency sirens or temporary traffic congestion. Such short-term events, while producing a relatively high noise level and which may have a significant impact on the five-minute average, generally have an insignificant effect on the 24-hour Ldn value.

5.1 COVID-19 Pandemic

Phoenix Noise & Vibration has been observing traffic on I-270 since the COVID-19 pandemic began. Starting in mid-March, the stay-at-home orders resulted in lower than typical traffic volumes on major roadways for many weeks. The Maryland State Highway Administration publishes daily traffic volumes for I-270, which Phoenix Noise & Vibration has been monitoring and evaluating to determine when traffic volumes will have returned to a level at which on-site noise measurements could once again be completed without being significantly influenced by the lower traffic volumes.

As of the date of the noise measurements at this site, daily traffic volumes on I-270 had returned to approximately 91% of the pre-pandemic volumes. At 91% of the pre-pandemic volume, the

Figure 3: Five-minute average noise levels recorded during 24-hour noise survey.



effect on the Ldn is 0.4 dBA, which is within the accuracy range of the measurement/modeling technique and considered an imperceptible amount. Noise measurements were therefore completed at ELP Bethesda at Rock Spring as the impact from any remaining stay-at-home orders on roadway volumes (and the resulting noise level) is believed to be minimal relative to the 24-hour average noise level at the site.

6 COMPUTER MODELING

The existing and future sites were computer-modeled using the CadnaA software program, a three-dimensional noise propagation model capable of determining noise impact from multiple noise sources across vertical and horizontal surfaces while accounting for factors such as topography, buildings, barriers, surface reflections, and roadway data (traffic volumes, speeds, and vehicle classifications, etc.). Noise levels can be presented either in spot locations or as noise contours of equal value throughout a defined surface area.

6.1 Current Model

A current model was developed to simulate the existing site and its surroundings using information provided on the site plan,[1] Montgomery County GIS, and data collected during the 24-hour measurement survey, and inputting existing topography, roadway alignments, and buildings. Roadway noise levels were calibrated using the on-site noise measurements by adjusting the modeled input until the modeled noise level output matched the measured values.

6.2 Future Model

A future model was developed by altering the calibrated current model to include the projected roadway data, future site grading, and the future buildings. Currently there are no plans to alter any of the roadways in the vicinity of the site; therefore, the existing roadway alignments were used in the future model. The preliminary building heights used in the model were provided by Soltesz and are shown below in Table 3.

Table 3: Future building heights used in the model.

Building	Height
A	106’-6”
B	106’-6”
C	106’-6”
D	108’-0”
E	114’-0”
F	150’-6”
G	67’-6”
Building G Garage	25’-0”
Health Center	80’-0” (See Note A)

Table 3 Notes:

A. Soltesz did not provide any heights for the health center building; therefore, the building was assumed to be 80 feet tall based on the number of living units within the facility.

[1] Provided by Soltesz, Inc. on May 27, 2020.

Future noise level contours were calculated throughout the site at the ground (5 feet) and upper level (25 feet) as shown on Drawing 2 and 3 of the Appendix. Drawing 2 represents the noise impact upon any at-grade outdoor activity areas throughout the site, while Drawing 3 represents the noise impact 25 feet above grade, typically at the second or third story of a multifamily building. The future model also calculated the projected noise levels across all future building facades (shown on Drawing 4 of the Appendix). The varying colors on the building elevations on Drawing 4 represent the future noise impact at that location. Note how the noise level changes with respect to height and orientation to the roadways.

All noise levels presented on Drawings 2, 3, and 4 are "mitigated" noise levels, calculated in the presence of all future site buildings and topography, as well as all existing surrounding buildings, topography, and significant structures. Mitigated noise levels account for the effect of buildings and other significant structures in reducing and reflecting roadway noise propagation and are more representative of the actual noise level experienced at a specific location.

6.3 Roadway Data

Average annual weekday traffic (AAWDT) volumes, vehicle percentages, and nighttime percentages for the roadways were based upon the most recent data published by the Maryland State Highway Administration (MDSHA). MDSHA does not typically provide future traffic data; therefore, a conservative, 2% increase in traffic compounded annually until 2040 was assumed.[2] All necessary traffic data is provided in Table 4.

Table 4: Roadway traffic data used in the computer models.

Roadway	I-270 Spur	I-270 Ramp	Democracy Boulevard	Fernwood Road
AAWDT (Year)	136,684 (2019)	6,131 (2017)	27,391 (2017)	14,980 (2018)
2040 AAWDT	207,167	9,668	43,193	23,159
Nighttime Percentage	25%	4%	5%	5%
Truck Percentage	2%	3%	< 1%	4%
Posted Speed Limit (mph)	55	35	35	30

6.4 Future Noise Impact

As shown in Drawing 2, a portion of the Civic Green and Linear Park will be exposed to noise levels greater than 65 dBA Ldn. Future transportation noise levels were calculated across each future building elevation (see Drawing 4 of the Appendix). Noise impact upon the elevations of buildings at ELP Bethesda impacted by noise levels higher than 65 dBA Ldn is summarized in Table 5. The Health Center and Buildings A, B and C (not shown in Table 5) will not be impacted by noise levels above 65 dBA Ldn.

[2]Montgomery County typically requires that roadway noise impact studies be conducted using the projected traffic volumes 20 years from the date of the study.

Table 5: Buildings at ELP Bethesda impacted by noise levels above 65 dBA Ldn.

Building Elevation	Future Noise Impact (dBA Ldn) by Building Elevation			
	Building D	Building E	Building F	Building G
North	<65 to 68	<65 to 69	<65 to 71	<65 to 67
East	<65	<65	<65	65 to 72
South	<65	<65	<65 to 71	<65
West	<65 to 66	<65 to 73	<65 to 74	<65

The north and west elevations of Building D, the north and west elevations of Building E, the north, south, and west elevations of Building F, and the north and east elevations of Building G will be exposed to future noise levels above 65 dBA Ldn. Residential units exposed to noise levels above 65 dBA Ldn require further analysis (see Section 7.2 below) to determine the mitigation measures necessary to maintain interior noise levels below 45 dBA Ldn.

The remaining residential units on all other elevations will not be exposed to future transportation noise levels above 65 dBA Ldn. These residences require no further analysis or modifications to comply with the residential noise regulations of Montgomery County.

7 MITIGATION

According to Montgomery County's noise regulations for residential development, residential sites and buildings impacted by noise levels above 65 dBA Ldn (at any height) require further analysis to determine the mitigation measures necessary to maintain noise levels in outdoor activity areas and interior living spaces below 65 and 45 dBA Ldn, respectively.

7.1 Outdoor Noise Levels

Drawing 2 indicates that a portion of the Civic Green and Linear Park along Fernwood Road will be exposed to noise levels greater than 65 dBA Ldn. Depending upon whether these outdoor spaces will be held to the 65 dBA Ldn limit, and furthermore which portion of these outdoor spaces will be held to the 65 dBA Ldn limit, additional mitigation may be required.

Additionally, while not available at the time of this analysis, future drawings may indicate outdoor amenity areas (courtyards, rooftops, etc.) for the buildings may be exposed to noise levels above 65 dBA Ldn. Any outdoor activity areas for Buildings D, F, and G exposed to noise levels greater than 65 dBA Ldn will require mitigation.

7.2 Interior Noise Levels

7.2.1 Building Shell Analysis

According to the noise levels shown on Drawings 3 and 4, residential units located closest to the I-270 Spur and Fernwood Road in Buildings D, E, F, and G will be exposed to future transportation noise levels greater than 65 dBA Ldn, with noise impact up to 74 dBA Ldn for the residential units on the west elevation of Building F. Residential buildings exposed to noise levels above 65 dBA Ldn require further analysis to determine whether the proposed building construction will be capable of maintaining interior noise levels below 45 dBA Ldn. This evaluation, or "building shell analysis," calculates a room's interior noise level based upon its

exterior noise level, the Sound Transmission Class (STC) ratings[3] of its various building components, the amount of exposed exterior wall area, and the room's size and finish.

Modifications to standard building construction may not be necessary for all units impacted by future noise levels above 65 dBA Ldn. It is possible that the proposed standard building construction will provide enough noise reduction to maintain the required 45 dBA Ldn interior noise level.

When architectural drawings are further developed (typically during the Design Development phase), noise impact upon each building will be analyzed on an elevation-by-elevation, floor-by-floor basis for each individual residential unit impacted by transportation noise levels above 65 dBA Ldn. Likewise, mitigation requirements will also be provided for each individual residential unit. Calculating minimum STC ratings specific to each unit reduces "overbuilding" (i.e. installing windows/doors with unnecessarily high STC ratings).

To aid in the early phases of the design process and provide information on the factors that influence noise reduction in residential buildings, general mitigation design guidelines and explanations are provided in the section that follows.

7.2.2 STC Rating Requirements

The noise reduction provided by a building structure, and the resulting interior noise level, are primarily dependent upon the percentage of the exterior wall surface area occupied by "non-wall" items and the STC ratings of these items. These items, typically windows and doors, act as "holes" in what would otherwise be a relatively effective exterior wall, significantly reducing its ability to prevent noise transmission. Consequently, the exterior surface area occupied by windows and doors is a significant issue. This information is recorded and tracked so that the STC ratings of exterior elements can be adjusted accordingly until the required interior noise level is achieved.

While the wall construction is also an important factor, the "holes" in the wall (i.e. the windows and doors) must be addressed first if the noise reduction of the overall building shell is to be significantly increased and the interior noise level decreased. This can be accomplished by reducing the size of existing windows/doors and/or increasing the STC ratings of windows/doors.

Table 6 and Table 7 illustrate this concept, indicating window/door STC rating requirements based upon the window/door (or glass) area when using either cementitious/Hardi panel or brick/masonry exterior walls.[4] The STC ratings shown are those necessary to maintain interior noise levels at 45 dBA Ldn when using that specific exterior wall construction. When looking at Tables 6 and 7, recall that the maximum noise impact upon ELP Bethesda at Rock Spring will be 74 dBA Ldn.

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[3] The STC rating is a single number value which describes a building element's (wall, window, door, roof, etc.) ability to reduce noise transmission from one side of the partition to the other.

[4] STC ratings were calculated assuming exterior walls constructed of one layer of 5/8" interior gypsum board, 2" x 4" wood studs with 3.5" fiberglass batt insulation, one layer of ½" exterior plywood, and the specified exterior wall finish.

The values included in Tables 6 and 7 were calculated using one generic room (15 feet x 15 feet, carpeted room with two walls exposed to noise) to demonstrate the concept of varying window/door percentages and the resulting effect on required STC ratings. Values in Tables 6 and 7 **should not** be universally applied to outdoor noise impact from ELP Bethesda at Rock Spring; however they can be used to gain a general idea of the window/door STC ratings to be expected based upon the level of noise impact upon a building elevation. Actual STC ratings will depend upon interior room finishes and characteristics, room/building orientation with respect to the noise source, building geometry, etc.

Table 6: Hypothetical window/door STC ratings with cementitious or Hardi panel exterior walls.

	Percentage of Exterior Wall Area Occupied by Windows/Doors			
	20%	40%	60%	80%
Outdoor Noise Impact (dBA Ldn)	**Required Window/Door STC Rating Necessary to Maintain Interior Noise Levels Below 45 dBA Ldn (When Using Cementitious or Hardi Panel Exterior Walls)**			
65	25	25	27	28
70	28	30	32	33
75	35	37	38	39

Table 7: Hypothetical window/door STC ratings with brick/masonry exterior walls.

	Percentage of Exterior Wall Area Occupied by Windows/Doors			
	20%	40%	60%	80%
Outdoor Noise Impact (dBA Ldn)	**Required Window/Door STC Rating Necessary to Maintain Interior Noise Levels Below 45 dBA Ldn (When Using Brick/Masonry Exterior Walls)**			
65	25	25	27	28
70	27	30	32	33
75	32	35	37	38

STC ratings apply to one individual element. The composite STC rating is the overall STC rating of a partition with multiple elements (e.g. a wall with a window) and is always controlled by the building element with the lowest individual STC rating. In residential construction, this is almost always the glass (windows and doors); therefore, the percentage of the exterior wall occupied by glass becomes critical. This also means the amount of outdoor noise heard inside a unit is primarily dependent on the glass percentage and STC rating, not the wall STC rating.

In other words, when the glass occupies such a significant portion of the exterior wall, increasing the wall STC rating even drastically will not decrease the interior noise level. Increasing the composite STC rating of the partition must be accomplished by first addressing the "weakest link" in the partition (the glass).

Note that when windows and/or doors occupy a high percentage of the impacted façade, substantially higher window/door STC ratings than those typically used in standard construction (usually around 26 STC) may be required depending upon the noise level impact.

8 CONCLUSION

The proposed ELP Bethesda at Rock Spring development will be exposed to future transportation noise levels above 65 dBA Ldn and up to 74 dBA Ldn. While this represents a moderate level of noise impact, compliance with Montgomery County's residential noise regulations can be achieved through reasonable modifications to proposed building plans.

A portion of the outdoor activity areas may be exposed to noise levels greater than 65 dBA Ldn. Additionally, the architectural plans for the buildings are not far along enough to show all outdoor amenity areas (courtyards, rooftops, etc.). If there will be outdoor activity areas on Buildings D, E, F, or G that are facing the roadways, they may be exposed to noise levels above 65 dBA Ldn. Mitigation will be required for any outdoor activity area exposed to noise levels greater than 65 dBA Ldn.

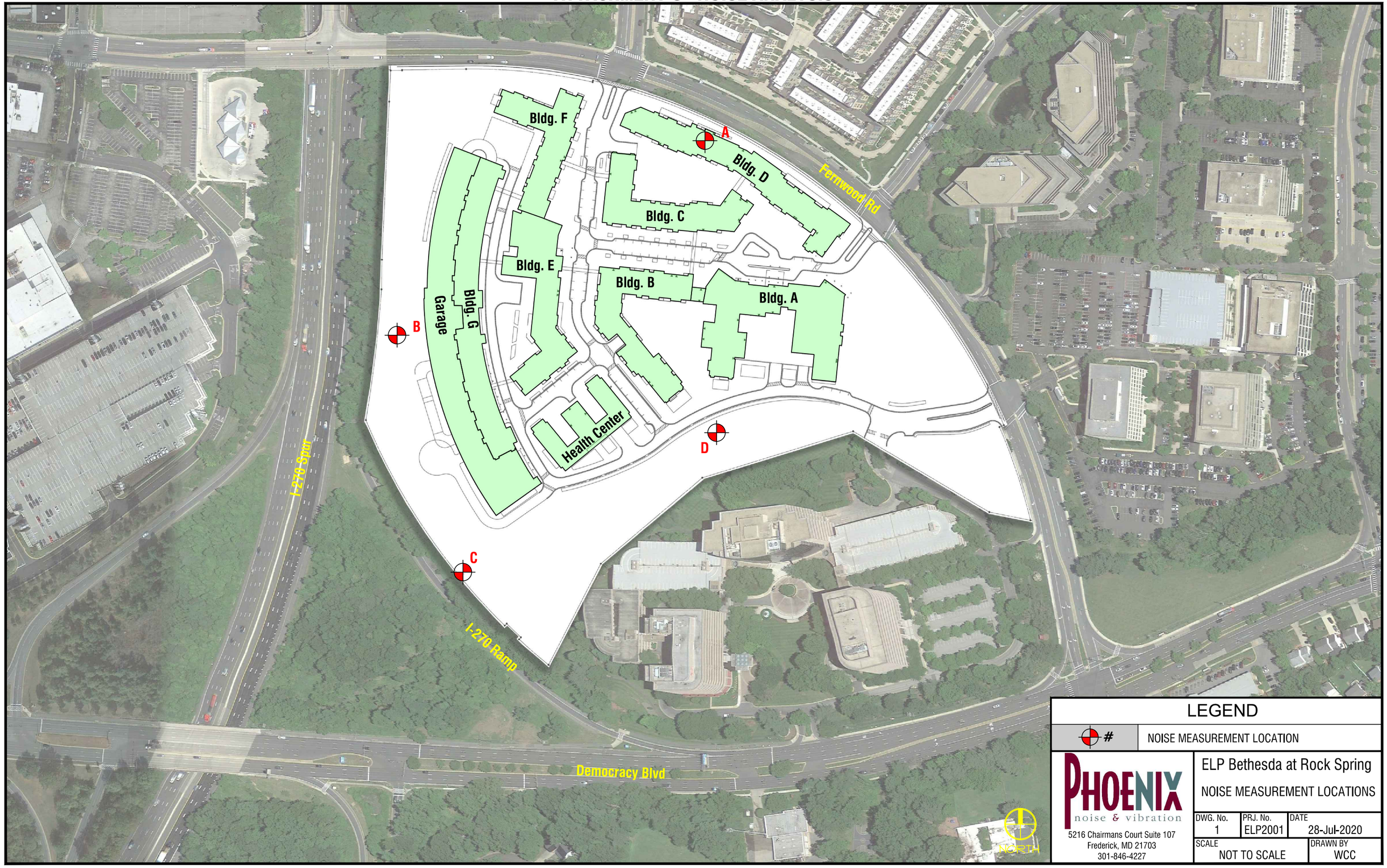
Residential units located closest to the I-270 Spur and Fernwood Road in Buildings D, E, F, and G will be exposed to future transportation noise levels greater than 65 dBA Ldn, with noise impact up to 74 dBA Ldn upon the residential units on the west elevation of Building F.

Residential units with impact above 65 dBA Ldn require further analysis and may require modifications to the proposed standard building construction. Depending upon the noise level specific to each impacted unit, modifications may include increased window/door STC ratings or slight adjustments to exterior wall construction. Further analysis is required to determine the exact mitigation designs necessary, which will be established once architectural plans (building elevations, window/door schedule, unit plans) are further developed.

The Health Center, remaining residential units in Buildings D, E, F, and G, and all residential units in Buildings A, B, and C, will not be exposed to future transportation noise levels above 65 dBA Ldn. These residences require no further analysis or modifications to comply with Montgomery County's residential interior noise regulation.

APPENDIX

ATTACHMENT G - NOISE ANALYSIS



LEGEND

#	NOISE MEASUREMENT LOCATION

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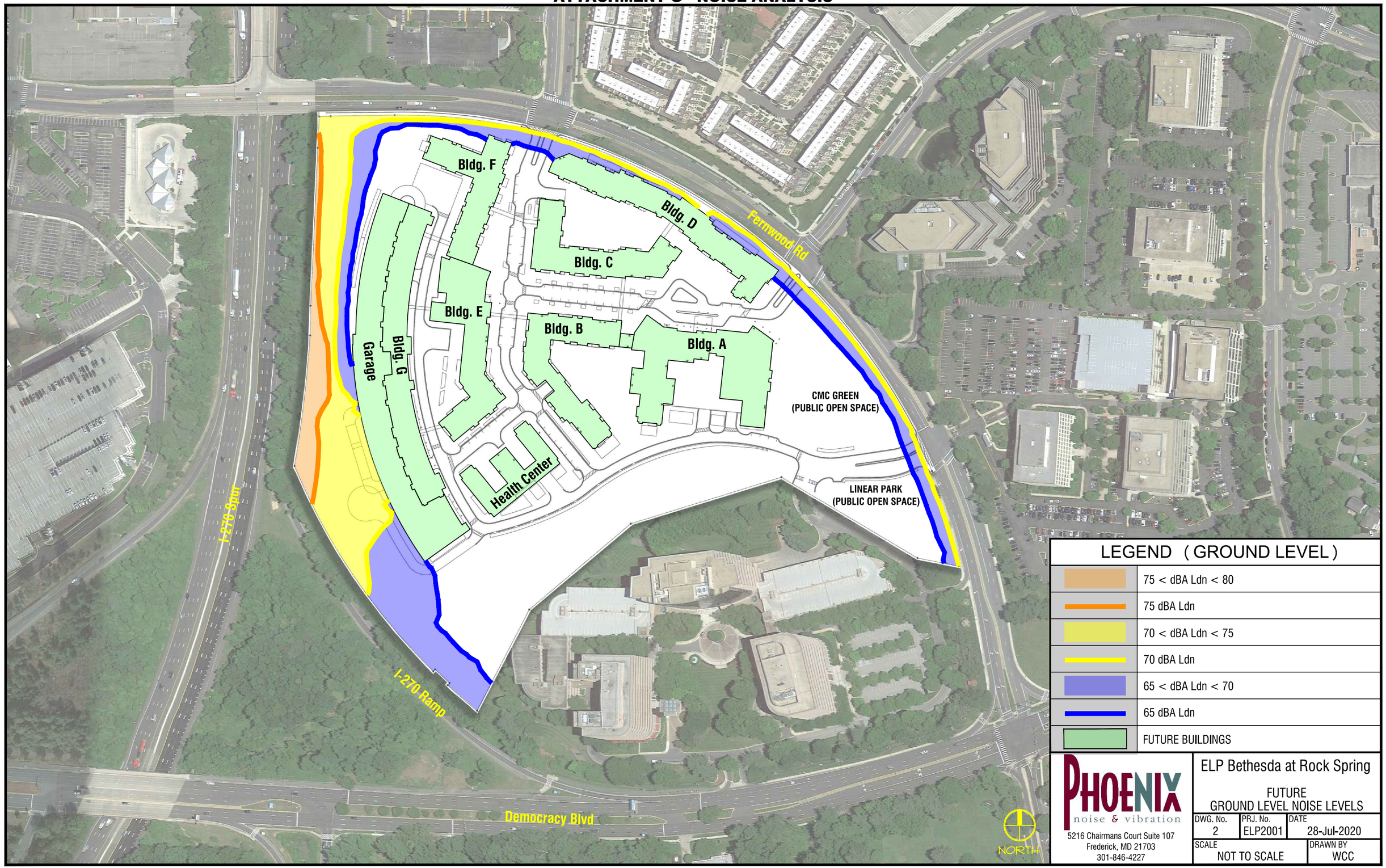
ELP Bethesda at Rock Spring

NOISE MEASUREMENT LOCATIONS

DWG. No.	PRJ. No.	DATE
1	ELP2001	28-Jul-2020

SCALE	DRAWN BY
NOT TO SCALE	WCC

ATTACHMENT G - NOISE ANALYSIS



LEGEND (GROUND LEVEL)

	75 < dBA Ldn < 80
	75 dBA Ldn
	70 < dBA Ldn < 75
	70 dBA Ldn
	65 < dBA Ldn < 70
	65 dBA Ldn
	FUTURE BUILDINGS

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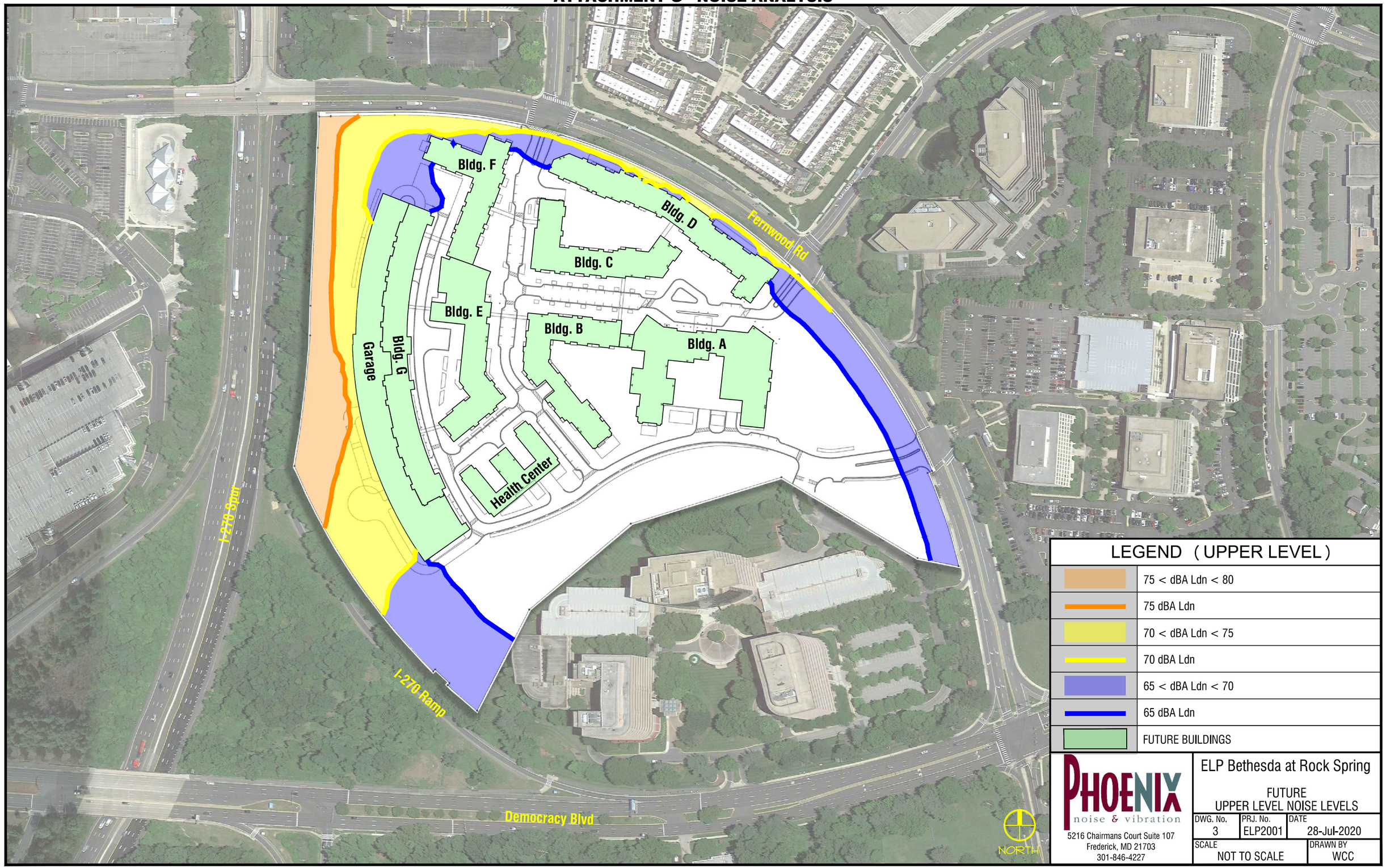
FUTURE
GROUND LEVEL NOISE LEVELS

DWG. No.	PRJ. No.	DATE
2	ELP2001	28-Jul-2020

SCALE	DRAWN BY
NOT TO SCALE	WCC

ATTACHMENT G - NOISE ANALYSIS



LEGEND (UPPER LEVEL)	
	75 < dBA Ldn < 80
	75 dBA Ldn
	70 < dBA Ldn < 75
	70 dBA Ldn
	65 < dBA Ldn < 70
	65 dBA Ldn
	FUTURE BUILDINGS

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ELP Bethesda at Rock Spring

FUTURE
UPPER LEVEL NOISE LEVELS

DWG. No.	PRJ. No.	DATE
3	ELP2001	28-Jul-2020

SCALE	DRAWN BY
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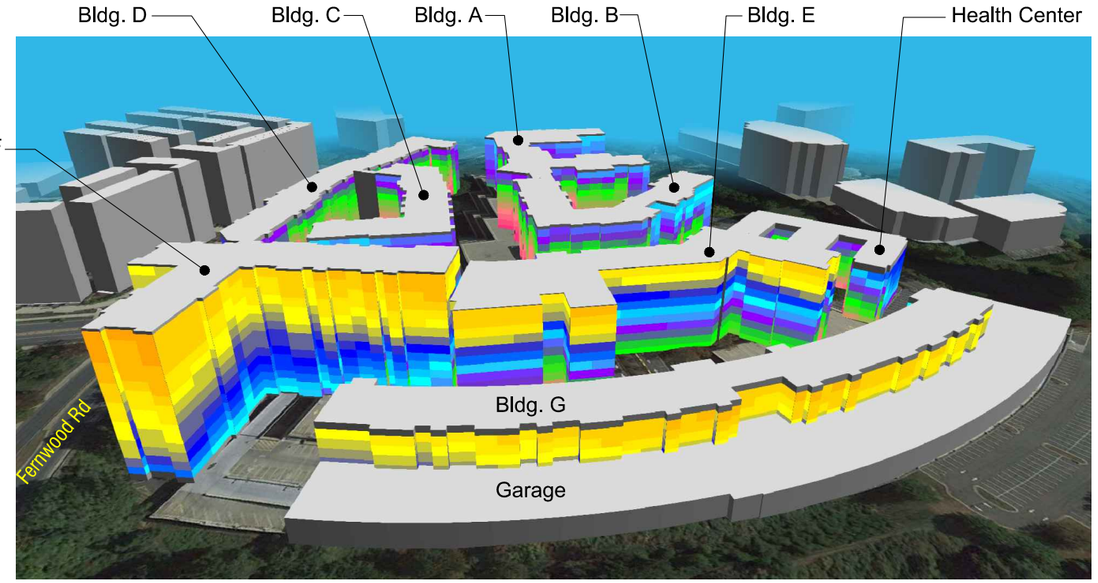
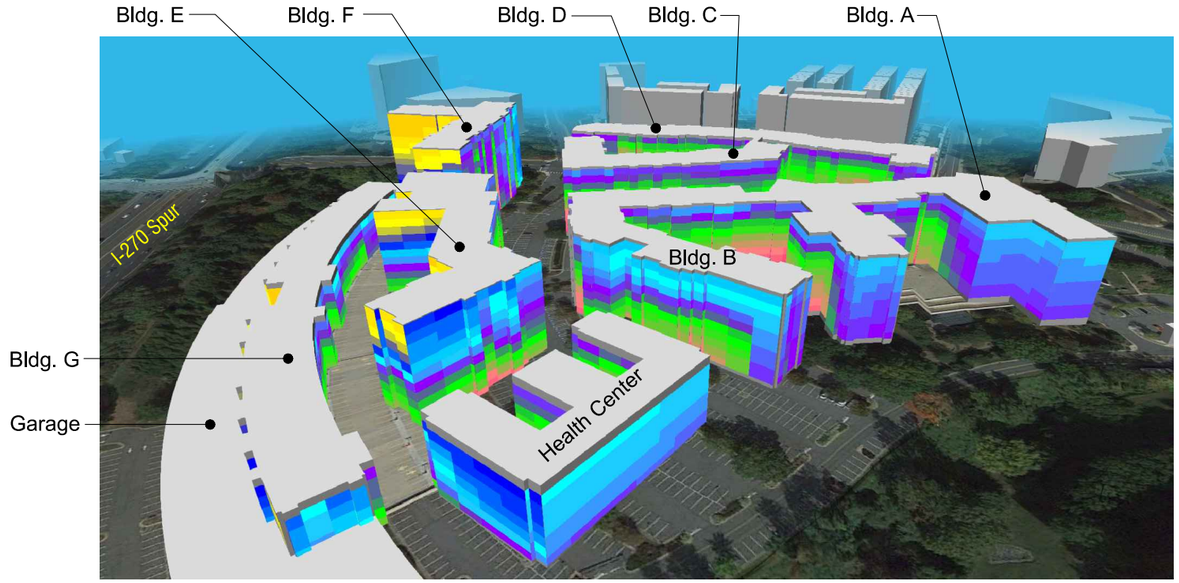
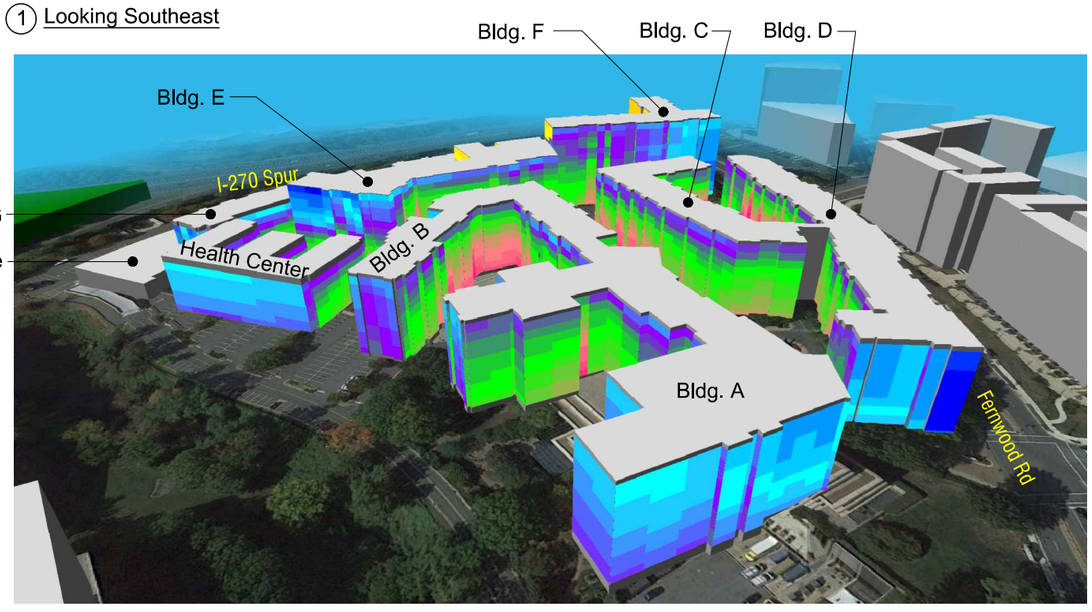


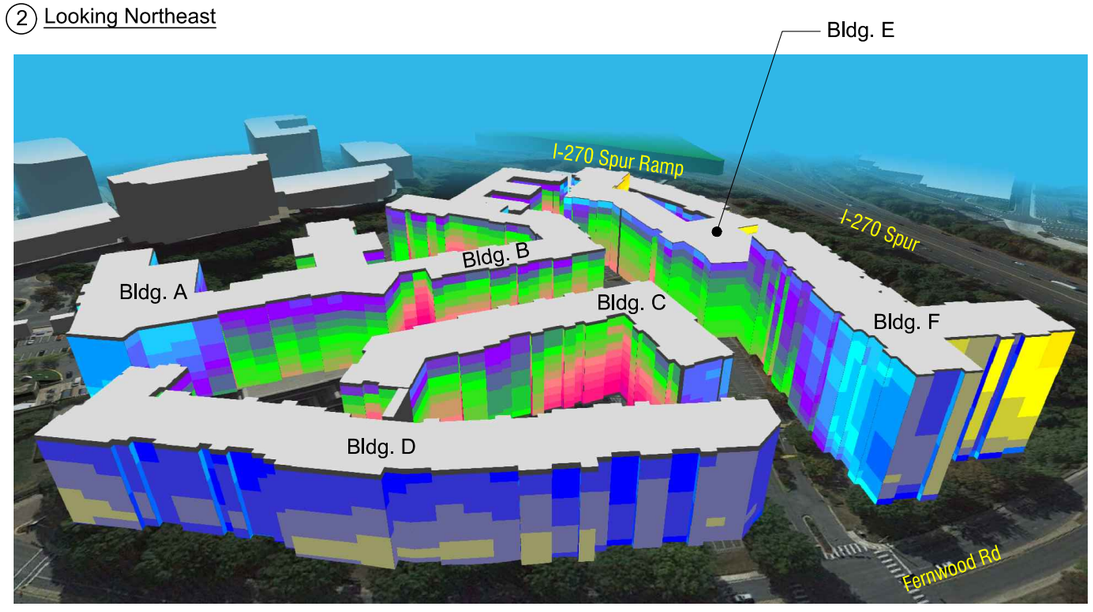
1 Looking Southeast



2 Looking Northeast



3 Looking Northwest

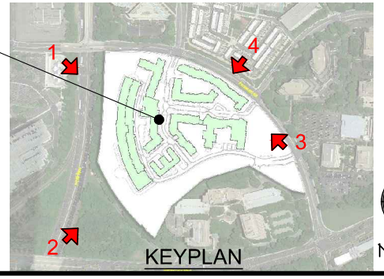


4 Looking Southwest

Future Transportation Noise Levels (dBA DNL)

74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40

ELP Bethesda at Rock Spring



NORTH

PHOENIX noise & vibration
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Frederick, MD 21703
301-846-4227

ELP Bethesda at Rock Spring

FUTURE TRANSPORTATION NOISE IMPACT

DWG. No.	PRJ. No.	DATE
4	ELP2001	28-Jul-2020

SCALE	DRAWN BY
NOT TO SCALE	WCC