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August 29, 2017

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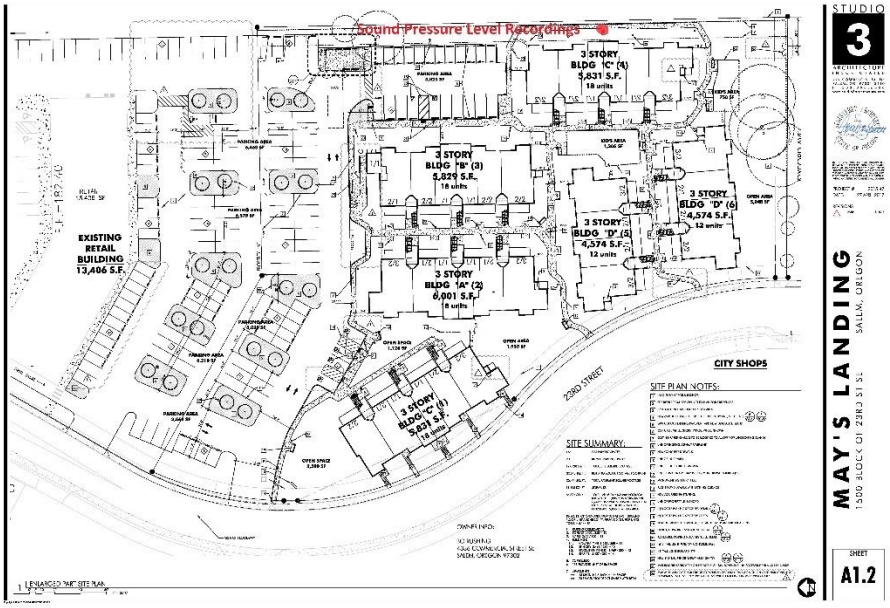
Re: Acoustical Engineering Services, Sound transmission analysis and recommendations, for the property located at the 1700-18000 Block of 23rd Street SE Salem Oregon

introduction

I this report we evaluate the noise from McNary Field, truck and machinery across the proposed location of the residential dwelling at 1700-18000 Block of 23rd Street SE Salem Oregon, and provide recommendations that would address the indoors day-night average sound level (L_{dn}) so it would be below L_{dn}-45. U.S. Department of Housing and Urban Development (HUD) regulations do not contain standards for interior noise levels. Rather, a goal of 45 decibels is set forth and the attenuation requirements are geared towards achieving that goal.

Figure 1
Development Site
And Sound Pressure Level Recordings



Sound Pressure Level Recording

The following instruments were used for the recordings:

- Precision sound level meter and analyzer, General Radio Model 1982
- Sound level calibrator, ACO Pacific, Inc., Model 511E
- Portable Tape Recorder, Marantz Professional Solid State Recorder PMD660

The recording was made with General Radio Precision Sound Level Meter (SLM) and analyzer (Type, I) Model 1982 Serial #0657982. The unit was calibrated on the site with a hand-held calibrator before the readings were made. The sound was recorded on Marantz Professional Solid State Recorder PMD660, and was analyzed in the acoustical laboratory using Spectra Pro Professional edition software. On 6:00 PM, Sunday, August 20, 2017 through 6:00 PM Monday August 21, 2017 *AAcoustics* visited the site (shown in Red in Figure 2) with a Sound Pressure Level meter to survey this site. During data collection, the weather was without rain or perceptible wind.

Table 1
Findings of Sound Pressure Level Recordings

Date	Time	L_{eq}	L_{10}	L_{50}	L_{90}
20-Aug	6:00 PM	58.9	62.7	57.8	59.0
20-Aug	7:00 PM	63.1	60.1	58.1	56.2
20-Aug	8:00 PM	57.2	59.9	57.9	56.6
20-Aug	9:00 PM	58.2	60.5	58.3	56.8
20-Aug	10:00 PM	58.4	59.7	57.9	56.6
20-Aug	11:00 PM	57.4	59.2	57.6	56.1
20-Aug	12:00 AM	57.1	61.5	56.9	56.0
21-Aug	1:00 AM	56.5	57.3	56.2	55.5
21-Aug	2:00 AM	57.7	59.1	57.0	56.0
21-Aug	3:00 AM	57.2	59.0	56.7	55.8
21-Aug	4:00 AM	59.7	60.1	58.6	56.9
21-Aug	5:00 AM	58.4	59.0	57.8	57.0
21-Aug	6:00 AM	80.0	78.2	65.7	60.6
21-Aug	7:00 AM	64.2	67.0	64.0	61.3
21-Aug	8:00 AM	64.2	75.0	63.1	60.0
21-Aug	9:00 AM	65.7	70.4	63.6	62.7
21-Aug	10:00 AM	66.0	69.8	65.7	64.2
21-Aug	11:00 AM	62.4	65.6	62.1	59.7
21-Aug	12:00 PM	63.3	65.2	61.9	60.0
21-Aug	1:00 PM	62.3	65.5	61.8	59.8
21-Aug	2:00 PM	61.2	63.3	60.7	57.3
21-Aug	3:00 PM	61.6	63.5	61.1	58.7
21-Aug	4:00 PM	59.1	63.0	58.2	58.0
21-Aug	5:00 PM	62.1	61.8	59.0	57.3

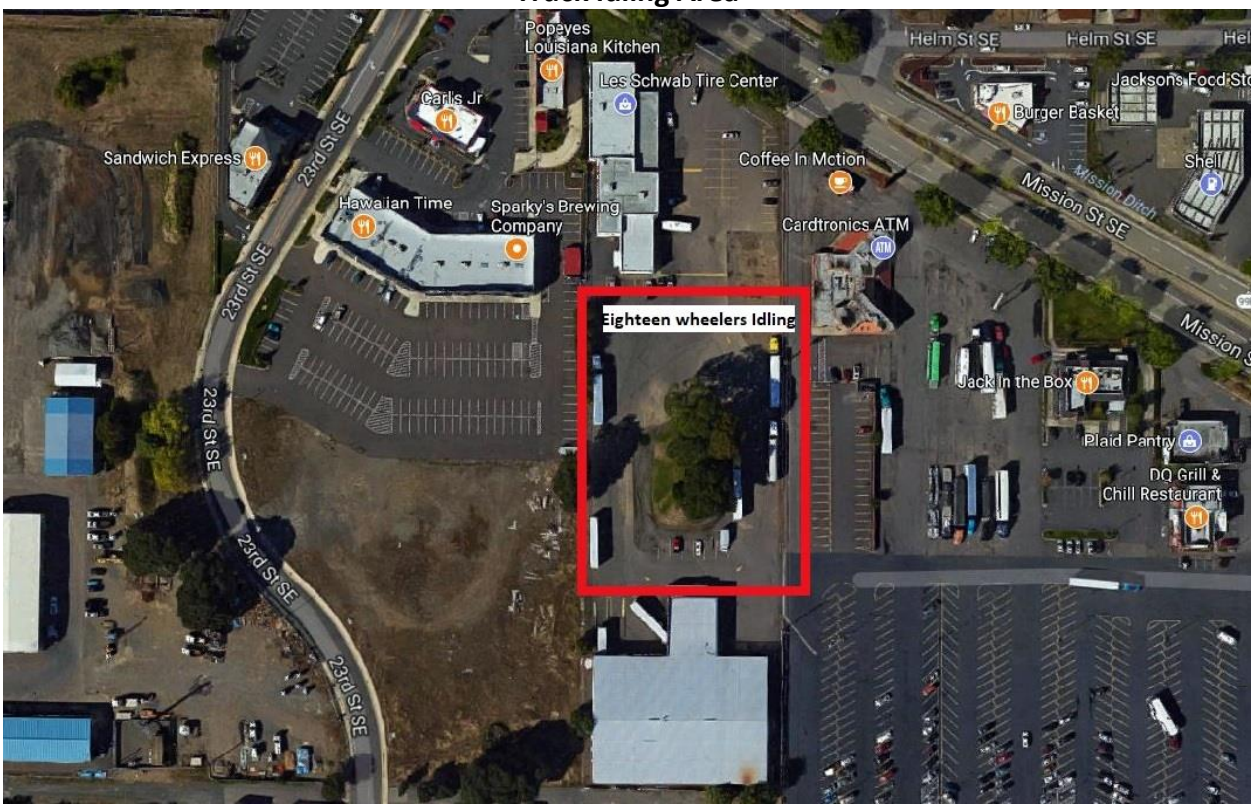
Definition

The hourly L_{10}, L_{50} and L_{90} noise levels are defined as the noise levels at a receiver (measurement point) that are equaled or exceed for 10%, 50%, and 90%, respectively, of any one hour.

L_{eq} - equivalent continuous sound level: Sound levels often fluctuate over a wide range with time. L_{eq} is the preferred method to describe sound levels that vary over time, resulting in a single decibel value which considers the total sound energy over the period of interest.

L_{dn} - Day Night Average Sound Level. The L_{dn} is the average equivalent sound level over a 24-hour period, with a penalty added for noise during the nighttime hours of 22:00 to 07:00. During the nighttime period 10 dB is added to reflect the impact of the noise

Figure 2
Truck Idling Area



Analysis

The calculated outdoors Day Night Average Sound Level on this site is L_{dn} - 65. Most of the sound is from Large trucks (eighteen wheelers) Idling from 6:00 am to 7:00 am. There was no noticeable activity from the McNary Field airport nearby.

Recommendations
Provide windows with Sound Transmission Class (STC) rating of STC-40 for all Back Windows (windows facing to the east) of Building “B”, and Building “C”.

Please call us at (503) 977-2690 if you have any question.

Sincerely,

A ACOUSTICS

Elki M. Lahav P.E.