

29 March 2022

Mr. Daniel T. Sehnal, PE  
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Re: Acoustical Evaluation of Proposed Warehouse  
399 Princeton Hightstown Road, West Windsor, New Jersey  
LSG&A File 2021110

Dear Mr. Sehnal:

As you requested, Lewis S. Goodfriend & Associates (LSG&A) has conducted an acoustical evaluation of the proposed warehouse to be located at 399 Princeton Hightstown Road in West Windsor, New Jersey. This letter summarizes LSG&A's acoustical measurements, evaluation, and recommendations for the application. The results indicate that the proposed operations can meet the daytime limits of the noise regulations with the proposed berm and fence, and can meet the nighttime limits of the noise regulations with the proposed berm and fence along with the recommended operational controls.

## **1.0 SITE LAYOUT**

The proposed warehouse site is located at 399 Princeton Hightstown Road in West Windsor, New Jersey, as depicted on Sheet 4 (*Site Plan*) of the *Preliminary And Final Site Plan For IV1 Windsor & Logistics Center, LLC Proposed Warehouse* drawing set, last revised 22 February 2022 and provided by Dynamic Engineering. Sheet 4 is attached at the end of this letter for reference. The nearest residential properties are located to the west and north of the site. The site and adjacent areas are shown on Figure 1, at the end of this letter.

## **2.0 REQUIREMENTS OF THE APPLICABLE NOISE REGULATIONS**

The New Jersey Department of Environmental Protection (NJDEP) maintains a statewide noise regulation, and the Township of West Windsor code also includes regulations regarding sound.

## 2.1 NJDEP Noise Regulation

The NJDEP noise regulation limits the A-weighted<sup>1</sup> sound levels produced by a commercial or industrial facility, when measured at a residential property, to the following sound levels:

|           |                             |   |          |
|-----------|-----------------------------|---|----------|
| Daytime   | (7:00 A.M. -to- 10:00 P.M.) | – | 65 dB(A) |
| Nighttime | (10:00 P.M. -to- 7:00 A.M.) | – | 50 dB(A) |

The NJDEP regulation also provides limits for sound pressure levels in the preferred octave bands with center frequencies between 31.5 and 8000 hertz during the daytime and nighttime hours, as summarized in Table 1.

| <b>Table 1 – Daytime and Nighttime Sound Pressure Level Limits [dB re: 20<math>\mu</math>Pa] of the NJDEP Noise Regulation for Residential Property Receivers (NJAC 7:29)</b> |   |           |            |            |            |             |             |             |             |
|---|---|-----------|------------|------------|------------|-------------|-------------|-------------|-------------|
|   | <b>Octave Band Center Frequency, Hz</b> |           |            |            |            |             |             |             |             |
|   | <b>31.5</b>                             | <b>63</b> | <b>125</b> | <b>250</b> | <b>500</b> | <b>1000</b> | <b>2000</b> | <b>4000</b> | <b>8000</b> |
| Daytime Limits  | 96                                      | 82        | 74         | 67         | 63         | 60          | 57          | 55          | 53          |
| Nighttime Limits  | 86                                      | 71        | 61         | 53         | 48         | 45          | 42          | 40          | 38          |

The NJDEP regulation limits sound pressure levels produced by noise sources with an impulsive character to not more than 80 dB(A) at any time, as measured by a sound level meter set to fast response. Impulsive sound that repeats more than four times in a nighttime hour is limited to 50 dB(A) when measured at a residential receiver.

## 2.2 Local Noise Regulation

The Code of the Township of West Windsor, Section 113-6 (*Maximum Permissible Sound Levels*), provides the same A-weighted and octave band sound pressure level limits as the NJDEP code. However, the NJDEP noise regulation states that the measured sound pressure levels may not exceed the given decibel levels, whereas the Township's noise ordinance states that the measured sound pressure levels may not equal or exceed the decibel limits.

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<sup>1</sup>A-Weighting, noted as dB(A), is a standardized sound level meter setting having a frequency characteristic similar to the human ear/brain frequency sensitivity and, therefore, provides an overall sound level measurement that correlates with how humans perceive sound.

### **3.0 ACOUSTICAL EVALUATION**

LSG&A completed an acoustical evaluation in order to determine the expected sound generated by typical warehouse operations. LSG&A utilized operational sound emission data based on measurements of similar facilities. The following sources were incorporated into the analysis:

- Truck Movement (continuous sound)
- Truck Backup Signal (continuous sound)
- Trash Compactors (continuous sound)
- Rooftop HVAC (continuous sound)
- Trailer Hitching (impulsive sound)
- Loading Activities (impulsive sound)

LSG&A used the above data to prepare an acoustical model using SoundPLAN software. Calculation of the expected sound pressure levels was based on the distances between operations and the evaluation locations, reflections and shielding from buildings and structures, the topographical features of the area, and air absorption. The proposed berm and fence were also considered in the evaluation, as described and depicted on Sheets 4 (*Site Plan*), 5 (*Grading Plan*), and 18 (*Construction Details*) of the *Preliminary And Final Site Plan For IV1 Windsor 8 Logistics Center, LLC Proposed Warehouse* drawing set, last revised 22 February 2022 and provided by Dynamic Engineering. Sheets 4, 5 and 18 are attached at the end of this letter for reference.

### **4.0 RECOMMENDATIONS**

LSG&A recommends using pneumatic dock levelers with smooth operation to reduce adjustment noise. As an administrative control, trucks should be prohibited from idling for prolonged periods of time. During nighttime hours, audible backup signal use should be prohibited or the trucks should be equipped with audible backup signals that are limited to 100 dB output sound power level.

## 5.0 RESULTS AND DISCUSSION

Table 2, below, shows the expected sound levels at the nearest residential properties due to various operations. For each location, the sound level was evaluated at both the property line and at the house façade, and the higher result of the two is reported below. The results are compared to the applicable limits of the noise regulations.

| <b>Table 2 – Expected Sound Levels for Various Operations, 399 Princeton Hightstown Road, West Windsor, New Jersey.</b> |                      |                                    |               |               |                     |
|---|----------------------|------------------------------------|---------------|---------------|---------------------|
| <b>Activity</b>   | <b>Type of Sound</b> | <b>Expected Sound Level, dB(A)</b> |               |               | <b>Limit, dB(A)</b> |
|   |                      | <b>Loc. 1</b>                      | <b>Loc. 2</b> | <b>Loc. 3</b> |                     |
| Backup Signal, Truck Movement, Compactors, Rooftop HVAC   | Continuous           | 53                                 | 53            | 55            | 65                  |
| Limited Backup Signal, Truck Movement, Compactors, Rooftop HVAC   | Continuous           | 49                                 | 47            | 49            | 50                  |
| Trailer Hitching, Loading Activity  | Impulsive            | 44                                 | 44            | 45            | 80/50*              |

\*50 dB(A) if more than four events occur in a nighttime hour.

The results indicate that the proposed operations can meet the daytime limits of the noise regulations with the proposed berm and fence, and can meet the nighttime limits of the noise regulations with the proposed berm and fence along with the recommended operational controls, at the nearest residential property lines and at the facades of the nearest houses.

Please note that all recommendations included in this report are acoustical in nature and should be reviewed by the appropriate licensed design professionals. Alternative products should be submitted to LSG&A for review. I trust that this information is sufficient for your present needs. Please call if you have any questions regarding this report.

Very truly yours,

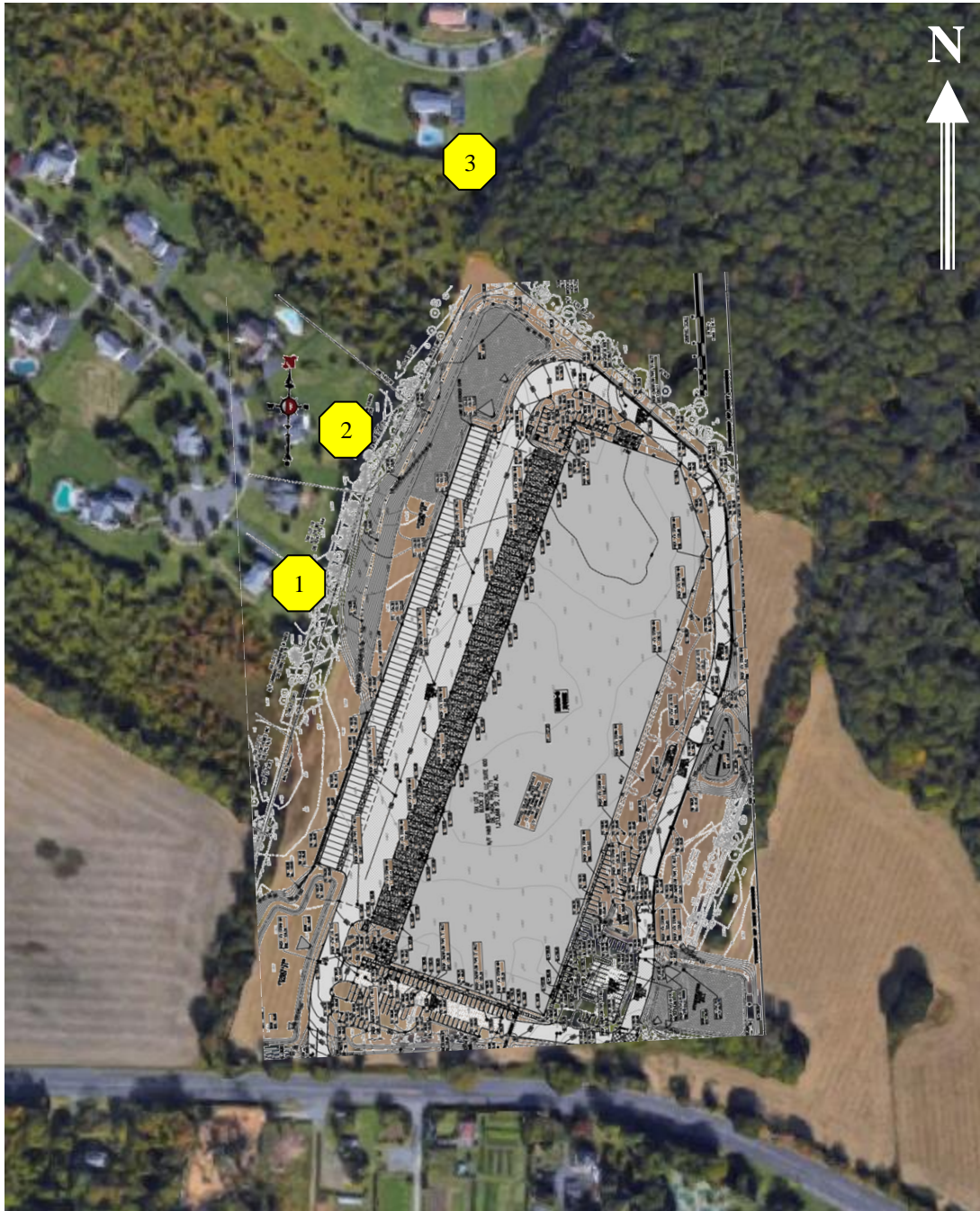
LEWIS S. GOODFRIEND & ASSOCIATES




Jack A. Zybura, P.E., INCE Bd. Cert.  
Associate Principal

MJD:jaz  
Enclosures

Figure 1 – Aerial View with Partial Site Overlay showing the Acoustical Evaluation Locations, 399 Princeton Hightstown Road, West Windsor, New Jersey.



All Locations Approximate  
Not to Scale  
Not for Construction

|   |                      |
|---|----------------------|
|  | Evaluation Locations |
|---|----------------------|