1. Agenda

    Documents:

        2022.05.31_BOH_AGENDA.PDF
        2022.05.31_BOH_AGENDA_-_REVISED.PDF

2. Meeting Materials

    Documents:

        KENS_FOOD_NOISE_STUDY_-_TRUCK_REFRIGERATION_UNITS_5-11-22.PDF
        MASTER_PLAN_DRAFT.PDF

Town of Southborough
Board of Health
9 Cordaville Road, Lower Level
Southborough, MA 01772-1662

Phone: (508) 481-3013

Tuesday, May 31, 2022 at 9:30AM
Meeting Agenda
Hybrid Meeting – McAuliffe Meeting Room (Town House - 17 Common Street)
& Virtual

Pursuant to Chapter 20 of the Acts of 2021, An Act Relative to Extending Certain COVID-19 Measures Adopted During the State of Emergency, signed into law on June 16, 2021, this meeting will be conducted via remote participation. This meeting may be watched or residents may participate in the meeting remotely with the meeting link at: https://www.southboroughtown.com/remotemeetings

Business Item (Board May Vote):

1. Public Comment
2. Representatives for Ken's Warehouse & Their Engineers
3. Covid Numbers and Booster Clinics Master
4. Plan Comments for the Board of Health
5. Upcoming Meeting Schedule:
    a. Regular Meetings: 6/7/22, 7/12/22

8. Public Comment

Chelsea Malinowski, Dr. Safdar Medina, Nancy Sacco

RECEIVED
By Town Clerk/jfh at 10:54 am, May 26, 2022

Town of Southborough
Board of Health
9 Cordaville Road, Lower Level
Southborough, MA 01772-1662

Phone: (508) 481-3013

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Business Item (Board May Vote):

1. Public Comment
2. Representatives for Ken's Warehouse & Their Engineers
3. Covid Numbers and Booster Clinics
4. Master Plan Comments for the Board of Health
5. Upcoming Meeting Schedule:
    a. Regular Meetings: 6/7/22, 7/12/22
6. Public Comment
7. Executive Session

The Board will be entering into Executive Session per M.G.L. Chapter 30A, Section 21, and not returning to Open Session to discuss contract for the Septic Inspector and Health Director as the Chair has determined that an open meeting may have a detrimental effect on the Town's position.

Chelsea Malinowski, Dr. Safdar Medina, Nancy Sacco

Memorandum

To: Jim Bourne (Ken's Food, Inc.)

CC:

Date: May 11, 2022

From: David Coate

Re: Ken's Food Facility Noise Analysis (West Side)- Additional Refrigeration Unit Acoustical Test Results

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At your request, David Coate Consulting (DCC) conducted additional acoustical tests to determine low-frequency sound levels of truck refrigeration units at Ken's facility in Southborough, Massachusetts. Neighbors along Flagg Road have continued to complain about noise they believe is associated Ken's trucking operations. DCC's previous analyses have shown that sources other than Ken's, such as traffic on I-495 and Route 9 also contribute to low frequency sound in this area. However, DCC's previous analysis concluded that Ken's trucks were likely audible at times for residents on Flagg Road. This study further quantifies low frequency sound from Ken's operations.

Noise Measurements

On 3/1/22 DCC conducted tests at a location approximately 550' to the west (Location 1 shown in Figure 1) of refrigeration units. Two additional sound level meters collected sound data at the parking lot edge and at the 550' location (to characterize ambient over a longer time period). The tests were performed around 8 pm when residents have indicated they hear truck noise and when ambient sound levels have dropped to some degree. The following tests were performed:

1. No truck operations whatsoever.
2. Eight refrigeration units operating with no moving trucks.
3. Moving trucks only, with no refrigeration units operating.

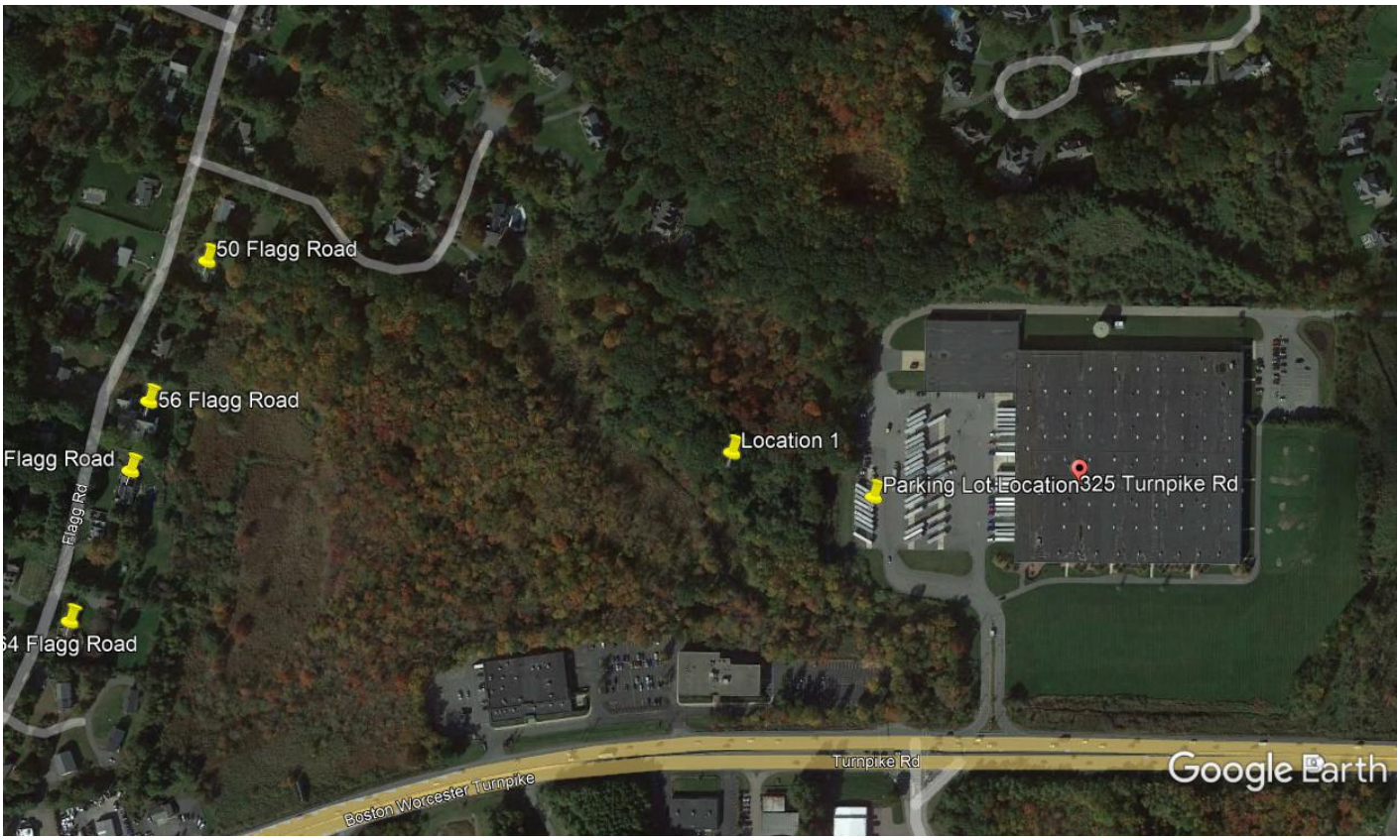

Figure 1. Noise Measurement and Residential Locations

Test 2 was noticeably different than Tests 1 and 3 at Location 1 due to low frequency sound of the refrigeration units being quite audible. Moving truck noise was barely audible above ambient and had much lower low frequency content. Figure 2 shows the results of tests 1-3 and refrigeration unit low frequency sound at 31.5 Hz and 63 Hz 20 decibels above ambient. This constitutes a large increase in low frequency sound and explains what neighbors along Flagg Road are likely hearing.

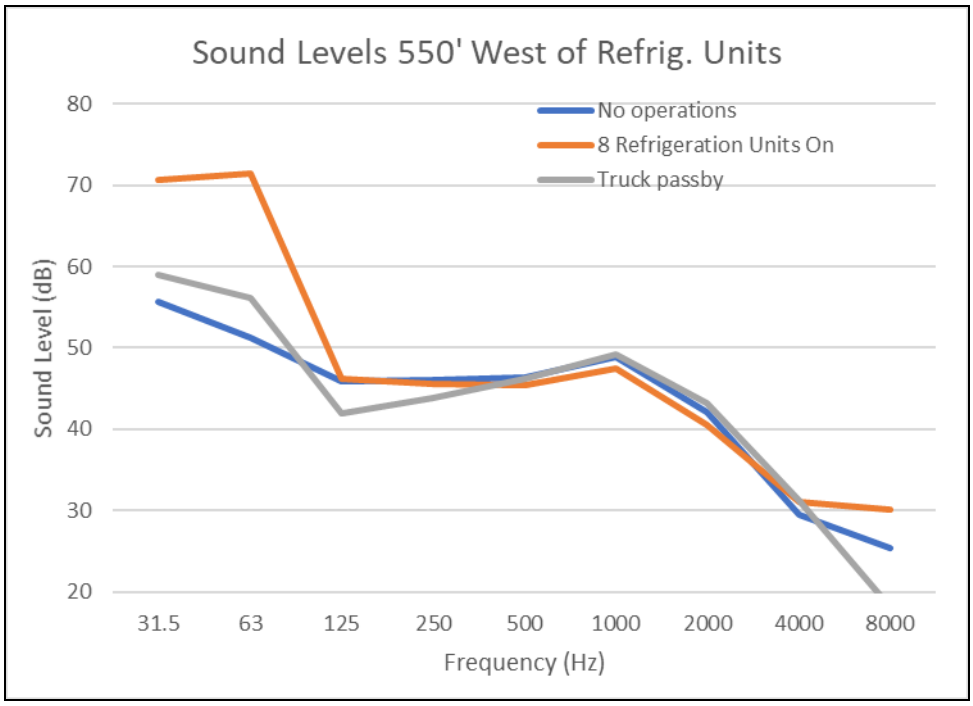

Figure 2. 3/1/22 Acoustic Test Results

CADNA Noise Modeling

Next, DCC modeled the 3/1/22 test situation in CADNA by moving 8 refrigeration unit point sources to the same location that was used in the test. Figure 3 shows the resulting noise contours, the parking lot measurement location, 550' measurement location, and 58 Flagg Road with the 8 refrigeration units running. (The underlying google image of the area was removed for clarity.)

The octave frequency band CADNA results at the 550' location are within 3 decibels of the actual measurements except at 125 Hz which was likely due to excess absorption caused by the deep snow cover. This finding shows that the CADNA model can be used to accurately model other scenarios, such as moving the refrigeration units to other locations.

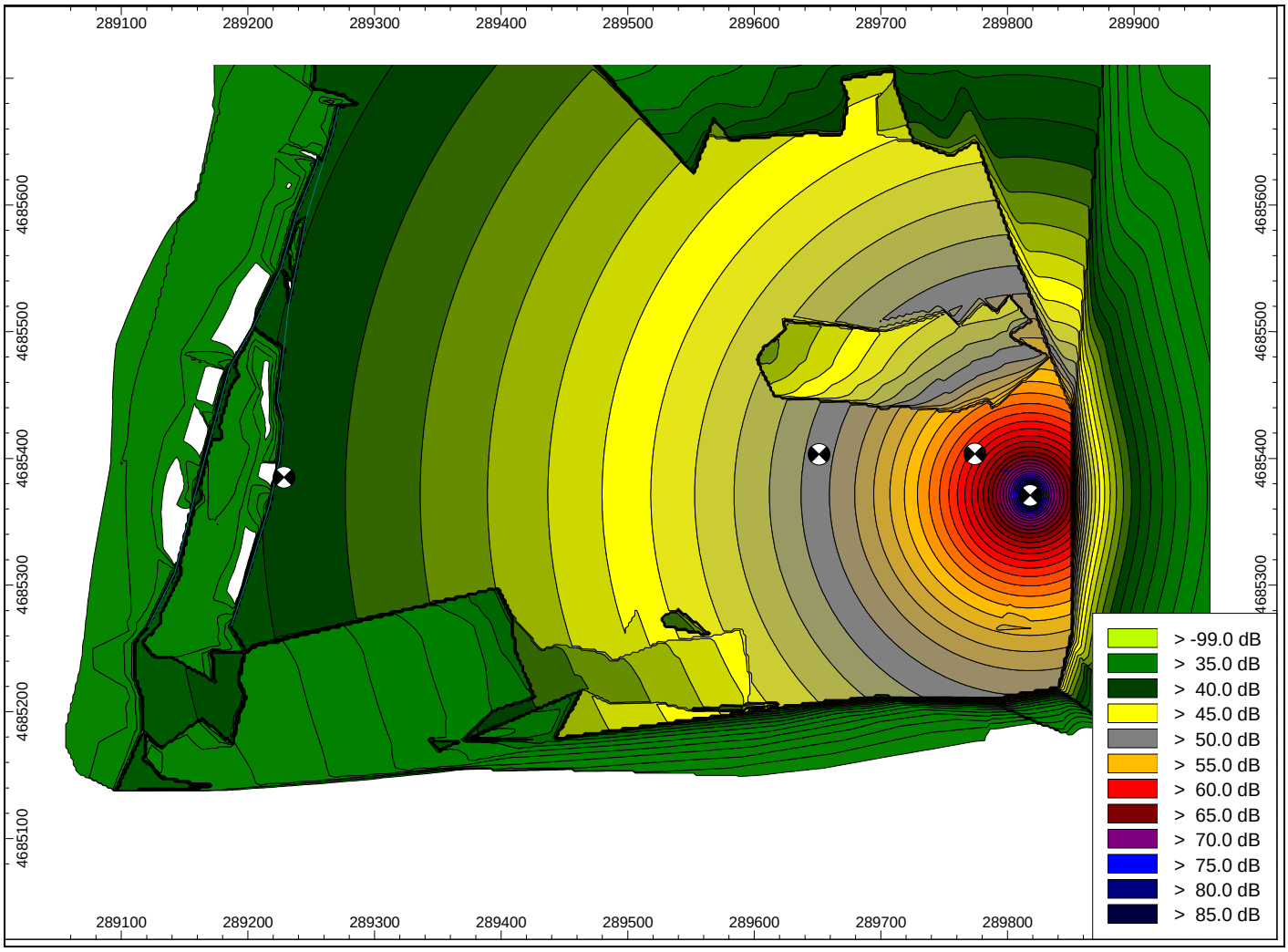

Figure 3. CADNA Predictions of 3-1-22 Tests with 8 Refrigeration Units

Next, DCC modified the CADNA model to place 10 refrigeration units at the loading dock, and 10 units spaced out along the parking lot location that parallels the loading dock. In addition, DCC modified the ground absorption assumption in the model to account for conditions without snow (i.e., less sound absorptive).

Table 1 shows the predicted octave frequency band results at 58 Flagg Road.

Table 1. CADNA Results at 58 Flagg Road (20 Refrigeration Units)

				Frequency (Hz)					
31.5	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dBA**
67.7	68.6	52	36	36	33.9	25.6	9.8	-53.3	44.4

An important finding with Table 1 is that the sound levels at 31.5 and 63 Hz are relatively high. Furthermore, during the tests, it was noted that the refrigeration unit noise was pulsing such that there was at least a 5 dB excursion in these values not reflected in the L_{eq} (average) values. This could be what the abutters are experiencing.

The following Figure 4 is from DCC's June 12, 2020 report which shows 63 Hz sound levels at 58 Flagg Road for several days. The data in this figure has some time periods including up to 6 refrigeration units, but there would certainly be some periods with no refrigeration units operating. The lower corresponding values at 63 Hz in this figure are around 65 dB. The value in Table 1 at 63 Hz is 68.6 dB or possibly 68.6 +5 = 73.6 dB both of which are higher than 65 dB. In other words, the data in Table 1 shows that refrigeration unit noise is above ambient level at this frequency and therefore audible at 58 Flagg Road.

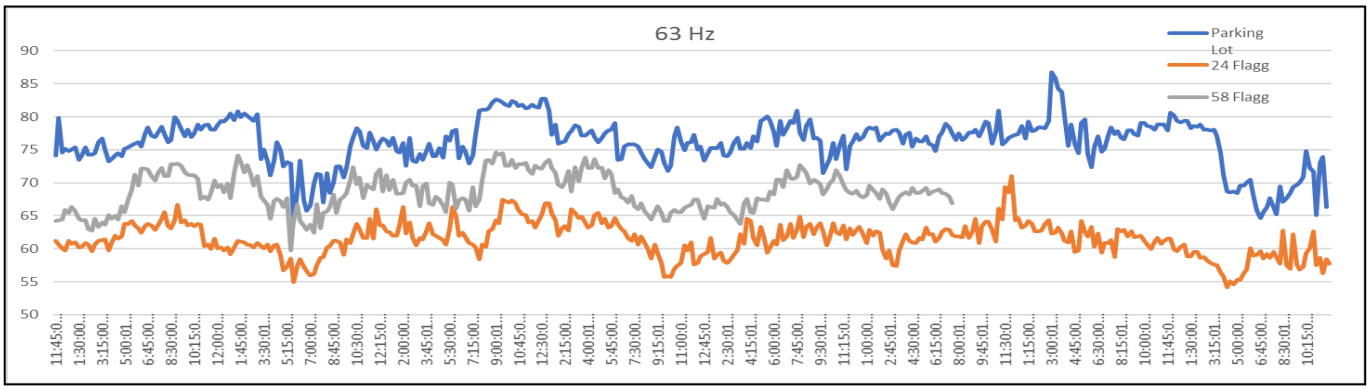

Figure 3. 63 Hz at measurement locations

Mass DEP

The reader is referred back to DCC's June 12, 2020 discussion on this subject. MDEP considers its noise regulation violated if an intrusive sound exceeds the ambient (L_{90}) by at least 10 dBA. In this case, "ambient" has not been measured since that would require no Ken's facility sound for several days. However, our previous analysis showed that the MDEP target level for this location is probably about 52 dBA. The A-weighted value from Table 1 (20 refrigeration units) is 44.4, still below this 52 dBA target level so the conclusion is still the same- it is unlikely that the MDEP noise regulation is being exceeded on an A-weighted basis.

Noise Mitigation

A few mitigation methods may be possible for this situation, including construction of a noise barrier, residential building sound insulation, or source noise control.

Noise Barrier

Figure 4 shows the CADNA results for a 375 foot long and 20-foot-high noise barrier located at the end of where trailers with refrigeration units on are in the parking lot. The model assumes that the inside face of the noise barrier would be highly absorptive (approximately NRC 0.9).

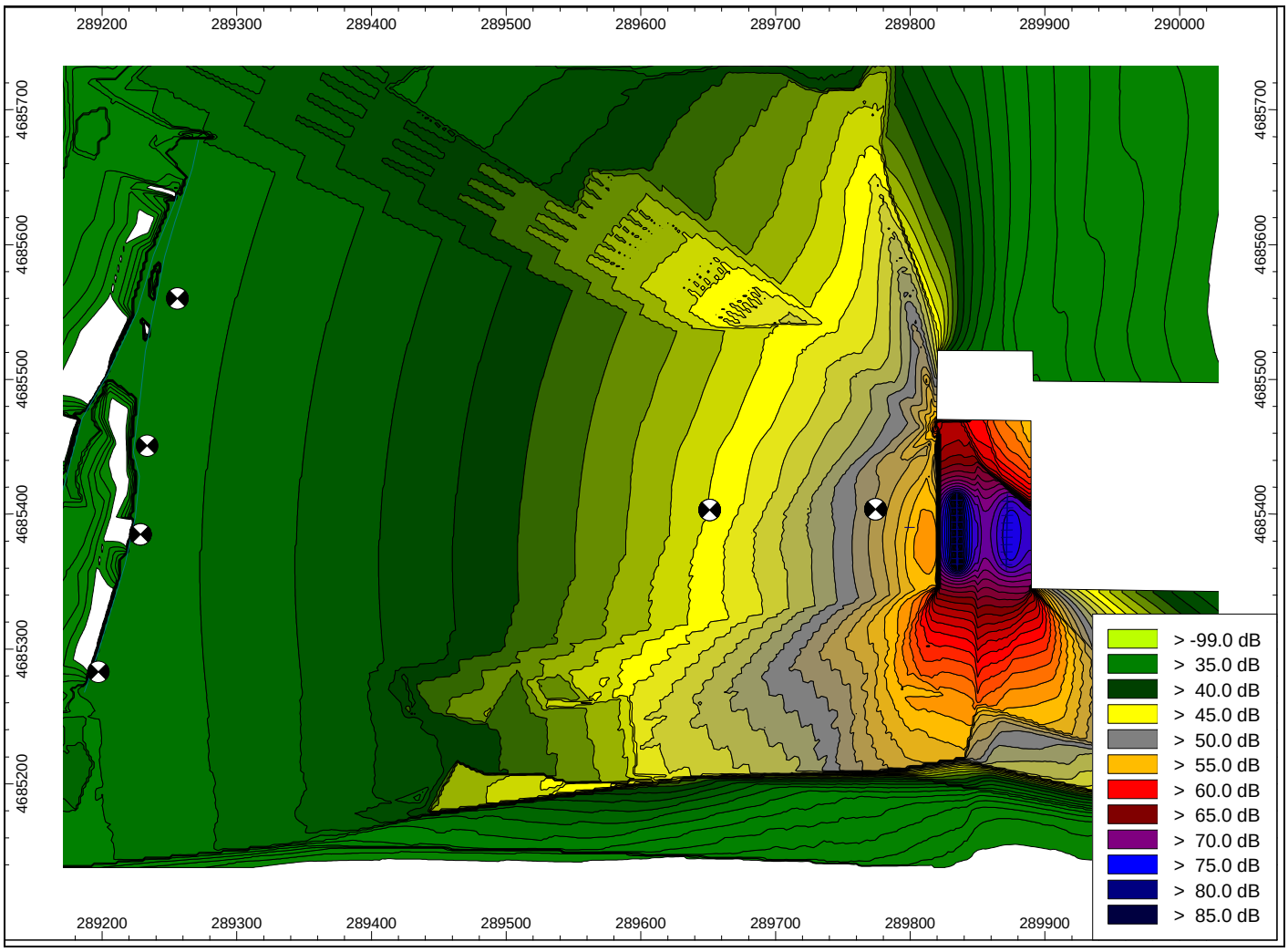

Figure 4. CADNA Predictions with 20-foot-tall Noise Barrier

Figure 5 shows a close-up plan view of the noise barrier.

This noise barrier design focuses on the refrigeration units and location of the units since the noise measurements previously discussed demonstrate that moving trucks comprise a minor part of the overall cumulative noise exposure. This noise barrier design is effective because it is close to where refrigeration units are located at the loading dock and parking lot. Noise barrier performance is evaluated on the basis of "feasibility and reasonableness." "Feasible" as defined by most state DOT's is that the barrier achieves at least 5 dBA reduction at residential receiver locations. "Reasonableness" is a

measure of the noise barrier's cost effectiveness. In this case, deliberately focusing on the refrigeration units and not moving trucks (for example), accounts for reasonableness which is important in noise barrier design. (Note that moving trucks are exempt from noise ordinances by virtue of the interstate commerce act.)

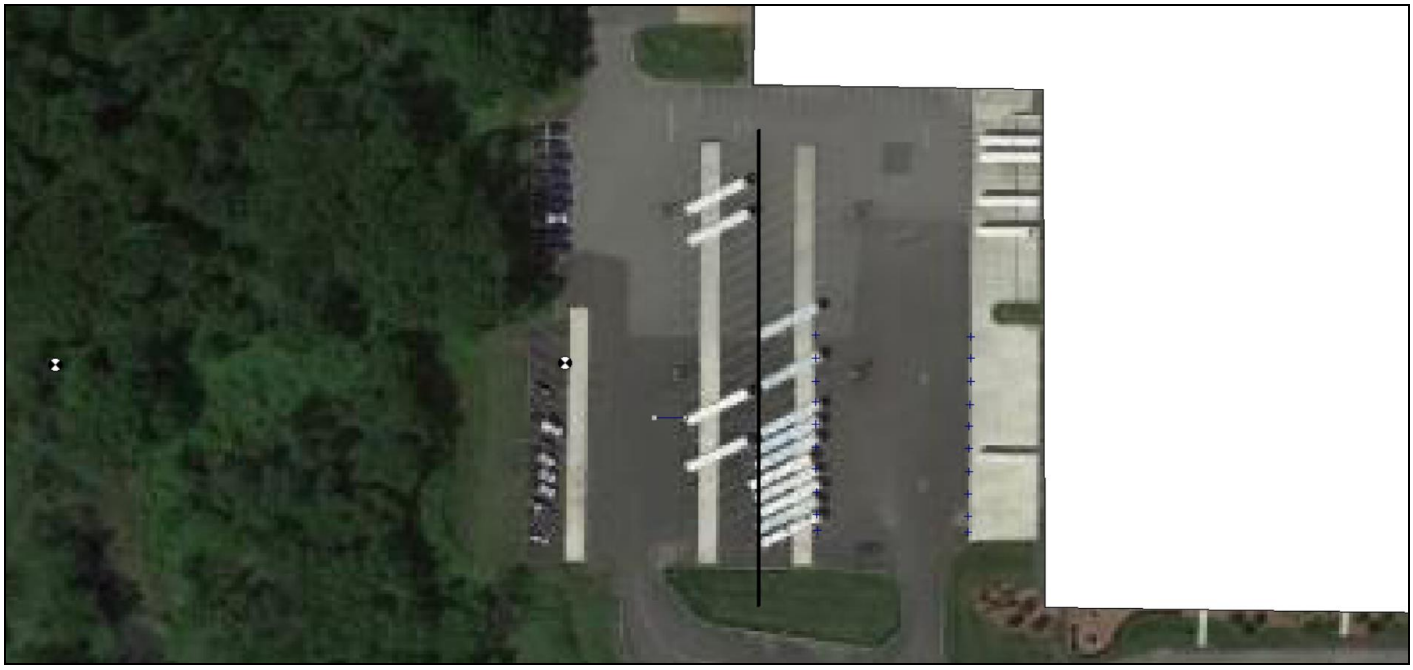

Figure 5. Close up View of Noise Barrier

Table 2 shows the noise level reduction results of this barrier at representative receptor locations on Flagg Road. The overall (dBA) results are substantially greater than 5 dBA resulting in a "feasible" noise barrier design. The low frequency performance is also quite good, between 9 and 10 decibels.

Table 2. Noise Level Reductions along Flagg Road afforded by Noise Barrier

	60 Flagg	**58 Flagg**	**56 Flagg**	**50 Flagg**
31.5 Hz	9	9	9	9
63 Hz	9	10	10	10
dBA	8	8	8	8

The results in Table 2 are at ground level (1.5 meters above ground). Second story results are nearly identical (within 1 dB) by virtue of the effective barrier location close to the noise sources.

Conclusions

Noise measurements of refrigeration units between the parking lot and residences on Flagg Road show low frequency (31.5 Hz and 63 Hz) sound substantially above ambient sound levels. Moving truck noise was barely audible in comparison to refrigeration unit noise. DCC's previous low frequency correlation analysis (June 12, 2020) still holds- meaning that vehicular traffic on Route 9 and I495 are also significant sources of low frequency sound. In addition, DCC's previous analysis still holds in that it is unlikely that the MDEP noise regulation is being exceeded on an A-weighted basis.

The noise barrier analyzed in this report would effectively reduce both low frequency refrigeration unit noise as well as on a A-weighted noise level basis. This design is effective because it would be located close to the noise sources. The noise barrier material would need to have a surface density between 4 and 8 lbs./square feet. Should the noise barrier be approved, DCC would specify the exact STC rating and surface density during the final design process, along with other detailed noise barrier design parameters[1].

[1] Note that the detailed noise barrier modeling performed in this study are accurate, industry standard, and appropriate for a NEPA type noise analysis. Typically, detailed engineering designs of noise barriers, once approved, take into account more precise barrier locations, end cap design, footings, etc. which may require minor changes to the modeling. DCC has nearly 40 years' experience designing noise barriers on highway systems and other facilities throughout North America.

Master Plan Draft.

Public Health

The Town has made considerable progress with broadening its Public Health service beyond the traditional "environmental" services (i.e., septic system inspections) which was the primary focus at the time of the 2008 Master Plan. The Board of Health and the Health Department staff have led the Town's successful response to the coronavirus pandemic, through such activities as case reporting, contact tracing and vaccination clinics. The Board of Health has also expanded its service capabilities through grant funding and regionalization efforts to provide enhanced capabilities in such areas as food and housing inspections, as well as with enforcement in the areas of alcohol and tobacco regulations. The Town's public health service is well positioned to continue its evolution toward a more comprehensive support of an appropriately wide range of health services for Town residents.

Heather's draft.

Public Health

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