

**Bellagio Express Auto Spa
6344 Sepulveda Blvd., Van Nuys, CA
Vacuum System Noise Impact Assessment**



Prepared for
Farzad Nourollah
FN Property Investment, LLC
6344 Sepulveda Blvd.
Van Nuys, CA 91411

Prepared by:
Navcon Engineering Network
701 West Las Palmas Dr.
Fullerton, CA 92835
Ph. 714-441-3488 Web. www.navcon.com

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1. Introduction

- This report documents the results of the Bellagio Express Auto Spa (6344 Sepulveda Blvd., Van Nuys, CA) vacuum system noise impact assessment.
- The principal objective was to characterize the noise impact from the vacuum cleaning stations and vacuum drops which are located in the P1-1VL-RIO Zone of the Bellagio Express property on the adjacent residential community. The P1-1VL-RIO Zone is along the Halbrent Ave. side of the property as shown in ***Aerial Photo 1.1.***
 - The “East Side” vacuum system includes a motor/turbine, seven vacuum cleaning stations and eight vacuum drops, all of which are located within the P1-1VL-RIO Zone.
 - The “South Side” vacuum system includes a motor/turbine, nine vacuum cleaning stations and ten vacuum drops. Four of the vacuum cleaning stations and five of the vacuum drops are located within the P1-1VL-RIO Zone.
 - The vacuum cleaning stations and vacuum drops which are located in the P1-1VL-RIO Zone are shown in ***Photo Set 1.1.***
- The noise impact assessment was conducted by comparing the noise level recorded at the closest residential property (6326 Halbrent Ave.) both without and with the vacuum systems operating. Since the car wash operates between 7 am and 7:30 pm seven days per week, the noise survey was conducted on a Sunday morning between 6 am and 8:15 am when the background/ambient noise level is at a minimum. This resulted in the most conservative noise impact assessment.

1. Introduction (cont'd)

- The results of the noise impact assessment are summarized in **Section 2**.

In summary, the results of this study indicate that the vacuum cleaning stations and vacuum drops which are located in the P1-1VL-RIO Zone of the Bellagio Express property do not represent a noise impact to the residential community located East of Halbrent Ave.

- The details of the noise measurement survey are described in **Section 3**.
- The project was conducted by Jim Steedman and Hans Forschner of Navcon Engineering Network under the direction of Arash Alex Nourollah, FN Property Investment, LLC. Both Farzad Nourollah and Arash Alex Nourollah were present during the noise measurement survey.

Sepulveda Blvd.



NORTH

6326 Halbrent Ave.

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Photo Set 1.1 East Side Vacuum System & South Side Vacuum System Drops



2. Project Summary & Noise Impact Assessment

- The noise survey was conducted on Sunday, March 5th, 2017 between 6:00 am and 8:15 am. A-weighted sound pressure levels were recorded at the three locations shown in **Aerial Photo 2.1** and **Photo Set 2.1**. The location in front of 6326 Halbrent Ave. is closest to the Bellagio Express vacuum systems and considered to be the most sensitive receptor location for the noise impact assessment. The noise analyzers located at 6306 Halbrent Ave. and at the Sepulveda Blvd. entrance to the car wash were used to monitor the overall change in the background/ambient noise level during the survey period.
- The three noise analyzers were time synchronized and configured to record 1 second Leq levels. The Leq level is the average noise level recorded over the measurement period (e.g. 1 second). The 1 second Leq levels were used to compute averaged Leq levels and the L90 statistical noise descriptors for the measurement periods. The L90 is that level which was exceeded 90% of the time during the measurement period and is often considered to be the minimum ambient noise level.
- The 1-second Leq, 15 minute Leq and the L90 levels recorded at the two reference locations are presented in **Graphics 2.1 & 2.2** (Halbrent Ave. & Sepulveda Blvd. respectively). Both microphones show an increase in ambient noise level during the survey period.
 - The increase in noise level at 6306 Halbrent Ave., the reference location was primarily due to arterial traffic and aircraft. Noise levels as high as 83 dBA were recorded for individual car pass-bys. The average L90 and Leq level increased as the traffic volume increased. Refer to **Graphic 2.1**.

2. Project Summary & Noise Impact Assessment (cont'd)

- The increase in noise level at Sepulveda Blvd. location was primarily due to an increase in arterial traffic until the car wash began operation at approximately 7:40 am. Once the car wash started up, both 15 minute L90 and Leq levels increased by several decibels. Refer to **Graphic 2.2**.
- The noise impact assessment was conducted by comparing the noise level recorded by the 6326 Halbrent Ave. noise analyzer both without and with the vacuum systems operating. The measurements were recorded between local vehicular pass-bys and aircraft flyovers. A subjective assessment was also made by Hans Forschner of Navcon Engineering for each situation. Mr. Forschner was standing in front of the house at 6326 Halbrent Ave., immediately across from the Bellagio Express driveway.
 - **East Side Vacuum System (Graphic 2.3):** Both the South and East Side Vacuum Systems were turned off. The noise measurement began at 07:23:30 and the ambient noise level recorded for a period of 30 seconds. The East Side Vacuum System motor and turbine were turned on at the 30 second mark. All of the vacuum nozzles were then systematically removed from their holders and placed on the vacuum arm support structure either facing up or towards the Bellagio Express exit as shown **Photo Set 2.2**. The noise recording continued for the next 60 seconds with all nozzles out of the holders. This is considered to be the worst case scenario for the East Side Vacuum System.
 - Subjectively, the noise generated by the startup of the motor and turbine was barely perceptible. The noise from nozzles was not perceptible or distinguishable from the ambient noise.

2. Project Summary & Noise Impact Assessment (cont'd)

- Objectively, the noise from the East Side Vacuum System was not distinguishable from the fluctuating ambient noise. Referring to the tables in **Graphic 2.3**, both the average Leq and the average L90 varied by less than 0.5 dB during the entire 160 second measurement period.
- The Bellagio Express property line wall breaks the line of sight between the East Side Vacuum System and the community and serves as an effective noise barrier (ref. **Photo Set 2.2**).
- **In summary, the East Side Vacuum System does not adversely impact the community noise environment.**
- **South Side Vacuum System Drops in the P1-1VL-RIO Zone (Graphics 2.4 – 2.9):** The East Side Vacuum System was turned off and the South Side Vacuum System was powered on. Each of the five Vacuum Drops in the P1-1VL-RIO Zone were tested individually and then all five Vacuum Drops were tested together. For the individual Vacuum Drop tests, (1) the ambient noise level was recorded for 15 seconds, (2) the nozzles were removed from the holders (refer to **Photo Set 2.3**) and pointed towards the 6326 Halbreth Ave. noise analyzer and the noise recorded for 30 seconds, and (3) the nozzles were placed back in the holders and the noise level was recorded for 15 seconds. To test all five Vacuum Drops simultaneously, all nine nozzles were removed from the holders and placed on the vacuum arm support structure facing the noise analyzer (refer to **Photo Set 2.3**). The noise level was then recorded for 60 seconds.
 - Subjectively, the South Side Vacuum System motor/turbine were slightly perceptible upon startup and occasionally throughout the test depending upon the traffic, aircraft and other noise sources.

2. Project Summary & Noise Impact Assessment (cont'd)

- Subjectively, the noise generated from the South Side Vacuum System nozzles ranged between imperceptible and barely perceptible depending upon the traffic, aircraft and other noise sources.
- Objectively, the noise from the East Side Vacuum System drops (i.e., 9 nozzles) which are located in the P1-1VL-RIO Zone was not distinguishable from the fluctuating ambient noise. The table below compares the average Leq level measured with the nozzles facing the 6326 Halbreant Ave. noise analyzer with the ambient noise level (i.e., with all of the nozzles in the holders). The difference levels were within ± 0.4 dB.

Sound Pressure Level [Average Leq, dBA]	Drop #1 1 Nozzle	Drop #2 2 Nozzles	Drop #3 2 Nozzles	Drop #4 2 Nozzles	Drop #5 2 Nozzles	All Drops 9 Nozzles
Nozzles Facing the Microphone	52.4	53.7	52.9	53.1	53.4	53.6
Nozzles in Holder (Ambient)	52.7	53.4	53.3	53.1	53.6	53.3
Difference	-0.3	0.3	-0.4	0.0	-0.2	0.3

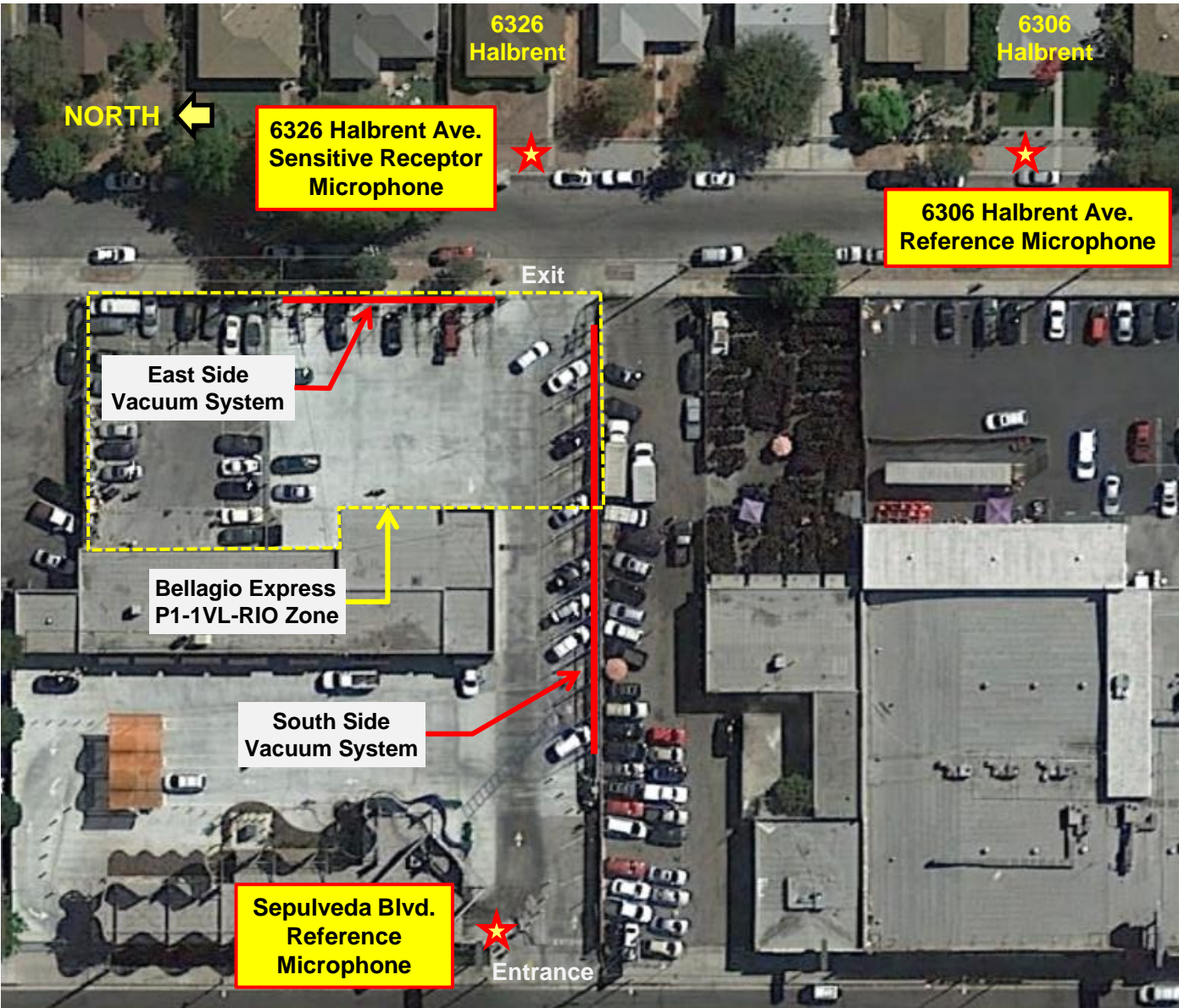
- The South Side Vacuum System does not adversely impact the community noise environment.
- **In summary, the results of this study indicate that the vacuum cleaning stations and vacuum drops which are located in the P1-1VL-RIO Zone of the Bellagio Express property do not represent a noise impact to the residential community located East of Halbreant Ave.**

2. Project Summary & Noise Impact Assessment (cont'd)

- **Los Angeles County Municipal Code (LACM), Chapter 12.08 - NOISE CONTROL**

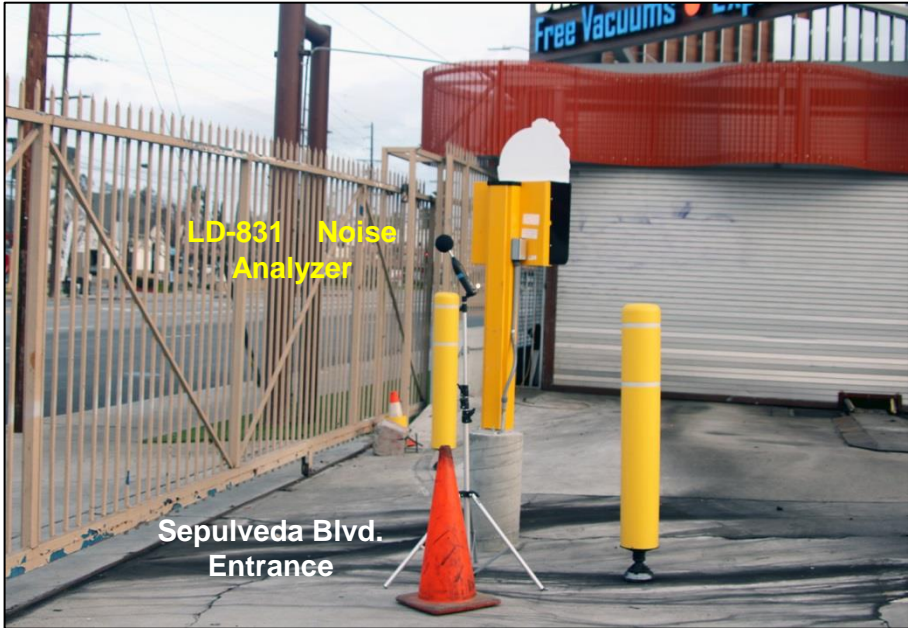
- The daytime Exterior Noise Limit for Residential Properties is 50 dBA for a cumulative period of more than 30 minutes in any hour during the daytime hours of 7 am to 10 pm. The ordinance states that if the ambient L50 (i.e., that level which is exceeded 50% of the time or 30 min. per hour) is greater than the limit, then the ambient L50 becomes the exterior noise level limit.
- The ambient L50 level measured at 6326 Halbreth Ave. (i.e., the residential ambient reference location) exceeded the 50 dBA limit after 7:30 am and therefore becomes the residential exterior noise level limit. The noise level limits are shown below.
 - 7:00 am to 7:30 am, Measured L50 = 49.2 dBA, Noise Level Limit = 50.0
 - 7:30 am to 8:00 am, Measured L50 = 50.9 dBA, Noise Level Limit = 50.9
 - 8:00 am to 8:30 am, Measured L50 = 51.6 dBA, Noise Level Limit = 51.6
 - 8:30 am to 9:00 am, Measured L50 = 52.8 dBA, Noise Level Limit = 52.8
 - After 9:00 am the ambient noise level continues to increase due to arterial traffic and therefore the Noise Level Limit will continue to increase.
- The measurements shown on the preceding page indicate that the noise from the vacuum nozzles do not contribute to the ambient noise level and therefore the nozzle noise must be less than 42 dBA when measured at the most sensitive receiver location (i.e., 6326 Halbreth Ave.).
- **In summary, the results of this study indicate that the vacuum cleaning stations and vacuum drops which are located in the P1-1VL-RIO Zone of the Bellagio Express property do not exceed the LACM noise limits and are in conformance with the LAMC Noise Ordinance.**

Aerial Photo 2.1 Microphone/Noise Analyzer Locations

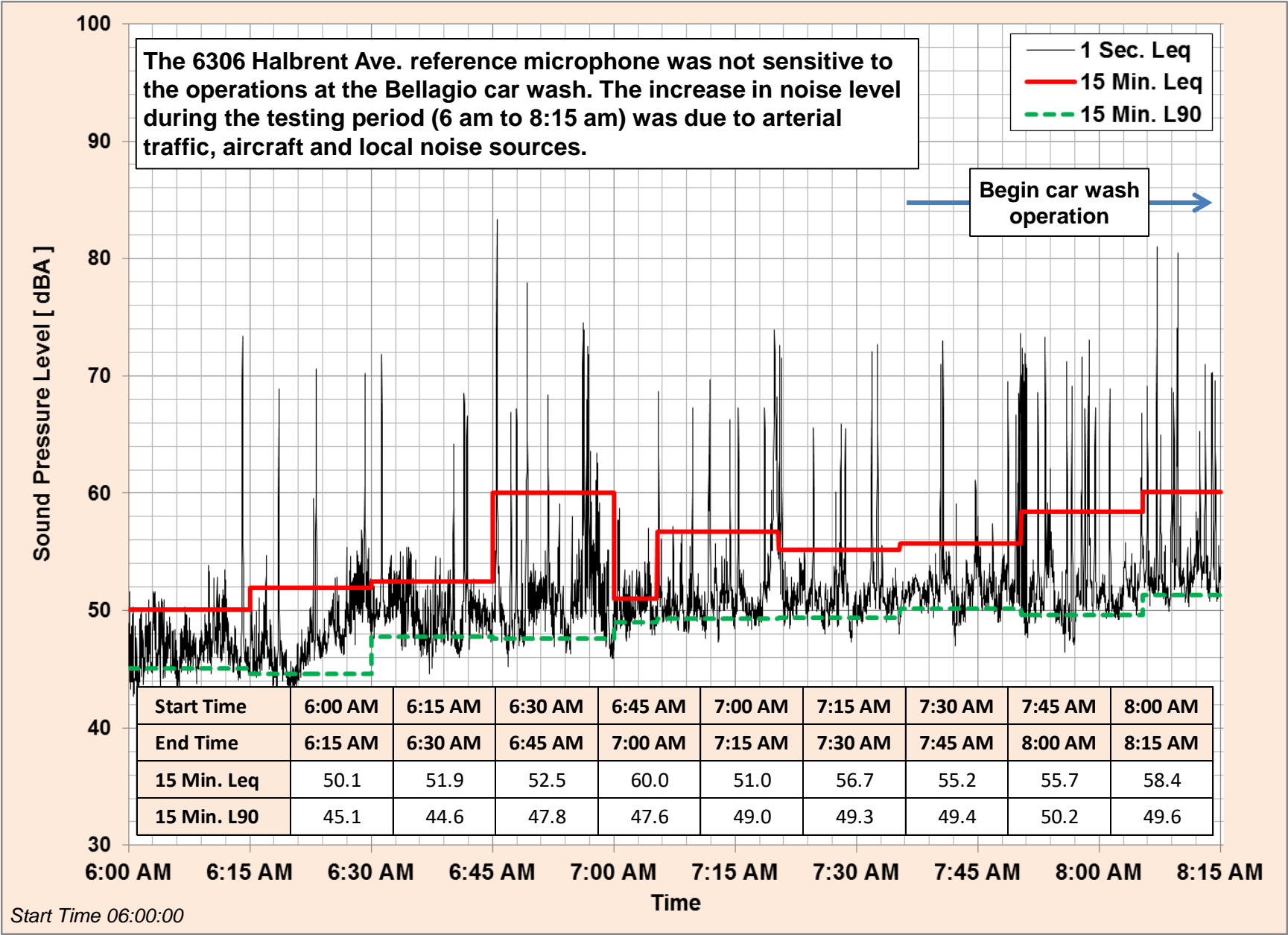


Google Earth Pro Image Date 10/2/2016

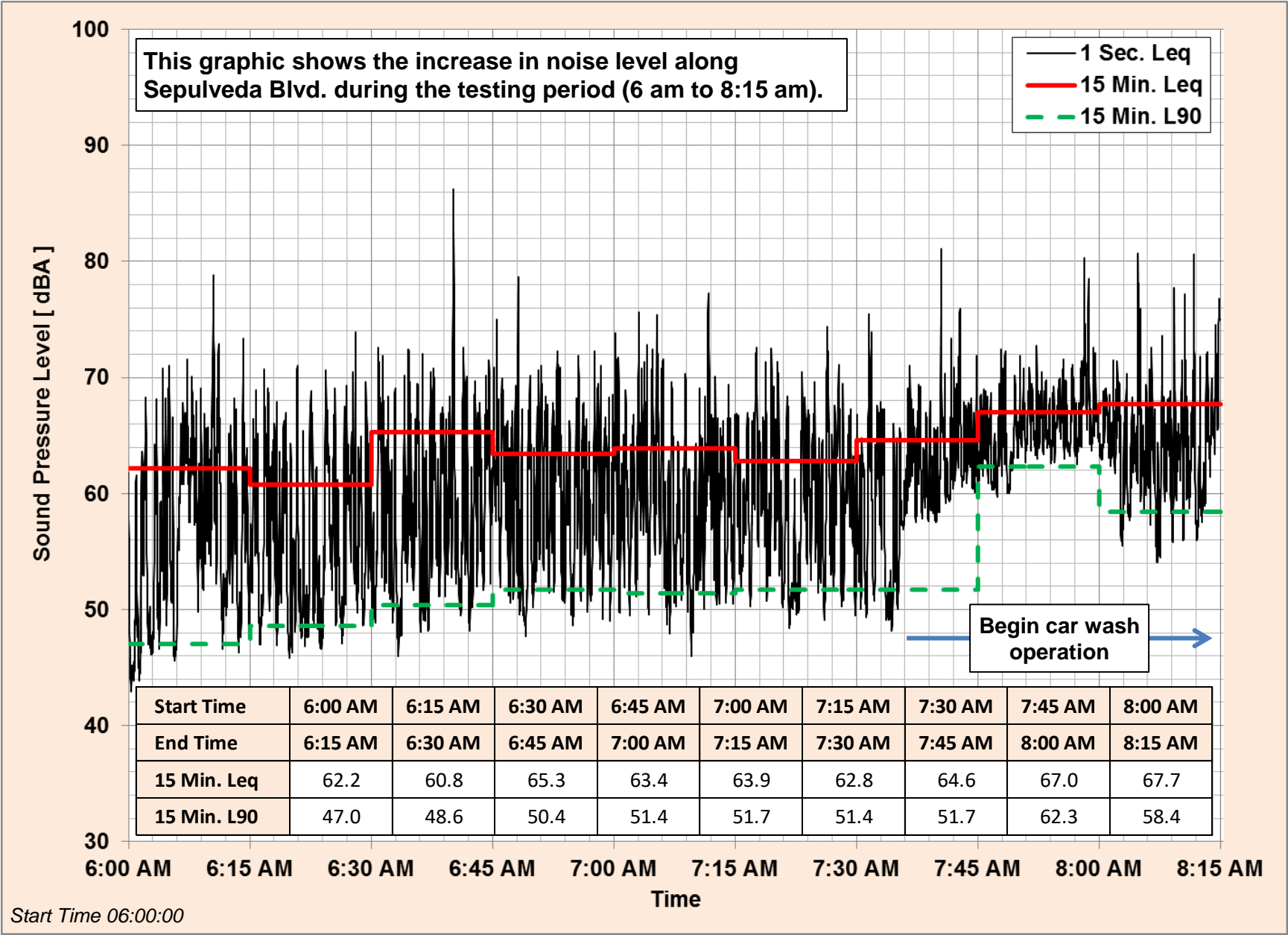
Photo Set 2.1 Microphone/Noise Analyzer Locations



Graphic 2.1 6306 Halbrent Ave. Reference Sound Pressure Level [dBA]



Graphic 2.2 Sepulveda Blvd. Entrance Reference Sound Pressure Level [dBA]



Graphic 2.3 6326 Halbrent Ave. – East Side Vacuum Drops Sound Pressure Level [dBA]

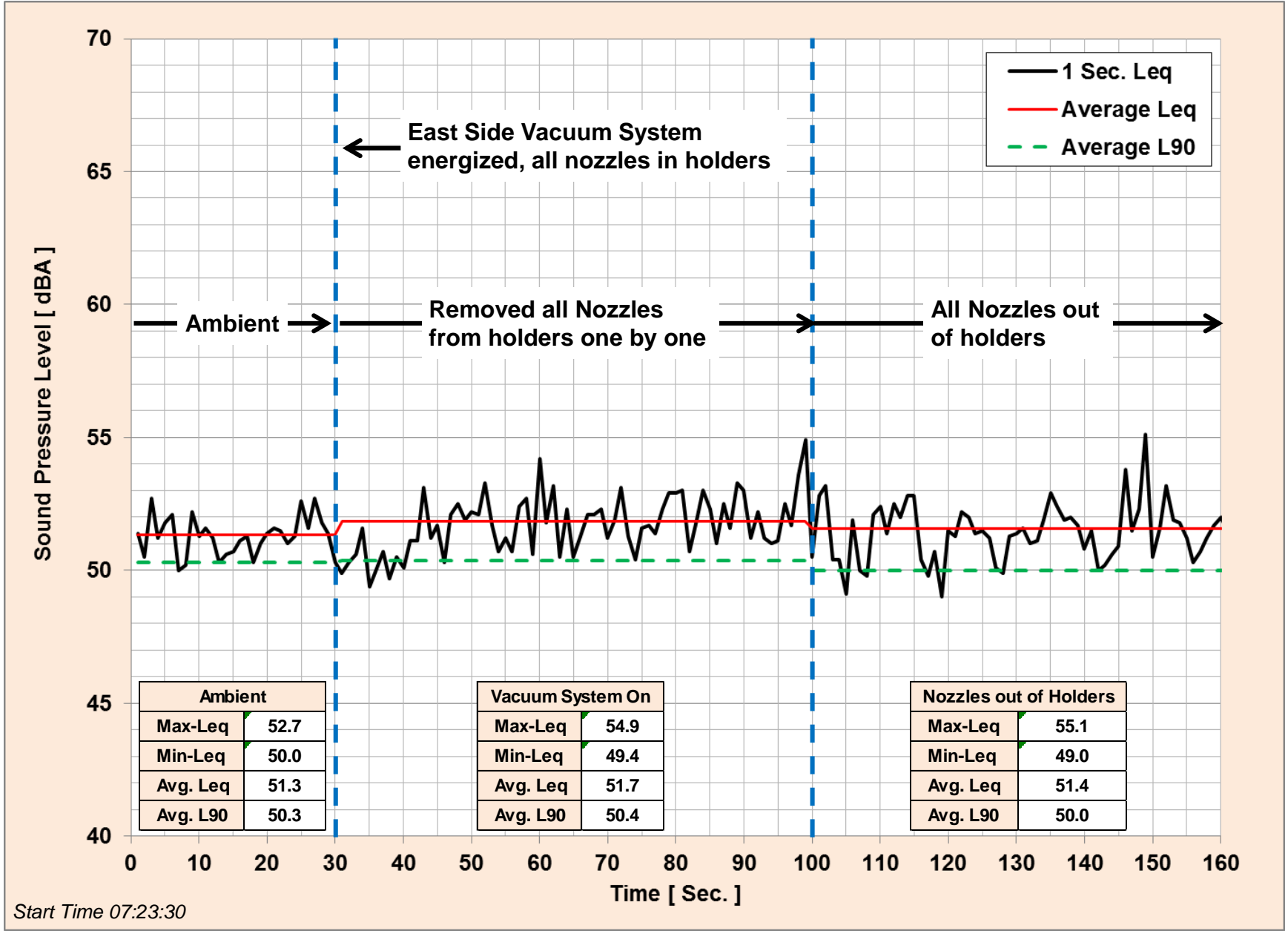


Photo Set 2.2 East Side Nozzles and Property Line Wall



Two Vacuum Nozzles in holders



Vacuum arm support structure

Two Vacuum Nozzles out of holders



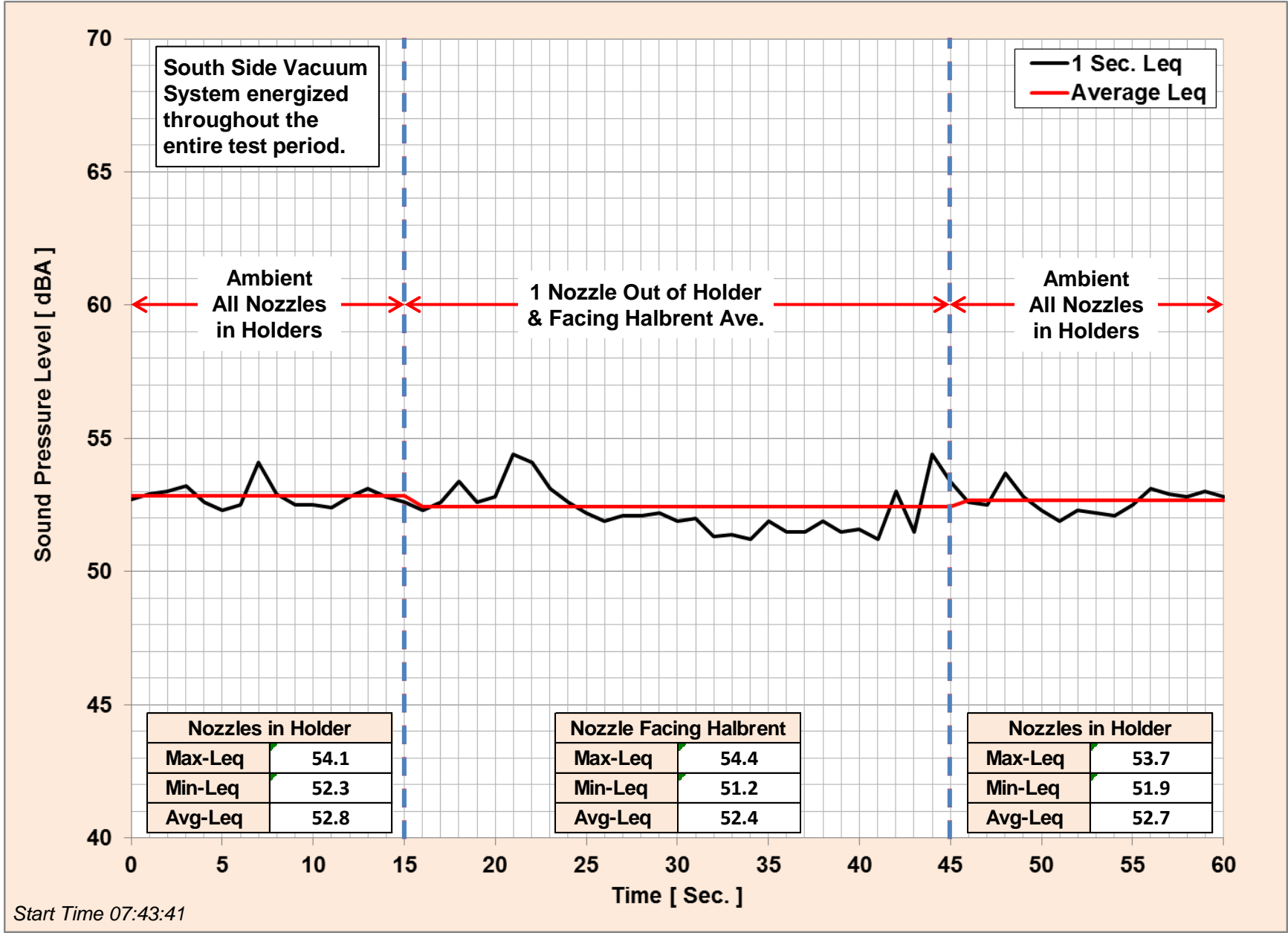
East Side Wall 25-Sep-2016



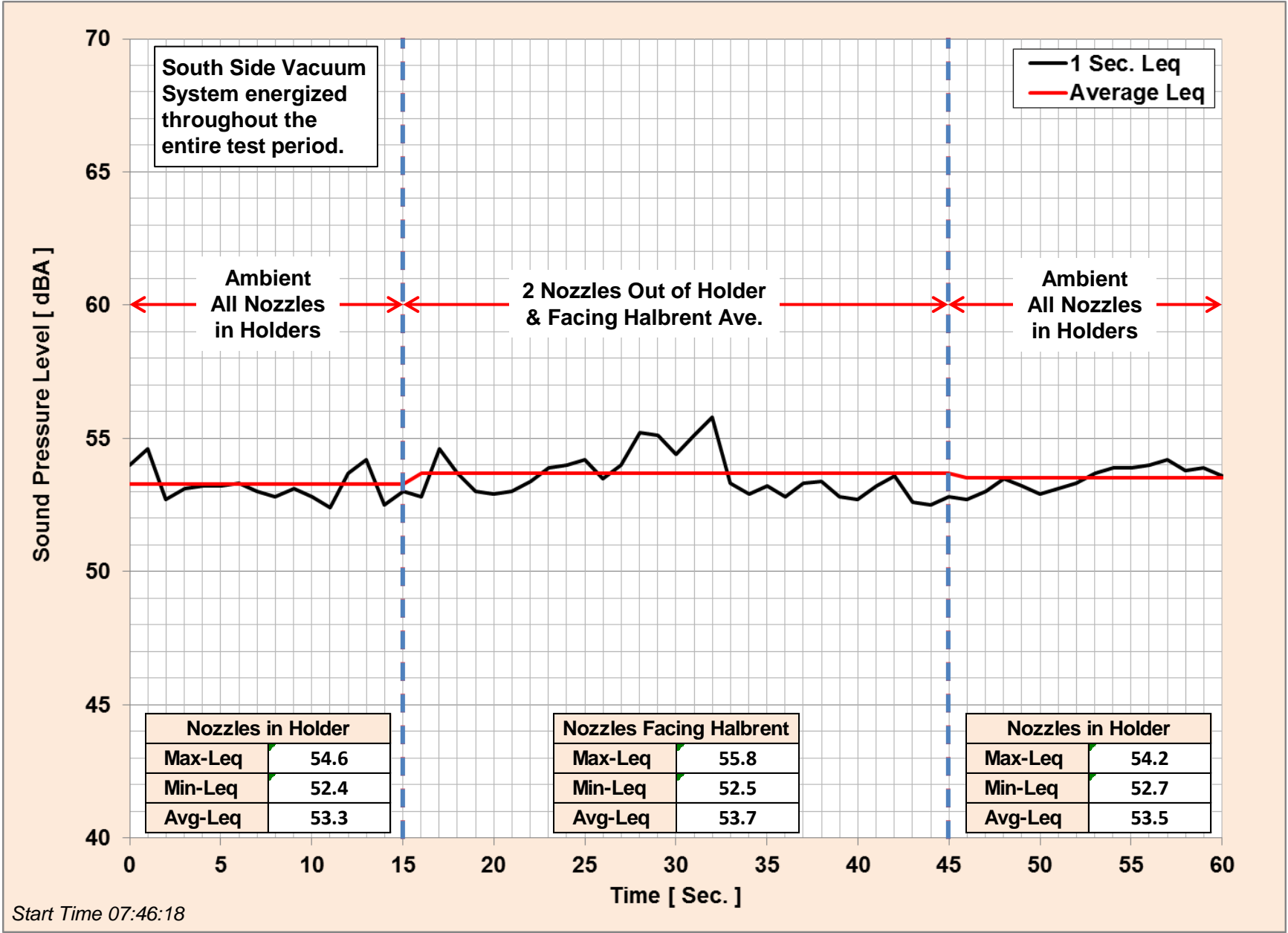
East Side Wall 5-Mar-2017

Note: the increased wall height breaks the line of sight to the East Side Vacuum System and serves as an effective noise barrier.

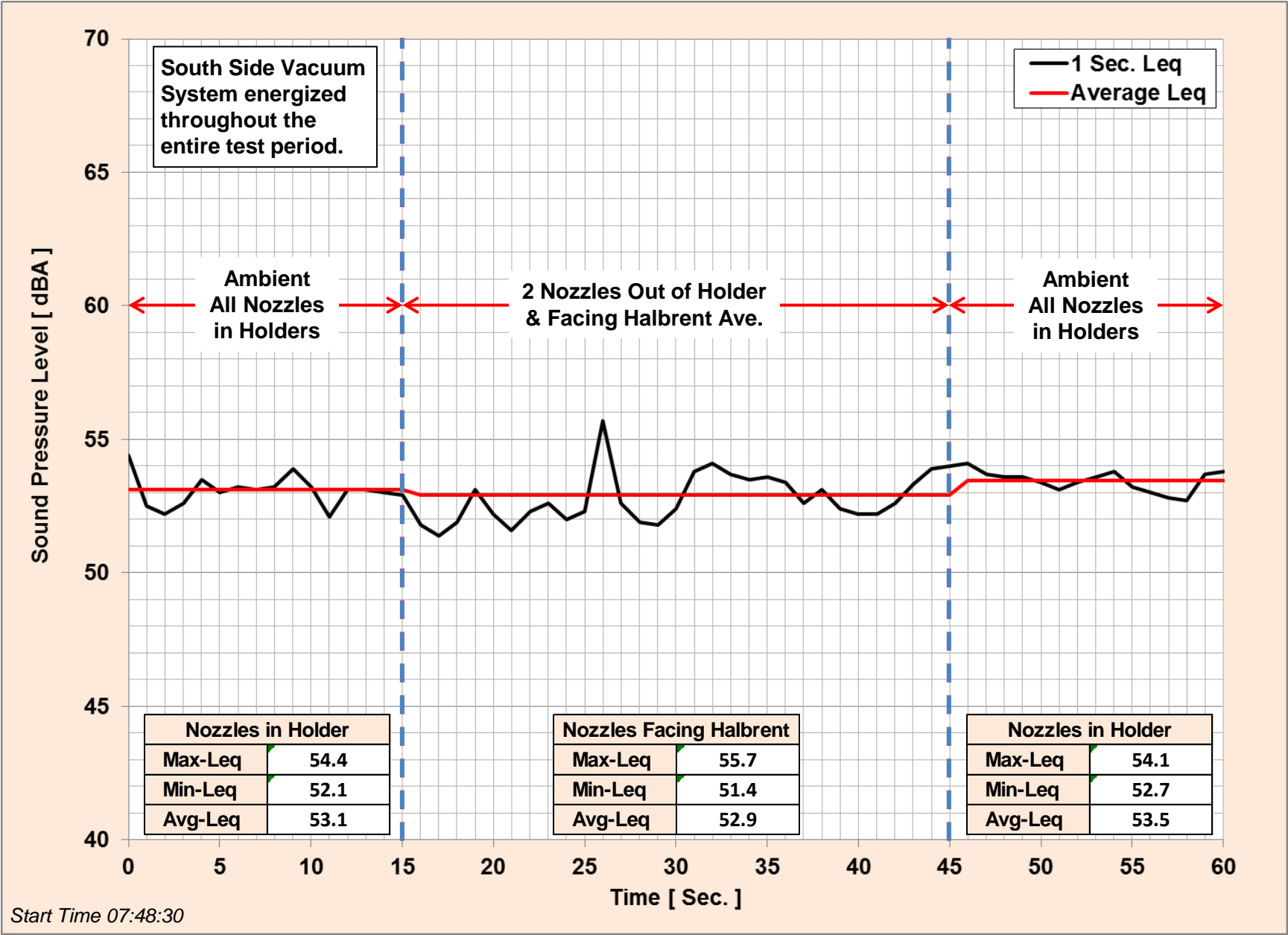
Graphic 2.4 6326 Halbrent Ave. – South Vacuum Drop #1 Sound Pressure Level [dBA]



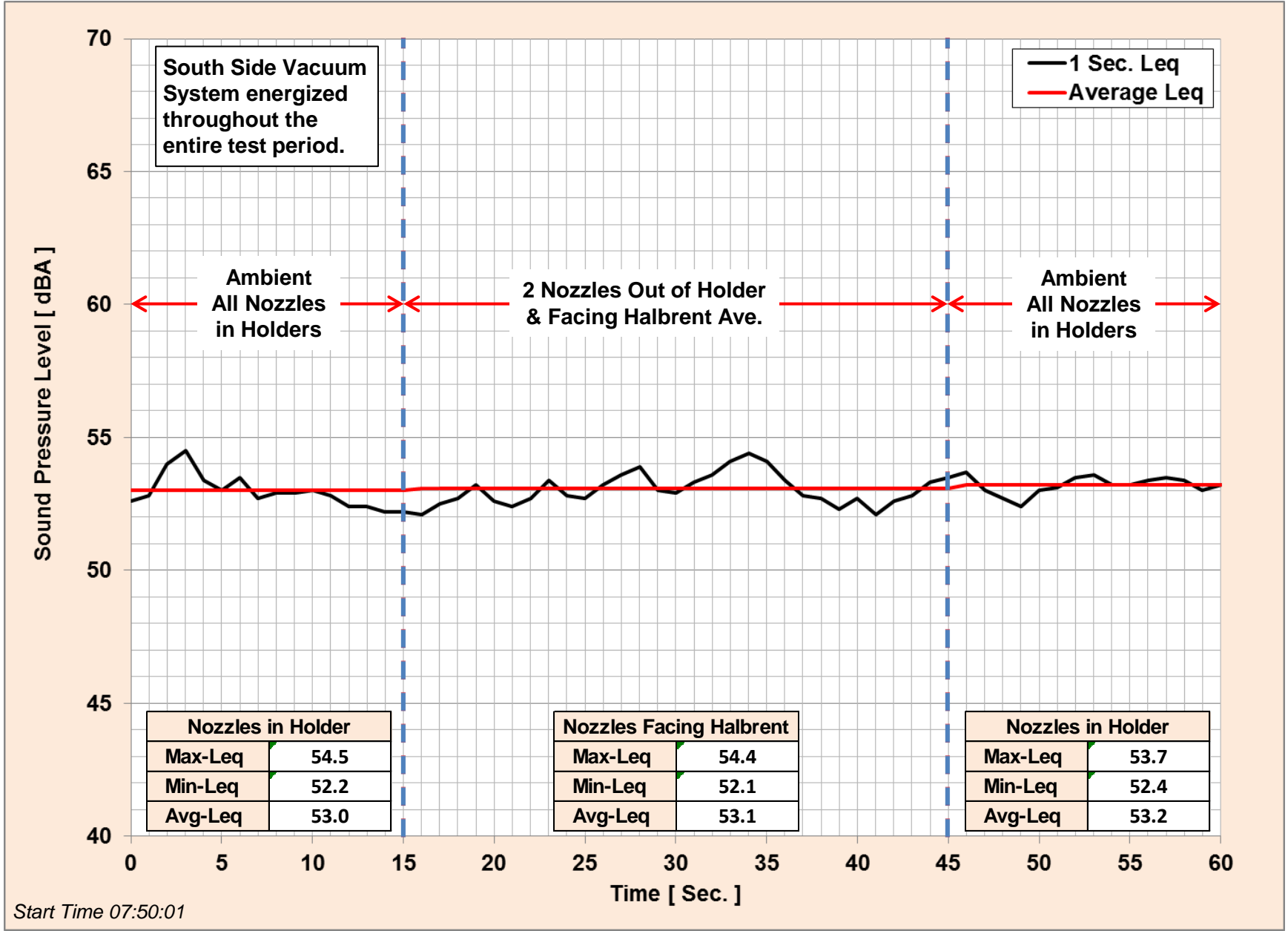
Graphic 2.5 6326 Halbrent Ave. – South Vacuum Drop #2 Sound Pressure Level [dBA]



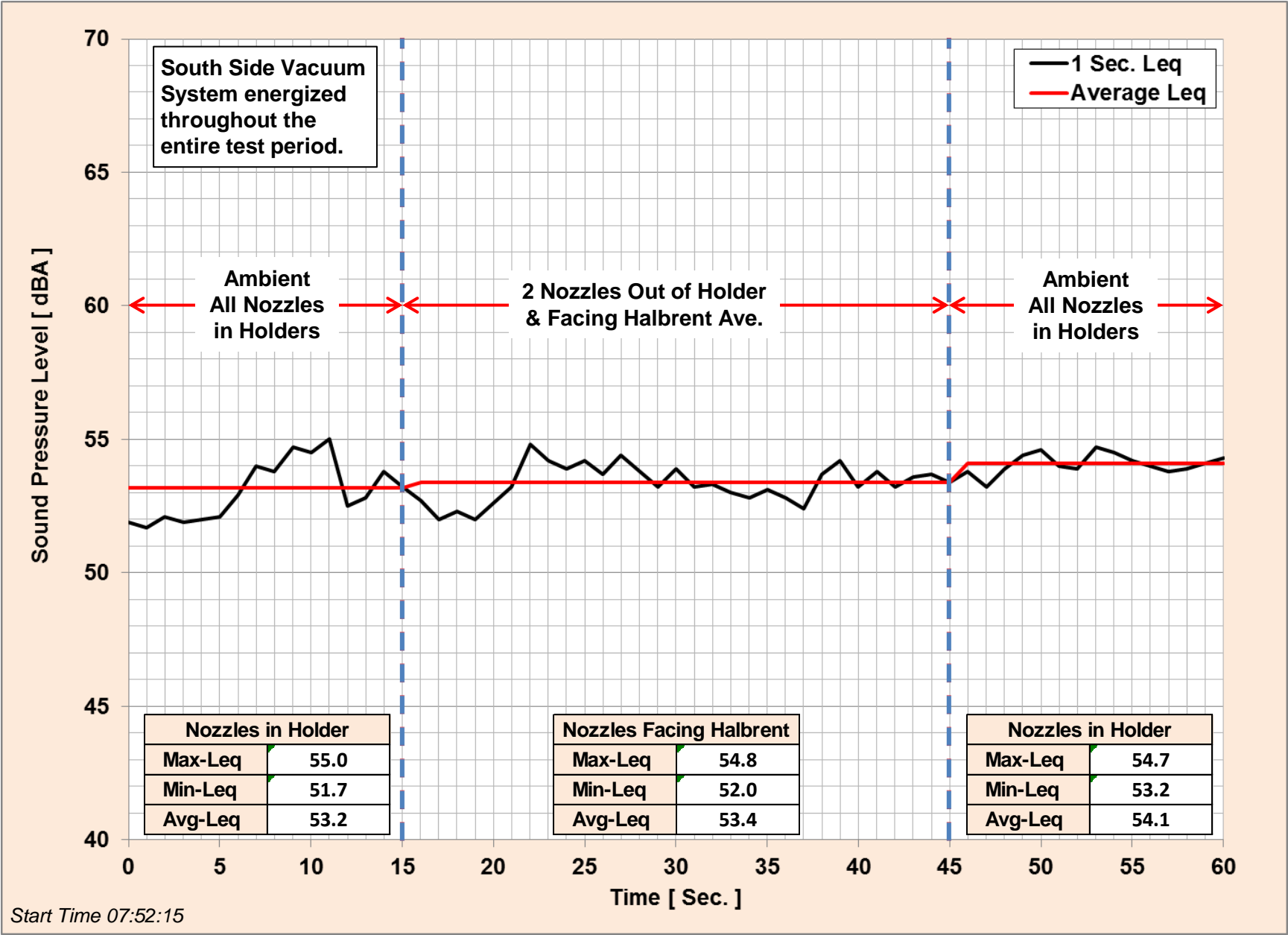
Graphic 2.6 6326 Halbrent Ave. – South Vacuum Drop #3 Sound Pressure Level [dBA]



Graphic 2.7 6326 Halbrent Ave. – South Vacuum Drop #4 Sound Pressure Level [dBA]



Graphic 2.8 6326 Halbrent Ave. – South Vacuum Drop #5 Sound Pressure Level [dBA]



Graphic 2.9 6326 Halbrent Ave. – South Vacuum Drops #1 - #5 Sound Pressure Level [dBA]

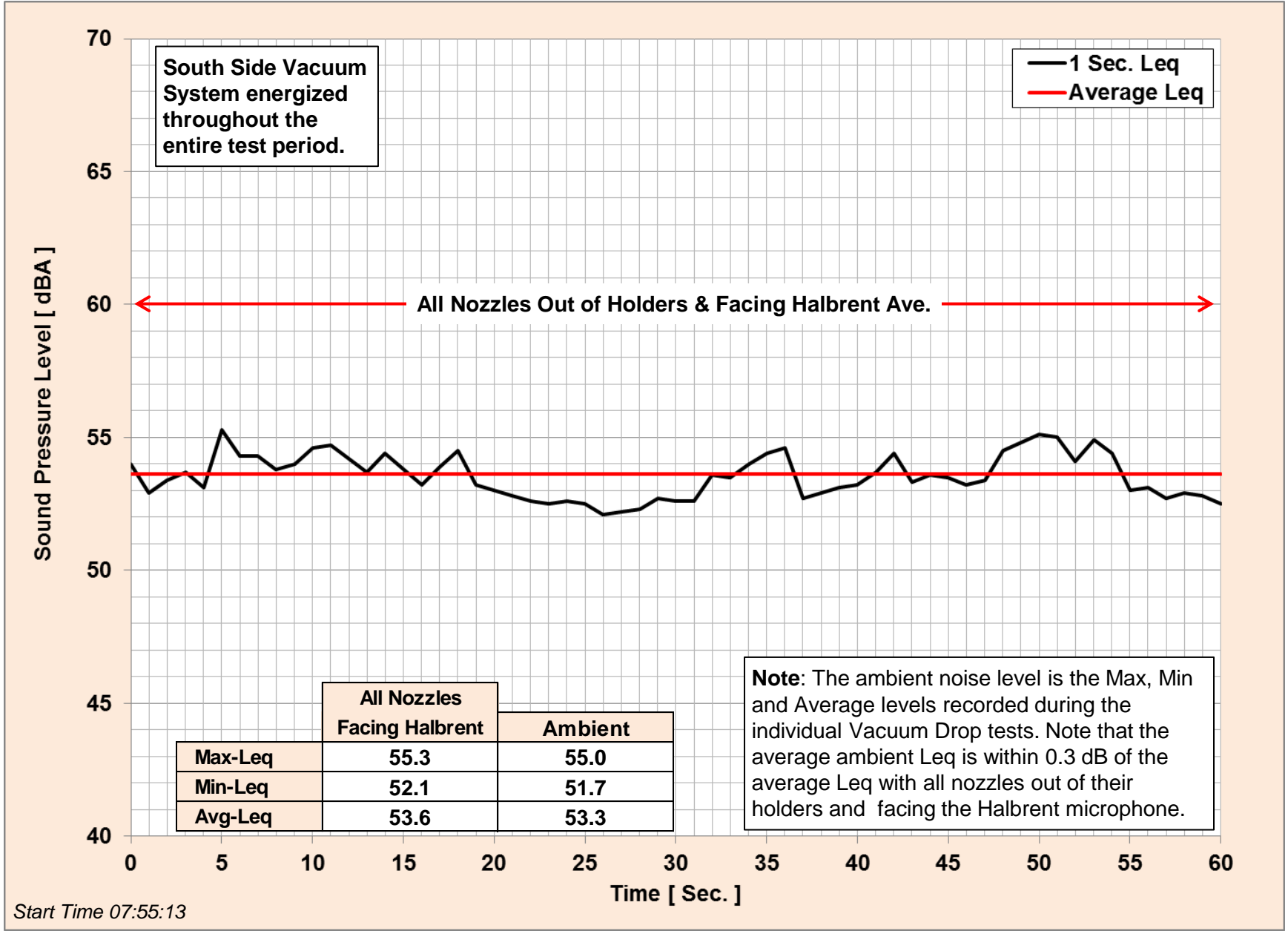


Photo Set 2.3 Nozzle Positions For South Side Vacuum System Tests



This picture shows two nozzles pointing towards the Halbrent Ave. microphone for an individual Vacuum Drop test (ref. **Graphics 2.4 – 2.8**).



This picture shows how the nozzles were secured to the vacuum arm support when testing the noise impact from all nozzles simultaneously. The nozzles were all mounted facing the Halbrent Ave. microphone which represents a worst case situation (ref. **Graphic 2.9**).

3. Noise Measurement Survey

- The noise survey was conducted on Sunday, March 5th, 2017 between 6:00 am and 8:15 am. The Sunday morning hours were selected for the survey assuming that the community ambient/background noise would be at its lowest level. A comparison between the measured Vacuum System noise levels and the ambient noise level would result in the most conservative noise impact assessment.
- The noise measurements were acquired using three Larson Davis (LD) Model 831 noise analyzers. The LD-831 meets the American National Standards Institute (ANSI) S1.4, 1983 specification for Type I (Precision) sound level meters. The analyzers are calibrated at a National Institute of Standards Technology (NIST) traceable laboratory on a periodic basis. The LD831 system sensitivities were checked immediately prior to and immediately following the noise survey using a Bruel & Kjaer (B&K) Model 4230 Sound Level Calibrator. The B&K 4230 is calibrated at a NIST laboratory on an annual basis.
- The three LD831's were time synchronized and configured to acquire 1-second A-weighted Leq levels using a slow meter response. The Leq level is the average noise level recorded over the measurement period (e.g. 1 second). The 1 second Leq levels were used to compute averaged Leq levels and the L90 statistical noise descriptors for the measurement periods. The L90 is that level which was exceeded 90% of the time during the measurement period and is often considered to be the minimum ambient noise level.

3. Noise Measurement Survey (cont'd)

- The LD-831 noise analyzers were mounted on tripods with the microphones positioned 65" above ground. They were then placed at the locations indicated in **Aerial Photo 2.1** and **Photo Set 2.1**. As described in **Section 2**, the noise analyzers located at 6306 Halbrent Ave. and at the entrance to the Bellagio Express Car Wash were used as references to track the overall change in the ambient noise level during the survey period. The noise analyzer located at 6326 Halbrent Ave. (the closest residential property) was used for the noise impact assessment.
- The LD-831 noise analyzers located at 6306 Halbrent Ave. and at the entrance to the Bellagio Express Car Wash were started at 6 am and collected data continuously throughout the survey period. The noise measurements are presented in **Graphics 2.1 & 2.2**.
- The LD-831 noise analyzer located at 6326 Halbrent Ave. was operated manually collecting data for the individual tests. The noise measurements are presented in **Graphics 2.3 – 2.9**.
 - **Graphic 2.3** 6326 Halbrent Ave. – East Side Vacuum Drops Sound Pressure Level [dBA]
 - **Graphic 2.4** 6326 Halbrent Ave. – South Vacuum Drop #1 Sound Pressure Level [dBA]
 - **Graphic 2.5** 6326 Halbrent Ave. – South Vacuum Drop #2 Sound Pressure Level [dBA]
 - **Graphic 2.6** 6326 Halbrent Ave. – South Vacuum Drop #3 Sound Pressure Level [dBA]
 - **Graphic 2.7** 6326 Halbrent Ave. – South Vacuum Drop #4 Sound Pressure Level [dBA]
 - **Graphic 2.8** 6326 Halbrent Ave. – South Vacuum Drop #5 Sound Pressure Level [dBA]
 - **Graphic 2.9** 6326 Halbrent Ave. – South Vacuum Drops #1 - #5 Sound Pressure Level [dBA]