



December 12, 2024

Mr. Michael Centinario
City of Bloomington
1800 West Old Shakopee Road
Bloomington, MN 55431

Subject: #PL2020-166 – 10801 BUSH LAKE RD
Summary of Results
Facility Noise Measurement Results
Verizon MSC – Bloomington, Minnesota

Dear Mr. Centinario:

This letter is a summary of noise measurements performed for the recent expansion at the Verizon Mobile Switching Center (MSC) in Bloomington, Minnesota. The Bloomington City Council approved the expansion of the Verizon Wireless office/warehouse facility at 18801 Bush Lake Road subject to certain conditions (City of Bloomington letter dated January 27, 2021). One of the conditions was to perform noise testing in the first year of occupancy during temperatures below zero degrees Fahrenheit. Unfortunately, there were very few days during the 2023/2024 winter when temperatures were below 0° F.

This letter is a summary of noise measurements performed between 2 AM and 3:30 AM on December 12, 2024, when the temperatures at the Verizon facility were between -1 and -3° F.

Noise Requirements

The City of Bloomington Code has requirements for outdoor noise. Section 10.29.02: Noise Source Requirements has maximum allowable sound levels by receiving land use. Table 1 shows the noise limits (in dBA) per noise area classification (NAC). In general, NAC 1 is residential and recreational, NAC 2 is commercial, and NAC 3 is industrial.

Table 1 – City of Bloomington Noise Code Requirements

Noise Area Classification	Receiver Type	Daytime (7AM - 10PM)		Nighttime (10PM - 7AM)	
		L10	L50	L10	L50
1	Residential	65 dBA	60 dBA	55 dBA	50 dBA
2	Commercial	70 dBA	65 dBA	70 dBA	65 dBA
3	Industrial	80 dBA	75 dBA	80 dBA	75 dBA

The new AHUs and condensing units will operate at all hours of the day and night. Therefore, noise from the AHUs and condensing units at the nearest residential receiver locations must meet the most stringent nighttime requirement of 50 dBA.

Measurement Results

Noise measurements were made at nineteen locations during the early morning hours between 2 AM and 3:30 AM on December 12, 2024. Figure 1 shows the measurement locations. Table 2 summarizes the measurement results. The facility was operating normally during the measurement period. The new AHU's and existing dry coolers were running. The outdoor temperature was between -1 and -3° F with calm winds.

As shown in Table 2, noise levels at all residential locations met the 50 dBA nighttime requirement. Traffic noise was noticeable, and along Old Shakopee Road, traffic frequently required measurements to be paused until the traffic passed. The measurement data for these tests is included in Attachment A.



Figure 1 – Measurement locations in the area around the Verizon facility.

Table 2 – Summary of Noise Measurement Results, L_{eqA}

Location	Nighttime Measurements (12/12/24)
	Normal Operating Conditions, -3 deg F and Calm Winds, L_{eqA}
Requirement	50 dBA
B	41
C	40
D	37
E	39
F	41
G	42
H	39
I	38
J	45
K	40
L	38
M	41
N	43
O	52 ^a
P	50 ^b
Q	42
R	45
S	42
Daisy Circle	37

Notes: a - on the Verizon property, no requirement
b - 65 dBA requirement at commercial property

Conclusions

This letter summarizes the results of noise tests performed at the Verizon MSC in Bloomington, Minnesota. The tests were required by the City Council as a condition of approval of the recent expansion. The facility was operating normally during the measurement period. The outdoor temperature was between -1 and -3° F with calm winds. **The noise measurement results show that the facility met the City of Bloomington residential nighttime noise requirement of 50 dBA.**

Please let us know if you have any questions or need more information.

Sincerely,



Anthony J. Baxter, P.E. (Mechanical, MN)
Principal
ESI Engineering, Inc.

Attachment A

Noise Measurement Data

Verizon MSC Bloomington – December 12, 2024



Acoustic Test Results

Minneapolis, Minnesota | o: 952.831.4646 | esi-engineering.com

Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

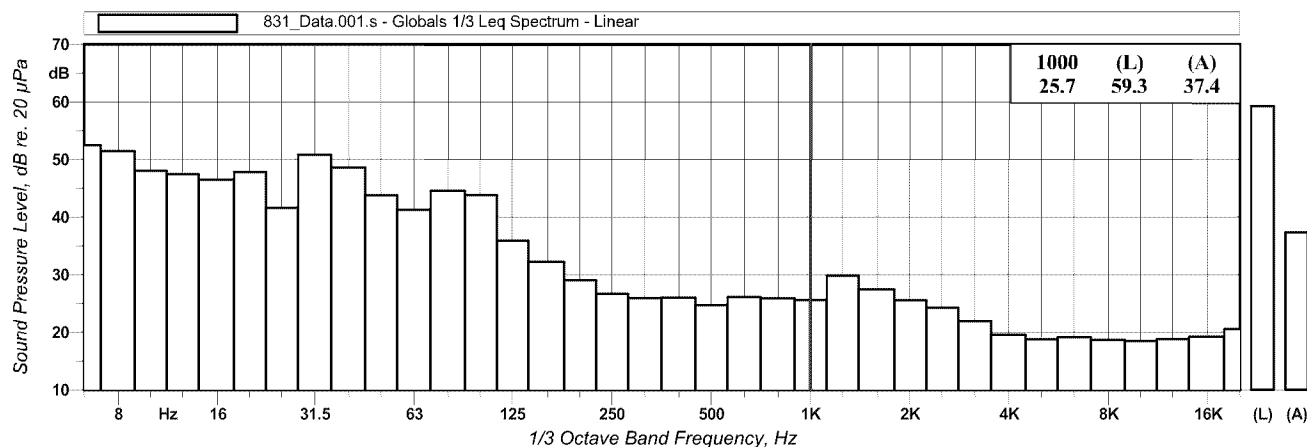
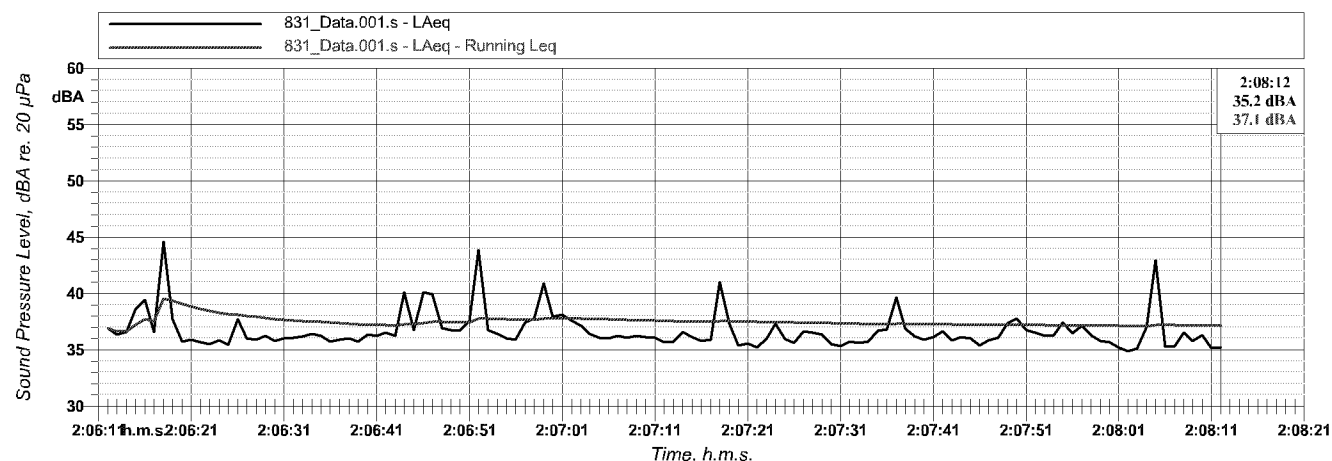
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: Daisy Circle
Date: 12/12/2024
Start Time: 2:06:11 AM
End Time: 2:08:12 AM
Run Time: 121.0 seconds

Meteorology: Temperature: -3 to -1 °F
 Wind Speed / Dir.: Calm
 Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
 Initial Calibration: 94.0 dB
 Final Calibration: 93.7 dB
 Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 1: Late Night, Subzero Temperature Ambient
 (Background) Measurement; All Verizon
 Equipment Running Normally



L1.0: 43.6 dBA

L50.0: 36.2 dBA

: N/A dBA

Leq: 37.1 dBA

L10.0: 38.2 dBA

L90.0: 35.4 dBA

LMin: 33.9 dBA

LMax: 51.7 dBA

831_Data.001.s
 Globals 1/3 Leq Spectrum - Linear

Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	41.6 dB	80	44.6 dB	250	26.7 dB	800	25.9 dB	2500	24.3 dB	8000	18.7 dB
31.5	50.8 dB	100	43.8 dB	315	26.0 dB	1000	25.7 dB	3150	21.9 dB	10000	18.5 dB
40	48.6 dB	125	35.9 dB	400	26.0 dB	1250	29.8 dB	4000	19.6 dB	12500	18.8 dB
50	43.8 dB	160	32.3 dB	500	24.8 dB	1600	27.4 dB	5000	18.8 dB	16000	19.2 dB
63	41.3 dB	200	29.1 dB	630	26.1 dB	2000	25.6 dB	6300	19.2 dB	20000	20.6 dB

Figure A1



Acoustic Test Results

Minneapolis, Minnesota | o: 952.831.4646 | esi-engineering.com

Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

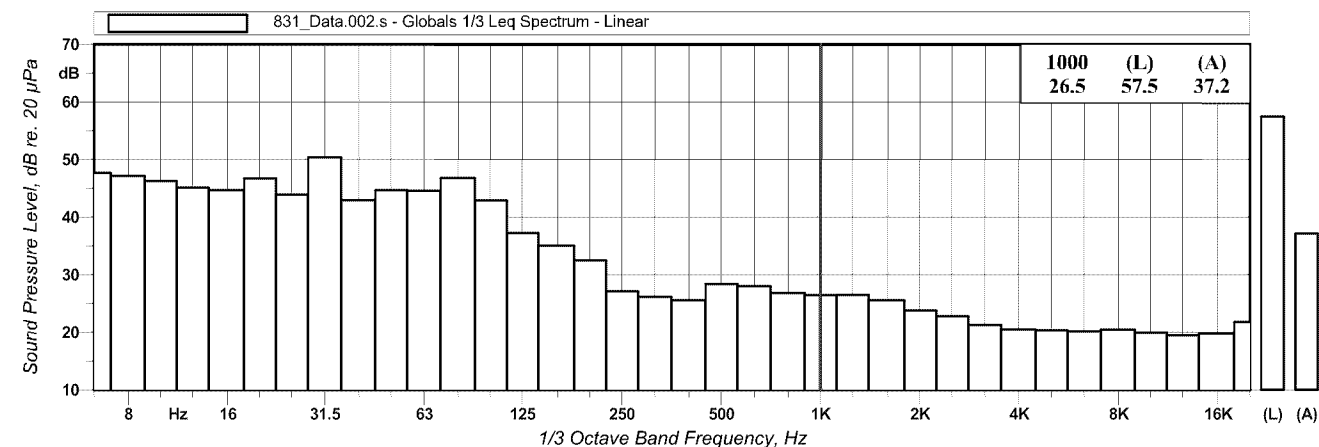
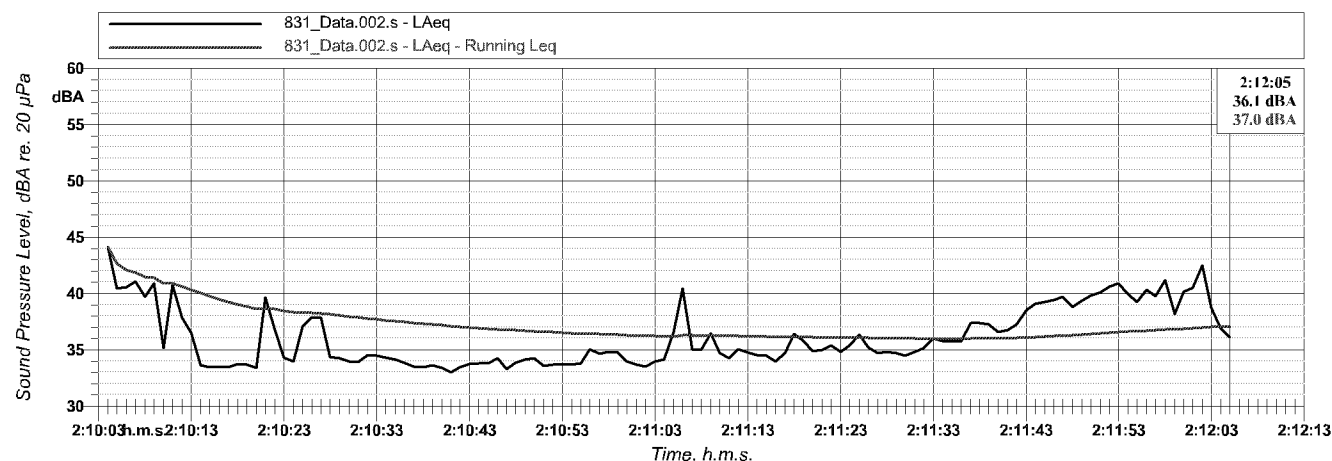
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Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: D
Date: 12/12/2024
Start Time: 2:10:03 AM
End Time: 2:12:05 AM
Run Time: 122.0 seconds

Meteorology: Temperature: -3 to -1 °F
Wind Speed / Dir.: Calm
Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
Initial Calibration: 94.0 dB
Final Calibration: 93.7 dB
Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 2: Late Night, Subzero Temperature Ambient
(Background) Measurement; All Verizon
Equipment Running Normally



L1.0: 42.8 dBA L50.0: 35.0 dBA : N/A dBA Leq: 36.9 dBA
L10.0: 40.0 dBA L90.0: 33.5 dBA LMin: 32.6 dBA LMax: 46.1 dBA

831_Data.002.s Globals 1/3 Leq Spectrum - Linear											
Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	43.9 dB	80	46.8 dB	250	27.1 dB	800	26.9 dB	2500	22.8 dB	8000	20.5 dB
31.5	50.4 dB	100	42.9 dB	315	26.2 dB	1000	26.5 dB	3150	21.3 dB	10000	20.0 dB
40	43.0 dB	125	37.3 dB	400	25.5 dB	1250	26.5 dB	4000	20.5 dB	12500	19.5 dB
50	44.7 dB	160	35.1 dB	500	28.4 dB	1600	25.6 dB	5000	20.4 dB	16000	19.8 dB
63	44.5 dB	200	32.5 dB	630	28.0 dB	2000	23.8 dB	6300	20.2 dB	20000	21.8 dB

Figure A2



Acoustic Test Results

Minneapolis, Minnesota | o: 952.831.4646 | esi-engineering.com

Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

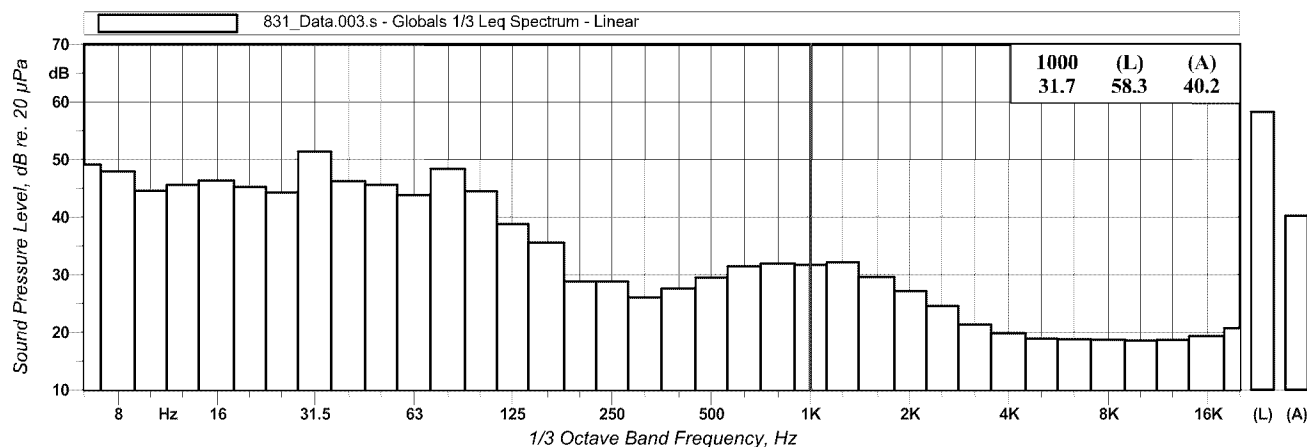
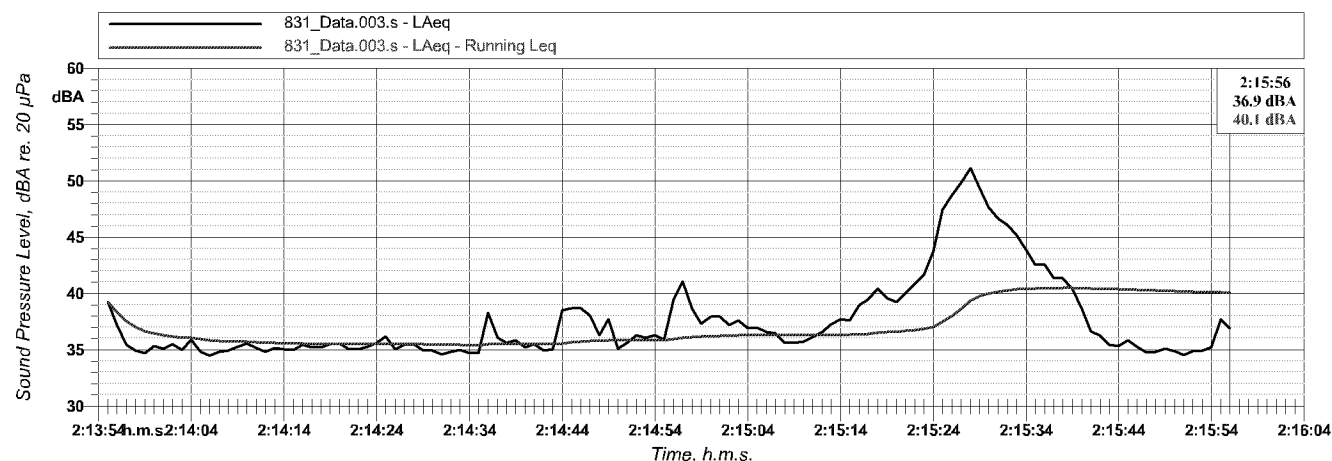
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: C
Date: 12/12/2024
Start Time: 2:13:54 AM
End Time: 2:15:56 AM
Run Time: 122.0 seconds

Meteorology: Temperature: -3 to -1 °F
 Wind Speed / Dir.: Calm
 Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
 Initial Calibration: 94.0 dB
 Final Calibration: 93.7 dB
 Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 3: Late Night, Subzero Temperature Ambient
 (Background) Measurement; All Verizon
 Equipment Running Normally



L1.0: 50.2 dBA
 L10.0: 42.4 dBA

L50.0: 35.9 dBA
 L90.0: 34.8 dBA

: N/A dBA
 LMin: 34.0 dBA

Leq: 40.1 dBA
 LMax: 52.4 dBA

831_Data.003.s
 Globals 1/3 Leq Spectrum - Linear

Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	44.3 dB	80	48.4 dB	250	28.8 dB	800	32.0 dB	2500	24.6 dB	8000	18.7 dB
31.5	51.4 dB	100	44.5 dB	315	26.0 dB	1000	31.7 dB	3150	21.4 dB	10000	18.6 dB
40	46.3 dB	125	38.8 dB	400	27.6 dB	1250	32.2 dB	4000	19.9 dB	12500	18.7 dB
50	45.6 dB	160	35.6 dB	500	29.6 dB	1600	29.6 dB	5000	18.9 dB	16000	19.3 dB
63	43.8 dB	200	28.8 dB	630	31.4 dB	2000	27.2 dB	6300	18.8 dB	20000	20.7 dB

Figure A3



Acoustic Test Results

Minneapolis, Minnesota | o: 952.831.4646 | esi-engineering.com

Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

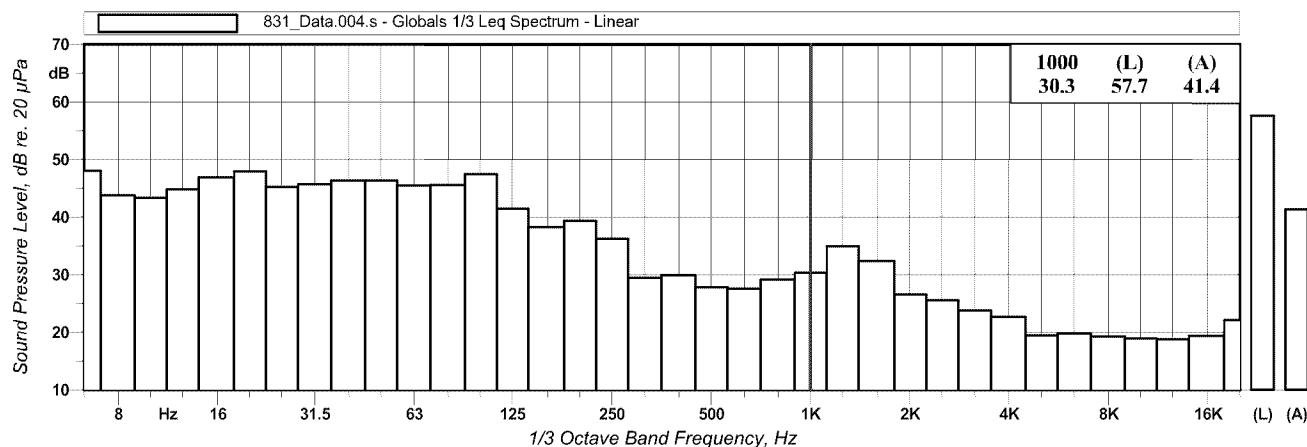
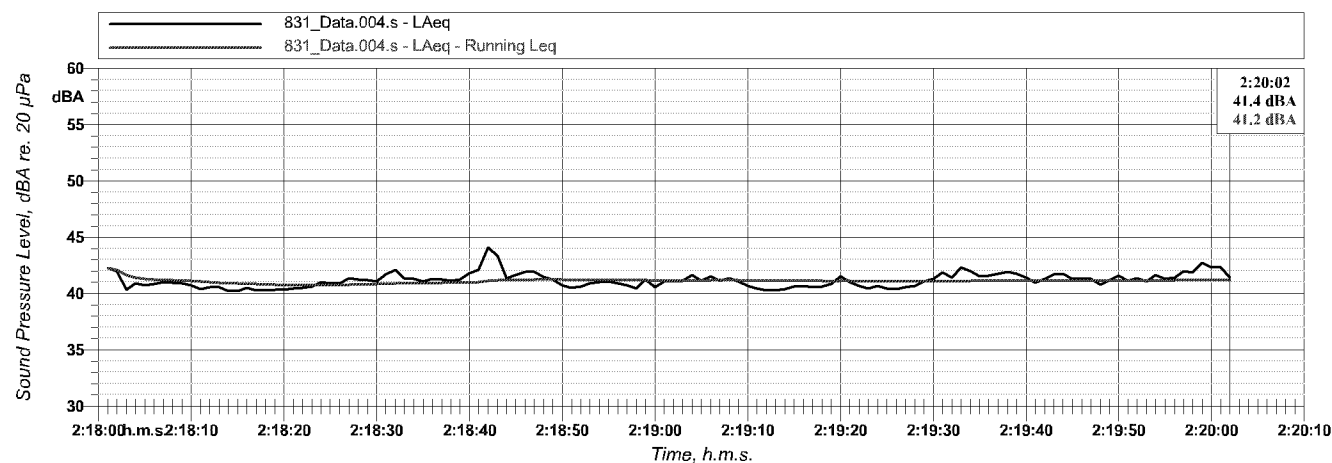
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: B
Date: 12/12/2024
Start Time: 2:18:00 AM
End Time: 2:20:02 AM
Run Time: 122.0 seconds

Meteorology: Temperature: -3 to -1 °F
Wind Speed / Dir.: Calm
Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
Initial Calibration: 94.0 dB
Final Calibration: 93.7 dB
Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 4: Late Night, Subzero Temperature Ambient
(Background) Measurement; All Verizon
Equipment Running Normally



L1.0: 43.6 dBA
L10.0: 41.9 dBA

L50.0: 41.1 dBA
L90.0: 40.4 dBA

: N/A dBA
LMin: 39.5 dBA

Leq: 41.2 dBA
LMax: 48.6 dBA

831_Data.004.s Globals 1/3 Leq Spectrum - Linear											
Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	45.2 dB	80	45.6 dB	250	36.2 dB	800	29.2 dB	2500	25.6 dB	8000	19.3 dB
31.5	45.8 dB	100	47.5 dB	315	29.5 dB	1000	30.3 dB	3150	23.8 dB	10000	19.0 dB
40	46.3 dB	125	41.5 dB	400	29.9 dB	1250	35.0 dB	4000	22.7 dB	12500	18.8 dB
50	46.3 dB	160	38.3 dB	500	27.9 dB	1600	32.4 dB	5000	19.5 dB	16000	19.4 dB
63	45.5 dB	200	39.4 dB	630	27.6 dB	2000	26.6 dB	6300	19.8 dB	20000	22.1 dB

Figure A4



Acoustic Test Results

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Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

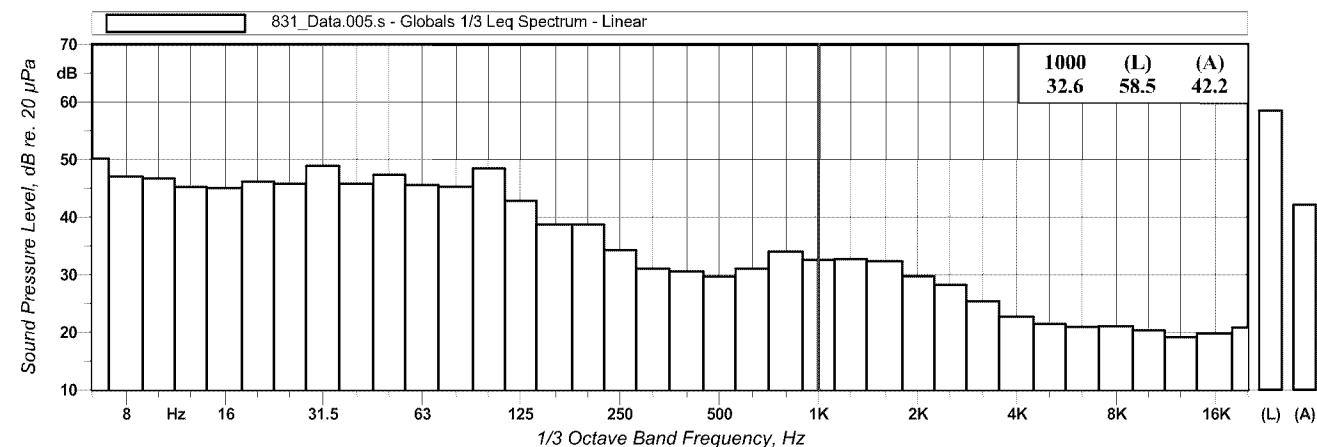
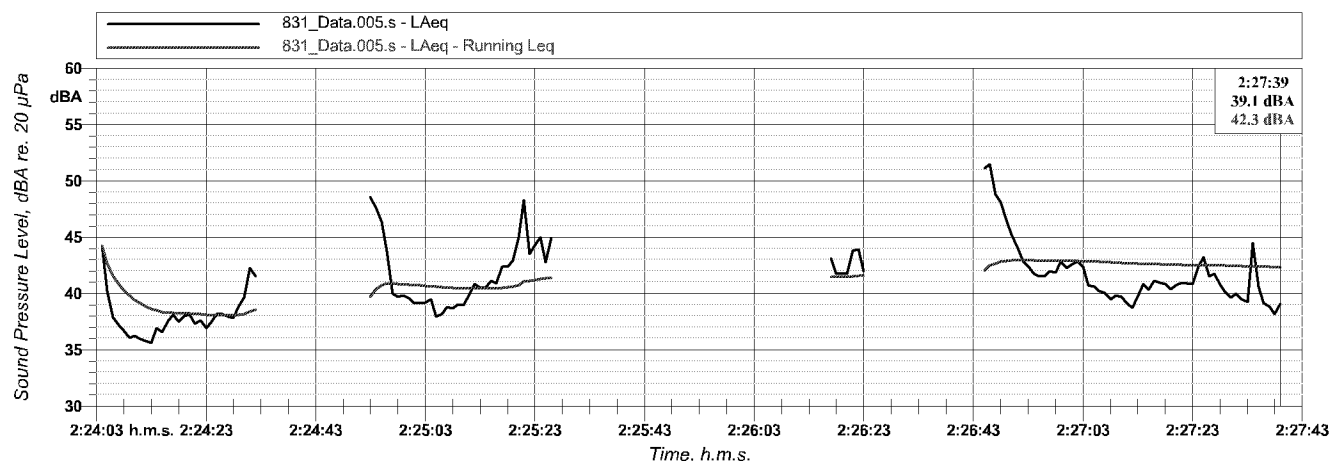
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: S
Date: 12/12/2024
Start Time: 2:24:03 AM
End Time: 2:27:39 AM
Run Time: 216.0 seconds

Meteorology: Temperature: -3 to -1 °F
Wind Speed / Dir.: Calm
Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
Initial Calibration: 94.0 dB
Final Calibration: 93.7 dB
Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 5: Late Night, Subzero Temperature Ambient
(Background) Measurement; All Verizon
Equipment Running Normally



L1.0: 50.6 dBA L50.0: 40.4 dBA : N/A dBA Leq: 42.0 dBA
L10.0: 44.5 dBA L90.0: 37.4 dBA LMin: 35.0 dBA LMax: 54.5 dBA

831_Data.005.s Globals 1/3 Leq Spectrum - Linear											
Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	45.8 dB	80	45.3 dB	250	34.3 dB	800	34.0 dB	2500	28.2 dB	8000	21.1 dB
31.5	48.9 dB	100	48.5 dB	315	31.1 dB	1000	32.6 dB	3150	25.4 dB	10000	20.4 dB
40	45.8 dB	125	42.8 dB	400	30.6 dB	1250	32.7 dB	4000	22.7 dB	12500	19.2 dB
50	47.3 dB	160	38.7 dB	500	29.7 dB	1600	32.4 dB	5000	21.5 dB	16000	19.8 dB
63	45.6 dB	200	38.7 dB	630	31.1 dB	2000	29.8 dB	6300	21.0 dB	20000	20.8 dB

Figure A5

Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

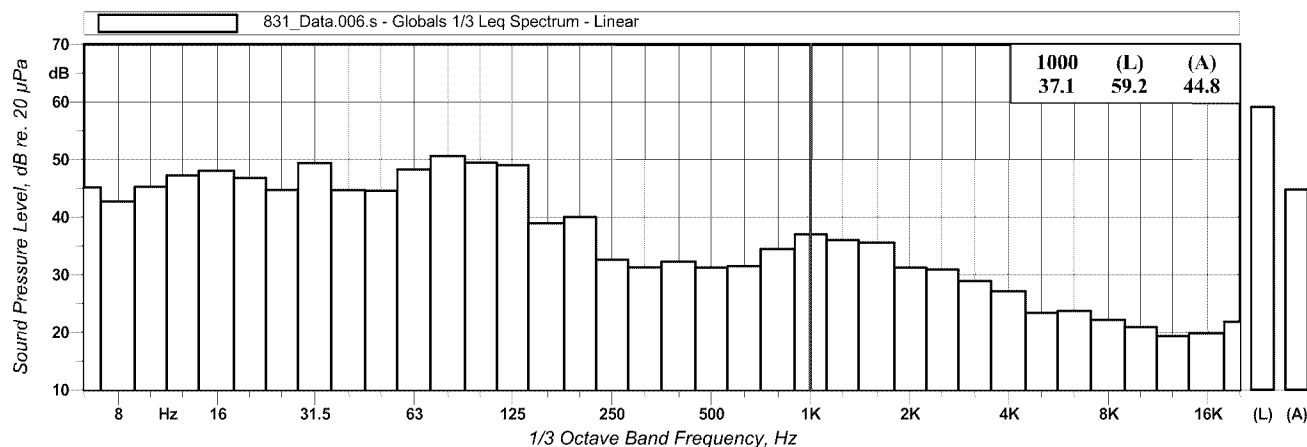
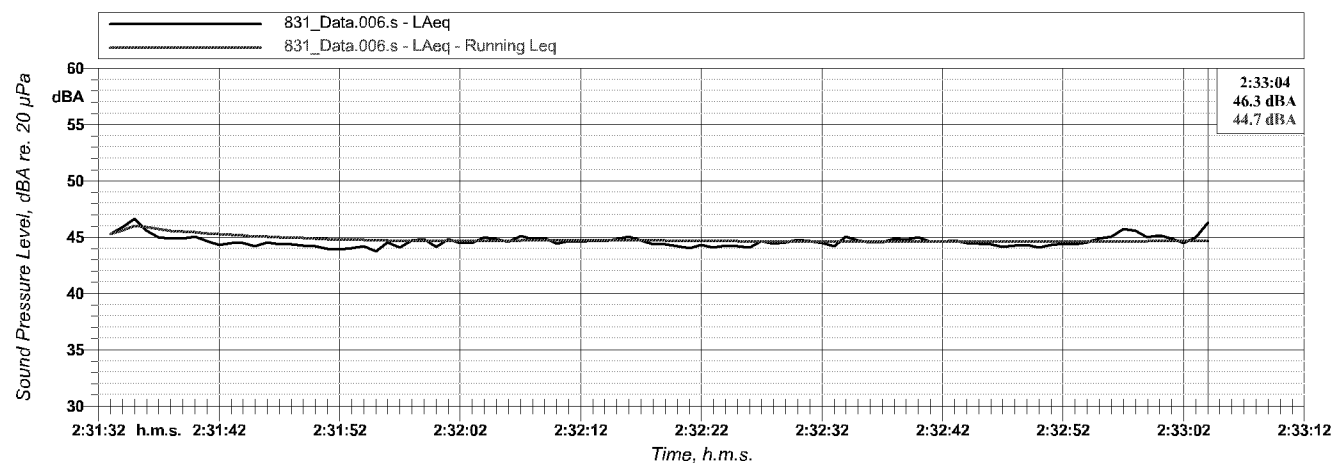
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: R
Date: 12/12/2024
Start Time: 2:31:32 AM
End Time: 2:33:04 AM
Run Time: 92.0 seconds

Meteorology: Temperature: -3 to -1 °F
 Wind Speed / Dir.: Calm
 Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
 Initial Calibration: 94.0 dB
 Final Calibration: 93.7 dB
 Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 6: Late Night, Subzero Temperature Ambient
 (Background) Measurement; All Verizon
 Equipment Running Normally



L1.0: 46.5 dBA

L50.0: 44.6 dBA

: N/A dBA

Leq: 44.7 dBA

L10.0: 45.2 dBA

L90.0: 44.1 dBA

LMin: 43.3 dBA

LMax: 47.7 dBA

831_Data.006.s
 Globals 1/3 Leq Spectrum - Linear

Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	44.7 dB	80	50.6 dB	250	32.6 dB	800	34.5 dB	2500	30.9 dB	8000	22.2 dB
31.5	49.4 dB	100	49.5 dB	315	31.3 dB	1000	37.1 dB	3150	28.9 dB	10000	20.9 dB
40	44.7 dB	125	49.0 dB	400	32.3 dB	1250	36.0 dB	4000	27.2 dB	12500	19.3 dB
50	44.6 dB	160	39.0 dB	500	31.2 dB	1600	35.5 dB	5000	23.4 dB	16000	19.8 dB
63	48.3 dB	200	40.0 dB	630	31.5 dB	2000	31.2 dB	6300	23.7 dB	20000	21.9 dB

Figure A6



Acoustic Test Results

Minneapolis, Minnesota | o: 952.831.4646 | esi-engineering.com

Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

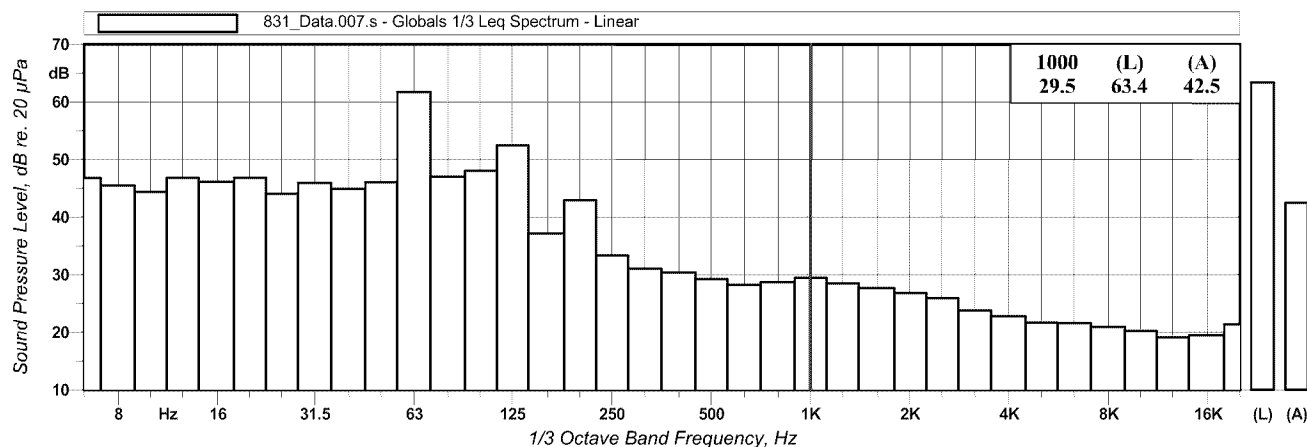
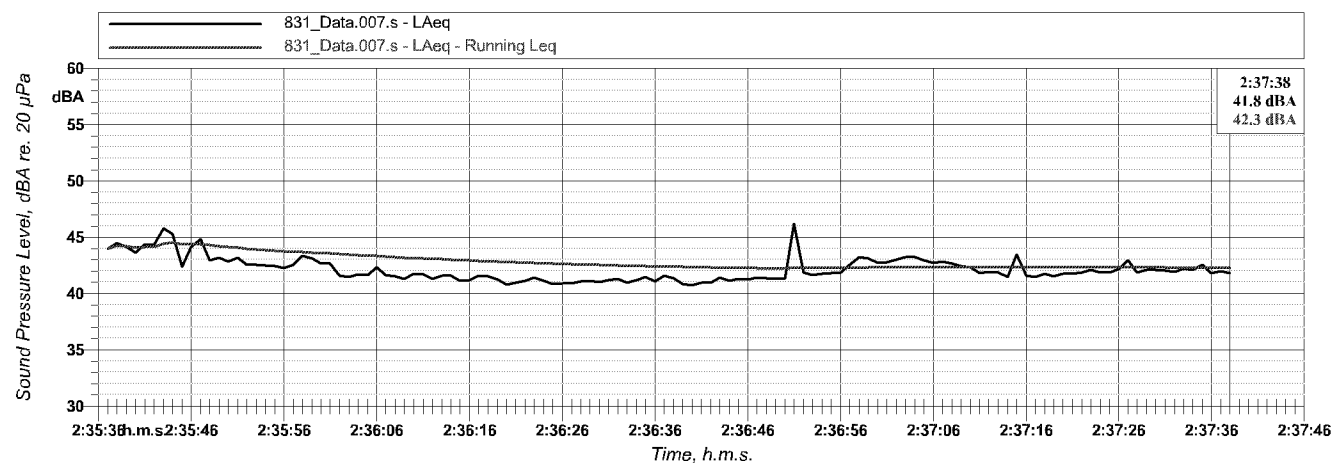
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Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: G
Date: 12/12/2024
Start Time: 2:35:36 AM
End Time: 2:37:38 AM
Run Time: 122.0 seconds

Meteorology: Temperature: -3 to -1 °F
 Wind Speed / Dir.: Calm
 Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
 Initial Calibration: 94.0 dB
 Final Calibration: 93.7 dB
 Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 7: Late Night, Subzero Temperature Ambient
 (Background) Measurement; All Verizon
 Equipment Running Normally



L1.0: 46.1 dBA

L50.0: 41.9 dBA

: N/A dBA

Leq: 42.3 dBA

L10.0: 43.4 dBA

L90.0: 41.0 dBA

LMin: 40.2 dBA

LMax: 52.0 dBA

831_Data.007.s
 Globals 1/3 Leq Spectrum - Linear

Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	44.1 dB	80	47.0 dB	250	33.4 dB	800	28.8 dB	2500	25.9 dB	8000	21.0 dB
31.5	46.0 dB	100	48.1 dB	315	31.1 dB	1000	29.5 dB	3150	23.8 dB	10000	20.2 dB
40	44.9 dB	125	52.5 dB	400	30.4 dB	1250	28.5 dB	4000	22.8 dB	12500	19.1 dB
50	46.1 dB	160	37.2 dB	500	29.2 dB	1600	27.7 dB	5000	21.7 dB	16000	19.5 dB
63	61.7 dB	200	43.0 dB	630	28.2 dB	2000	26.9 dB	6300	21.6 dB	20000	21.4 dB

Figure A7



Acoustic Test Results

Minneapolis, Minnesota | o: 952.831.4646 | esi-engineering.com

Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

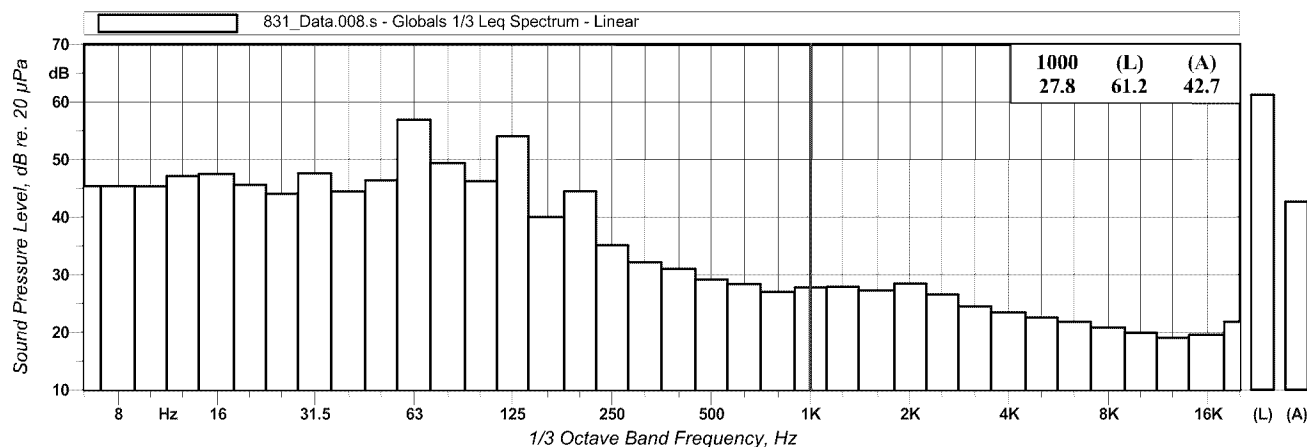
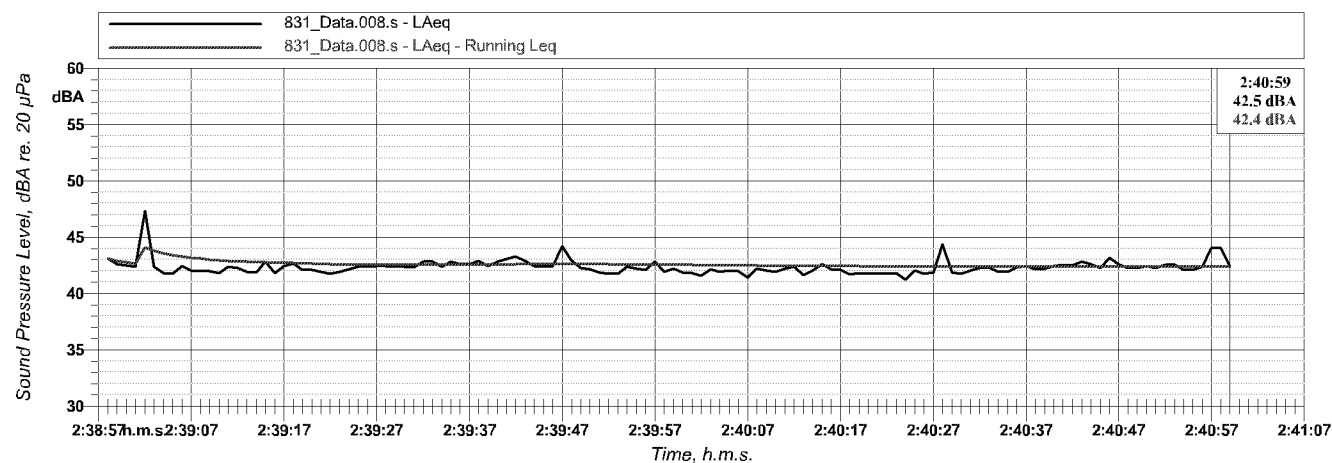
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: Q
Date: 12/12/2024
Start Time: 2:38:57 AM
End Time: 2:40:59 AM
Run Time: 122.0 seconds

Meteorology: Temperature: -3 to -1 °F
 Wind Speed / Dir.: Calm
 Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
 Initial Calibration: 94.0 dB
 Final Calibration: 93.7 dB
 Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 8: Late Night, Subzero Temperature Ambient
 (Background) Measurement; All Verizon
 Equipment Running Normally



L1.0: 45.2 dBA

L50.0: 42.2 dBA

: N/A dBA

Leq: 42.4 dBA

L10.0: 43.0 dBA

L90.0: 41.6 dBA

LMin: 40.7 dBA

LMax: 51.3 dBA

831_Data.008.s
 Globals 1/3 Leq Spectrum - Linear

Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	44.1 dB	80	49.4 dB	250	35.2 dB	800	27.0 dB	2500	26.6 dB	8000	20.9 dB
31.5	47.6 dB	100	46.3 dB	315	32.2 dB	1000	27.8 dB	3150	24.5 dB	10000	19.9 dB
40	44.5 dB	125	54.1 dB	400	31.0 dB	1250	27.9 dB	4000	23.5 dB	12500	19.1 dB
50	46.4 dB	160	40.0 dB	500	29.2 dB	1600	27.3 dB	5000	22.6 dB	16000	19.6 dB
63	56.9 dB	200	44.5 dB	630	28.4 dB	2000	28.5 dB	6300	21.9 dB	20000	21.9 dB

Figure A8

Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

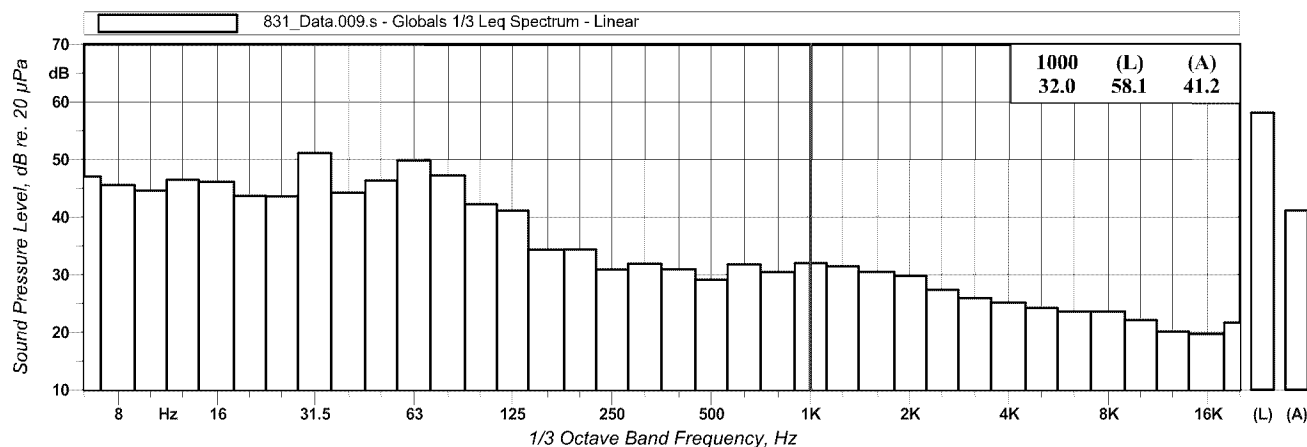
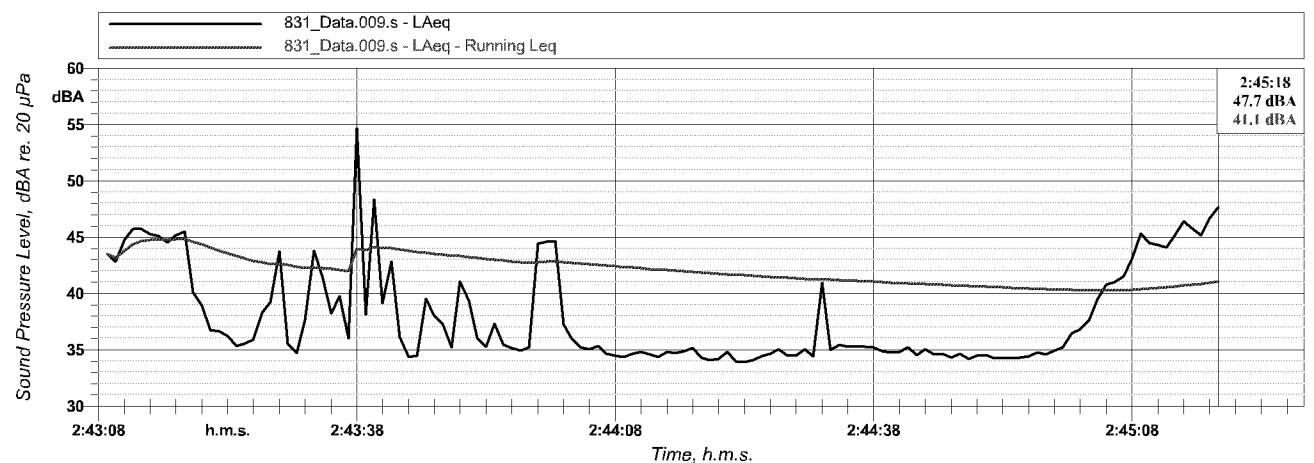
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: F
Date: 12/12/2024
Start Time: 2:43:08 AM
End Time: 2:45:18 AM
Run Time: 130.0 seconds

Meteorology: Temperature: -3 to -1 °F
 Wind Speed / Dir.: Calm
 Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
 Initial Calibration: 94.0 dB
 Final Calibration: 93.7 dB
 Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 9: Late Night, Subzero Temperature Ambient
 (Background) Measurement; All Verizon
 Equipment Running Normally (Cars on Old Shakopee Passing)



L1.0: 49.0 dBA

L50.0: 35.4 dBA

: N/A dBA

Leq: 41.0 dBA

L10.0: 45.1 dBA

L90.0: 34.3 dBA

LMin: 33.2 dBA

LMax: 62.6 dBA

831_Data.009.s
 Globals 1/3 Leq Spectrum - Linear

Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	43.6 dB	80	47.2 dB	250	30.9 dB	800	30.4 dB	2500	27.4 dB	8000	23.6 dB
31.5	51.1 dB	100	42.3 dB	315	31.9 dB	1000	32.0 dB	3150	26.0 dB	10000	22.1 dB
40	44.2 dB	125	41.1 dB	400	30.9 dB	1250	31.5 dB	4000	25.2 dB	12500	20.1 dB
50	46.3 dB	160	34.4 dB	500	29.2 dB	1600	30.5 dB	5000	24.2 dB	16000	19.7 dB
63	49.8 dB	200	34.4 dB	630	31.8 dB	2000	29.8 dB	6300	23.6 dB	20000	21.7 dB

Figure A9



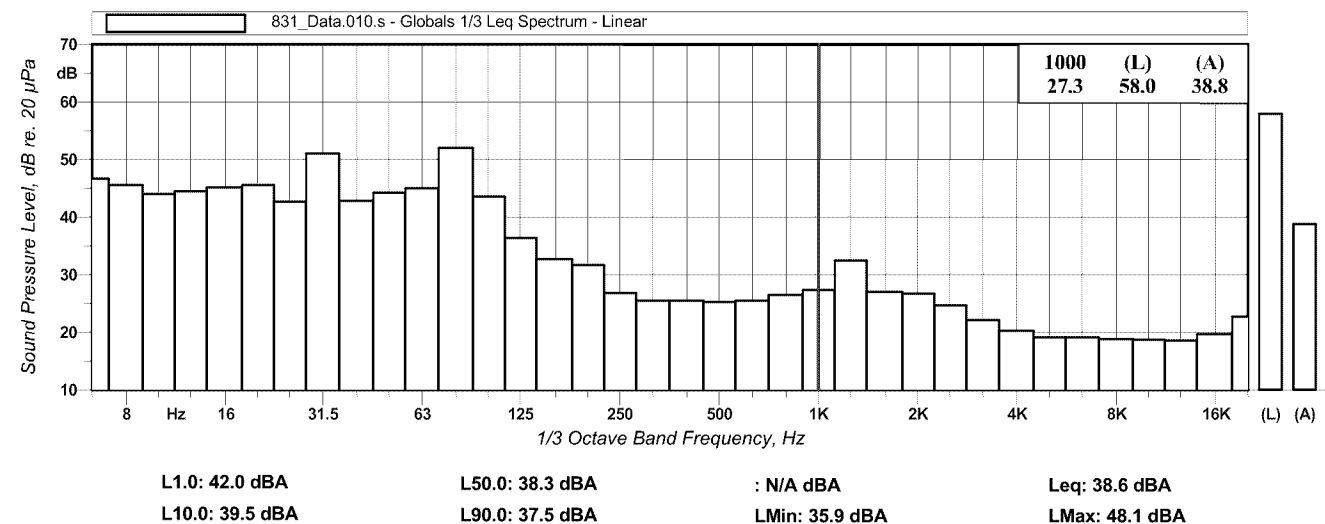
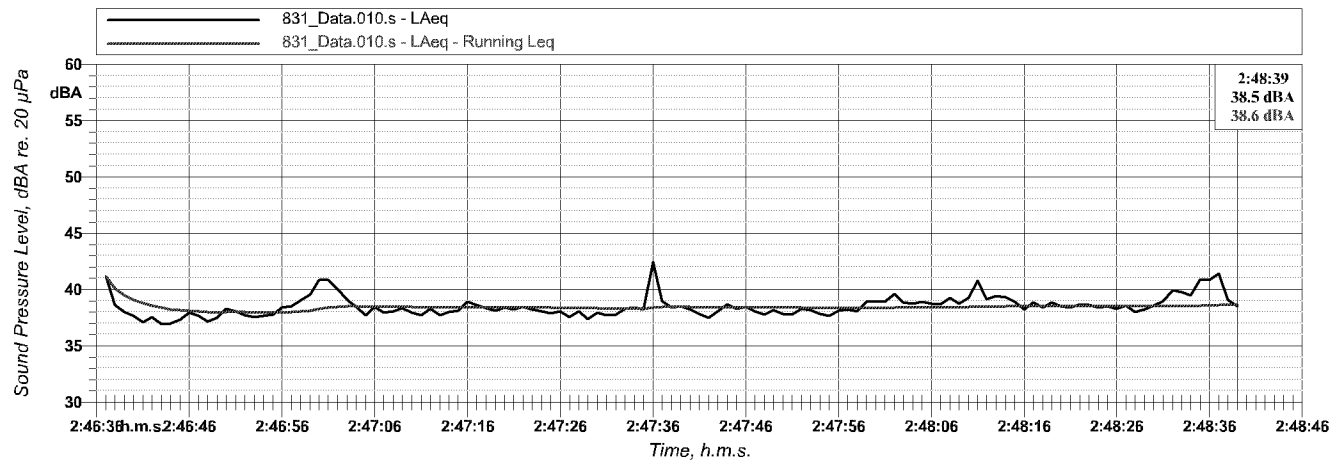
Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: E
Date: 12/12/2024
Start Time: 2:46:36 AM
End Time: 2:48:39 AM
Run Time: 123.0 seconds

Meteorology: Temperature: -3 to -1 °F
Wind Speed / Dir.: Calm
Humidity: 62-65%
Calibration Check: Calibration Frequency: 1 kHz
Initial Calibration: 94.0 dB
Final Calibration: 93.7 dB
Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 10: Late Night, Subzero Temperature Ambient
(Background) Measurement; All Verizon
Equipment Running Normally



831_Data.010.s Globals 1/3 Leq Spectrum - Linear											
Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	42.7 dB	80	52.0 dB	250	26.8 dB	800	26.5 dB	2500	24.7 dB	8000	18.8 dB
31.5	51.1 dB	100	43.6 dB	315	25.5 dB	1000	27.3 dB	3150	22.1 dB	10000	18.7 dB
40	42.9 dB	125	36.4 dB	400	25.5 dB	1250	32.5 dB	4000	20.3 dB	12500	18.6 dB
50	44.3 dB	160	32.7 dB	500	25.3 dB	1600	27.0 dB	5000	19.1 dB	16000	19.7 dB
63	45.0 dB	200	31.7 dB	630	25.5 dB	2000	26.7 dB	6300	19.1 dB	20000	22.7 dB

Figure A10



Acoustic Test Results

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Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

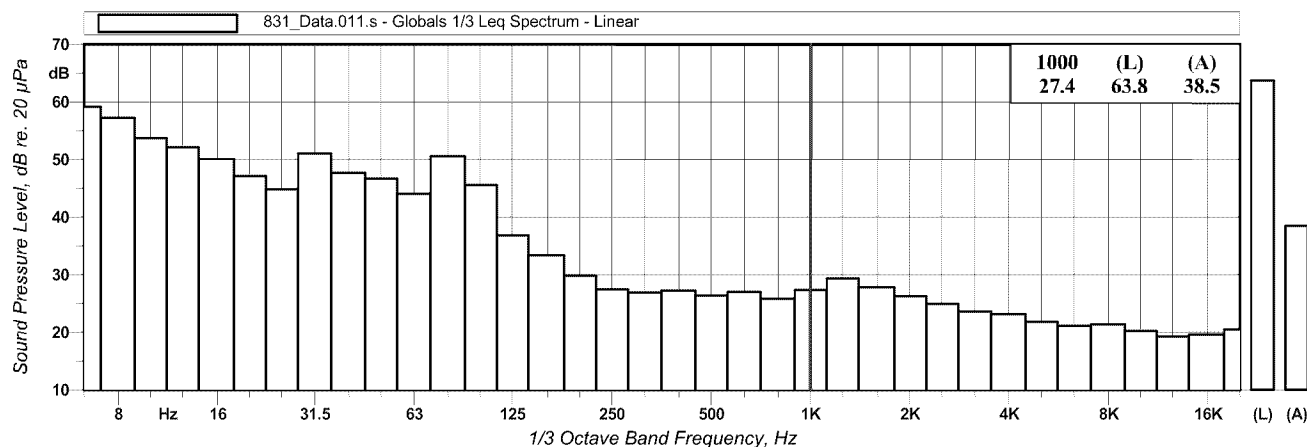
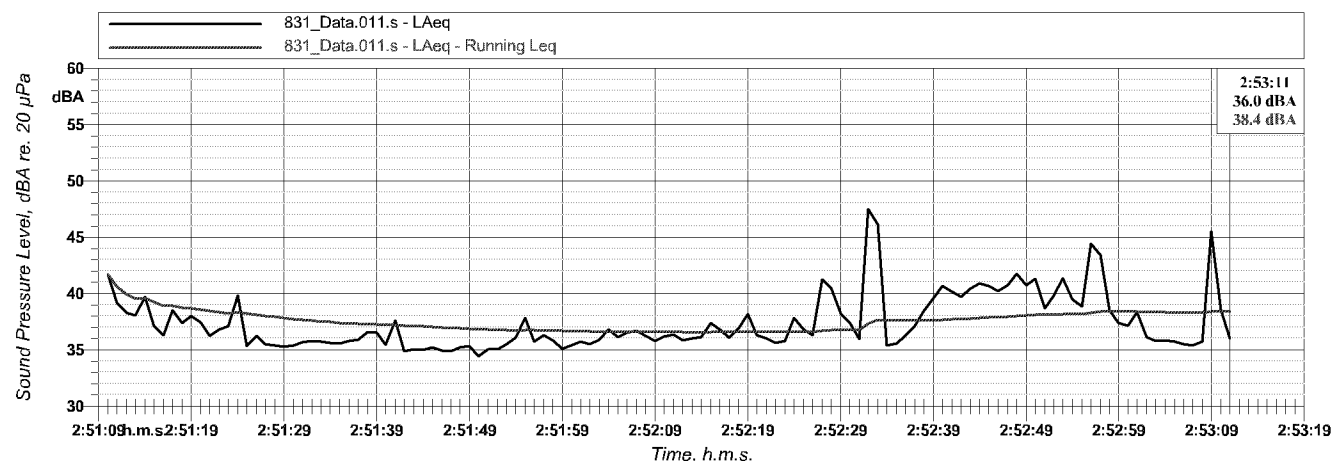
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: I
Date: 12/12/2024
Start Time: 2:51:09 AM
End Time: 2:53:11 AM
Run Time: 122.0 seconds

Meteorology: Temperature: -3 to -1 °F
Wind Speed / Dir.: Calm
Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
Initial Calibration: 94.0 dB
Final Calibration: 93.7 dB
Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 11: Late Night, Subzero Temperature Ambient
(Background) Measurement; All Verizon
Equipment Running Normally



L1.0: 45.9 dBA
L10.0: 40.6 dBA

L50.0: 36.3 dBA
L90.0: 35.2 dBA

: N/A dBA
LMin: 33.9 dBA

Leq: 38.4 dBA
LMax: 57.7 dBA

831_Data.011.s
Globals 1/3 Leq Spectrum - Linear

Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	44.8 dB	80	50.6 dB	250	27.5 dB	800	25.9 dB	2500	25.0 dB	8000	21.4 dB
31.5	51.1 dB	100	45.6 dB	315	26.9 dB	1000	27.4 dB	3150	23.6 dB	10000	20.2 dB
40	47.7 dB	125	36.9 dB	400	27.2 dB	1250	29.3 dB	4000	23.2 dB	12500	19.3 dB
50	46.7 dB	160	33.4 dB	500	26.4 dB	1600	27.8 dB	5000	21.9 dB	16000	19.6 dB
63	44.1 dB	200	29.9 dB	630	27.0 dB	2000	26.3 dB	6300	21.1 dB	20000	20.5 dB

Figure A11



Acoustic Test Results

Minneapolis, Minnesota | o: 952.831.4646 | esi-engineering.com

Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

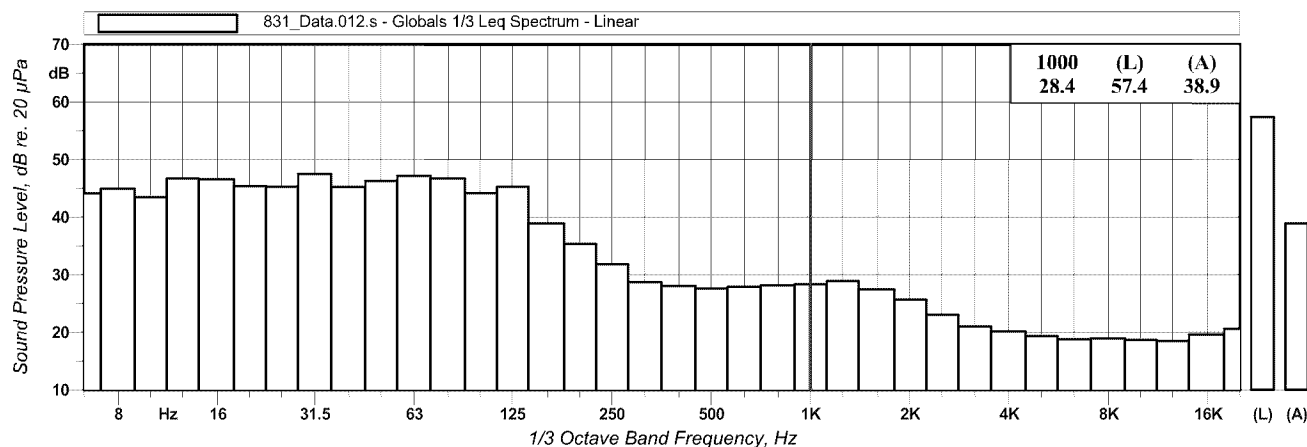
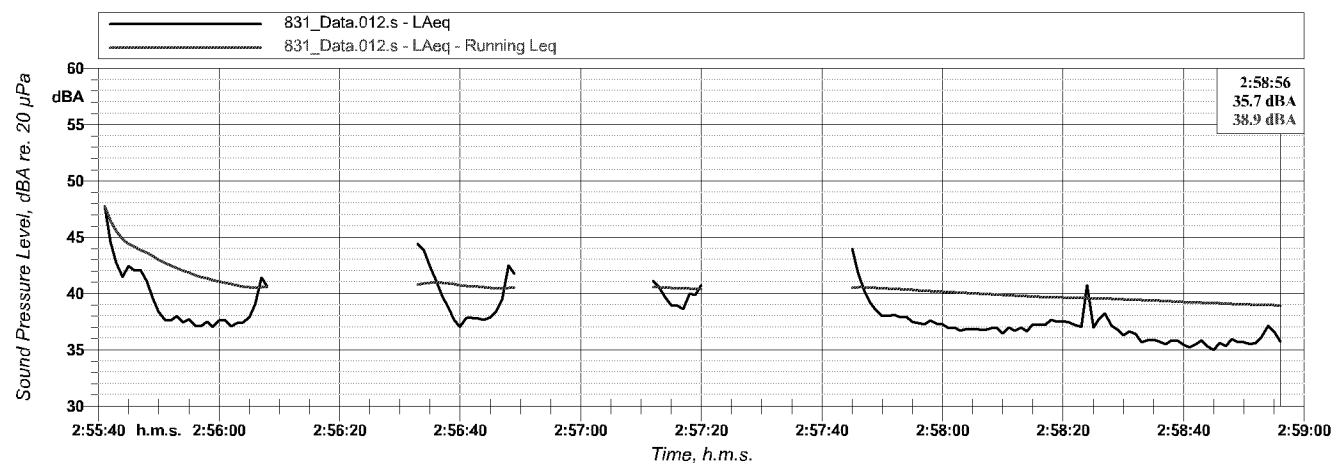
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: H
Date: 12/12/2024
Start Time: 2:55:40 AM
End Time: 2:58:56 AM
Run Time: 196.0 seconds

Meteorology: Temperature: -3 to -1 °F
Wind Speed / Dir.: Calm
Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
Initial Calibration: 94.0 dB
Final Calibration: 93.7 dB
Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 12: Late Night, Subzero Temperature Ambient
(Background) Measurement; All Verizon
Equipment Running Normally



L1.0: 44.8 dBA
L10.0: 41.5 dBA

L50.0: 37.4 dBA
L90.0: 35.7 dBA

: N/A dBA
LMin: 34.6 dBA

Leq: 38.7 dBA
LMax: 48.6 dBA

831_Data.012.s
Globals 1/3 Leq Spectrum - Linear

Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	45.3 dB	80	46.8 dB	250	31.9 dB	800	28.2 dB	2500	23.1 dB	8000	19.0 dB
31.5	47.5 dB	100	44.2 dB	315	28.7 dB	1000	28.4 dB	3150	21.0 dB	10000	18.7 dB
40	45.2 dB	125	45.3 dB	400	28.1 dB	1250	28.9 dB	4000	20.2 dB	12500	18.5 dB
50	46.3 dB	160	38.9 dB	500	27.6 dB	1600	27.5 dB	5000	19.3 dB	16000	19.6 dB
63	47.2 dB	200	35.3 dB	630	27.9 dB	2000	25.7 dB	6300	18.8 dB	20000	20.6 dB

Figure A12

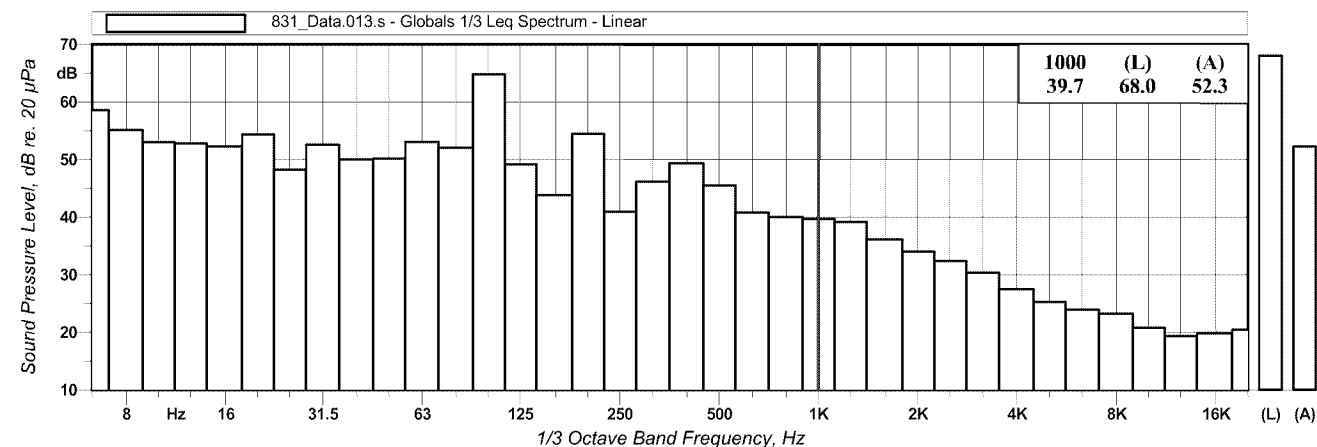
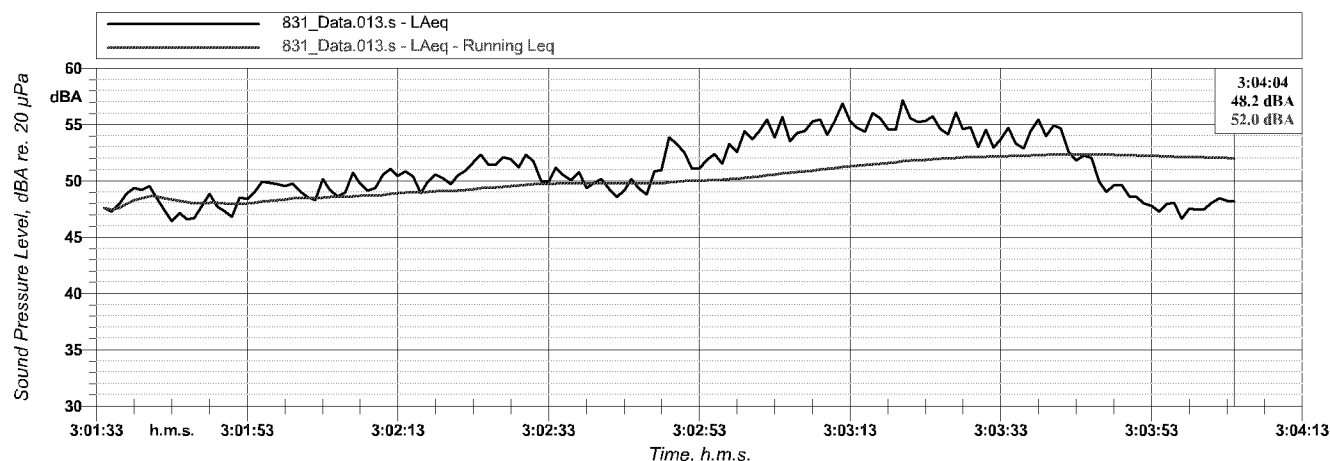
Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: O
Date: 12/12/2024
Start Time: 3:01:33 AM
End Time: 3:04:04 AM
Run Time: 151.0 seconds

Meteorology: Temperature: -3 to -1 °F
Wind Speed / Dir.: Calm
Humidity: 62-65%
Calibration Check: Calibration Frequency: 1 kHz
Initial Calibration: 94.0 dB
Final Calibration: 93.7 dB
Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 13: Late Night, Subzero Temperature Ambient
(Background) Measurement; All Verizon
Equipment Running Normally (Dry Coolers Running But Conditions Changing)



L1.0: 56.8 dBA L50.0: 50.6 dBA : N/A dBA Leq: 52.0 dBA
L10.0: 55.1 dBA L90.0: 47.7 dBA LMin: 45.7 dBA LMax: 58.4 dBA

831_Data.013.s Globals 1/3 Leq Spectrum - Linear											
Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	48.2 dB	80	52.1 dB	250	41.0 dB	800	40.0 dB	2500	32.4 dB	8000	23.3 dB
31.5	52.6 dB	100	64.8 dB	315	46.2 dB	1000	39.7 dB	3150	30.4 dB	10000	20.8 dB
40	50.0 dB	125	49.2 dB	400	49.4 dB	1250	39.2 dB	4000	27.5 dB	12500	19.3 dB
50	50.2 dB	160	43.8 dB	500	45.5 dB	1600	36.2 dB	5000	25.3 dB	16000	19.9 dB
63	53.1 dB	200	54.4 dB	630	40.8 dB	2000	34.0 dB	6300	24.0 dB	20000	20.5 dB

Figure A13



Acoustic Test Results

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Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

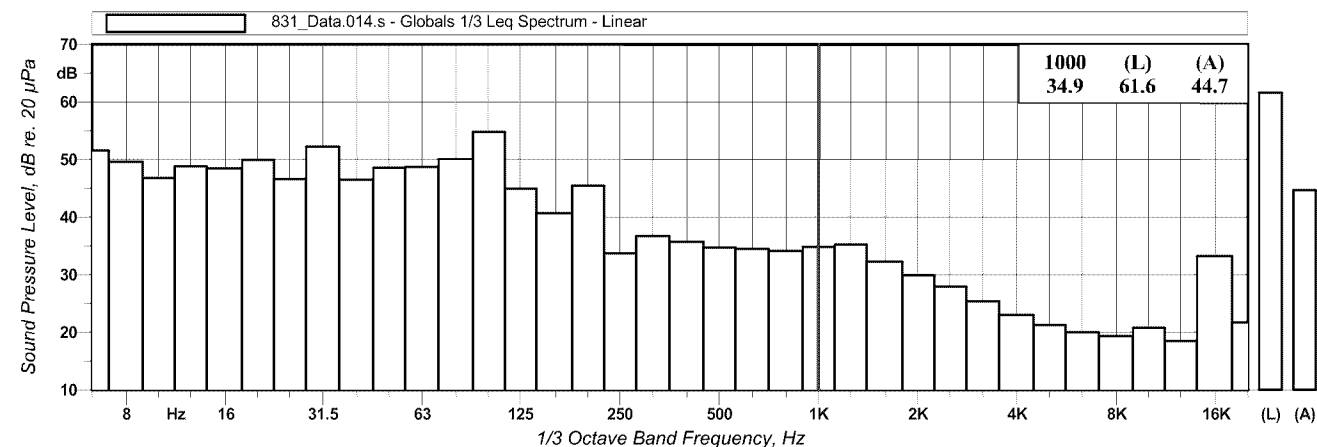
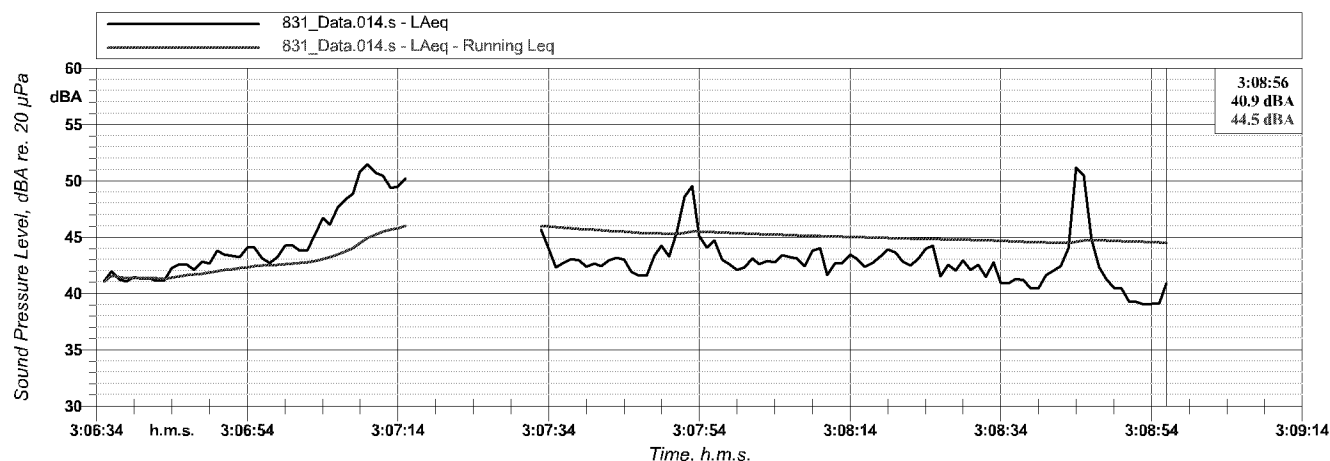
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: J
Date: 12/12/2024
Start Time: 3:06:34 AM
End Time: 3:08:56 AM
Run Time: 142.0 seconds

Meteorology: Temperature: -3 to -1 °F
Wind Speed / Dir.: Calm
Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
Initial Calibration: 94.0 dB
Final Calibration: 93.7 dB
Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 14: Late Night, Subzero Temperature Ambient
(Background) Measurement; All Verizon
Equipment Running Normally (Dry Coolers Running But Conditions Changing)



L1.0: 51.6 dBA L50.0: 42.8 dBA : N/A dBA Leq: 44.5 dBA
L10.0: 47.7 dBA L90.0: 41.0 dBA LMin: 38.5 dBA LMax: 53.2 dBA

831_Data.014.s
Globals 1/3 Leq Spectrum - Linear

Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	46.6 dB	80	50.1 dB	250	33.8 dB	800	34.1 dB	2500	28.0 dB	8000	19.3 dB
31.5	52.2 dB	100	54.8 dB	315	36.8 dB	1000	34.9 dB	3150	25.4 dB	10000	20.8 dB
40	46.6 dB	125	45.0 dB	400	35.8 dB	1250	35.2 dB	4000	23.0 dB	12500	18.5 dB
50	48.6 dB	160	40.7 dB	500	34.8 dB	1600	32.3 dB	5000	21.3 dB	16000	33.2 dB
63	48.8 dB	200	45.4 dB	630	34.5 dB	2000	29.9 dB	6300	20.0 dB	20000	21.7 dB

Figure A14

Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

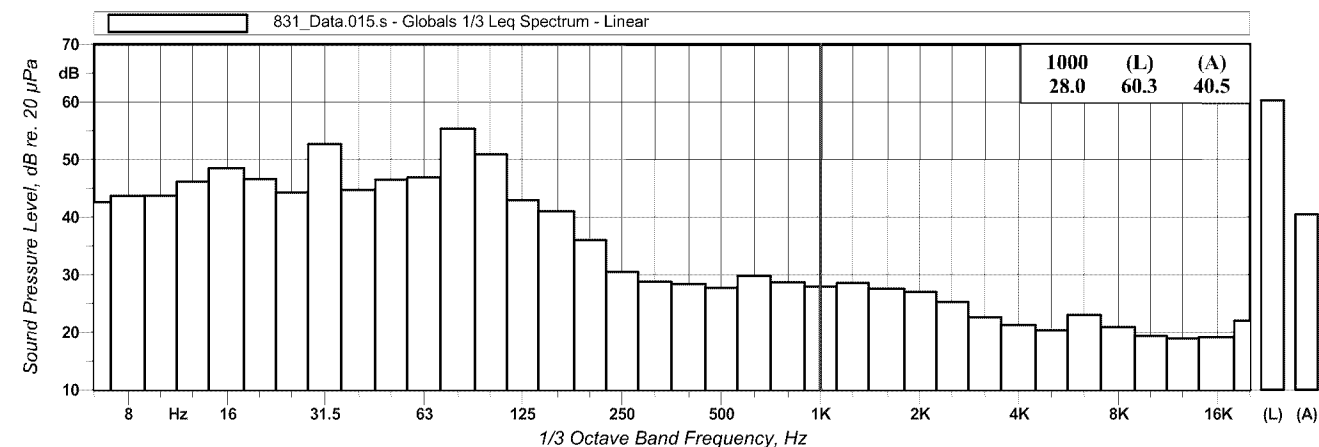
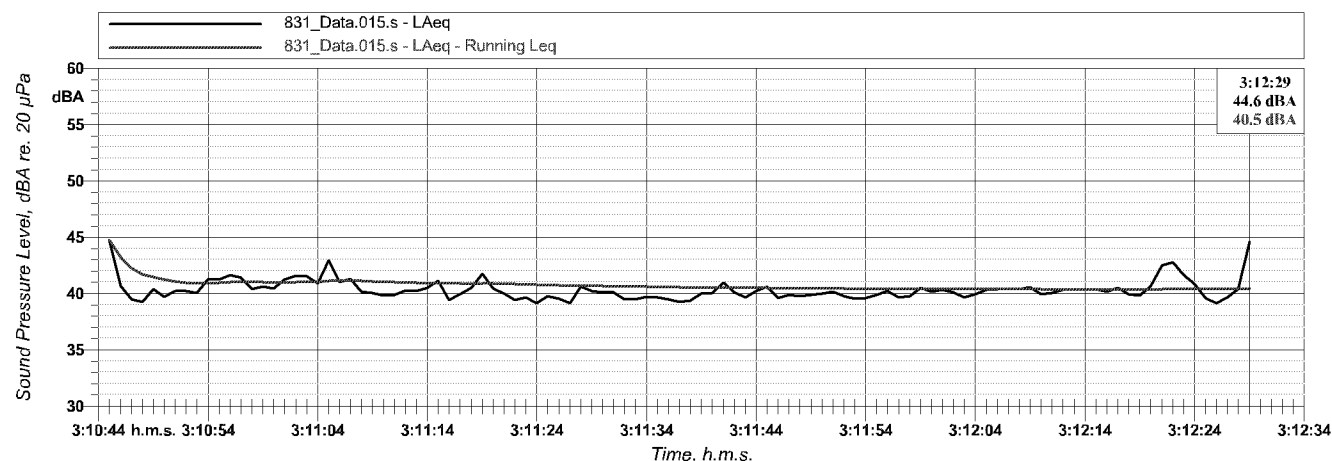
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: K
Date: 12/12/2024
Start Time: 3:10:44 AM
End Time: 3:12:29 AM
Run Time: 105.0 seconds

Meteorology: Temperature: -3 to -1 °F
Wind Speed / Dir.: Calm
Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
Initial Calibration: 94.0 dB
Final Calibration: 93.7 dB
Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 15: Late Night, Subzero Temperature Ambient
(Background) Measurement; All Verizon
Equipment Running Normally (Dry Coolers Running But Conditions Changing)



L1.0: 43.6 dBA L50.0: 40.1 dBA : N/A dBA Leq: 40.4 dBA
L10.0: 41.5 dBA L90.0: 39.4 dBA LMin: 38.4 dBA LMax: 49.0 dBA

831_Data.015.s Globals 1/3 Leq Spectrum - Linear											
Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	44.3 dB	80	55.3 dB	250	30.5 dB	800	28.7 dB	2500	25.3 dB	8000	20.9 dB
31.5	52.7 dB	100	50.9 dB	315	28.8 dB	1000	28.0 dB	3150	22.6 dB	10000	19.4 dB
40	44.7 dB	125	43.0 dB	400	28.4 dB	1250	28.6 dB	4000	21.3 dB	12500	19.0 dB
50	46.5 dB	160	41.0 dB	500	27.8 dB	1600	27.6 dB	5000	20.4 dB	16000	19.2 dB
63	46.9 dB	200	36.0 dB	630	29.8 dB	2000	27.0 dB	6300	23.0 dB	20000	22.0 dB

Figure A15

Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

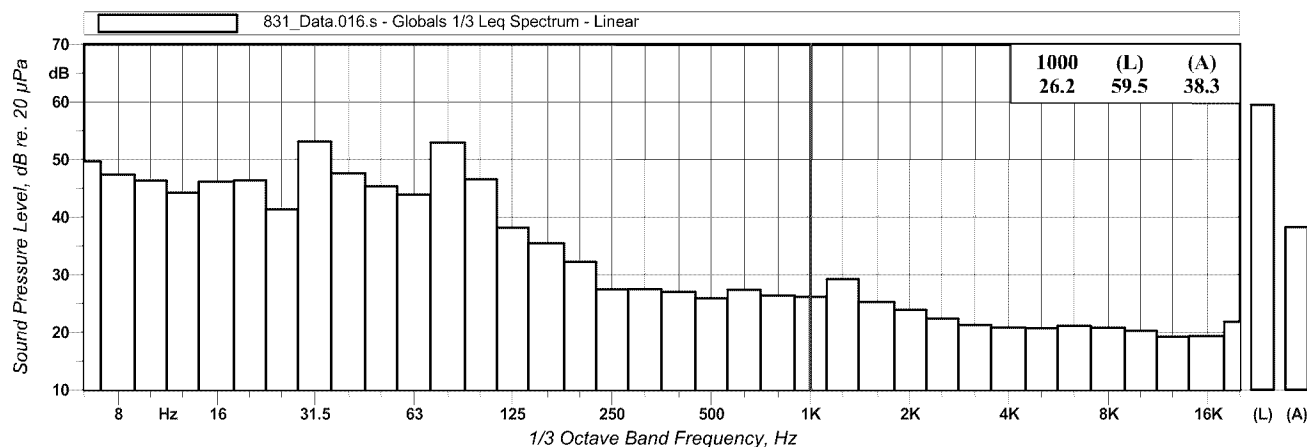
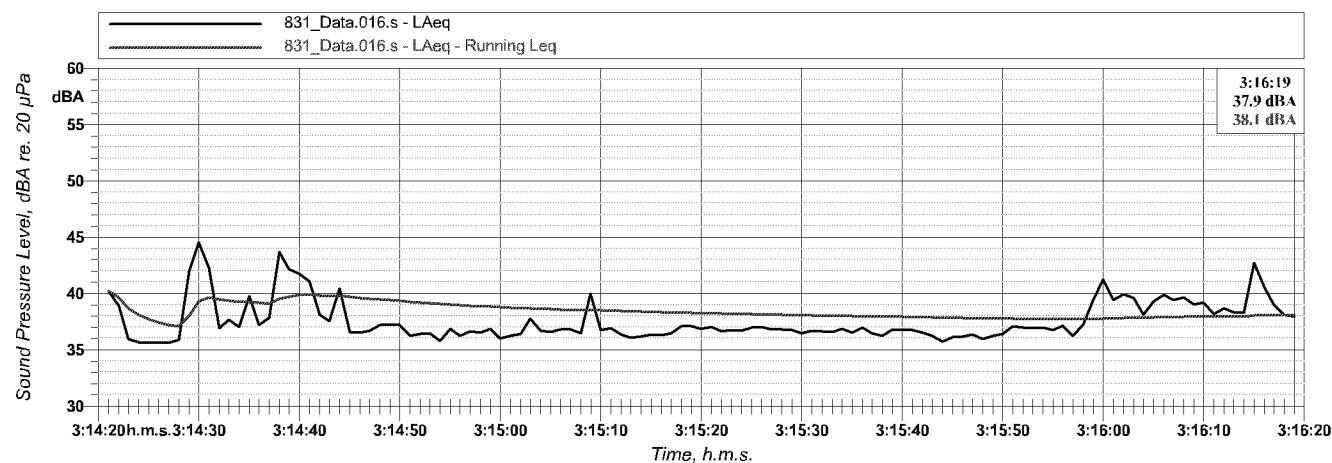
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: L
Date: 12/12/2024
Start Time: 3:14:20 AM
End Time: 3:16:19 AM
Run Time: 119.0 seconds

Meteorology: Temperature: -3 to -1 °F
 Wind Speed / Dir.: Calm
 Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
 Initial Calibration: 94.0 dB
 Final Calibration: 93.7 dB
 Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 16: Late Night, Subzero Temperature Ambient
 (Background) Measurement; All Verizon
 Equipment Running Normally (Dry Coolers Running But Conditions Changing)



L1.0: 44.7 dBA

L50.0: 36.9 dBA

: N/A dBA

Leq: 38.1 dBA

L10.0: 39.8 dBA

L90.0: 36.0 dBA

LMin: 34.7 dBA

LMax: 49.2 dBA

831_Data.016.s
 Globals 1/3 Leq Spectrum - Linear

Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	41.4 dB	80	53.0 dB	250	27.5 dB	800	26.4 dB	2500	22.4 dB	8000	20.8 dB
31.5	53.1 dB	100	46.6 dB	315	27.5 dB	1000	26.2 dB	3150	21.3 dB	10000	20.3 dB
40	47.6 dB	125	38.2 dB	400	27.1 dB	1250	29.2 dB	4000	20.9 dB	12500	19.2 dB
50	45.3 dB	160	35.5 dB	500	25.9 dB	1600	25.3 dB	5000	20.7 dB	16000	19.4 dB
63	43.9 dB	200	32.3 dB	630	27.4 dB	2000	23.9 dB	6300	21.1 dB	20000	21.8 dB

Figure A16

Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

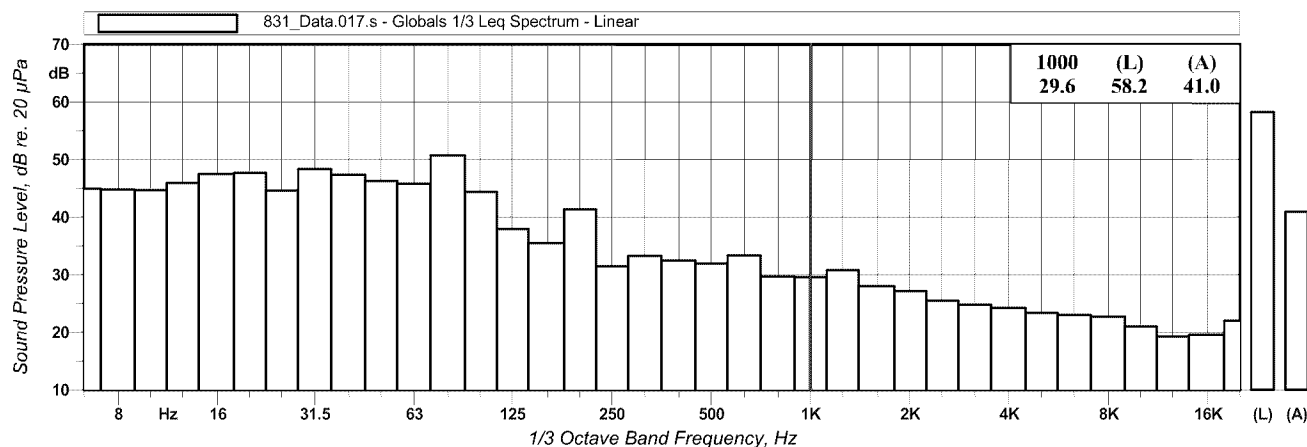
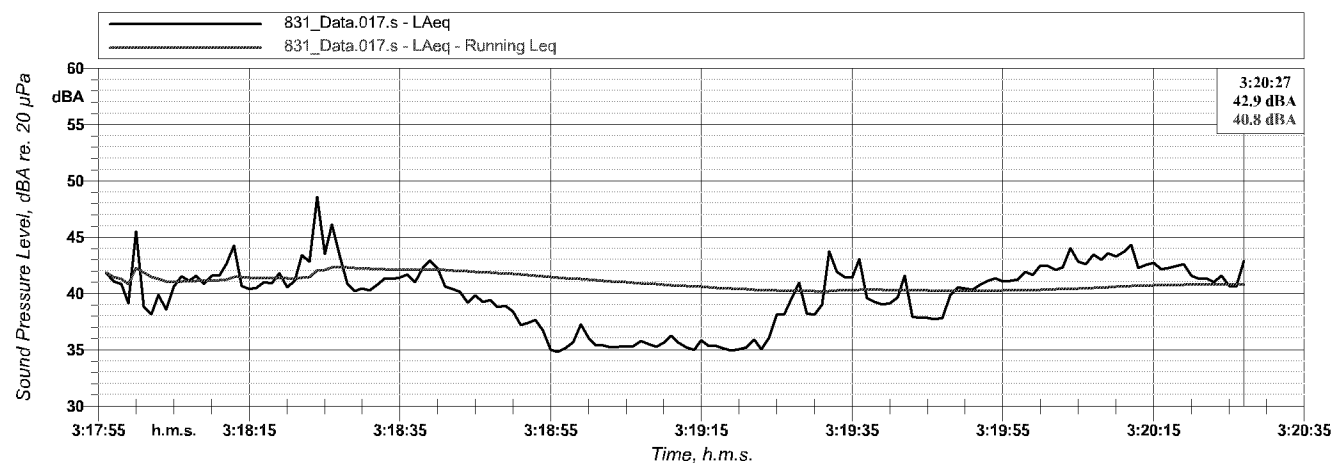
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: M
Date: 12/12/2024
Start Time: 3:17:55 AM
End Time: 3:20:27 AM
Run Time: 152.0 seconds

Meteorology: Temperature: -3 to -1 °F
 Wind Speed / Dir.: Calm
 Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
 Initial Calibration: 94.0 dB
 Final Calibration: 93.7 dB
 Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 17: Late Night, Subzero Temperature Ambient
 (Background) Measurement; All Verizon
 Equipment Running Normally (Dry Coolers Running But Conditions Changing)



L1.0: 46.9 dBA
 L10.0: 43.0 dBA

L50.0: 40.5 dBA
 L90.0: 35.3 dBA

: N/A dBA
 LMin: 34.0 dBA

Leq: 40.8 dBA
 LMax: 52.5 dBA

831_Data.017.s
 Globals 1/3 Leq Spectrum - Linear

Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	44.6 dB	80	50.7 dB	250	31.5 dB	800	29.7 dB	2500	25.5 dB	8000	22.7 dB
31.5	48.4 dB	100	44.4 dB	315	33.3 dB	1000	29.6 dB	3150	24.8 dB	10000	21.0 dB
40	47.3 dB	125	38.0 dB	400	32.5 dB	1250	30.8 dB	4000	24.3 dB	12500	19.3 dB
50	46.3 dB	160	35.5 dB	500	32.0 dB	1600	28.0 dB	5000	23.4 dB	16000	19.6 dB
63	45.8 dB	200	41.3 dB	630	33.4 dB	2000	27.2 dB	6300	23.0 dB	20000	22.0 dB

Figure A17



Acoustic Test Results

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Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

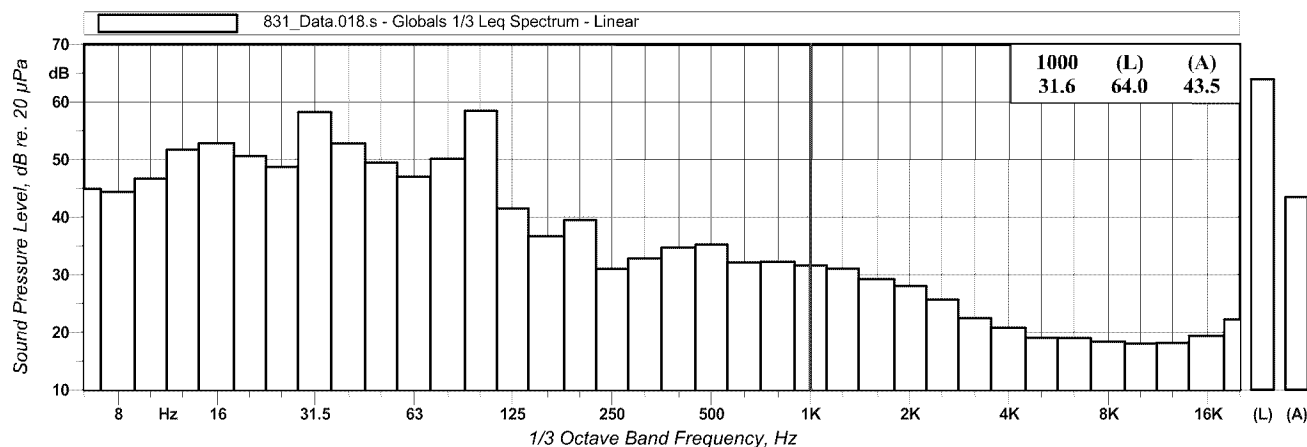
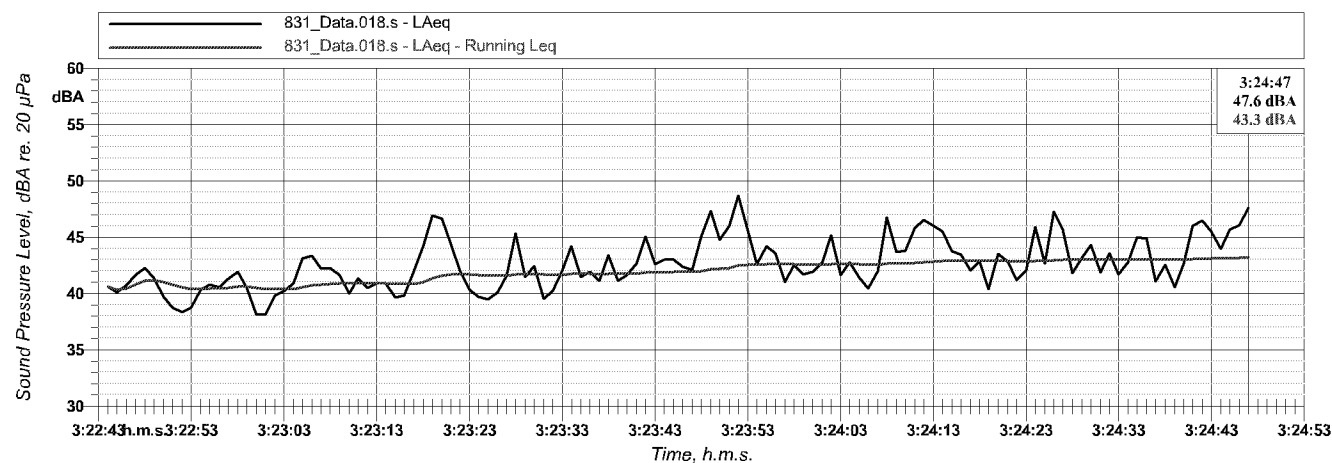
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: N
Date: 12/12/2024
Start Time: 3:22:43 AM
End Time: 3:24:47 AM
Run Time: 124.0 seconds

Meteorology: Temperature: -3 to -1 °F
 Wind Speed / Dir.: Calm
 Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
 Initial Calibration: 94.0 dB
 Final Calibration: 93.7 dB
 Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 18: Late Night, Subzero Temperature Ambient
 (Background) Measurement; All Verizon
 Equipment Running Normally (Dry Coolers Running But Conditions Changing)



831_Data.018.s Globals 1/3 Leq Spectrum - Linear											
Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	48.7 dB	80	50.1 dB	250	31.0 dB	800	32.2 dB	2500	25.7 dB	8000	18.4 dB
31.5	58.2 dB	100	58.5 dB	315	32.9 dB	1000	31.6 dB	3150	22.5 dB	10000	18.1 dB
40	52.8 dB	125	41.5 dB	400	34.8 dB	1250	31.1 dB	4000	20.8 dB	12500	18.2 dB
50	49.5 dB	160	36.7 dB	500	35.3 dB	1600	29.3 dB	5000	19.1 dB	16000	19.4 dB
63	47.0 dB	200	39.5 dB	630	32.1 dB	2000	28.1 dB	6300	19.0 dB	20000	22.3 dB

Figure A18

Project No: P2646
Project: Stantec - Verizon MSC Winter Msmts
Location: Bloomington, Minnesota
Engineer: A.A.J. Schmitt & A.J. Baxter

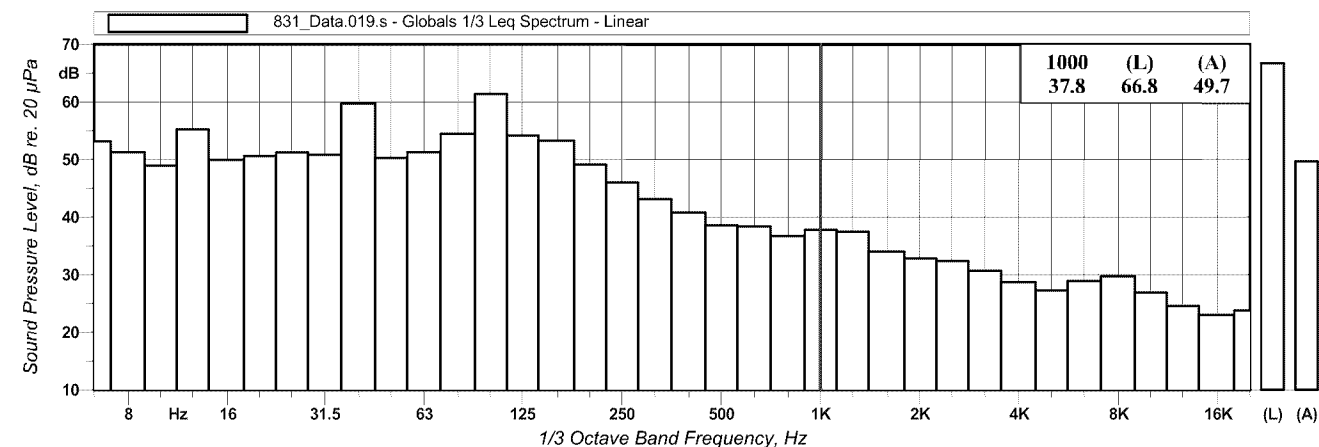
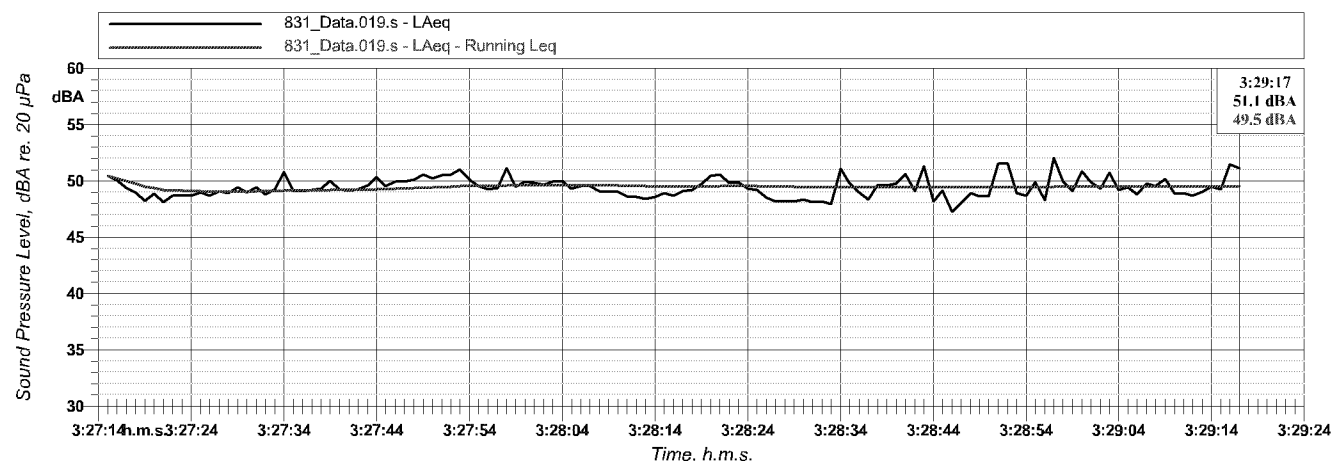
Analyzer: Larson Davis 831 s/n 3553
Preamplifier: Larson Davis PRM831 s/n 029391
Microphone: Larson Davis 377C20 s/n 315625
Calibrator: Larson Davis CAL200 s/n 18322
Last Calibrated: January 22, 2024

Location: P
Date: 12/12/2024
Start Time: 3:27:14 AM
End Time: 3:29:17 AM
Run Time: 123.0 seconds

Meteorology: Temperature: -3 to -1 °F
Wind Speed / Dir.: Calm
Humidity: 62-65%

Calibration Check: Calibration Frequency: 1 kHz
Initial Calibration: 94.0 dB
Final Calibration: 93.7 dB
Last Cal. Check: 12/12/24 @ 3:31 AM

Measurements: File N. 19: Late Night, Subzero Temperature Ambient
(Background) Measurement; All Verizon
Equipment Running Normally (Most Noise Here from Entegris Fan)



L1.0: 52.3 dBA L50.0: 49.3 dBA : N/A dBA Leq: 49.5 dBA
L10.0: 50.7 dBA L90.0: 48.2 dBA LMin: 46.6 dBA LMax: 55.8 dBA

831_Data.019.s Globals 1/3 Leq Spectrum - Linear											
Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB	Hz	dB
25	51.2 dB	80	54.5 dB	250	46.0 dB	800	36.7 dB	2500	32.4 dB	8000	29.7 dB
31.5	50.8 dB	100	61.4 dB	315	43.1 dB	1000	37.8 dB	3150	30.7 dB	10000	26.9 dB
40	59.8 dB	125	54.2 dB	400	40.8 dB	1250	37.5 dB	4000	28.8 dB	12500	24.6 dB
50	50.3 dB	160	53.3 dB	500	38.6 dB	1600	34.0 dB	5000	27.3 dB	16000	23.0 dB
63	51.3 dB	200	49.1 dB	630	38.4 dB	2000	32.9 dB	6300	28.9 dB	20000	23.8 dB

Figure A19