

Testing Protocol:

- All testing was performed to ASTM specifications.
- Testing was conducted using the Bruel & Kjaer 2270 analyzer running BZ-7222 (Sound Level Meter), and BZ-7223 (Frequency Analysis) software packages. This system is of Type 1 precision and the type approvals for the unit are included below:

4.2 Standards

Hand-held Analyzer Type 2250/2250-L/2270 conforms to the following National and International Standards and Classes/Types/Groups with the accessories and configurations specified in section 1.2.4, when the software modules provide Sound Level Meter functionality:

- **IEC 61672-1** (2002-05), Class 1, Group X/Z
- **IEC 61672-1** (2013), Class 1, Group X/Z, from software version 4.4
- **IEC 60651** (1979) plus Amendment 1 (1993-02) and Amendment 2 (2000-10), Type 1, Group X/Z
- **IEC 60804** (2000-10), Type 1, Group X/Z
- **DIN 45657** (1997-07)
- **DIN 45657** (2014-07), from software version 4.4
- **ANSI S1.4** –1983 plus ANSI S1.4A -1985 Amendment, Type 1
- **ANSI S1.43** –1997, Type 1

Hand-held Analyzer Type 2250/2250-L/2270 conforms to the following additional National and International Standards and Classes/Types/Groups when the software modules provide Frequency Analysis functionality:

- **IEC 61260** (1995-07) plus Amendment 1 (2001-09), 1/1-octave Bands and 1/3-octave Bands, Class 0, Group X/Z, all filters
- **ANSI S1.11** –1986, 1/1-octave Bands and 1/3-octave Bands, Order 3, Type 0-C, Optional Range
- **ANSI S1.11** –2004, 1/1-octave Bands and 1/3-octave Bands, Class 0, Group X/Z, all filters

Note: For Type 2270, both channels conform to the standards.

In the text elsewhere in this manual, references to these standards are shortened to the standards name but are to be understood as the full text above.

The International IEC Standards are adopted as European standards by CENELEC. When this happens, the letters IEC are replaced with EN and the number is retained. Type 2250/2250-L/2270 also conforms to these EN Standards.

Summary Table of Handheld Testing:

NORFOLK		ARCHIVES\NORFOLK\2270\MA\NORFOLK					
I	C	Name	Graph	LAeq	LAFmax	LAFmin	Start Time
		Property Line - 2 LedgeWay - Excavator and Gun Shots		57.2	72.6	38.5	6/11/2016 10:47:15 AM
		Excavator and Gun Shots - No Traffic Noise		59.5	68.2	40.8	6/11/2016 11:35:39 AM
		Traffic Noise - No Excavator or Gun Shots		64.4	77.2	38.8	6/11/2016 12:14:33 PM
		Ambient Level - No Traffic Noise, Excavator, or Gun Shots		33.0	45.9	29.1	6/11/2016 12:21:58 PM
		Road Noise and Gun Shots - No Excavator		61.6	70.4	47.8	6/11/2016 1:34:28 PM

Allowable Noise Levels – Norfolk:

F.10.c.2. Noise

Maximum permissible sound pressure levels at specified points of measurement for noise radiated continuously from a facility between 10 P.M. and 7 A.M. shall be as follows:

Frequency Band Cycles per Second	Sound Pressure Level Decibels re 0.0002 dyne/cm ²
20 - 75	69
75 - 150	54
150 - 300	47
300 - 600	41
600 - 1,200	37
1,200 - 2,400	34
2,400 - 4,800	31
4,800 - 10,000	28

If this noise is not smooth and continuous, the following corrections shall be added to each of the preceding decibel levels.

- (a) Daytime operation only + 5
- (b) Noise source operates less than 20% of any one hour period + 5

Noise levels noted were subject to a 10 dB octave band correction as they conformed to both conditions A and B as shown above.



Adjusted Noise Level Limits

Frequency	Correction	Noise Level Limit
20-75	10 dB	79
75-150	10 dB	64
150-300	10 dB	57
300-600	10 dB	51
600-1200	10 dB	47
1200-2400	10 dB	44
2400-4800	10 dB	41
4800-10000	10 dB	38

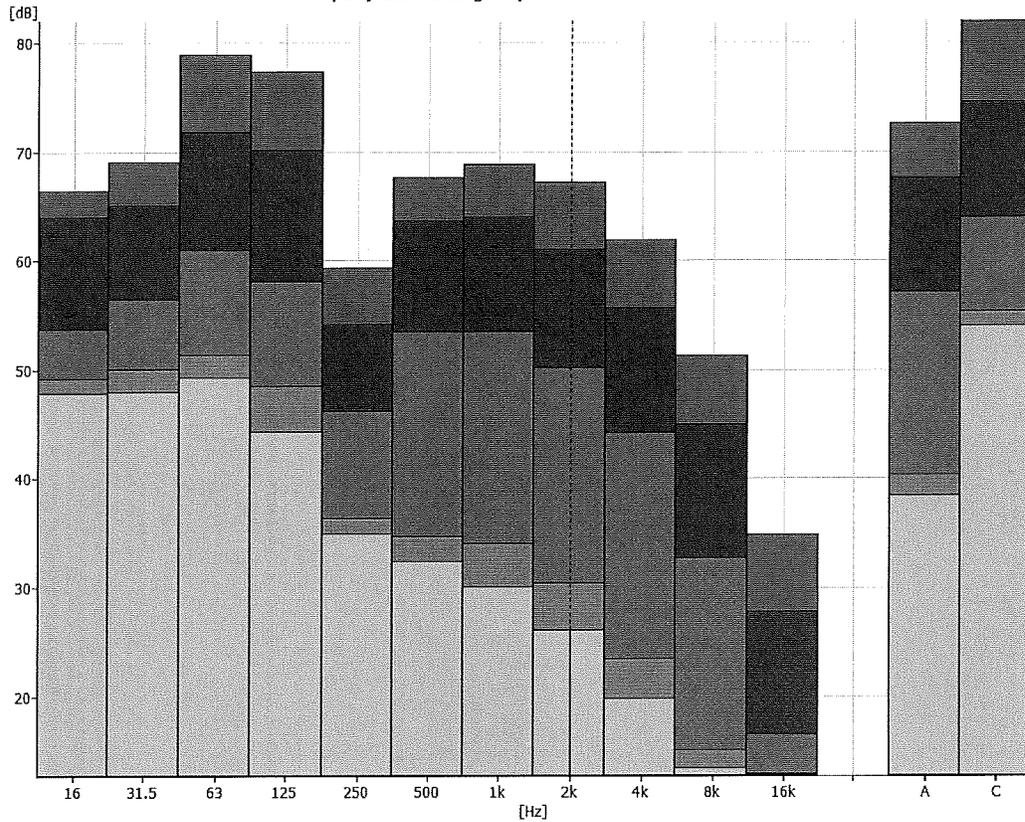
Handheld Results:

Project Name	LZeq_O 16Hz	LZeq_O 31.5Hz	LZeq_O 63Hz	LZeq_O 125Hz	LZeq_O 250Hz
Ambient Level - No Traffic Noise, Excavator, or Gun Shots	55.92	49.29	45.87	42.24	31.72
Excavator and Gun Shots - No Traffic Noise	58.63	60.2	59.8	58.49	50.51
Property Line - 2 LedgeWay - Excavator and Gun Shots	53.74	56.49	60.98	58.17	46.21
Road Noise and Gun Shots - No Excavator	51.34	55.77	56.69	55.66	49.93
Traffic Noise - No Excavator or Gun Shots	63	62.66	60	58.65	59.38

Project Name	LZeq_O 500Hz	LZeq_O 1kHz	LZeq_O 2kHz	LZeq_O 4kHz	LZeq_O 8kHz
Ambient Level - No Traffic Noise, Excavator, or Gun Shots	25.27	27.97	24.72	21.82	16.57
Excavator and Gun Shots - No Traffic Noise	52.06	54.77	54.32	49.31	37.17
Property Line - 2 LedgeWay - Excavator and Gun Shots	53.54	53.49	50.19	44.25	32.78
Road Noise and Gun Shots - No Excavator	56.38	57.37	54.77	52.89	45.91
Traffic Noise - No Excavator or Gun Shots	59.24	62.04	56.9	47.25	39.38

Post Wgt: View As:

Property Line - 2 Ledgeway - Excavator and Gun Shots

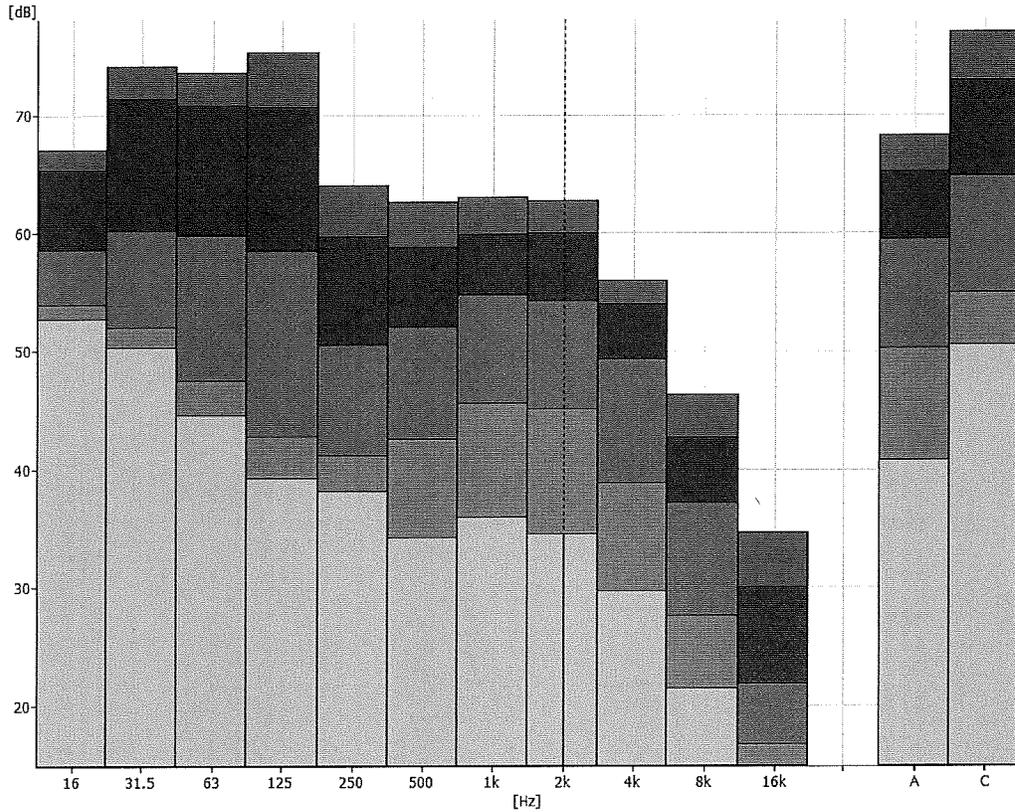


Cursor values

X: 2 kHz
 LZFmax: 67.2 dB
 LZSmax: 61.1 dB
 LZeq: 50.2 dB
 LZSmin: 30.5 dB
 LZFmin: 26.2 dB

Post Wgt: View As

Excavator and Gun Shots - No Traffic Noise

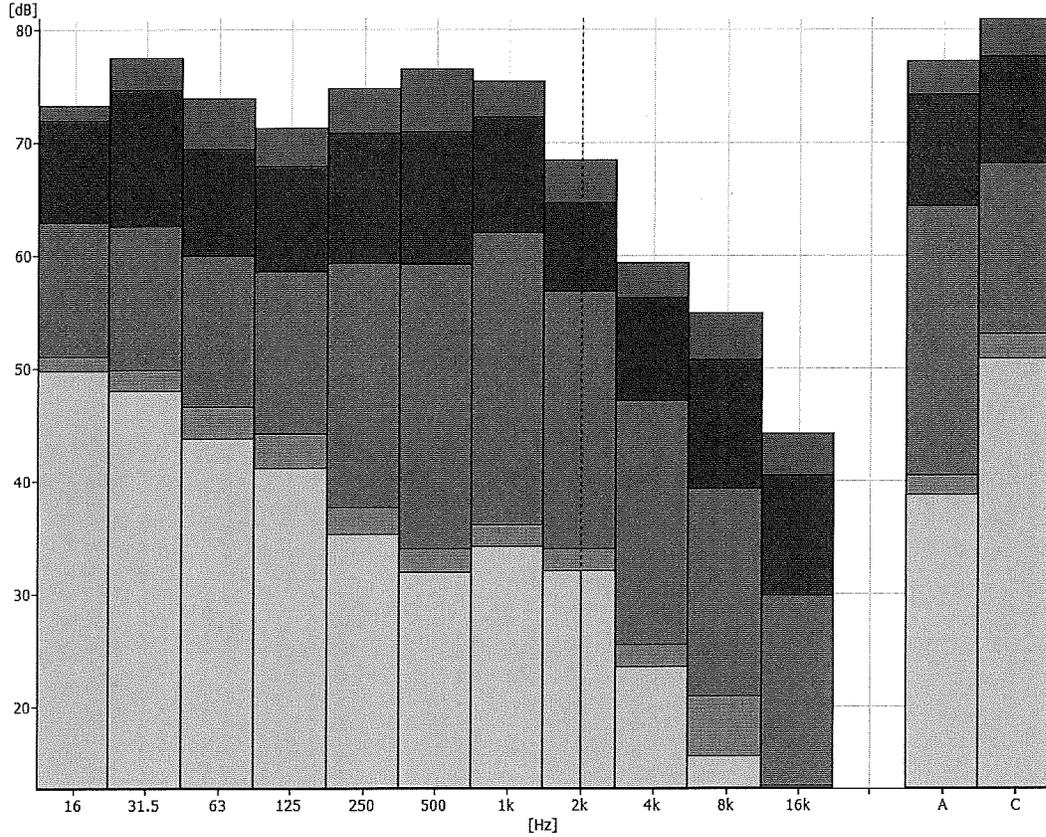


Cursor values

A: 2 kHz
 LZPmax: 62.8 dB
 LZSmax: 60.0 dB
 LZeq: 54.3 dB
 LZSmin: 45.2 dB
 LZPmin: 34.5 dB

Post Wgt: View As:

Traffic Noise - No Excavator or Gun Shots

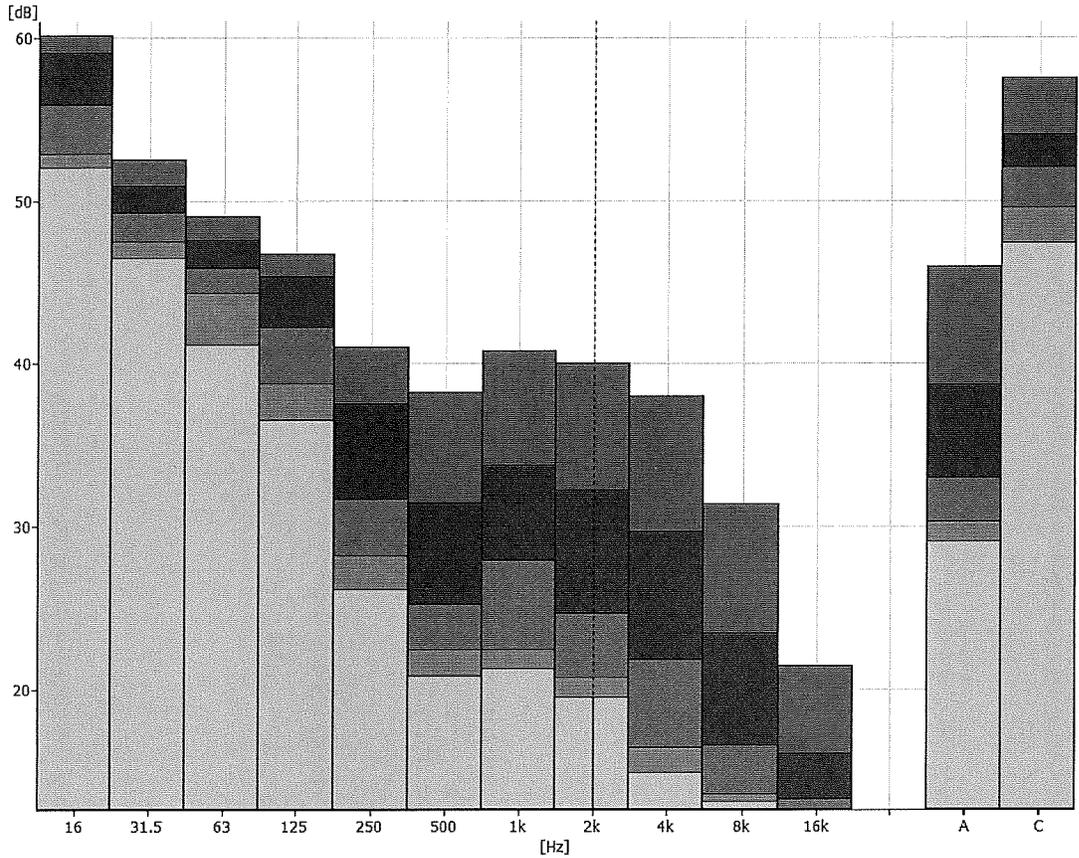


Cursor values

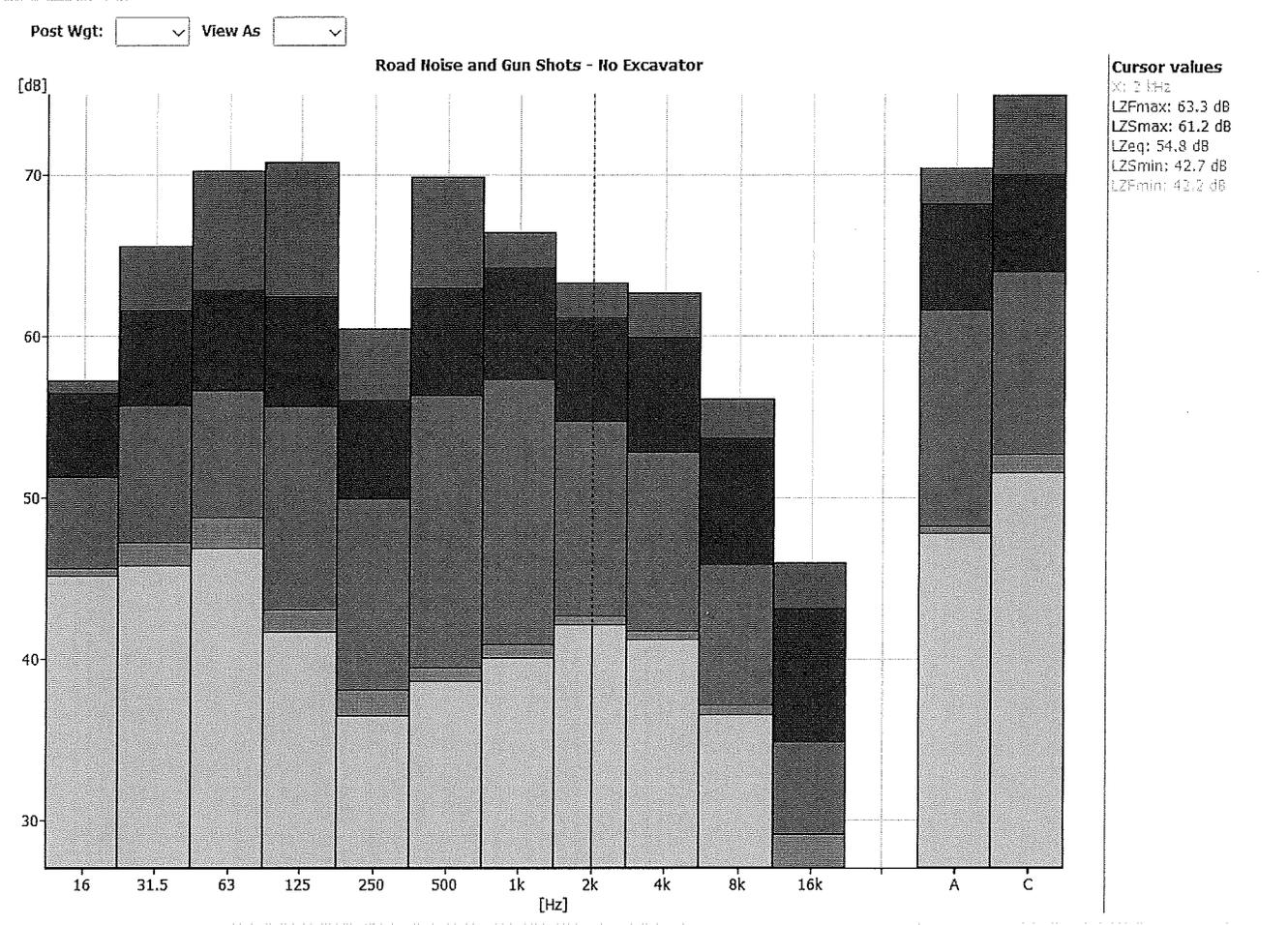
X: 2119 Hz
LZFmax: 68.6 dB
LZSmax: 64.7 dB
LZeq: 56.9 dB
LZSmin: 34.1 dB
LZFmin: 32.1 dB

Post Wgt: View As:

Ambient Level - No Traffic Noise, Excavator, or Gun Shots



Cursor values
 X: 2 kHz
 LZPmax: 40.1 dB
 LZSmax: 32.2 dB
 LZeq: 24.7 dB
 LZSmin: 20.7 dB
 LZPmin: 19.5 dB

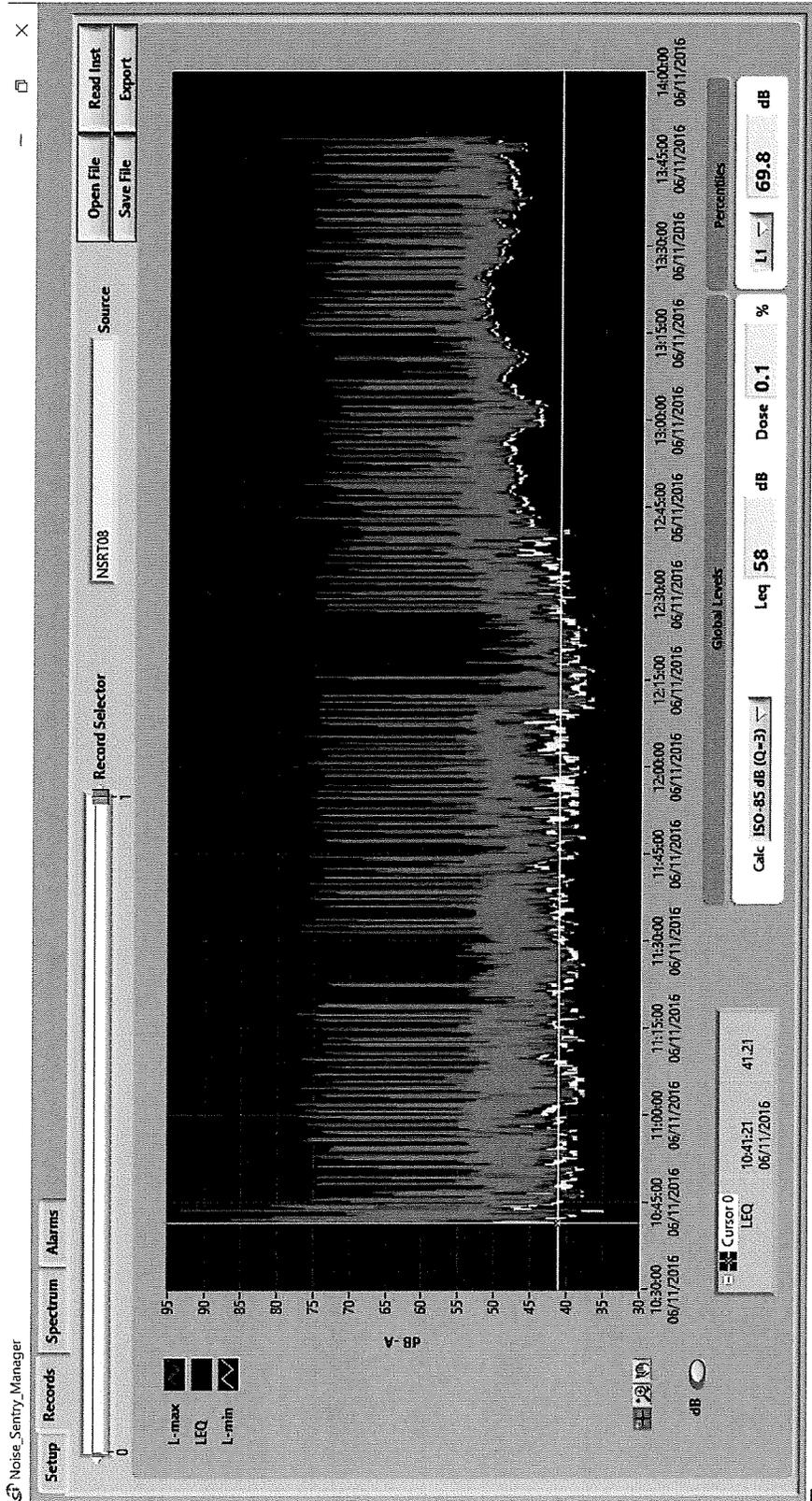


Logged Testing Locations:

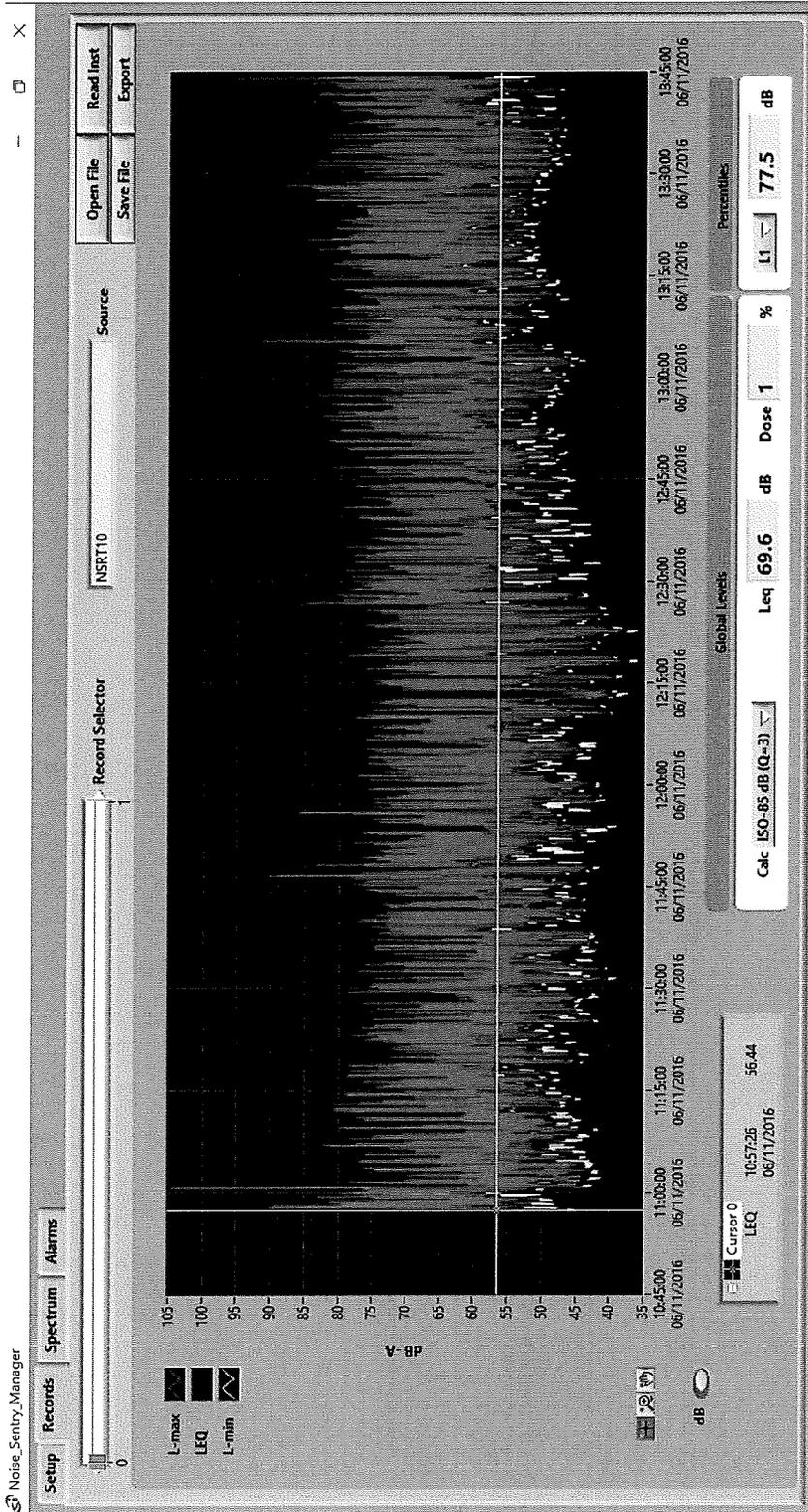


Aerial view of noise monitoring locations

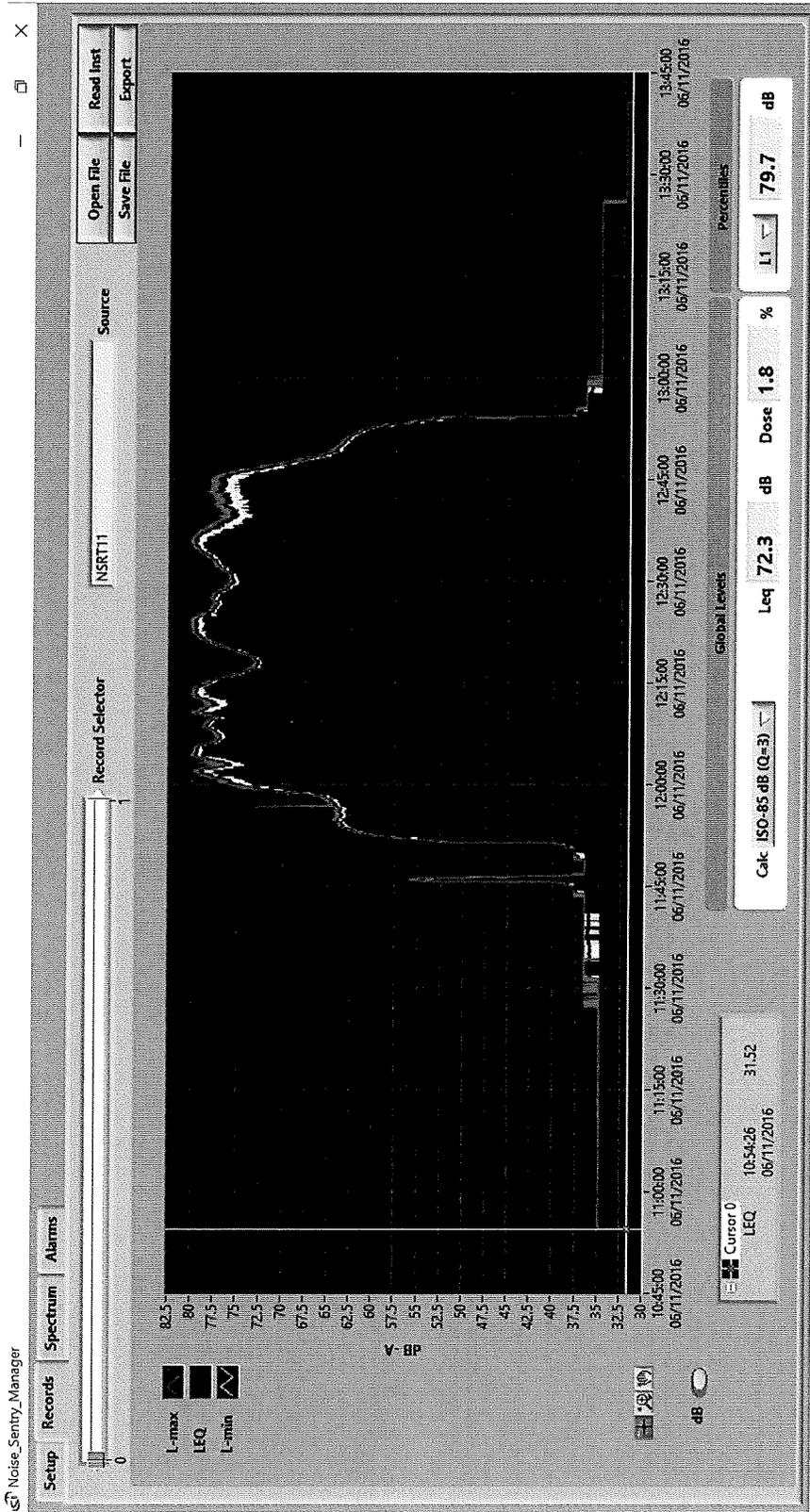
Monitored Noise Levels:



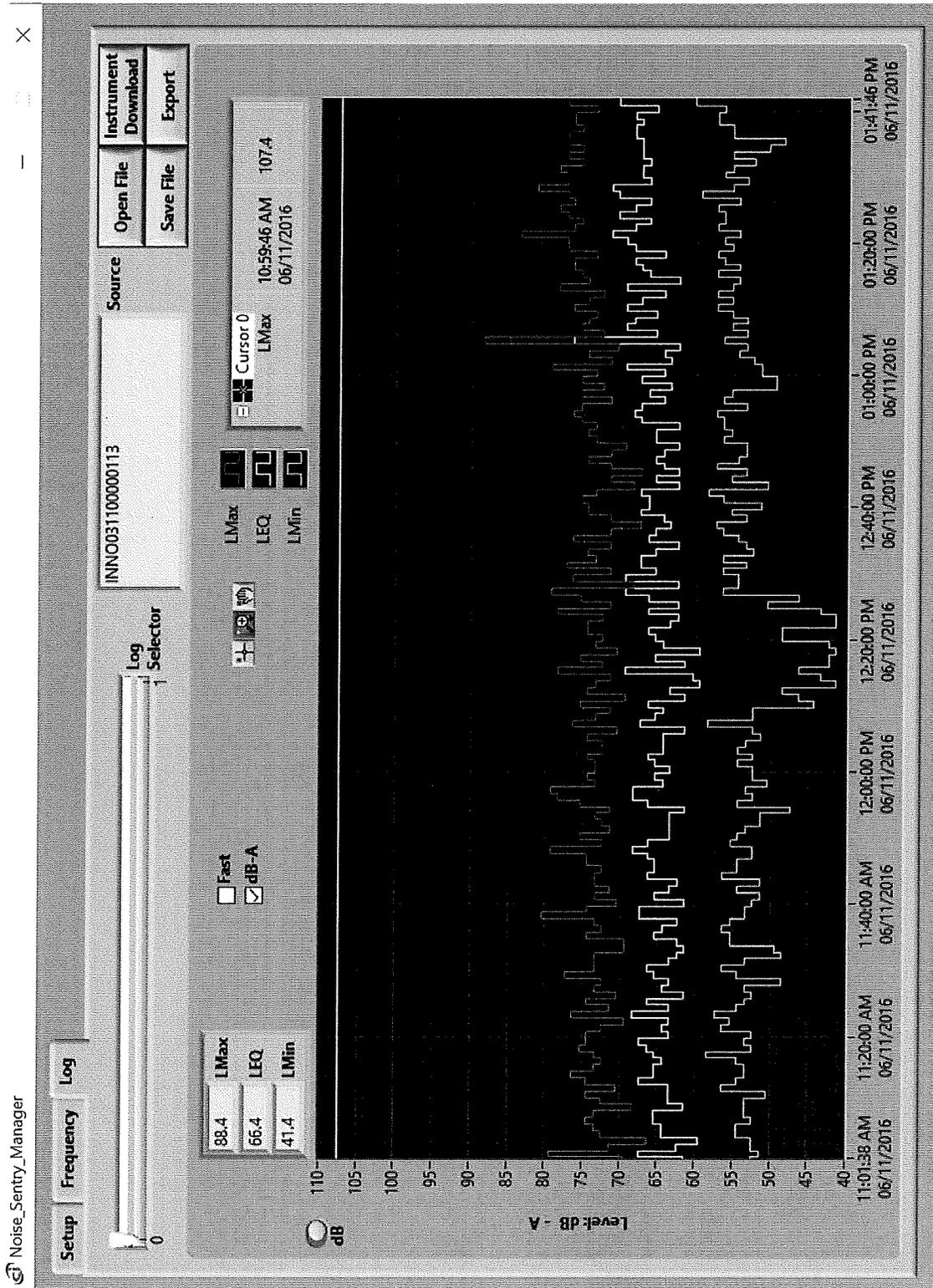
Monitor 8



Monitor 10



Monitor 11



Monitor 12



Summary of Results:

We find that while the activities of the Run and Gun competition are audible in different areas of the neighborhood, the primary contributors to the noise level is that of road traffic.

Additionally, the operation of excavation equipment on the premises of the property with the Run and Gun event made a marked difference in the noise floor at the property.

Examination of the noise level monitor 8 shows two periods of quiet (lasting approximately 15 minutes each). This corresponds with the cessation of operation of the excavation equipment.

In our opinion, the operation of the Run and Gun competition is not in violation of the Town of Norfolk statutes governing noise emissions.