ASTI ENVIRONMENTAL

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May 14, 2020

Sent via email only

Dane Olmstead
Chief Investment Officer
Jackson Dearborn Partners
404 Wells Street Suite 400
Chicago, IL 60607

RE: Sound Transmission Calculations (STC) for Noise Attenuation for the Proposed Residential Development Located at: Powers Blvd. and Galley Road, Colorado Springs, Colorado (ASTI Project No. 11311)

Dear Mr. Olmstead:

ASTI Environmental (ASTI) was retained to estimate the noise attenuation for the exterior wall, door and window assemblies for the Proposed Residential Development located at: Powers Blvd. and Galley Road, Colorado Springs, Colorado.

Applicable Standards

Federal regulations 24 CFR 51, Subpart B requires a noise assessment for proposed new construction if the project is located near a major noise source, i.e., civil airports (within 5 miles), military airfields (15 miles), major highways or busy roads (within 1000 feet), or railroads (within 3000 feet).

Department of Housing and Urban Development U.S. Department of Housing and Urban Affairs (HUD) defines acceptability of land used for residential development to be Normally Acceptable when the measured DNL < 65 dB(A). Residential areas with an DNL < 65 dB(A) comply with the Normally Acceptable Criteria for residential development, areas that have DNL's > 65 and < 75 dB(A) are considered Normally Unacceptable, and areas that have DNL's > 75 dB(A) are considered Unacceptable. For residential housing in the Normally Unacceptable category Interior DNL's must be less than 4 dB(A).

Methodology

ASTI based the following estimates on the noise attenuation methods in the HUD Noise Notebook Chapter 4 Supplement and Catalog of STC and the STC and IIC Ratings for Wall and Floor/Ceiling Assemblies, California Department of Health Services.

Proposed Residential Development Project

The proposed wall, window and door designs are from the LCM Architects drawings dated June 21, 2019. Manufacture, model numbers or STC ratings were not included in the plans. STC rating for the windows was provided via email. STC ratings for walls were estimated based on the architectural drawings and the HUD Noise Book Chapter 4 Supplement or the California Department of Health Catalog of STC and IIC Ratings for Wall and Floor/Ceiling Assemblies.

The site Location Map and the Site Features Map with the Noise Assessment Locations (NAL) are attached to this letter. The locations were chosen based on the shortest distance from the source.

Table 1 Proposed Wall Window and Door Designs and Alternative Designs

Proposed Residential Development Powers Blvd. and Galley Rd., Colorado Springs, Colorado

Cross Section Design	Description	STC
NAL 1 and NAL 2; Building Type II Design and STC provided by architect Windows - 1,115 sf	• Vinyl frame • Insulated glass • Steel reinforced	39
NAL 1 and NAL 2; Building II Design and STC provided by architect Doors - 308 sf	• Vinyl frame • Insulated glass • Steel reinforced	39
NAL 1 and NAL 2; Building Type II HUD Noise Book Chapter 4 Supplement Brick (1,253 sf) and Concrete Siding (1,022 sf) total 2,153 sf	• 1 courses of brick • ½" air space with metal ties • 3/4 insulation board sheathing • 2"x4" studs; 16" O.C. • Resilient channel • Fiberglass Insulation (3-1/2") • ½" gypsum board	54
NAL 1 and NAL 2; Building Type II California STC Book (1.2.2.1.5.8) Aluminum Siding - 1,753 sf	• 2x4 studs, 16" O.C. • 5/8" type X gypsum Board Screwed 12" O.C. • Resilient channels, 24" O.C. • 5/8" type X gypsum Board Screwed 12" O.C. • 3" thick sound attenuation blanket	52
A cross section for aluminum siding was not available in the data bases. Closest cross section is shown.		
NAL 3 Building Type I Design and STC provided by architect Windows - 674 sf	• Vinyl frame • Insulated glass • Steel reinforced	39

Table 1 Proposed Wall Window and Door Designs and Alternative Designs

Proposed Residential Development Powers Blvd. and Galley Rd., Colorado Springs, Colorado

Cross Section Design	Description	STC
NAL 3 Building Type I Design and STC provided by architect Doors - 69 sf	• Vinyl frame • Insulated glass • Steel reinforced	39
HUD Noise Book Chapter 4 Supplement Wood Panel Horizontal 638 sf; Vertical 898; total 1,536 sf -	• 5/8" redwood siding • 1/2" insulation board sheathing • 2x4 wood studs 16" O.C. • fiberglass building insulation 3-1/2" • Resilient channel • 1/2" gypsum board screwed to channel	47
HUD Noise Book Chapter 4 Supplement Feathered Stone 1,389 sf - Cast Stone 712 sf; total 2,101	• 1 courses of brick • ½" air space with metal ties • 3/4 insulation board sheathing • 2"x4" studs; 16" O.C. • Resilient channel • Fiberglass Insulation (3-1/2") • ½" gypsum board	54

Traffic Volumes

Traffic volumes were obtained from the El Paso County Department of Transportation and the Colorado Online Transportation Information Service. Airport noise levels were obtained from the National Transportation Board web site Noise Map.

Railroad Noise

There are not heavy or light rail lines within 3,000 ft of the proposed development.

Airport Noise

Noise contours for Colorado Springs Airport and Paterson Air Force Base show 60 dB(A) to 65 dB(A) contours across the site. The 65 dB(A) contour was used to calculate outdoor noise with the HUD DNL calculator.

HUD DNL Calculator

Exterior noise levels at the proposed development were calculated with the HUD DNL calculator. Predicted traffic for the year 2029 for Powers Blvd. and Galley Road; and, an airport noise at 65 dB(A) was input to calculate exterior noise levels.

Summary of Calculations

The following Table 2 summarizes the calculations completed according to the HUD Noise Notebook using HUD's figure 17 in Chapter 4 of the Notebook.

Table 2 – Summary of STC Calculations
Proposed Residential Development Powers Blvd. and Galley Rd., Colorado Springs, Colorado

Location	Calculated Exterior Noise HUD DNL Calculator	Calculated STC Wall/Windows/ Doors Based on HUD Figure 17	Calculated Interior Noise
NAL 1 Building Type II	69	44	25
NAL 2 Building Type II	69	44	25
NAL 3 Building Type I	66	44	22

Conclusions

The level of accuracy for the calculations in this report are limited to level of accuracy of the information provided by the HUD methodology and HUD or California Guidelines for STC ratings for walls, windows and doors.

US EPA guidelines and regulations in 24 CFR 51 states 65 decibel, or below, exterior noise level is acceptable. Interior acceptable noise level is 45 decibels or less. The calculations indicate that interior noise levels are acceptable.

According to the Board of County Commissioners, County of El Paso, State of Colorado Resolution No. 17-118, Conditions and Notations of Approval, states "Multifamily Development is appropriate at this location, despite being located within the ADNL subzone, as a result of the applicant using construction techniques to decrease indoor noise levels to 30 dB(A) or lower." Item 2 states "A 30 dB(A) indoor noise reduction shall be achieved by approved construction techniques as evidenced by a Noise Reduction Certificate prior to site development plan approval." Based on the data sources cited in this letter report and noise level calculations using HUD methodology, the required 30 dB(A) reduction and less than 30 dB(A) interior noise level will be attained for the proposed development.

If you have any questions or comments, please do not hesitate to call me at **800.395.ASTI**. We greatly appreciate the opportunity to work with you on this project.

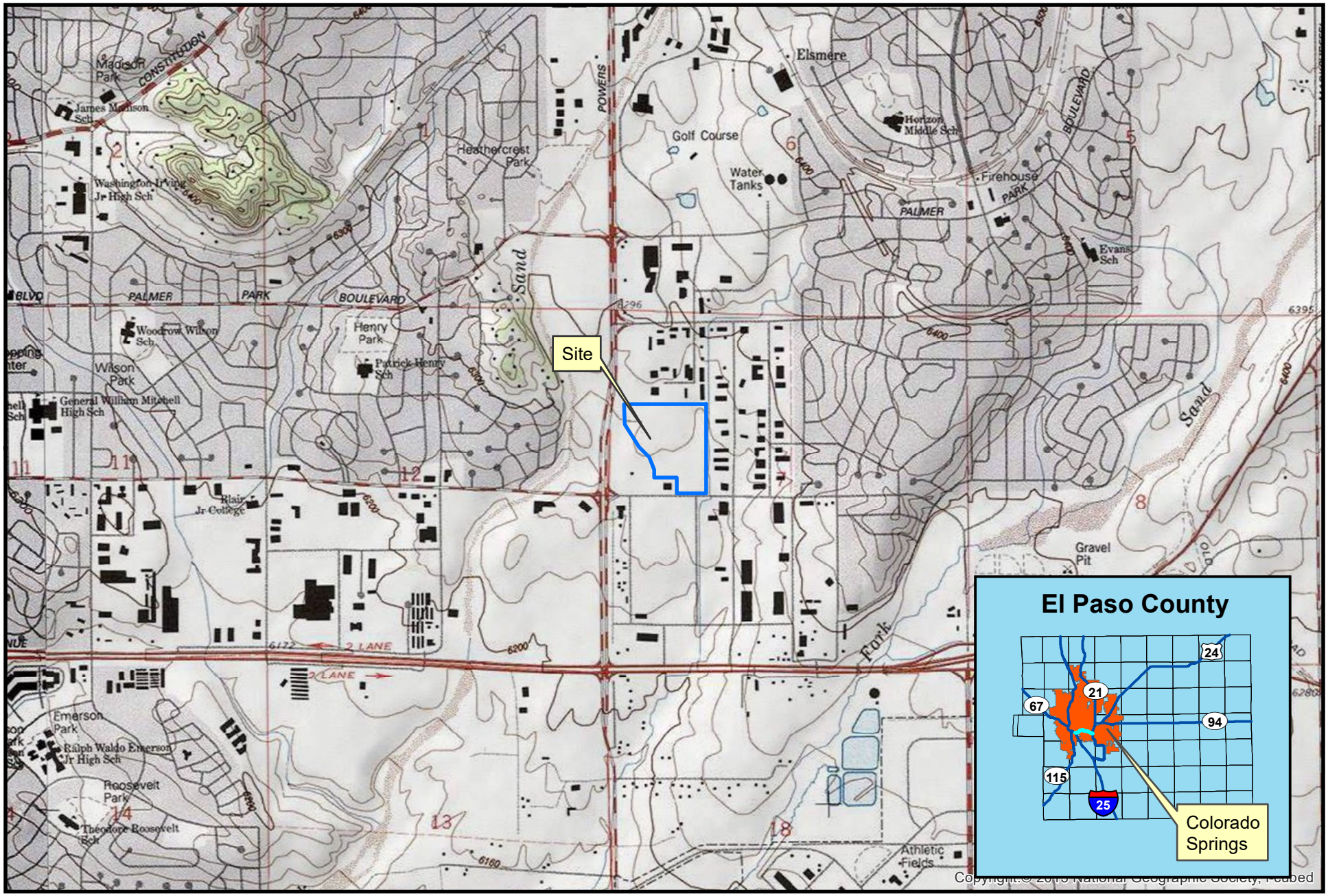
Sincerely yours,

ASTI ENVIRONMENTAL

Bruce Bawkon
Director, Industrial Compliance

Attachments: Site Location Map
Site Features Map
HUD DNL Calculations

Attachment A
Site Location Map
Site Features Map



STC Ratings for Sound Attenuation

Powers Boulevard (US 21) & Galley Road,
Colorado Springs, CO

2,000 1,000 0 2,000 Feet

ASTI Environmental

Created for: N.E.S Inc.
Created by: RMH, December 12, 2019, ASTI Project 11311

Township T14S, Range R65W
Lat. 38.85, Long. -104.72

Site Location Map

STC Ratings for Sound Attenuation

Powers Boulevard (US 21) & Galley Road, Colorado Springs, CO

150 75 0 150 Feet

ASTI Environmental

Created for: N.E.S Inc.
Created by: RMH, December 18, 2019, ASTI Project 11311

Township T14S, Range R65W
Lat. 38.85, Long. -104.72

Figure 2 - STC Calculations

Attachment B
HUD DNL Calculations

DNL Calculator

The Day/Night Noise Level Calculator is an electronic assessment tool that calculates the Day/Night Noise Level (DNL) from roadway and railway traffic. For more information on using the DNL calculator, view the **Day/Night Noise Level Calculator Electronic Assessment Tool Overview (/programs/environmental-review/daynight-noise-level-electronic-assessment-tool/)**.

Guidelines

- To display the Road and/or Rail DNL calculator(s), click on the "Add Road Source" and/or "Add Rail Source" button(s) below.
- All Road and Rail input values must be positive non-decimal numbers.
- All Road and/or Rail DNL value(s) must be calculated separately before calculating the Site DNL.
- All checkboxes that apply must be checked for vehicles and trains in the tables' headers.
- **Note #1:** Tooltips, containing field specific information, have been added in this tool and may be accessed by hovering over all the respective data fields (site identification, roadway and railway assessment, DNL calculation results, roadway and railway input variables) with the mouse.
- **Note #2:** DNL Calculator assumes roadway data is always entered.

DNL Calculator

Site ID	11311 Powers and Galley Rd Colorado Springs
Record Date	05/14/2020
User's Name	ASTI NAL 1

Road # 1 Name:	**Powers Blvd.**

Road #1

Vehicle Type	Cars ☑	Medium Trucks ☑	Heavy Trucks ☑
Effective Distance	439	439	439
Distance to Stop Sign			
Average Speed	55	55	55
Average Daily Trips (ADT)	67532	2936	2936
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	62	58	66
Calculate Road #1 DNL	68	Reset	

Add Road Source | Add Rail Source

Airport Noise Level	65
Loud Impulse Sounds?	○ **Yes** ◉ **No**
Combined DNL for all Road and Rail sources	**68**
Combined DNL including Airport	**69**
Site DNL with Loud Impulse Sound	

Calculate Reset

Mitigation Options

If your site DNL is in Excess of 65 decibels, your options are:

- **No Action Alternative**: Cancel the project at this location
- **Other Reasonable Alternatives**: Choose an alternate site
- **Mitigation**
  - **Contact your Field or Regional Environmental Officer (/programs/environmental-review/hud-environmental-staff-contacts/)**
  - Increase mitigation in the building walls (only effective if no outdoor, noise sensitive areas)
  - Reconfigure the site plan to increase the distance between the noise source and noise-sensitive uses
  - Incorporate natural or man-made barriers. See ***The Noise Guidebook (/resource/313/hud-noise-guidebook/)***
  - Construct noise barrier. See the **Barrier Performance Module (/programs/environmental-review/bpm-calculator/)**

Tools and Guidance

Day/Night Noise Level Assessment Tool User Guide (/resource/3822/day-night-noise-level-assessment-tool-user-guide/)

Day/Night Noise Level Assessment Tool Flowcharts (/resource/3823/day-night-noise-level-assessment-tool-flowcharts/)

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- **Note #2:** DNL Calculator assumes roadway data is always entered.

DNL Calculator

Site ID	11311 Powers and Galley Rd Colorado Springs
Record Date	05/14/2020
User's Name	ASTI NAL 2

Road # 1 Name:	**Powers Blvd.**

Road #1

Vehicle Type	Cars ☑	Medium Trucks ☑	Heavy Trucks ☑
Effective Distance	557	557	557
Distance to Stop Sign			
Average Speed	55	55	55
Average Daily Trips (ADT)	67532	2936	2936
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	60	57	64
Calculate Road #1 DNL	66	Reset	

Add Road Source | Add Rail Source

Airport Noise Level	65
Loud Impulse Sounds?	○ **Yes** ◉ **No**
Combined DNL for all Road and Rail sources	**66**
Combined DNL including Airport	**68**
Site DNL with Loud Impulse Sound	

Calculate Reset

Mitigation Options

If your site DNL is in Excess of 65 decibels, your options are:

- **No Action Alternative**: Cancel the project at this location
- **Other Reasonable Alternatives**: Choose an alternate site
- **Mitigation**
  - **Contact your Field or Regional Environmental Officer (/programs/environmental-review/hud-environmental-staff-contacts/)**
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DNL Calculator

Site ID	11311 Powers and Galley Rd Colorado Springs
Record Date	05/14/2020
User's Name	ASTI NAL 3

Road # 1 Name:	**Galley Rd.**

Road #1

Vehicle Type	Cars ☑	Medium Trucks ☑	Heavy Trucks ☑
Effective Distance	530	530	530
Distance to Stop Sign			
Average Speed	45	45	45
Average Daily Trips (ADT)	20885	908	908
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	54	50	58

Calculate Road #1 DNL | 60 | Reset

Add Road Source | Add Rail Source

Airport Noise Level	65
Loud Impulse Sounds?	○ **Yes** ◉ **No**
Combined DNL for all Road and Rail sources	**60**
Combined DNL including Airport	**66**
Site DNL with Loud Impulse Sound	

Calculate Reset

Mitigation Options

If your site DNL is in Excess of 65 decibels, your options are:

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