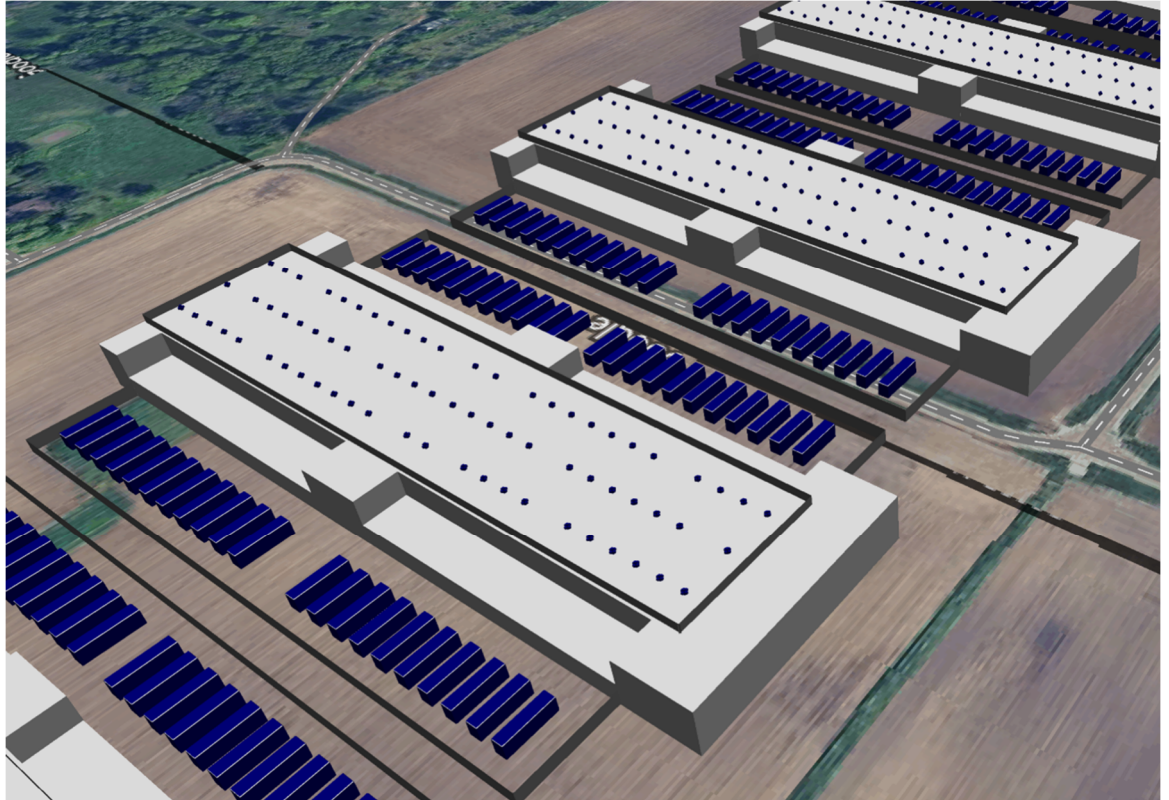


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## Langan – Project Steel Environmental Noise Assessment



SA project 1250506

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Revision A  
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Prepared for  
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## 1. Summary

The noise evaluation for the Project Steel data centers in Yorkville, Illinois comprises two phases: environmental sound measurements at the proposed site and predictions of the project's outdoor sound levels. For the first phase, Shiner Acoustics, LLC took sound measurements from June 23 to 27, 2025, which were documented in a July 3, 2025 report. The second phase consisted of reviewing project documents and vendor data, developing an acoustical model of the equipment, predicting environmental sound levels, determining compliance, and recommending mitigation.

Long-term sound measurements were taken on the site, before facility construction and installation of outdoor equipment. The measurements showed that environmental sound levels were moderate, with average baseline ( $L_{90}$ ) sound levels of 39 to 42 dBA.

The Yorkville noise code limits noise to residential land uses for the daytime (60 dBA) and nighttime (50 dBA) periods. The Illinois noise code limits noise from commercial to residential land uses for the daytime (about 55 dBA) and nighttime (about 44 dBA) periods.

The site has residences in every direction. Two residences and the Caledonia subdivision are in Yorkville, so the Yorkville sound limits apply. The remaining residences are located in unincorporated Kendall County, so the Illinois limits apply.

Facility noise sources and outdoor sound propagation to the residences were modeled with acoustical software. The facility's base design includes outdoor chillers, rooftop units, and enclosed emergency generators.

We analyzed environmental noise with the preceding equipment and predict sound levels of 49 to 61 dBA at residential receivers with the rooftop-mounted standard-noise chillers, which exceeds both noise codes.

We revised the acoustical model to include mitigation, such as lower-noise chillers and rooftop sound walls at chillers and generator sets. With these measures, the facility is predicted to achieve compliance with the Yorkville limits.

To achieve substantial compliance with the Illinois limits, the lowest-noise chillers are recommended, in addition to the rooftop and generator set sound walls.

The recommended mitigation is as follows:

- Construct a rooftop sound wall on each building to surround the chillers;
- Construct two sound walls at grade on each building to surround the emergency generators;
- Specify chillers to meet the sound levels described below; and
- Specify emergency generators to meet the sound limits described below.

## **2. Introduction**

The project will be about 540 acres on two parcels generally between Eldamain Rd., Galena Rd., a relocated Beecher Rd., and Corneils Rd. Some properties are located in unincorporated Kendall Co. and some will be annexed into Yorkville, or are currently in Yorkville.

The data center will be built in three phases:

- Six buildings in the southeastern corner of the property;
- Six buildings in the northeastern corner of the property;
- Six buildings in the southwest corner of the property;

Each phase will include a substation and two to three retention ponds. The buildings will be about 380,000 sf each, for a total of 6.8 million sf. Noise-generating equipment will include cooling equipment such as chillers, diesel emergency generators, and rooftop units for building ventilation.

The site will be adjacent to residential properties in every direction. Several residential property lines will be located close to mechanical equipment or data center buildings and the equipment has the potential to generate high noise levels at the residences.

As part of the annexation, rezoning, and PUD (planned use development) approval process, the City of Yorkville is requiring Prologis to demonstrate compliance with the Yorkville noise code. In addition, compliance with the Illinois noise code is required at many properties.

## **3. Site Description**

The proposed facility will be a data center on a greenfield site in Yorkville, Illinois, as shown in Figure 1. The site is essentially flat in every direction. The noise-sensitive receivers are as follows:

- To the north: multiple residence on Galena Rd.;
- To the east: residence on the east side of the proposed relocated Beecher Rd., residences on Corneils Rd. to the southeast, and the Caledonia subdivision to the southeast;
- To the south: single-family residence on Corneils Rd.; and
- To the west: single-family residences on Eldamain Rd.

## **4. Measurements**

Long-term ambient sound measurements were conducted at four locations surrounding the proposed data center. These locations were chosen due to their proximity to the proposed buildings and associated outdoor equipment.

Measurements were conducted from June 23 to 27, 2025 and are documented in our July 3, 2025 report. Environmental sound varies with time and is commonly quantified by the  $L_{90}$  metric, which is the baseline, or steady-state sound level that does not include louder, transient noises such as from vehicles.



Measurements were made in terms of one-third octave bands and an overall A-weighted value. The one-third octave-bands quantified frequency content, and A-weighting is commonly used for environmental sound measurement. A-weighting discriminates against low frequencies in an approximation of human hearing.

A summary of measurement results is shown in Table 1.

Table 1. Sound Measurements  
June 23 to 27, 2025

Location	Baseline Sound Level ( $L_{90}$ , dB re 20 $\mu$ Pa, A-weighted)		
	Lowest	Average	Highest
MP 1	35 6/24 7:00 p.m.	42	51 6/23 3:00 p.m.
MP 2	26 6/24 1:00 a.m.	39	46 6/27 12:00 a.m.
MP 3	31 6/24 12:00 a.m.	41	47 6/23 4:00 p.m.
MP 4	29 6/24 2:00 a.m.	39	45 6/23 3:00 p.m.

The soundscape was affected by wind noise in trees, general traffic noise, including occasional vehicles on nearby roads, and some bird noise.

## 5. Criteria

The Yorkville code applies to residential properties located in the City of Yorkville. The code contains numeric limits for residential land uses, as shown in Table 1. The code limits noise levels by time of day, with more restrictive limits for nighttime.

Table 1. Yorkville Sound Level Limits

Time of Day	Receiving Property Land Use
	Residential
Daytime (7:00 a.m. - 10:00 p.m.)	60 dBA
Nighttime (10:00 p.m. - 7:00 a.m.)	50 dBA

The code contains an adjustment for the noise duration, as shown in Table 2. Since all noise sources will be operating for 12 minutes per hour or longer, as discussed below, this adjustment does not apply.

The code contains an adjustment for the noise character, as shown in Table 2. Since none of the noise sources have a tonal character, as discussed below, this adjustment does not apply.

Table 2. Yorkville Adjustments to Sound Level Limits

	Adjustment to Sound Level Limit
1. Duration of noise in any one-hour period (use 1 adjustment only):	
a. 12 minutes and longer	Add 0 dBA
b. Under 12 minutes but over 3 minutes	Add 5 dBA
c. Under 3 minutes but over 1/2 minute	Add 10 dBA
d. Under 1/2 minute	Add 15 dBA
2. Noise is impulsive in character (e.g., hammering, firearms discharge, explosions)	Subtract 5 dBA
3. Content of noise includes electronically amplified, reinforced, or reproduced voice or music	Subtract 5 dBA
4. Noise is tonal in character (e.g., hum, screech)	Subtract 10 dBA
5. If measured within a building on the receiving property per subsections 4-4-4.C and D of this chapter	Subtract 20 dBA

The Illinois noise code applies to noise emissions from the data center, which is a commercial land use, to residential land uses in unincorporated Kendall County. The limits are established for daytime and nighttime in each of nine octave bands, as shown in Table 3. Note that the A-weighted level is not limited by the code, but is provided for convenience. In addition, the Illinois noise code limits tones (i.e. prominent discrete tones) to minimize community annoyance caused by this noise characteristic.

Table 3. Illinois Noise Limits

	Sound Pressure Level (dB re 20 µPa)									
	Octave Band Center Frequency (Hz)									Awt*
	31.5	63	125	250	500	1k	2k	4k	8k	
Daytime (7:00 a.m. - 10:00 p.m.)	72	71	65	57	51	45	39	34	32	55
Nighttime (10:00 p.m. to 7:00 a.m.)	63	61	55	47	40	35	30	25	25	44

\* A-weighted level provided for convenience; not limited by code

## 6. Noise Sources

The facility will have rooftop air-cooled chillers and enclosed emergency generators at grade.

Each building will have 84 air-cooled chillers. The basis of design is 300-ton nominal Trane ACR units. The chillers are available with multiple levels of sound emissions, as described below and in Table 4:

- Standard, with the factory default condenser fan speed of 950 RPM;
- Superior or low noise;
- Ultimate or very low noise with four fan speeds of 600, 650, 700, and 950 RPM.

We reviewed Trane one-third octave band sound data for the presence of tones (i.e. prominent discrete tones). The noise data does not show the presence of tones. If the facility were to contain equipment with tonal noise emissions, its sound levels would be compared to a much more stringent (10 dB lower) Yorkville noise code. The Illinois noise code limits tones at residential receivers.

Each building will have 43 (42 critical and 1 house) packaged emergency generators, each with a 3 MW engine and generator. The enclosures will have inlet and relief ventilation silencers, and there will be an engine exhaust silencer or muffler. The units will be specified to meet 85 dBA at 23 ft and this sound rating was used as the basis of design for this project. Each emergency generator will be exercised 30 minutes per month between 11:00 a.m. and 5:00 p.m.

Table 4 shows the equipment noise emissions in terms of sound power levels. Sound power levels are independent of measurement distance and enable the acoustic emissions of different sources to be compared.

Table 4. Noise Sources

Equipment	Option	Sound Power Level (dBA) (L <sub>w</sub> , dB re 10 <sup>-12</sup> W, A-weighted)
Trane ACR air-cooled chiller, 300 tons nominal, 100% load	Superior	102
	Superior or low-noise	98
	Ultimate or very low noise (fan 700 RPM)	94
	Ultimate or very low noise (fan 650 RPM)	92
	Ultimate or very low noise (fan 600 RPM)	90
	Ultimate or very low noise (fan standard RPM)	101
Genset enclosure (85 dBA at 23 ft)	n/a	113

There will be rooftop mechanical units (RTUs) serving the data center, but no information was available on these. These can be included in future iterations of the acoustical analysis. The facility will have three substations, which will have transformers. Since the substations are not laid out, at Prologis' direction these noise sources were not included in the acoustical

model. They will be included in a future iteration.

## **7. Receivers**

Residential receivers are located in Yorkville, in which case the Yorkville noise code applies, or unincorporated Kendall County, in which case the Illinois noise code applies. Addresses and the applicable noise code for receivers are listed in Table 5.

## **8. Modeling Methodology**

Outdoor sound propagation calculations are based on the International Organization for Standardization (ISO) 9613-2, which considers sound sources, receivers and factors that influence sound propagation such as distance and screening. CadnaA software from DataKustik GmbH implements the standard and our acoustical model uses this software and standard acoustical calculations. The methodology is described in more detail in Appendix A.

## **9. Modeling Results**

### **9.1. Base Scenario**

Shiner Acoustics predicted sound pressure levels at the residences. Note that although the results below are presented as single-number A-weighted levels for simplicity, all prediction and analysis was performed using octave bands.

We modelled a base scenario, which assumes the following equipment operation and sound barriers:

- Day: standard-sound chillers and emergency generators; and
- Night: standard-sound chillers.

Table 5 shows the facility's predicted sound levels, which are in excess of the criteria. Figure 1 shows the facility site plan, noise sources, sound barriers (if any), receivers, and nighttime sound level contours overlaid on an aerial photo.

Table 5. Predicted Sound Levels, Base Scenario

Receiver	Jurisdiction	Sound Pressure Level (dB re 20 $\mu$ Pa), A-weighted		Excess at Nighttime (dB)
		Day	Night	
Yorkville noise code	n/a	60	50	n/a
Illinois noise code	n/a	55	44	n/a
R1: 1410 E. Beecher Rd.	Illinois	61	61	16
R2: 10907 Corneils Rd.	Illinois	58	58	14
R3: Caledonia	Yorkville	49	49	-
R4: 10825 Corneils Rd.	Yorkville	57	57	7
R5: 2013 Beecher Rd.	Illinois	58	58	14
R6: 1414 Eldamain Rd.	Yorkville	56	56	6
R7: 1314 Eldamain Rd.	Illinois	57	57	12
R8: 790 Eldamain Rd.	Illinois	60	60	15
R9: 11843 Galena Rd.	Illinois	57	57	12
R10: 11018 Galena Rd.	Illinois	53	53	9
R11: 10724 Galena Rd.	Illinois	51	51	7

## 9.2. Mitigation to Meet Yorkville Code

Since there were excessive sound levels with the base scenario, as described below, we modeled a scenario with mitigation to meet the Yorkville noise code:

- Day: Superior sound (low-noise) chillers and standard emergency generators;
- Night: Superior sound (low-noise) chillers.
- Sound walls: acoustical sound walls on chiller building roofs to enclose the chillers, and acoustical sound walls on each side of the buildings to enclose the emergency generators, as described below.

Predicted facility noise levels with this additional mitigation are shown in Table 6. The nighttime sound level contours are shown graphically in Figure 2.

Table 6. Predicted Sound Levels, with Yorkville Mitigation

Receiver	Jurisdiction	Sound Pressure Level (dB re 20 $\mu$ Pa), A-weighted		Excess at Nighttime (dB)
		Day	Night	
Yorkville noise code	n/a	60	50	n/a
Illinois noise code	n/a	55	44	n/a
R1: 1410 E. Beecher Rd.	Illinois	52	52	7
R2: 10907 Corneils Rd.	Illinois	50	49	5
R3: Caledonia	Yorkville	41	41	-
R4: 10825 Corneils Rd.	Yorkville	49	49	-
R5: 2013 Beecher Rd.	Illinois	50	50	5
R6: 1414 Eldamain Rd.	Yorkville	50	50	-
R7: 1314 Eldamain Rd.	Illinois	50	50	5
R8: 790 Eldamain Rd.	Illinois	51	51	6
R9: 11843 Galena Rd.	Illinois	49	49	5
R10: 11018 Galena Rd.	Illinois	47	46	2
R11: 10724 Galena Rd.	Illinois	44	44	-

### 9.3. Mitigation to Meet Yorkville and Illinois Codes

Although the preceding scenario is predicted to meet the less stringent Yorkville code, there were excessive sound levels with respect to the more stringent Illinois noise code. Therefore, we modelled a scenario with mitigation to meet both the Yorkville and Illinois noise codes:

- Day: Ultimate sound (very low noise) chillers with a fan speed of 600 RPM and standard emergency generators;
- Night: Ultimate sound (very low noise) chillers with a fan speed of 600 RPM.
- Sound walls: acoustical sound walls on chiller building roofs to enclose the chillers, and acoustical sound walls on each side of the buildings to enclose the emergency generators, as described below.

Predicted facility noise levels with this additional mitigation are shown in Table 7. The nighttime sound level contours are shown graphically in Figure 3.

Table 7. Predicted Sound Levels, with Yorkville and Illinois Mitigation

Receiver	Jurisdiction	Sound Pressure Level (dB re 20 $\mu$ Pa), A-weighted		Excess at Nighttime (dB)
		Day	Night	
Yorkville noise code	n/a	60	50	n/a
Illinois noise code	n/a	55	44	n/a
R1: 1410 E. Beecher Rd.	Illinois	46	44	-
R2: 10907 Corneils Rd.	Illinois	43	42	-
R3: Caledonia	Yorkville	34	33	-
R4: 10825 Corneils Rd.	Yorkville	42	41	-
R5: 2013 Beecher Rd.	Illinois	43	42	-
R6: 1414 Eldamain Rd.	Yorkville	43	42	-
R7: 1314 Eldamain Rd.	Illinois	43	42	-
R8: 790 Eldamain Rd.	Illinois	45	43	-
R9: 11843 Galena Rd.	Illinois	43	42	-
R10: 11018 Galena Rd.	Illinois	40	39	-
R11: 10724 Galena Rd.	Illinois	38	36	-

We note that although the overall A-weighted sound levels show compliance during the day and night, we predict minor excesses in some octave bands, as follows:

- Night: one to six dB in the 1 kHz and 2 kHz octave bands;

## 10. Recommendations

We recommend the following mitigation to reduce facility sound levels:

- Chillers: to meet the Yorkville limits, specify superior (low-noise) sound chillers that have a maximum sound power level of 98 dBA;
- Chillers: to meet the Yorkville and Illinois limits, specify ultimate (very low noise) sound chillers with a fan speed 600 RPM and a maximum sound power level of 91 dBA;
- The chillers should be specified so that they do not emit prominent discrete tones;
- Generators: emergency generators should be specified to meet 85 dBA at 23 ft;
- Sound walls are recommended, as follows:
  - Each building should have a rooftop sound wall surrounding the chillers;
  - The chiller sound wall height should be at least as high as the top of the chillers. The current drawings show a minimum height of 11.5 ft. There should be a minimal (a few inches) gap between the roof and the bottom of the sound walls. The anticipated length of each barrier is about 2,000 ft;
  - The emergency generator sound wall height should be at least as high as the top of the generators. The current drawings show a minimum height of 24 ft. There should be a minimal (a few inches) gap between grade and the bottom of the sound walls. The anticipated length of each barrier, including returns to the building, is about 1,000 ft. It may be possible to optimize the generator wall design in future iterations of the project;
  - The sound walls should have two performance specifications:
    - Sound absorption: meet NRC (noise reduction coefficient) 0.90 minimum. This is usually met by an open or perforated liner facing the equipment;
    - Sound isolation: meet STC (sound transmission class) 30 minimum. This can be met with construction such as vinyl or metal barriers.
  - We recommend AIL Sound Walls, Koch, Acoustiblok All-Weather Sound Panels, Kinetics Noiseblock Barrier Panels, or Noise Barriers QuietLine (e.g. V-Stack).

Rooftop units and transformers will be included in future iterations of the acoustical analysis once the equipment is defined.

## 11. Conclusion

Measurements taken in June, 2025 document sound levels at the proposed site. Facility sound levels are limited by the Yorkville and Illinois noise codes; the Illinois noise code is the most stringent. With standard equipment, we predict sound levels in excess of the criteria. Therefore, we recommend additional mitigation, such as low-noise chillers and sound walls to meet the Yorkville or Illinois codes.



## Appendix A. Outdoor Sound Modeling Methodology

Outdoor sound propagation calculations are based on the International Organization for Standardization (ISO) 9613-2. The standard predicts sound pressure levels under conditions favorable to sound propagation. The standard considers sound sources, receivers and factors that influence sound propagation: distance, screening by obstacles, ground effects, atmospheric absorption, source directivity, and reflection from surfaces. CadnaA software from DataKustik GmbH implements the standard and our acoustical model is based on this software and standard acoustical calculations.

Two sound ray reflections were used in the model to account for reflections from buildings and obstacles. The terrain surrounding the plant was modeled. We entered the essential acoustical features of the facility, such as significant obstructions and noise sources, into the program, as well as noise-sensitive receivers.

Atmospheric attenuation was based on conservative atmospheric conditions of 10°C, 70% relative humidity. We set the ground attenuation factor G at 1.0 for soft, porous ground; this factor can vary from 0.0 for sound-reflective water or concrete to 1.0 for soft, porous ground.

ISO 9613-2 specifies methods to calculate long-term average receiver sound levels under conditions favorable to sound propagation, namely downwind from the source or clear and calm nighttime conditions, to a distance of 1,000m/3,280 ft. There may be deviation between the CadnaA prediction and measured levels; however, in most cases, CadnaA will yield conservative results. The prediction uncertainty is much smaller than the uncertainty associated with source noise levels and actual meteorological conditions.











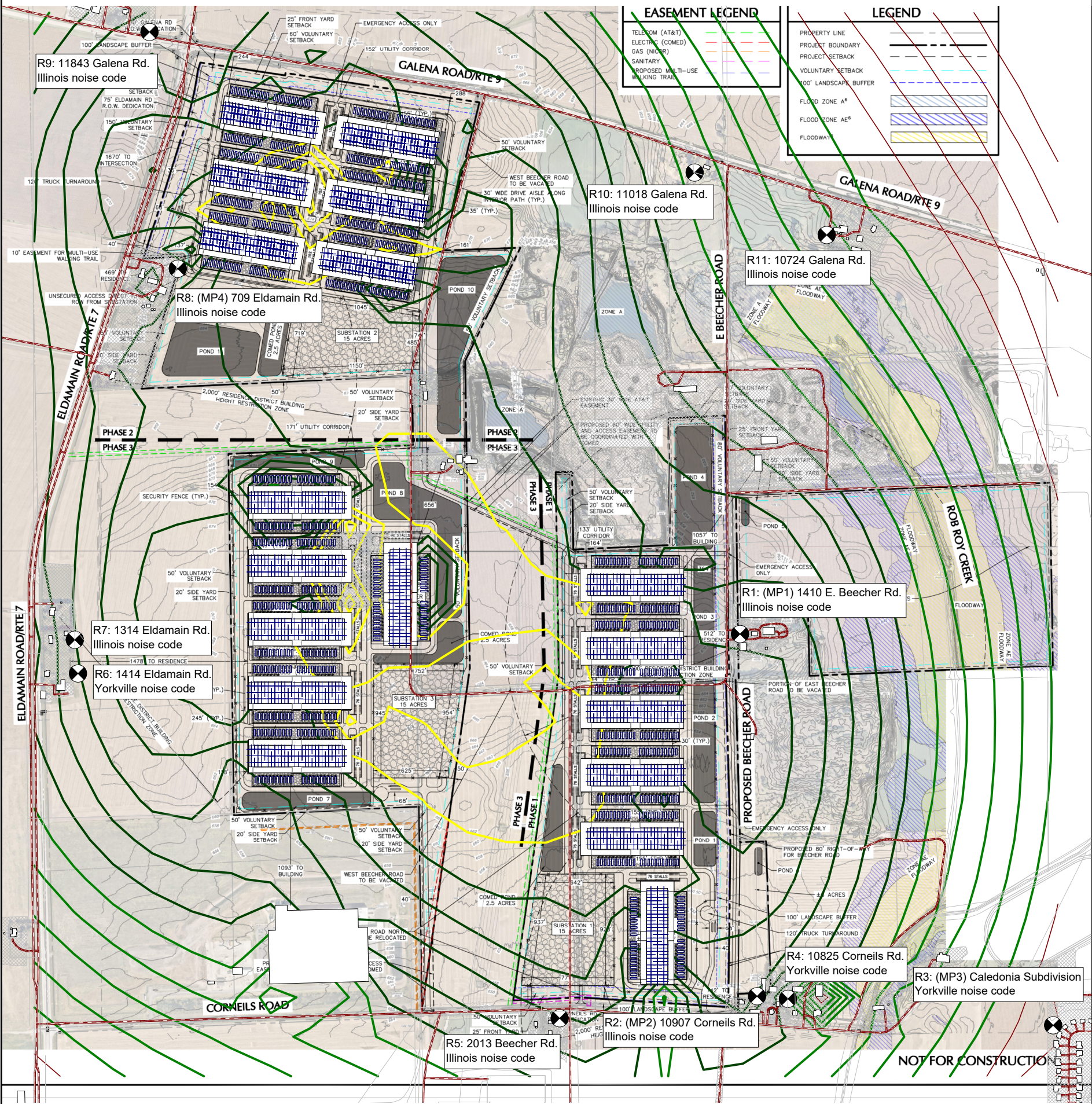
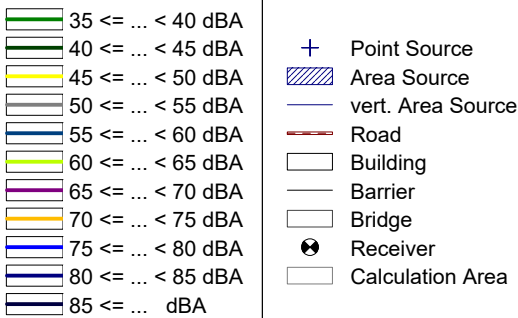


Figure 3. Prologis Project Steel Predicted Nighttime Sound Levels

Very Low-noise Chillers (600 RPM fans), Sound Walls, Standard Generators



Scale 1 : 10176  
Units in meters  
UTM Zone 16  
Datum WGS84

Rev

Date

0

8/11/25

Shiner Acoustics, LLC