

O'Day, Liz

From: Carlson, Ryan <Ryan.Carlson@kimley-horn.com>
Sent: Tuesday, June 25, 2024 9:00 AM
To: O'Day, Liz; Blixrud, Alex
Subject: RE: [EXTERNAL]: RE: 8000 Ikea Way - Generator
Attachments: KD1000_60Hz Sound Info.pdf

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Good morning Liz,

I've attached the noise information we received from the vendor today. In short, the emergency generator with a Level 2 sound enclosure produces 75dB at 23 feet. This is over the Level 1 classification but I want to reiterate some points.

- This is an emergency generator. It is only used when the power goes out and for monthly testing.
 - o Per city code 10.31, this should fall under a public safety exception as personnel depend on its use in emergency situations.
- The 75 dB level occurs 23 feet from the generator. The vendor is unsure of the exact distance to reach 50 dB but it is heavily reduced by the time it could reach the hotel to the north that is 300 plus feet away.
 - o Other factors that contribute to the noise reduction are the tightly packed safety fence inserts and concrete retaining wall to the north which also serves as the ramp to the loading dock. Both of which exceed the height of the generator at grade.
- A Level 2 enclosure is the industry standard when noise is to be limited.
 - o Does Bloomington require these emergency generators to get custom enclosures?

Hopefully these points resolve this hold-up but please let me know if we need to have further discussions or if you have any questions.

Thank you!

Ryan Carlson, E.I.T.

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From: O'Day, Liz <eoday@BloomingtonMN.gov>
Sent: Monday, June 24, 2024 12:53 PM
To: Blixrud, Alex <Alex.Blixrud@kimley-horn.com>; Carlson, Ryan <Ryan.Carlson@kimley-horn.com>
Subject: RE: [EXTERNAL]: RE: 8000 Ikea Way - Generator

Hi Alex –

The noise Code has requirements based on the maximum allowable sound level by land use at the point of the nearest receiver. Noise area classification 1 is residential or lodging. Area 2 is commercial and Area 3 is Industrial. Because there is hotel to the north, the generator noise level cannot exceed 60 and 65 during the daytime (7am-10pm) at the nearest receiver and 50 and 55 during the nighttime (10pm-7am)

TECHNICAL INFORMATION BULLETIN

Generator Set Sound Data Sheet

| | | | Sound Pressure Data in dB(A) | | | |
|---------------------|----|-----------|------------------------------|-----------------------------|-------------------------|-------------------------|
| Generator Set Model | Hz | Load | Raw Exhaust | Open Unit, Isolated Exhaust | Level 1 Sound Enclosure | Level 2 Sound Enclosure |
| KD1000 | 60 | 100% Load | 124.4 | 96.2 | 91.8 | 75.7 |
| | | No Load | 111.3 | 92.8 | 88.6 | 72.1 |

Note: Sound pressure data is the logarithmic average of eight perimeter measurement points at a distance of 7 m (23 ft.), except Raw Exhaust data which is a single measurement point at 1 m (3.3 ft.) from the mouth of a straight pipe exhaust.

| KD1000 | | 60 Hz | | Sound Pressure Levels, dB(A) | | | | | | | | |
|-----------|------------------|---------------|----------------------------|-----------------------------------|------|------|------|------|------|------|------|---------------|
| Load | Distance, m (ft) | Enclosure | Measurement Clock Position | Octave Band Center Frequency (Hz) | | | | | | | | Overall Level |
| | | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| 100% Load | 7 (23) | Level 2 Sound | 3:00 | 61.3 | 67.9 | 68.3 | 71.3 | 68.3 | 64.1 | 58.5 | 55.6 | 75.8 |
| | | | 1:30 | 58.4 | 60.3 | 70.9 | 70.2 | 67.8 | 64.0 | 58.7 | 52.7 | 75.3 |
| | | | 12:00 - Engine | 57.4 | 64.4 | 70.5 | 70.4 | 68.9 | 63.9 | 57.1 | 49.2 | 75.6 |
| | | | 10:30 | 55.1 | 60.4 | 76.2 | 72.2 | 70.0 | 67.5 | 61.3 | 55.3 | 78.9 |
| | | | 9:00 | 60.8 | 65.6 | 69.4 | 70.7 | 68.5 | 65.0 | 58.3 | 55.5 | 75.6 |
| | | | 7:30 | 61.7 | 67.2 | 68.5 | 69.2 | 66.5 | 63.1 | 56.2 | 55.9 | 74.7 |
| | | | 6:00 - Alternator | 56.4 | 64.3 | 59.1 | 63.4 | 57.9 | 58.2 | 53.5 | 59.9 | 69.4 |
| | | | 4:30 | 62.9 | 69.7 | 71.6 | 67.0 | 62.0 | 62.9 | 57.1 | 57.1 | 75.4 |
| | | | 8-pos. log avg. | 60.0 | 66.0 | 71.1 | 69.9 | 67.4 | 64.2 | 58.1 | 56.0 | 75.7 |

| | | | | Sound Pressure Levels, dB(A) | | | | | | | | |
|-----------|------------------|---------------|----------------------------|-----------------------------------|------|------|------|------|------|------|------|---------------|
| Load | Distance, m (ft) | Enclosure | Measurement Clock Position | Octave Band Center Frequency (Hz) | | | | | | | | Overall Level |
| | | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| 100% Load | 7 (23) | Level 1 Sound | 3:00 | 63.5 | 72.9 | 76.2 | 81.0 | 78.1 | 75.0 | 71.8 | 63.9 | 84.8 |
| | | | 1:30 | 64.4 | 76.0 | 86.6 | 88.4 | 91.0 | 88.7 | 86.4 | 79.1 | 95.7 |
| | | | 12:00 - Engine | 68.6 | 78.8 | 81.4 | 89.3 | 91.5 | 83.1 | 78.2 | 70.8 | 94.4 |
| | | | 10:30 | 61.8 | 77.8 | 86.6 | 88.4 | 91.9 | 90.2 | 87.8 | 78.5 | 96.5 |
| | | | 9:00 | 61.8 | 73.8 | 74.9 | 81.6 | 78.3 | 74.9 | 71.4 | 63.7 | 85.0 |
| | | | 7:30 | 56.2 | 70.3 | 76.8 | 74.2 | 79.3 | 75.3 | 67.2 | 60.4 | 83.2 |
| | | | 6:00 - Alternator | 51.5 | 64.4 | 76.4 | 73.7 | 69.8 | 67.1 | 61.6 | 53.9 | 79.4 |
| | | | 4:30 | 59.7 | 69.7 | 76.0 | 76.3 | 76.6 | 75.9 | 69.7 | 65.5 | 82.8 |
| | | | 8-pos. log avg. | 63.2 | 74.8 | 82.0 | 85.1 | 87.5 | 84.3 | 81.6 | 73.4 | 91.8 |

| | | | | Sound Pressure Levels, dB(A) | | | | | | | | |
|-----------|------------------|-----------------------------|----------------------------|-----------------------------------|------|------|------|------|------|------|------|---------------|
| Load | Distance, m (ft) | | Measurement Clock Position | Octave Band Center Frequency (Hz) | | | | | | | | Overall Level |
| | | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| 100% Load | 7 (23) | Open Unit, Isolated Exhaust | 3:00 | 59.9 | 73.6 | 90.4 | 87.0 | 89.7 | 91.2 | 88.2 | 86.2 | 96.9 |
| | | | 1:30 | 53.9 | 70.3 | 92.3 | 90.8 | 91.4 | 92.1 | 88.6 | 85.7 | 98.5 |
| | | | 12:00 - Engine | 55.6 | 72.5 | 78.2 | 87.6 | 87.7 | 87.4 | 82.9 | 77.7 | 93.1 |
| | | | 10:30 | 57.1 | 72.9 | 86.1 | 87.9 | 89.6 | 90.0 | 87.4 | 82.8 | 95.7 |
| | | | 9:00 | 57.7 | 74.5 | 85.9 | 87.7 | 89.1 | 90.9 | 88.2 | 86.0 | 96.2 |
| | | | 7:30 | 58.5 | 76.6 | 86.3 | 87.2 | 89.8 | 91.2 | 88.1 | 85.1 | 96.3 |
| | | | 6:00 - Alternator | 57.7 | 72.6 | 85.1 | 82.6 | 85.1 | 87.4 | 84.6 | 81.6 | 92.7 |
| | | | 4:30 | 59.5 | 75.2 | 91.1 | 88.6 | 89.4 | 90.7 | 88.7 | 86.8 | 97.3 |
| | | | 8-pos. log avg. | 57.8 | 73.9 | 88.5 | 87.9 | 89.3 | 90.4 | 87.5 | 84.7 | 96.2 |

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| | | | Sound Pressure Levels, dB(A) | | | | | | | | |
|-----------|------------------|---------------------------|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|---------------|
| Load | Distance, m (ft) | Exhaust | Octave Band Center Frequency (Hz) | | | | | | | | Overall Level |
| | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| 100% Load | 1 (3.3) | Raw Exhaust (No Silencer) | 98.8 | 105.0 | 111.6 | 117.6 | 116.7 | 119.1 | 117.1 | 113.1 | 124.4 |

| | |
|---------------|--------------|
| KD1000 | 60 Hz |
|---------------|--------------|

| | | | | Sound Pressure Levels, dB(A) | | | | | | | | |
|---------|------------------|---------------|----------------------------|-----------------------------------|------|------|------|------|------|------|------|---------------|
| Load | Distance, m (ft) | Enclosure | Measurement Clock Position | Octave Band Center Frequency (Hz) | | | | | | | | Overall Level |
| | | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| No Load | 7 (23) | Level 2 Sound | 3:00 | 55.6 | 61.7 | 65.7 | 64.5 | 62.7 | 59.3 | 54.7 | 47.1 | 70.6 |
| | | | 1:30 | 53.4 | 60.8 | 68.5 | 64.4 | 63.3 | 56.9 | 50.4 | 44.1 | 71.5 |
| | | | 12:00 - Engine | 54.4 | 60.7 | 67.9 | 63.7 | 65.7 | 57.5 | 50.9 | 45.6 | 71.6 |
| | | | 10:30 | 53.7 | 61.0 | 72.8 | 66.9 | 64.3 | 59.1 | 52.9 | 47.1 | 74.6 |
| | | | 9:00 | 53.7 | 61.4 | 65.8 | 66.8 | 63.3 | 56.5 | 51.7 | 45.0 | 71.1 |
| | | | 7:30 | 51.8 | 59.7 | 69.5 | 66.0 | 62.4 | 57.8 | 51.0 | 44.3 | 72.2 |
| | | | 6:00 - Alternator | 52.7 | 57.6 | 67.9 | 62.7 | 59.2 | 54.1 | 49.1 | 42.9 | 70.0 |
| | | | 4:30 | 53.8 | 62.9 | 70.1 | 67.8 | 63.1 | 59.6 | 53.7 | 45.8 | 73.3 |
| | | | 8-pos. log avg. | 53.8 | 60.9 | 69.1 | 65.7 | 63.3 | 57.9 | 52.1 | 45.5 | 72.1 |

| | | | | Sound Pressure Levels, dB(A) | | | | | | | | |
|---------|------------------|---------------|----------------------------|-----------------------------------|------|------|------|------|------|------|------|---------------|
| Load | Distance, m (ft) | Enclosure | Measurement Clock Position | Octave Band Center Frequency (Hz) | | | | | | | | Overall Level |
| | | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| No Load | 7 (23) | Level 1 Sound | 3:00 | 61.0 | 68.2 | 72.3 | 73.9 | 74.7 | 69.4 | 61.5 | 55.6 | 79.5 |
| | | | 1:30 | 60.1 | 68.0 | 83.5 | 88.4 | 85.1 | 83.0 | 76.7 | 71.9 | 91.8 |
| | | | 12:00 - Engine | 63.7 | 71.2 | 80.9 | 82.4 | 92.3 | 83.8 | 76.5 | 70.6 | 93.6 |
| | | | 10:30 | 59.7 | 67.1 | 83.4 | 84.7 | 88.1 | 84.3 | 76.8 | 70.8 | 91.7 |
| | | | 9:00 | 61.2 | 68.2 | 72.3 | 75.7 | 75.6 | 70.5 | 61.8 | 56.0 | 80.5 |
| | | | 7:30 | 54.3 | 63.1 | 75.9 | 71.8 | 77.9 | 73.4 | 63.9 | 54.8 | 81.5 |
| | | | 6:00 - Alternator | 52.1 | 60.9 | 75.9 | 72.6 | 67.3 | 65.6 | 55.7 | 48.3 | 78.3 |
| | | | 4:30 | 56.3 | 64.6 | 73.4 | 72.9 | 76.3 | 74.9 | 66.2 | 58.9 | 80.9 |
| | | | 8-pos. log avg. | 59.9 | 67.4 | 79.4 | 82.0 | 85.5 | 79.9 | 72.7 | 67.1 | 88.6 |

| | | | | Sound Pressure Levels, dB(A) | | | | | | | | |
|------------|---------------------|--------------------------------|-------------------------------|-----------------------------------|------|------|------|------|------|------|------|------------------|
| Load | Distance, m (ft) | | Measurement Clock Position | Octave Band Center Frequency (Hz) | | | | | | | | Overall Level |
| | | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| No Load | 7 (23) | Open Unit, Isolated Exhaust | 3:00 | 58.0 | 75.7 | 86.4 | 84.9 | 87.4 | 86.9 | 84.4 | 76.8 | 93.3 |
| | | | 1:30 | 54.9 | 71.8 | 86.6 | 89.0 | 86.8 | 86.8 | 83.8 | 76.9 | 94.0 |
| | | | 12:00 - Engine | 55.4 | 74.0 | 81.2 | 86.8 | 84.4 | 82.8 | 79.1 | 72.7 | 90.8 |
| | | | 10:30 | 53.3 | 71.5 | 82.7 | 85.3 | 86.7 | 86.9 | 82.9 | 74.5 | 92.4 |
| | | | 9:00 | 55.9 | 74.2 | 86.3 | 85.2 | 87.1 | 87.2 | 85.0 | 77.8 | 93.4 |
| | | | 7:30 | 55.8 | 75.2 | 85.2 | 84.7 | 87.5 | 87.3 | 84.4 | 77.7 | 93.2 |
| | | | 6:00 - Alternator | 54.1 | 73.5 | 84.4 | 82.2 | 82.6 | 82.1 | 78.9 | 70.6 | 89.5 |
| | | | 4:30 | 57.4 | 75.9 | 89.0 | 85.2 | 87.0 | 86.4 | 84.3 | 77.9 | 93.9 |
| | | | 8-pos. log avg. | 55.8 | 74.2 | 85.8 | 85.8 | 86.4 | 86.2 | 83.3 | 76.2 | 92.8 |

| | | | Sound Pressure Levels, dB(A) | | | | | | | | |
|------------|---------------------|---------------------------|-----------------------------------|------|-------|-------|-------|-------|------|------|------------------|
| Load | Distance, m (ft) | Exhaust | Octave Band Center Frequency (Hz) | | | | | | | | Overall Level |
| | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| No Load | 1 (3.3) | Raw Exhaust (No Silencer) | 86.9 | 94.6 | 108.2 | 102.0 | 104.9 | 100.9 | 95.6 | 91.9 | 111.3 |