NOISE STUDY

KPAC COIL AVENUE FREEZER EXPANSION PROJECT

1420 Coil Avenue, Wilmington, CA 90074

PREPARED FOR:

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EXECUTIVE SUMMARY

This *Noise Study* assesses and discusses the potential noise and vibration impacts that may occur with the KPAC Coil Avenue Freezer Expansion Project (Project), located in the City of Los Angeles (City), California.

The analysis describes the existing environment in the Project area; estimates future noise and vibration levels at surrounding land uses resulting from construction and operation of the Project; and identifies the potential for significant impacts. An evaluation of the Project's contribution to potential cumulative noise impacts is also provided. The study summarizes the potential for the Project to conflict with applicable noise and vibration regulations, standards, or thresholds, and to identify any measures that may be necessary to reduce potentially significant impacts.

On-Site Construction Noise

Construction noise levels would be further reduced via Environmental Protection Measures (already included in Community Plan EIRs), which are existing requirements and reasonably anticipated standard conditions based on local, State, or federal regulations and laws that are frequently required independently of CEQA review and serve to offset or prevent specific impacts. These measures are not included as mitigation measures in the environmental clearance document because the Project is required to comply with these measures through State and local regulations.

Construction noise sources are regulated within the City of Los Angeles Municipal Code Section 41.40, which prohibits construction between the hours of 9:00 PM and 7:00 AM Monday through Friday, 6:00 PM and 8:00 AM on Saturday, and at any time on Sunday (i.e., construction is allowed Monday through Friday between 7:00 AM to 9:00 PM; and Saturdays and National Holidays between 8:00 AM to 6:00 PM).

Modeled construction noise levels would not result in an increase above the absolute threshold of 90 dBA during any phase of construction. Reduction measures that would further reduce noise levels include but are not limited to optimal muffler systems, dampening materials, sound aprons and limiting simultaneous operations.

Off-Site Construction Noise

Construction of the Project would require worker, haul, and vendor truck trips to and from the site to work on the site, export soil, and deliver supplies to the site. Trucks traveling to and from the Project site would be required to travel along a haul route approved by the City. At the maximum, approximately 146 hauling trips per day would take place during the grading phase, based on construction schedule assumptions. Haul truck traffic would take the most direct route to the freeway ramp along Drumm Avenue and Pacific Coast Highway. The noise level increases from truck trips would be below the significance threshold of 5 dBA above ambient. As such, off-site construction noise impacts would not be considered significant.

Operational Noise

All Project mechanical equipment would be required to be designed with appropriate noise-control devices—such as sound attenuators, acoustics louvers, or sound screens/parapet walls—to comply with noise-limitation requirements provided in Section 112.02 of the LAMC, which prohibits equipment from causing more than a 5 dBA increase in the ambient noise level.

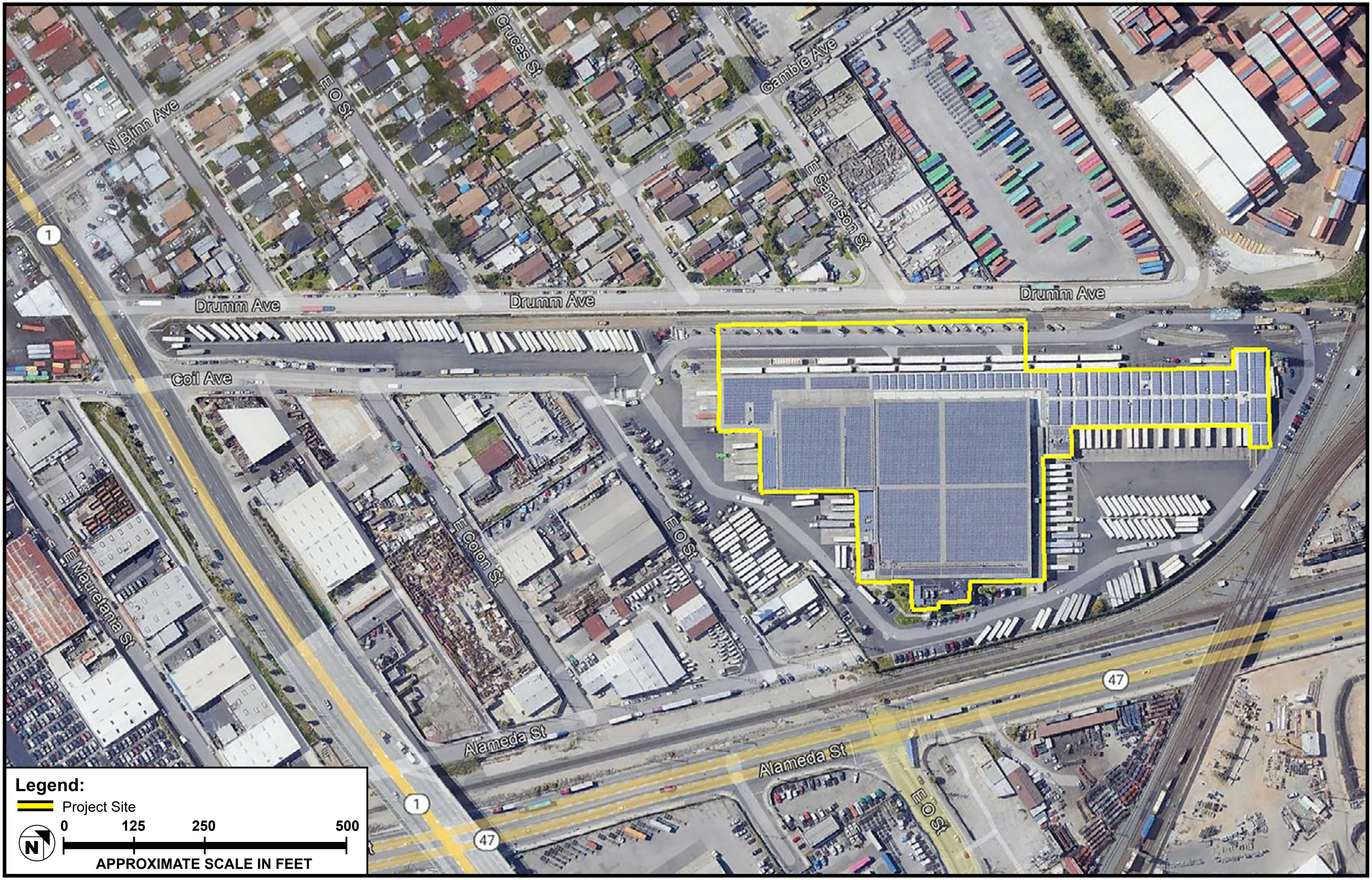
Construction Vibration

The forecasted vibration levels due to on-site construction activities would not exceed the building damage significance threshold of 0.5 PPV for reinforced-concrete, steel, or timber building at the adjacent single family residential and commercial uses.

PROJECT DESCRIPTION

The Project site is located at 1420 Coil Avenue within the Wilmington-Harbor Community Plan area in the City of Los Angeles (City) as shown in **Figure 1: Project Site Location**. The Project site area encompasses approximately 747,302 square feet (16.82 acres) in size and is designated for Light Manufacturing land uses and zoned [Q] MR2-1 VL-CUGU (Restricted Light Industrial). The Project site is currently developed with a one-story (varying heights between 26 to 42 feet) 221,496 square foot cold storage facility is used to store wholesale food products for third party users. The facility currently provides cooler and freezer temperature storage and operates 5 days a week (Monday through Friday) for 16 hours per day, at a quantity of two 8-hour shifts per day. Additionally, there is an existing double rail spur that includes 9 unloading docks each, equating to 18 unloading stations. Properties surrounding the Project site are zoned M3-1VL, [Q]M3-1VL-CUGU and [Q]M3-1 (Heavy Industrial) to the north and east along Alameda Street, R1-1XL-O-CUGU (One-Family Residential) to the west along Drumm Avenue and C1-1VL-O-CUGU (Limited Commercial) to the southwest along Pacific Coast Highway.

The Proposed Project involves improvement and expansion of the existing cold storage facility which includes demolition and alteration of the 27,157 square foot existing cold dock for a new freezer. The new freezer will be approximately 71,331 square feet resulting in a net addition of 44,174 square feet of new floor area. The new structure would be 65 feet in height (not including rooftop equipment), which exceeds the 45-foot height limit currently allowed per the applicable zoning. The existing interior freezer would be remodeled. The improved facility will be expanding to the west and will result in the removal of the existing portion of double rail spur that is located in the path of the expansion. Additionally, the proposed development would include 2,290 square feet designated for the mechanical room expansion, electrical room expansion, and fire pump building and 13,939 square feet of total new second floor building area for the offices. Following the expansion, the facility would also operate on Saturdays for one 8-hour shift. The expansion would decrease the length of the existing double rail spur and will also decrease of the number of train unloading stations from 18 down to 6. However, the overall operation of the cold storage facility would remain unchanged following the expansion.



SOURCE: Google Earth - 2022

FIGURE 1

Meridian Consultants

Project Site Location

359-001-22

Ambient Noise Levels

Short-term sound monitoring was conducted at six (6) locations to measure the ambient sound environment in the Project vicinity. Measurements were taken over 15-minute intervals at each location between the hours of 9:24 AM and 11:13 AM on July 6, 2022 and provided in **Table 1: Ambient Noise Measurements**. **Figures 2-7: Noise Monitoring Locations** depicts locations where ambient noise measurements were conducted. As shown in **Table 1**, ambient noise levels ranged from a low of 61.9 dBA (Leq-15minute) on the corner of Cruces Street and Blinn Avenue (Site 5) to a high of 76.9 dBA (Leq-15minute) on the corner of Cruces Street and Drumm Avenue (Site 2).

TABLE 1: AMBIENT NOISE MEASUREMENTS

Location Number/Description		Nearest Use	Time Period	Noise Source	dBA Leq-15-minute
1	Corner of Sandison Street and Drumm Avenue	Residential	9:43 AM-9:57 AM	Truck traffic along Drumm Avenue	71.5
2	Corner of Cruces Street and Drumm Avenue	Residential	10:03 AM-10:18 AM	Truck Traffic along Drumm Avenue	76.9
3	Corner of O Street and Drumm Avenue	Residential	10:23 AM-10:38 AM	Truck traffic along Drumm Avenue	71.2
4	Along Drumm Avenue between Colon Street and Pacific Coast Highway	Residential /Commercial	10:44 AM-10:59 AM	Truck and vehicle traffic along Drumm Avenue and Pacific Coast Highway	76.6
5	Corner of Sandison Street and Gamble Avenue	Residential	11:06 AM-11:21 AM	Vehicle traffic along Sandison Street	69.3
6	Corner of Cruces Street and Blinn Avenue	Residential	11:24 AM - 11:39 AM	Vehicle traffic along Cruces Street	61.9

Notes: dBA = A-weighted decibels; Leq = average equivalent sound level.
*Source: Refer to **Attachment 1.0** for noise monitoring data sheets.*

Sensitive Uses

Properties surrounding the Project site are zoned M3-1VL, Q]M3-1VL-CUGU and [Q]M3-1 to the north and east along Alameda Street with heavy industrial uses, R1-1XL-O-CUGU to the west along Drumm Avenue with single family residential uses and [Q]C1-1VL-O-CUGU to the southwest along Pacific Coast Highway with commercial uses. An overview of the surrounding land uses relative to the noise monitoring location in **Table 1** above is provided below. Additionally, refer to **Figure 7: Sensitive Receptor Map** for location of the sensitive uses described below:

- **<u>Noise Monitoring Site 1</u>**: Located at the corner of E. Sandison Street and Drumm Avenue, sensitive uses include the single- and multi-family residential uses.

- **Noise Monitoring Site 2**: Located at the corner of E. Cruces Street and Drumm Avenue, sensitive uses include single and multi-family residential uses .
- **Noise Monitoring Site 3**: Located at the corner of E. O Street and Drumm Avenue, sensitive uses include single family residential uses.
- **Noise Monitoring Site 4**: Located along Drumm Avenue between E. Colon Street and Pacific Coast Highway, sensitive uses include the multi-family residential uses.
- **Noise Monitoring Site 5**: Located at the corner of E. Sandison Street and Gamble Avenue, sensitive uses include single- and multi-family residential uses.
- **Noise Monitoring Site 6**: Located at the corner of E. Cruces Street and N. Binn Avenue, sensitive uses include single- and multi-family residential uses.

Vibration Conditions

Based on field observations, the primary source of existing ground-borne vibration in the vicinity of the Project site is vehicle traffic on local roadways. According to the Federal Transit Administration,[1] typical road traffic–induced vibration levels are unlikely to be perceptible by people. Trucks and buses typically generate ground-borne vibration velocity levels of approximately 63 VdB (at a 50-foot distance), and these levels could reach 72 VdB when trucks and buses pass over bumps in the road. A vibration level of 72 VdB is above the 60 VdB level of perceptibility.

1 Federal Transit Administration, Transit Noise and Vibration Impact Assessment, FTA report no. 0123 (September 2018), https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed July 2022.

North

West

South

East

SOURCE: Google Earth - 2022

FIGURE 2

Meridian Consultants

Noise Monitoring Location (Site 1)

359-001-22

North

West

South

East

SOURCE: Google Earth - 2022

FIGURE **3**

Meridian Consultants

Noise Monitoring Location (Site 2)

359-001-22

North

West

South

East

SOURCE: Google Earth - 2022

FIGURE 4

Meridian Consultants

Noise Monitoring Location (Site 3)

359-001-22

North

West

South

East

SOURCE: Google Earth - 2022

FIGURE 5

Meridian Consultants

Noise Monitoring Location (Site 4)

359-001-22

North

West

South

East

SOURCE: Google Earth - 2022

FIGURE 6

Meridian Consultants

Noise Monitoring Location (Site 5)

359-001-22

North

West

South

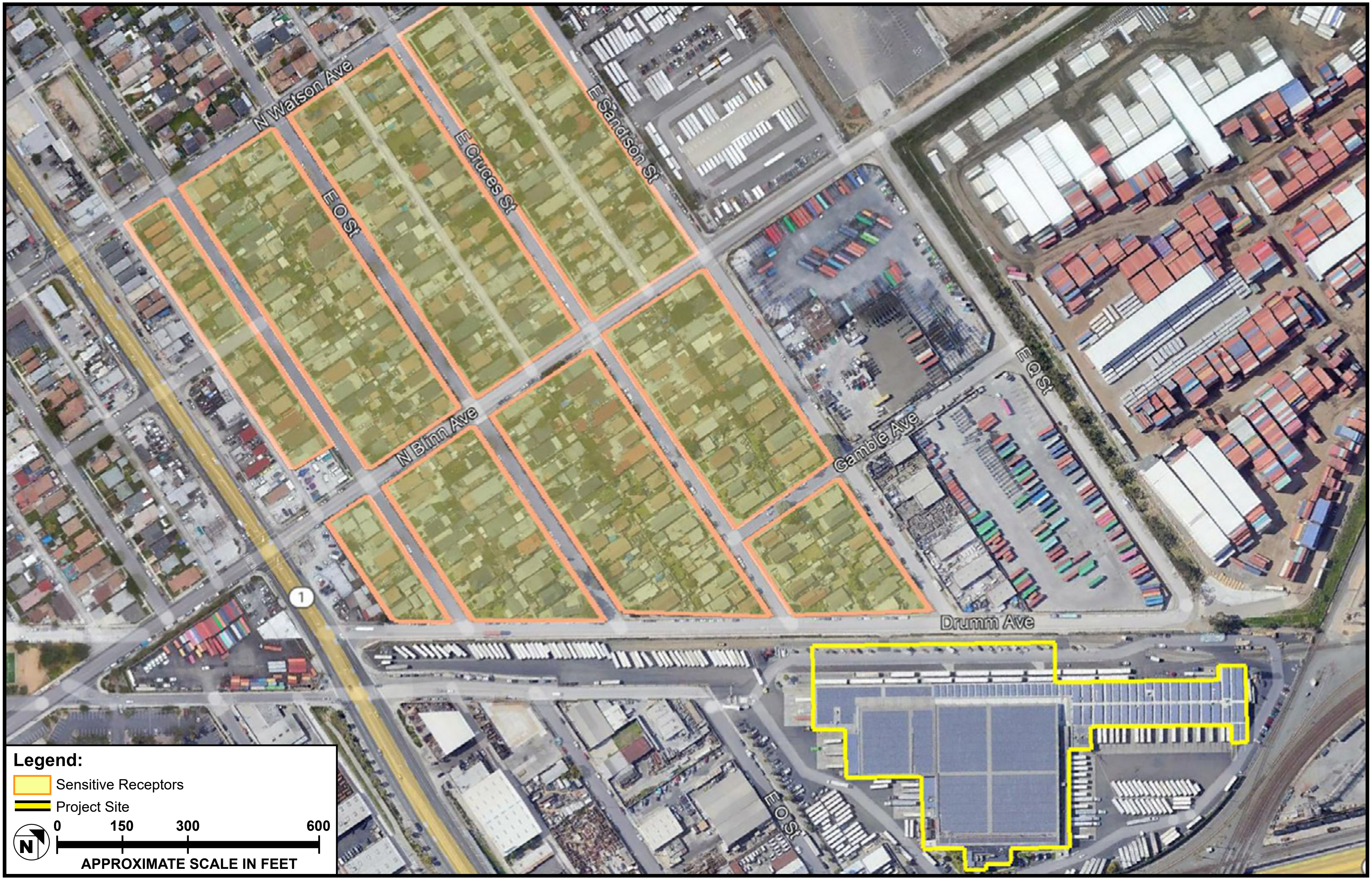
East

SOURCE: Google Earth - 2022

FIGURE 7

Meridian Consultants

Noise Monitoring Location (Site 6)



SOURCE: Google Earth - 2022

FIGURE 8

Meridian Consultants

Sensitive Receptor Map

359-001-22

Ambient Noise Measurements

Noise-level monitoring was conducted by Meridian Consultants on June 22, 2022, at six (6) locations within the Project area vicinity, as shown in **Figure 2** through **7**. Noise-level monitoring was conducted for 15-minute intervals at each location using a Larson Davis Model 831 sound-level meter. This meter satisfies the American National Standards Institute (ANSI) standard for general environmental noise measurement instrumentation. The ANSI specifies several types of sound-level meters according to their precision. Types 1, 2, and 3 are referred to as “precision,” “general-purpose,” and “survey” meters, respectively. Most measurements carefully taken with a Type 1 sound-level meter will have a margin of error not exceeding 1 dB.

The Larson Davis Model 831 is a Type 1 precision sound-level meter. This meter meets all requirements of ANSI S1.4-1983 and ANSI1.43-1997 Type 1 standards, as well as International Electrotechnical Commission (IEC) IEC61672-1 Ed. 1.0, IEC60651 Ed 1.2, and IEC60804 Type 1, Group X standards. The sound-level meter was located approximately 5 feet above ground and was covered with a Larson Davis windscreen. The sound-level meter was field calibrated with an external calibrator prior to operation.

Construction

Future dates represent approximations based on the general Project timeline and are subject to change pending unpredictable circumstances that may arise. As such, for purposes of this analysis, project construction is assumed to begin January 2024 and is expected to last until June 2025. Construction would occur over five (5) phases: (1) demolition; (2) grading, (3) building construction, (4) paving, and (5) architectural coating.

Each phase of construction would result in varying levels of intensity and a number of construction personnel. The construction workforce would consist of approximately 13 worker trips per day and 16 hauling trips per day during demolition; 10 worker trips per day and 15 hauling trips per day during grading; 37 worker trips per day and 14 vendor trips per day during building construction; 15 worker trips per day during paving; and 7 worker trips per day during architectural coating.

On-Site Construction Equipment

Construction activities typically generate noise from the operation of equipment within the Project Site that is required for the construction of various facilities. Noise impacts from on-site construction equipment as well as the on-site staging of construction trucks were evaluated by determining the noise levels generated by different types of construction activity and calculating the construction-related noise level at nearby noise-sensitive receptor locations. Actual construction noise levels would vary, depending upon the equipment type, model, the type of work activity being performed, and the condition of the equipment.

In order to calculate construction noise levels, hourly activity or utilization factors (i.e., the percentage of normal construction activity that would occur, or construction equipment that would be active, during each hour of the day) are estimated based on the temporal characteristics of other previous and current construction projects. The hourly activity factors express the percentage of time that construction activities would emit average noise levels. Typical noise levels for each type of construction equipment were obtained from the FHWA Roadway Construction Noise Model.[2]

An inventory of construction equipment, including the number and types of equipment, which would be operating simultaneously within the Project Site was identified for each phase/component of construction and shown in **Table 2: Construction Equipment by Phase**. It is highly unlikely that all pieces of construction equipment identified in **Table 2** would operate simultaneously in any specific location during construction because equipment is generally operated only when needed and space constraints limit the equipment that can be used at any one time in a specific location. Therefore, this modeling is considered a conservative approach to calculate the maximum noise levels that would be generated.

TABLE 2: CONSTRUCTION EQUIPMENT BY PHASE

Construction Phase	Equipment Type	Quantity	Usage Hours (per day)	Noise Level at 50 feet (dBA Leq-1hour)	Calculated Average Noise Level (dBA Leq-1hour)
Demolition	Concrete/Industrial Saws	1	8	82.6	87.3
	Rubber Tired Dozers	1	8	77.7	
	Tractors/Loaders/Backhoes	3	8	84.8	
Grading	Graders	1	8	81.0	85.9
	Rubber Tired Dozers	1	8	77.7	
	Tractors/Loaders/Backhoes	2	7	83.0	
Building Construction	Cranes	1	8	72.6	87.2
	Forklifts	2	7	81.0	
	Generator Sets	1	8	77.6	
	Tractors/Loaders/Backhoes	1	6	80.0	
	Welder	3	8	74.8	
Paving	Cement and Mortar Mixers	1	8	74.8	83.9
	Pavers	1	8	74.2	
	Paving Equipment	1	8	74.2	
	Rollers	2	8	73.0	
	Tractors/Loaders/Backhoes	1	8	80.0	
Architectural Coating	Air Compressors	1	6	73.7	73.7

Source: FHWA Roadway Construction Noise Model (RCNM) version 1.1
Refer to **Attachment 2.0: Construction Noise Worksheets**.

2 U.S. Department of Transportation, FHWA Roadway Construction Noise Model Final Report, January 2006, accessed July 2022, https://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/rcnm.pdf

The calculated average noise levels provided in **Table 2** were inputted into the noise model SoundPLAN,[3] which generates computer simulations of noise propagation from sources such as construction noise. SoundPLAN forecasts noise levels at specific receptors using sound power data and three-dimensional topographical data.

Construction noise levels have been calculated at each of the analyzed sensitive receptors as follows: (1) construction noise levels generated during each of the three construction phases; and (2) construction noise levels during those periods when the three construction phases could potentially occur concurrently.

Construction Traffic Noise

The analysis of off-site construction traffic noise impacts focuses on: (1) identifying major roadways that may be used for construction worker commute routes or truck haul routes; (2) identifying the nature and location of noise-sensitive receptors along those routes; and (3) evaluating the traffic characteristics along those routes, specifically as related to existing traffic volumes.

Construction Equipment Vibration

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. While ground vibrations from construction activities do not often reach the levels that can damage structures, fragile buildings must receive special consideration.

Impacts due to construction activities were evaluated by identifying vibration sources (i.e., construction equipment), measuring the distance between vibration sources and surrounding structure locations, and making a significance determination.

For quantitative construction vibration assessments related to building damage and human annoyance, vibration source levels for construction equipment are taken from the FTA *Transit Noise and Vibration Impact Assessment Manual*.[4] Building damage would be assessed for each piece of equipment individually and assessed in terms of peak particle velocity.

The vibration source levels for various types of equipment are based on data provided by the FTA.

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3 SoundPLAN model is in compliance with ISO 9613-2 standards for assessing attenuation of sound propagating outdoors and general calculation method.

4 FTA, Transit Noise and Vibration Impact Assessment Manual, September 2018, accessed July 2022, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

ENVIRONMENTAL PROTECTION MEASURES RELATED TO NOISE AND VIBRATION (ALREADY INCLUDED IN COMMUNITY PLAN EIRS)

The Project site is located within the Wilmington – Harbor City Community Plan. The Environmental Protection Measures (EPMs) listed below have been drafted and have already been incorporated into draft updates to the City's Land Use Element (in individual Community Plan updates which comprise the Land Use Element) that are underway. These will be applicable to development projects within those geographic areas once those Community Plans are adopted. For areas not undergoing Community Plan updates, EPMs could be made standard conditions of approval until such time that the EPMs are adopted for discretionary projects requiring findings that could support imposing noise conditions. Relevant proposed EPMs that can be applicable to this Project are provided below:

Noise and Vibration Standards (NV1) – Construction Noise

NV1-1: **Noise Shielding and Muffling**

a. Applicability Threshold

Any Project whose earthwork or construction activities involve the use of construction equipment and require a permit from LADBS.

b. Standard

Power construction equipment (including combustion engines), fixed or mobile, shall be equipped with noise shielding and muffling devices consistent with manufacturers' standards or the Best Available Control Technology. All equipment shall be properly maintained, and the Applicant or Owner shall require any construction contractor to keep documentation on-site during any earthwork or construction activities demonstrating that the equipment has been maintained in accordance with manufacturer's specifications.

NV1-2: **Use of Drive Pile Systems**

a. Applicability Threshold

Any Project whose earthwork and construction activities involve the use of construction equipment and require a permit from LADBS.

b. Standard

Driven (Impact) pile systems shall not be used, except in locations where the underlying geology renders drilled piles, sonic, or vibratory pile drivers infeasible, as determined by a soils or geotechnical engineer and documented in a soils report.

NV1-3: **Enclosure or Screening of Outdoor Mechanical Equipment**

a. Applicability Threshold

Any Project whose earthwork or construction activities involve the use of construction equipment and require a permit from LADBS.

b. Standard

All outdoor mechanical equipment (e.g., generators, compressors) shall be enclosed or visually screened. The equipment enclosure or screen shall be impermeable (i.e., solid material with minimum weight of 2 pounds per square feet) and break the line of sight between the equipment and any off-site Noise-Sensitive Uses.

NV1-4: **Location of Construction Staging Areas**

a. Applicability Threshold

Any Project whose earthwork or construction activities involve the use of construction equipment and require a permit from LADBS.

b. Standard

Construction staging areas shall be located as far from Noise-Sensitive Uses as reasonably possible and technically feasible in consideration of site boundaries, topography, intervening roads and uses, and operational constraints. The burden of proving what constitutes 'as far as possible' shall be upon the Applicant or Owner, in consideration of the above factors.

NV1-5: **Temporary Walls**

a. Applicability Threshold

Any Project whose earthwork and construction activities involve the use of construction equipment and require a permit from LADBS; and whose construction activities are located within a line of sight to and within 500 feet of Noise-Sensitive Uses, with the exception of Projects limited to the construction of 2,000 square feet or less of floor area dedicated to residential uses.

b. Standard

Noise barriers, such as temporary walls (minimum ½-inch thick plywood) or sound blankets (minimum STC 25 rating), that are a minimum of eight feet tall, shall be erected between construction activities and Noise-Sensitive Uses as reasonably possible and technically feasible in consideration of site boundaries, topography, intervening roads and uses, and operational constraints. The burden of proving that compliance is technically infeasible shall be upon the Applicant or Owner. Technical infeasibility shall mean that noise barriers cannot be located between construction activities and Noise-Sensitive Uses due to site boundaries, topography, intervening roads and uses, and/or operational constraints.

NV1-6: **Noise Study**

a. Applicability Threshold

Any Project whose earthwork or construction activities involve the use of construction equipment and require a permit from LADBS; are located within 500 feet of Noise-Sensitive Uses; and have one or more of the following characteristics:

- Two or more subterranean levels;
- 20,000 cubic yards or more of excavated material;
- Simultaneous use of five or more pieces of construction equipment; or
- Construction duration (excluding architectural coatings) of 18 months or more.

Or any Project whose construction activities involve impact pile driving or the use of 300 horsepower equipment.

b. Standard

A Noise Study prepared by a Qualified Noise Expert shall be required and prepared prior to obtaining any permit by LADBS. The Noise Study shall characterize expected sources of earthwork and construction noise that may affect identified Noise-Sensitive Uses, quantify expected noise levels at these Noise-Sensitive Uses, and recommend measures to reduce noise exposure to the extent noise reduction measures are available and feasible, and to demonstrate compliance with any noise requirements in the LAMC. Specifically, the Noise Study shall identify noise reduction devices or techniques to reduce noise levels in accordance with accepted industry practices and in compliance with LAMC standards. Noise reduction devices or techniques shall include but not be limited to mufflers, shields, sound barriers, and time and place restrictions on equipment and activities. The Noise Study shall identify anticipated noise reductions at Noise-Sensitive Uses associated with the noise reduction measures. Applicants and Owners shall be required to implement and comply with all measures identified and recommended in the Noise Study. The Noise Study and copies of any contractor agreements shall be maintained pursuant to the proof of compliance requirements in Section I.D.6

THRESHOLDS OF SIGNIFICANCE

In December 2023, Department of City Planning released their proposed updates to the construction noise and vibration thresholds. The proposed thresholds are intended to be suited to the generally urban nature of the City, while still recognizing the importance of human health, including sleep disruption.

Noise

Construction

The construction noise thresholds are focused on impacts to sensitive uses. The Noise Element defines noise-sensitive land uses as single-family and multi-unit dwellings, long-term care facilities (including convalescent and retirement facilities), dormitories, motels, hotels, transient lodging, and other residential uses; places of assembly including churches or houses of worship; hospitals; libraries; schools; auditoriums, concert halls; outdoor theaters; nature and wildlife preserves; and parks.

Generally, there are commonly two types of noise standards, as follows:

- Relative or “increase” standards – these are quantified thresholds, expressed as an allowable increase in decibels, attributed to the construction noise contribution, over the pre-existing outdoor ambient sound level at a receptor.
- Absolute or “fixed standards – these are quantified thresholds that represent a fixed noise limit and take into account a potential impact that is independent of the pre-existing outdoor ambient sound level at a receptor.

Increase Over Ambient

- For construction activities that occur between 7:00 AM and 7:00 PM Monday through Friday, and between 8:00 AM and 6:00 PM on Saturdays, no daytime numerical threshold above ambient noise levels are identified. The City does not consider increases in daytime ambient noise levels resulting from construction activities as constituting significant environmental effects. Instead, the City utilizes an absolute noise exposure level over an extended period for evaluating potential noise impacts during daytime hours, as this metric better reflects potential health impacts due to construction noise.
- For construction activities that occur between 7:00 PM and 7:00 AM Monday through Friday, and between 6:00 PM and 8:00 AM on Saturdays, and anytime on Sundays or national holidays, noise levels at sensitive uses would not exceed 5 dBA above the ambient noise level at the receptor.

Absolute Threshold

- On- and off-site construction noise during daytime hours (7:00 AM and 7:00 PM Monday through Friday, and 8:00 AM to 6:00 PM on Saturdays) would be limited to a maximum 80 dBA Leq(8-hour) absolute threshold at sensitive uses (at the property line with outdoor uses or at the exterior of the building), including outdoor public recreational areas.

- This threshold applies to residential uses (at the property line with outdoor uses or at the exterior of the building); including expansive upper-level deck/open spaces areas that provide for the recreational use of residents. Examples include large patios or decks that are the primary outdoor use area in an apartment complex. However, this standard does not apply to private residential balconies which may or may not extend past the exterior of a building.

- For construction activities that occur between 7:00 PM and 7:00 AM Monday through Friday, and between 6:00 PM and 8:00 AM on Saturdays, and anytime on Sundays or national holidays, the maximum exterior noise level at sensitive uses where sleep is expected may not exceed the following:
- 55 dBA Leq for sensitive uses within older buildings that would have operable windows that may be open.
- 65 dBA Leq for sensitive uses with windows closed that are not operable are are single-glazed.

70 dBA Leq for sensitive uses that have newer construction (i.e., the structures have been designed to ensure that an interior 45 dBA is obtained with double-paned windows).

Operation

The following criteria are applied to the Proposed Project, as set forth in the 2006 L.A. CEQA Thresholds Guide and the City's Noise Regulations, with the more restrictive provisions applied, to evaluate operational noise. The Proposed Project would have a significant impact from operations if:

- The Proposed Project causes the ambient noise level measured at the property line of affected uses to increase by 3 dBA CNEL to or within the "normally unacceptable" or "clearly unacceptable" category; or
- The Project causes the ambient noise levels measured at the property line of affected uses to increase by 5 dBA CNEL or more increase in noise level; or
- Project-related operational on-site (i.e., non-roadway) noise sources such as outdoor building mechanical/electrical equipment, outdoor activities, or parking facilities increase the ambient noise level (Leq) at noise sensitive uses by 5 dBA Leq.

In summary, for operational noise, the criterion for on-site operational noise is an increase in the ambient noise level of 5 dBA Leq at an adjacent property line, in accordance with the LAMC. The LAMC does not apply to off-site traffic (i.e., vehicle traveling on public roadways) noise levels. Therefore, the criteria for off-site traffic noise associated with Project operations is based on the 2006 L.A. CEQA Thresholds Guide. In addition, the criteria for composite noise levels (on-site and off-site sources) are also based on the 2006 L.A. CEQA Thresholds Guide as, again, the LAMC does not apply to off-site traffic noise. Therefore, the criteria used for determining impacts related to off-site operational noises and composite operational noise are an increase in the ambient noise level of 5 dBA CNEL or 3 dBA CNEL to or within the "normally unacceptable" or "clearly unacceptable" categories, respectively, depending on the existing noise conditions at the affected noise-sensitive land use.

Vibration

Human Annoyance

- For construction activities that occur between 7:00 AM and 7:00 PM Monday through Friday, and between 8:00 AM and 6:00 PM on Saturdays, no numerical threshold is proposed related to human annoyance.
- During nighttime hours (between 7:00 PM and 7:00 AM Monday through Friday, and between 6:00 PM and 8:00 AM on Saturdays), and anytime on Sundays or national holidays, construction activities shall not generate groundborne vibration levels that exceed 0.80 VdB at the exterior of a sensitive use building.

Building Damage

- Architectural Building Damage – Construction activities shall not exceed the following building damage thresholds for the identified structures:
- Fragile Buildings: 0.1 PPV
- Historic Buildings: 0.25 PPV
- Older[5] Residential Structures: 0.3 PPV
- New Residential Structures: 0.5 PPV
- Modern Industrial/Commercial Buildings: 0.5 PPV

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5 Caltrans does not specify the age of the building to be considered. For vibration impact analyses, a building over 50 years can be considered an “older” residential structure.

Construction

On-Site Construction Noise

Noise from construction activities would be affected by the amount of construction equipment, the location of this equipment, the timing and duration of construction activities, and the relative distance to noise-sensitive receptors. Construction activities that would occur during the construction phases would generate both steady-state and episodic noise that would be heard both on and off the Project site. Each construction phase involves the use of different types of construction equipment and, therefore, has its own distinct noise characteristics. The Project would be constructed using typical construction techniques; no blasting or impact pile driving would be required.

The construction equipment reference noise levels provided in **Table 2** above, are based on measured noise data compiled by the FHWA and would occur when equipment is operating under full power conditions. However, equipment used on construction sites typically operate at less than full power. The acoustical usage factor is the percentage of time that each type of construction equipment is anticipated to be in full power operation during a typical construction day. These values are estimates and will vary based on the actual construction process and schedule.

Construction equipment operates at its noisiest levels for certain percentages of time during operation. As such, equipment would operate at different percentages over the course of an hour.[6] During a construction day, the highest noise levels would be generated when multiple pieces of construction equipment are operated concurrently.

To characterize construction-period noise levels, the average (hourly Leq) noise level associated with each construction stage was calculated based on the quantity, type, and usage factors for each type of equipment that would be used during each construction stage. These noise levels are typically associated with multiple pieces of equipment operating simultaneously.

The estimated construction noise levels were calculated for each of the analyzed receptors (refer to **Figure 8: Noise Sensitive Receptors**) during each of the construction phases. As mentioned previously, given the physical size of the Project site and logistical limitations, and with the noise equipment located at the construction area nearest to the affected receptors to present a conservative impact analysis. This is considered a worst-case evaluation because construction of the Project would typically use fewer pieces of equipment simultaneously at any given time as well as operating throughout the construction site (i.e., most of the time construction equipment would be operating at distances further away from

6 Federal Highway Administration, Traffic Noise Model (2006).

the off-site receptors than that assumed in the forecasting of Project construction noise levels). As such, Project construction would often generate lower noise levels than reported herein.

Table 3: Maximum Noise Impacts Associated With On-Site Construction Activities presents the maximum noise impacts that are forecasted to occur at each of the receptor sites. As shown, average noise levels during construction would not result in an increase above the absolute threshold of 80 dBA during any phase of construction.

As mentioned previously, EPMs could be made standard conditions of approval until such time that the EPMs are adopted for discretionary projects requiring findings that could support imposing noise conditions. Therefore, in the event EPMs NV1-1 through NV1-6 are part of standard conditions of approval, construction noise levels presented in **Table 3** would be further reduced to levels below the absolute threshold. As such, construction noise levels would not be considered significant.

Table 3 **: CONSTRUCTION MAXIMUM NOISE ESTIMATES**

Noise Monitoring Site	Calculated Noise Level (Leq-1hour) by Construction Phase					Absolute Threshold	Increase Above Significance Threshold
	Demolition	Grading	Building Construction	Paving	Architectural Coating		
Site 1	77.4	76.3	77.6	74.3	64.1	80	--
Site 2	72.2	70.5	71.7	68.5	58.3	80	--
Site 3	64.9	64.0	65.3	62.0	51.8	80	--
Site 4	57.9	59.8	61.1	57.8	47.6	80	--
Site 5	66.6	67.5	68.8	65.5	55.3	80	--
Site 6	59.7	60.7	62.0	58.7	48.5	80	--

Source: FHWA, RCNM, version 1.1. Refer to **Attachment 2.0: Construction Noise Worksheets**.

Off-Site Construction Noise

Construction of the Project would require worker, haul, and vendor truck trips to and from the site to work on the site, export soil, and deliver supplies to the site. Trucks traveling to and from the Project site would be required to travel along a haul route approved by the City. At the maximum, approximately 146 hauling trips per day would take place during the grading phase. Haul truck traffic would take the most direct route to the freeway ramp along Drumm Avenue and Pacific Coast Highway.

Noise associated with construction truck trips were estimated using the Caltrans FHWA Traffic Noise Model based on the maximum number of worker and truck trips in a day. Project haul truck trips, which includes medium- and heavy-duty trucks, would generate noise levels of approximately 58.9 to 63.7 dBA, respectively, measured at a distance of 25 feet from the adjacent sensitive receptor. As shown in **Table 2**, existing noise levels ranged from 61.9 dBA to 76.9 dBA. The noise level increases from truck trips would be below the significance threshold of 5 dBA. As such, off-site construction noise impacts would not be considered significant.

Construction Vibration

Table 4: On-Site Construction Vibration Impacts-Building Damage presents construction vibration impacts associated with on-site construction in terms of building damage. It is important to note pile driving would not be required during construction. As shown in **Table 4**, the forecasted vibration levels due to on-site construction activities would not exceed the building damage significance threshold of 0.3 PPV for older residential structures. Impacts related to building damage from on-site construction vibration would not be considered significant.

TABLE 4: ON-SITE CONSTRUCTION VIBRATION IMPACTS – BUILDING DAMAGE

Site	Nearest Location	Estimated Vibration Velocity Levels at the Nearest Off-Site Structures from the Project Construction Equipment				Significance Threshold (PPV ips)
		Vibratory Roller	Loaded Trucks	Jackhammer	Small bulldozer	
1	1630 E. Sandison Street	0.033	0.012	0.006	0.000	0.3
2	1614 E. Cruces Street	0.013	0.005	0.002	0.000	0.3
3	1351 Drumm Avenue	0.002	0.001	0.000	0.000	0.3
4	1325 Drumm Avenue	0.001	0.000	0.000	0.000	0.3
5	1600 E. Sandison Street	0.003	0.001	0.000	0.000	0.3
6	1502 E. Cruces Street	0.001	0.000	0.000	0.000	0.3

Source: US Department of Transportation, Federal Transportation Authority, Transit Noise and Vibration Impact Assessment.
Refer to **Attachment 3.0**: Construction Vibration Worksheets.

Operation

Fixed Mechanical Equipment Noise

The Project would introduce various stationary noise sources, including heating, ventilation, and air conditioning systems, which would be located either on the roof, the side of a structure, or on the ground. All Project mechanical equipment would be required to be designed with appropriate noise-control devices—such as sound attenuators, acoustics louvers, or sound screens/parapet walls—to comply with noise-limitation requirements provided in Section 112.02 of the LAMC, which prohibits equipment from causing more than a 5 dBA increase in the ambient noise level. Therefore, operation of mechanical equipment on the Project building would not exceed the City's threshold of significance.

Cumulative

For purposes of this analysis, development of the related projects will be considered to contribute to cumulative noise impacts. Noise, by definition, is a localized phenomenon and drastically reduces as distance from the source increases. As a result, only related projects and growth in the general area of the Project site (within 500 feet) would contribute to cumulative noise impacts. Cumulative construction-noise impacts have the potential to occur when multiple construction projects in the local area generate noise within the same time frame and contribute to the local ambient noise environment. It is expected that, as with the Project, related projects would implement noise reduction techniques such as mufflers, shields, sound barriers, which would minimize any noise-related nuisances during construction. In addition, distance attenuation and intervening structures would further reduce construction noise levels and not result in noticeable increases. Therefore, the combined construction-noise impacts of related projects within 500 feet and the Project's contribution would not cause a significant cumulative impact.

With regard to stationary sources, cumulative significant noise impacts may result from cumulative development. Stationary sources of noise that could be introduced in the area by cumulative projects could include mechanical equipment, loading docks, and parking lots. Given that these projects would be required to adhere to the City's noise standards, all stationary sources would be required to have shielding or other noise-abatement measures so as not to cause a substantial increase in ambient noise levels. Moreover, due to distance, it is unlikely that noise from multiple cumulative projects would interact to create a significant combined noise impact. As such, it is not anticipated that a significant cumulative increase in permanent ambient noise levels would occur.

CERTIFICATION

The contents of this noise study represent an accurate depiction of the noise environment and impacts associated with the proposed KPAC Coil Avenue Freezer Expansion Project. The information contained in this noise study is based on the best available information at the time of preparation. If you have any questions, please contact me directly at (818) 415-7274.

Sincerely,

Christ Kirikian, INCE
Partner | Director of Air Quality & Acoustics
ckirikian@meridianconsultantsllc.com

ATTACHMENT 1.0

Noise Monitoring Data Sheets

Monitoring Location: Site 1
Monitoring Date: 7/6/2022

Monitoring Period

Time	**LAeq**	**LASmax**	**LASmin**
9:43:13	73.3	79.6	56.2
9:44:13	71.1	79.7	55.5
9:45:13	72.4	78.9	61.2
9:46:13	73.5	82.1	60.9
9:47:13	72.6	80.0	60.3
9:48:13	71.1	80.4	58.1
9:49:13	66.6	77.0	52.0
9:50:13	68.3	80.8	52.3
9:51:13	72.3	79.2	55.3
9:52:13	69.1	78.0	55.5
9:53:13	70.2	77.5	53.6
9:54:13	71.7	79.9	60.3
9:55:13	60.4	69.2	56.6
9:56:13	74.6	80.7	58.5
9:57:13	71.6	83.7	56.2

15-minute LAeq **71.5**

Monitoring Location: Site 2
Monitoring Date: 7/6/2022

Monitoring Period

Time	LAeq	LASmax	LASmin
10:03:55	73.0	82.7	54.3
10:04:55	75.4	81.5	62.8
10:05:55	75.1	80.6	62.4
10:06:55	83.6	98.5	63.7
10:07:55	66.8	76.5	55.8
10:08:55	78.6	85.7	60.5
10:09:55	79.3	86.4	68.9
10:10:55	78.4	85.7	63.6
10:11:55	73.7	82.5	56.6
10:12:55	74.3	80.8	54.5
10:13:55	74.2	81.2	54.6
10:14:55	72.2	80.1	54.7
10:15:55	72.5	79.1	60.4
10:16:55	73.1	81.3	60.3
10:17:55	75.8	80.8	64.9
10:18:55	77.6	80.3	75.0

15-minute LAeq	**76.9**

Monitoring Location: Site 3
Monitoring Date: 7/6/2022

Monitoring Period

Time	**LAeq**	**LASmax**	**LASmin**
10:23:51	70.7	78.7	57.0
10:24:51	72.6	83.3	56.5
10:25:51	69.5	77.1	58.1
10:26:51	67.9	76.5	55.0
10:27:51	72.8	78.8	63.7
10:28:51	72.1	79.9	59.1
10:29:51	66.3	76.6	55.1
10:30:51	71.5	78.4	59.4
10:31:51	71.7	86.3	60.1
10:32:51	70.2	78.6	60.7
10:33:51	72.1	80.1	65.1
10:34:51	68.2	73.7	65.1
10:35:51	74.5	80.8	66.8
10:36:51	73.3	80.2	69.3
10:37:51	68.1	76.1	62.4
10:38:51	69.3	70.0	67.9

15-minute LAeq	**71.2**

Monitoring Location: Site 4
Monitoring Date: 7/6/2022

Monitoring Period

Time	**LAeq**	**LASmax**	**LASmin**
10:44:34	78.0	83.0	72.1
10:45:34	78.0	87.5	71.1
10:46:34	73.1	78.2	70.5
10:47:34	78.5	87.1	70.5
10:48:34	74.5	80.5	71.8
10:49:34	72.3	77.5	66.8
10:50:34	74.7	84.7	66.3
10:51:34	73.8	80.8	68.8
10:52:34	80.1	90.6	69.7
10:53:34	77.3	82.6	66.8
10:54:34	77.2	83.9	67.2
10:55:34	75.6	81.1	69.0
10:56:34	73.8	81.2	65.9
10:57:34	74.7	82.1	64.5
10:58:34	78.2	85.3	65.2
10:59:34	76.2	79.3	77.0

15-minute LAeq **76.6**

Monitoring Location: Site 5
Monitoring Date: 7/6/2022

Monitoring Period

Time	LAeq	LASmax	LASmin
11:06:01	70.0	79.1	68.1
11:07:01	68.1	71.2	67.3
11:08:01	68.2	70.1	67.1
11:09:01	67.5	68.9	66.7
11:10:01	69.7	74.1	62.8
11:11:01	62.7	67.9	60.2
11:12:01	64.1	67.9	60.3
11:13:01	68.1	70.9	66.6
11:14:01	69.4	72.7	67.8
11:15:01	69.8	73.4	68.0
11:16:01	74.3	83.2	66.6
11:17:01	69.1	74.4	62.7
11:18:01	66.7	74.4	62.4
11:19:01	69.1	77.5	63.3
11:20:01	71.4	78.9	64.5
11:21:01	68.7	69.3	64.5

15-minute LAeq **69.3**

Monitoring Location: Site 6
Monitoring Date: 7/6/2022

Monitoring Period

Time	LAeq	LASmax	LASmin
11:24:50	61.0	71.5	48.1
11:25:50	56.6	65.3	50.1
11:26:50	52.9	58.5	49.4
11:27:50	65.6	75.0	50.0
11:28:50	69.4	77.7	53.6
11:29:50	62.6	69.3	55.4
11:30:50	59.3	67.3	50.1
11:31:50	62.3	73.4	48.9
11:32:50	56.0	64.0	48.0
11:33:50	55.8	63.2	47.8
11:34:50	63.4	76.4	50.2
11:35:50	56.5	67.8	48.1
11:36:50	55.0	62.3	48.7
11:37:50	57.2	65.9	50.6
11:38:50	58.3	73.3	49.9
11:39:50	61.6	61.8	56.1

15-minute LAeq **61.9**

ATTACHMENT 2.0

Construction Noise Worksheets

KPAC Cold Storage Expansion

Mean propagation Leq - Demolition

10

Source	Source type	Time slice	Li	R'w	L'w	Lw	I or A	KI	KT	Ko	S	Adiv	Agr	Abar	Aatm	Amisc	ADI	dLrefl	Ls	dLw	Cmet	ZR	Lr
			dB(A)	dB	dB(A)	dB(A)	m,m²	dB	dB	dB	m	dB	dB	dB	dB	dB	dB	dB(A)	dB(A)	dB	dB	dB	dB(A)
Receiver Site 1 Fl G Leq-1hour dB(A) Leq-1hour 79.6 dB(A)																							
Demolition	Area	Leq-1hour			87.3	125.6	6744.0	0.0	0.0	3	59.26	-46.4	-2.5	0.0	-0.1		0.0	0.0	79.6	0.0	0.0	0.0	79.6
Receiver Site 2 Fl G Leq-1hour dB(A) Leq-1hour 72.2 dB(A)																							
Demolition	Area	Leq-1hour			87.3	125.6	6744.0	0.0	0.0	3	114.75	-52.2	-4.0	0.0	-0.2		0.0	0.0	72.2	0.0	0.0	0.0	72.2
Receiver Site 2 Fl F2 Leq-1hour dB(A) Leq-1hour 72.8 dB(A)																							
Demolition	Area	Leq-1hour			87.3	125.6	6744.0	0.0	0.0	3	114.95	-52.2	-3.3	0.0	-0.2		0.0	0.0	72.8	0.0	0.0	0.0	72.8
Receiver Site 3 Fl G Leq-1hour dB(A) Leq-1hour 65.1 dB(A)																							
Demolition	Area	Leq-1hour			87.3	125.6	6744.0	0.0	0.0	3	238.07	-58.5	-4.5	0.0	-0.4		0.0	0.0	65.1	0.0	0.0	0.0	65.1
Receiver Site 4 Fl G Leq-1hour dB(A) Leq-1hour 58.3 dB(A)																							
Demolition	Area	Leq-1hour			87.3	125.6	6744.0	0.0	0.0	3	362.76	-62.2	-4.6	-3.0	-0.7		0.0	0.2	58.3	0.0	0.0	0.0	58.3
Receiver Site 5 Fl G Leq-1hour dB(A) Leq-1hour 58.0 dB(A)																							
Demolition	Area	Leq-1hour			87.3	125.6	6744.0	0.0	0.0	3	149.68	-54.5	-4.4	-11.4	-0.3		0.0	0.0	58.0	0.0	0.0	0.0	58.0
Receiver Site 5 Fl F2 Leq-1hour dB(A) Leq-1hour 67.3 dB(A)																							
Demolition	Area	Leq-1hour			87.3	125.6	6744.0	0.0	0.0	3	149.80	-54.5	-4.0	-2.5	-0.3		0.0	0.0	67.3	0.0	0.0	0.0	67.3
Receiver Site 6 Fl G Leq-1hour dB(A) Leq-1hour 59.4 dB(A)																							
Demolition	Area	Leq-1hour			87.3	125.6	6744.0	0.0	0.0	3	326.49	-61.3	-4.6	-2.7	-0.6		0.0	0.0	59.4	0.0	0.0	0.0	59.4
Receiver Site 6 Fl F2 Leq-1hour dB(A) Leq-1hour 60.4 dB(A)																							
Demolition	Area	Leq-1hour			87.3	125.6	6744.0	0.0	0.0	3	326.53	-61.3	-4.4	-1.9	-0.6		0.0	0.0	60.4	0.0	0.0	0.0	60.4

Mean propagation Leq - Grading

Source	Source type	Time slice	Li	R'w	L'w	Lw	I or A	KI	KT	Ko	S	Adiv	Agr	Abar	Aatm	Amisc	ADI	dLrefl	Ls	dLw	Cmet	ZR	Lr
			dB(A)	dB	dB(A)	dB(A)	m,m²	dB	dB	dB	m	dB	dB	dB	dB	dB	dB	dB(A)	dB(A)	dB	dB	dB	dB(A)
Receiver Site 1 Fl G Leq-1hour dB(A) Leq-1hour 78.3 dB(A) Leq-1hour,diff dB(A)																							
Grading	Area	Leq-1hour			85.9	124.2	6744.0	0.0	0.0	3	59.26	-46.4	-2.5	0.0	0.0		0.0	0.0	78.3	0.0	0.0	0.0	78.3
Receiver Site 2 Fl G Leq-1hour dB(A) Leq-1hour 71.0 dB(A) Leq-1hour,diff dB(A)																							
Grading	Area	Leq-1hour			85.9	124.2	6744.0	0.0	0.0	3	114.75	-52.2	-4.0	0.0	0.0		0.0	0.0	71.0	0.0	0.0	0.0	71.0
Receiver Site 2 Fl F2 Leq-1hour dB(A) Leq-1hour 71.6 dB(A) Leq-1hour,diff dB(A)																							
Grading	Area	Leq-1hour			85.9	124.2	6744.0	0.0	0.0	3	114.95	-52.2	-3.3	0.0	0.0		0.0	0.0	71.6	0.0	0.0	0.0	71.6
Receiver Site 3 Fl G Leq-1hour dB(A) Leq-1hour 64.1 dB(A) Leq-1hour,diff dB(A)																							
Grading	Area	Leq-1hour			85.9	124.2	6744.0	0.0	0.0	3	238.07	-58.5	-4.5	0.0	0.0		0.0	0.0	64.1	0.0	0.0	0.0	64.1
Receiver Site 4 Fl G Leq-1hour dB(A) Leq-1hour 60.0 dB(A) Leq-1hour,diff dB(A)																							
Grading	Area	Leq-1hour			85.9	124.2	6744.0	0.0	0.0	3	362.76	-62.2	-4.6	-0.4	0.0		0.0	0.0	60.0	0.0	0.0	0.0	60.0
Receiver Site 5 Fl G Leq-1hour dB(A) Leq-1hour 62.9 dB(A) Leq-1hour,diff dB(A)																							
Grading	Area	Leq-1hour			85.9	124.2	6744.0	0.0	0.0	3	149.68	-54.5	-4.4	-5.4	0.0		0.0	0.0	62.9	0.0	0.0	0.0	62.9
Receiver Site 5 Fl F2 Leq-1hour dB(A) Leq-1hour 67.9 dB(A) Leq-1hour,diff dB(A)																							
Grading	Area	Leq-1hour			85.9	124.2	6744.0	0.0	0.0	3	149.80	-54.5	-4.0	-0.8	0.0		0.0	0.0	67.9	0.0	0.0	0.0	67.9
Receiver Site 6 Fl G Leq-1hour dB(A) Leq-1hour 60.6 dB(A) Leq-1hour,diff dB(A)																							
Grading	Area	Leq-1hour			85.9	124.2	6744.0	0.0	0.0	3	326.49	-61.3	-4.6	-0.7	0.0		0.0	0.0	60.6	0.0	0.0	0.0	60.6
Receiver Site 6 Fl F2 Leq-1hour dB(A) Leq-1hour 60.9 dB(A) Leq-1hour,diff dB(A)																							
Grading	Area	Leq-1hour			85.9	124.2	6744.0	0.0	0.0	3	326.53	-61.3	-4.4	-0.5	0.0		0.0	0.0	60.9	0.0	0.0	0.0	60.9

KPAC Cold Storage Expansion

Mean propagation Leq - Building Construction

Source type	Time slice	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	I or A m,m²	KI dB	KT dB	Ko dB	S m	Adiv dB	Agr dB	Abar dB	Aatm dB	Amisc dB	ADI dB	dLrefl dB(A)	Ls dB(A)	dLw dB	Cmet dB	ZR dB	Lr dB(A)
Receiver Site 1 Fl G Leq-1hour dB(A) Leq-1hour 79.6 dB(A) Leq-1hour,diff dB(A)																						
Area	Leq-1hour			87.2	125.5	6744.0	0.0	0.0	3	59.26	-46.4	-2.5	0.0	0.0		0.0	0.0	79.6	0.0	0.0	0.0	79.6
Receiver Site 2 Fl G Leq-1hour dB(A) Leq-1hour 72.3 dB(A) Leq-1hour,diff dB(A)																						
Area	Leq-1hour			87.2	125.5	6744.0	0.0	0.0	3	114.75	-52.2	-4.0	0.0	0.0		0.0	0.0	72.3	0.0	0.0	0.0	72.3
Receiver Site 2 Fl F2 Leq-1hour dB(A) Leq-1hour 72.9 dB(A) Leq-1hour,diff dB(A)																						
Area	Leq-1hour			87.2	125.5	6744.0	0.0	0.0	3	114.95	-52.2	-3.3	0.0	0.0		0.0	0.0	72.9	0.0	0.0	0.0	72.9
Receiver Site 3 Fl G Leq-1hour dB(A) Leq-1hour 65.4 dB(A) Leq-1hour,diff dB(A)																						
Area	Leq-1hour			87.2	125.5	6744.0	0.0	0.0	3	238.07	-58.5	-4.5	0.0	0.0		0.0	0.0	65.4	0.0	0.0	0.0	65.4
Receiver Site 4 Fl G Leq-1hour dB(A) Leq-1hour 61.3 dB(A) Leq-1hour,diff dB(A)																						
Area	Leq-1hour			87.2	125.5	6744.0	0.0	0.0	3	362.76	-62.2	-4.6	-0.4	0.0		0.0	0.0	61.3	0.0	0.0	0.0	61.3
Receiver Site 5 Fl G Leq-1hour dB(A) Leq-1hour 64.2 dB(A) Leq-1hour,diff dB(A)																						
Area	Leq-1hour			87.2	125.5	6744.0	0.0	0.0	3	149.68	-54.5	-4.4	-5.4	0.0		0.0	0.0	64.2	0.0	0.0	0.0	64.2
Receiver Site 5 Fl F2 Leq-1hour dB(A) Leq-1hour 69.2 dB(A) Leq-1hour,diff dB(A)																						
Area	Leq-1hour			87.2	125.5	6744.0	0.0	0.0	3	149.80	-54.5	-4.0	-0.8	0.0		0.0	0.0	69.2	0.0	0.0	0.0	69.2
Receiver Site 6 Fl G Leq-1hour dB(A) Leq-1hour 61.9 dB(A) Leq-1hour,diff dB(A)																						
Area	Leq-1hour			87.2	125.5	6744.0	0.0	0.0	3	326.49	-61.3	-4.6	-0.7	0.0		0.0	0.0	61.9	0.0	0.0	0.0	61.9
Receiver Site 6 Fl F2 Leq-1hour dB(A) Leq-1hour 62.2 dB(A) Leq-1hour,diff dB(A)																						
Area	Leq-1hour			87.2	125.5	6744.0	0.0	0.0	3	326.53	-61.3	-4.4	-0.5	0.0		0.0	0.0	62.2	0.0	0.0	0.0	62.2

KPAC Cold Storage Expansion
Mean propagation Leq - Paving

Source type	Time slice	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	l or A m,m²	Kl dB	KT dB	Ko dB	S m	Adiv dB	Agr dB	Abar dB	Aatm dB	Amisc dB	ADI dB	dLrefl dB(A)	Ls dB(A)	dLw dB	Cmet dB	ZR dB	Lr dB(A)
Receiver Site 1 Fl G Leq-1hour dB(A) Leq-1hour 76.3 dB(A)																						
Area	Leq-1hour			83.9	122.2	6744.0	0.0	0.0	3	59.26	-46.4	-2.5	0.0	0.0		0.0	0.0	76.3	0.0	0.0	0.0	76.3
Receiver Site 2 Fl G Leq-1hour dB(A) Leq-1hour 69.0 dB(A)																						
Area	Leq-1hour			83.9	122.2	6744.0	0.0	0.0	3	114.75	-52.2	-4.0	0.0	0.0		0.0	0.0	69.0	0.0	0.0	0.0	69.0
Receiver Site 2 Fl F2 Leq-1hour dB(A) Leq-1hour 69.6 dB(A)																						
Area	Leq-1hour			83.9	122.2	6744.0	0.0	0.0	3	114.95	-52.2	-3.3	0.0	0.0		0.0	0.0	69.6	0.0	0.0	0.0	69.6
Receiver Site 3 Fl G Leq-1hour dB(A) Leq-1hour 62.1 dB(A)																						
Area	Leq-1hour			83.9	122.2	6744.0	0.0	0.0	3	238.07	-58.5	-4.5	0.0	0.0		0.0	0.0	62.1	0.0	0.0	0.0	62.1
Receiver Site 4 Fl G Leq-1hour dB(A) Leq-1hour 58.0 dB(A)																						
Area	Leq-1hour			83.9	122.2	6744.0	0.0	0.0	3	362.76	-62.2	-4.6	-0.4	0.0		0.0	0.0	58.0	0.0	0.0	0.0	58.0
Receiver Site 5 Fl G Leq-1hour dB(A) Leq-1hour 60.9 dB(A)																						
Area	Leq-1hour			83.9	122.2	6744.0	0.0	0.0	3	149.68	-54.5	-4.4	-5.4	0.0		0.0	0.0	60.9	0.0	0.0	0.0	60.9
Receiver Site 5 Fl F2 Leq-1hour dB(A) Leq-1hour 65.9 dB(A)																						
Area	Leq-1hour			83.9	122.2	6744.0	0.0	0.0	3	149.80	-54.5	-4.0	-0.8	0.0		0.0	0.0	65.9	0.0	0.0	0.0	65.9
Receiver Site 6 Fl G Leq-1hour dB(A) Leq-1hour 58.6 dB(A)																						
Area	Leq-1hour			83.9	122.2	6744.0	0.0	0.0	3	326.49	-61.3	-4.6	-0.7	0.0		0.0	0.0	58.6	0.0	0.0	0.0	58.6
Receiver Site 6 Fl F2 Leq-1hour dB(A) Leq-1hour 58.9 dB(A)																						
Area	Leq-1hour			83.9	122.2	6744.0	0.0	0.0	3	326.53	-61.3	-4.4	-0.5	0.0		0.0	0.0	58.9	0.0	0.0	0.0	58.9

KPAC Cold Storage Expansion
Mean propagation Leq - Architectural Coating

Source	Source type	Time slice	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	l or A m,m²	KI dB	KT dB	Ko dB	S m	Adiv dB	Agr dB	Abar dB	Aatm dB	Amisc dB	ADI dB	dLrefl dB(A)	Ls dB(A)	dLw dB	Cmet dB	ZR dB	Lr dB(A)
Receiver Site 1 Fl G Leq-1hour dB(A) Leq-1hour 66.1 dB(A)																							
Architectural Coating	Area	Leq-1hour			73.7	112.0	6744.0	0.0	0.0	3	59.26	-46.4	-2.5	0.0	0.0		0.0	0.0	66.1	0.0	0.0	0.0	66.1
Receiver Site 2 Fl G Leq-1hour dB(A) Leq-1hour 58.8 dB(A)																							
Architectural Coating	Area	Leq-1hour			73.7	112.0	6744.0	0.0	0.0	3	114.75	-52.2	-4.0	0.0	0.0		0.0	0.0	58.8	0.0	0.0	0.0	58.8
Receiver Site 2 Fl F2 Leq-1hour dB(A) Leq-1hour 59.4 dB(A)																							
Architectural Coating	Area	Leq-1hour			73.7	112.0	6744.0	0.0	0.0	3	114.95	-52.2	-3.3	0.0	0.0		0.0	0.0	59.4	0.0	0.0	0.0	59.4
Receiver Site 3 Fl G Leq-1hour dB(A) Leq-1hour 51.9 dB(A)																							
Architectural Coating	Area	Leq-1hour			73.7	112.0	6744.0	0.0	0.0	3	238.07	-58.5	-4.5	0.0	0.0		0.0	0.0	51.9	0.0	0.0	0.0	51.9
Receiver Site 4 Fl G Leq-1hour dB(A) Leq-1hour 47.8 dB(A)																							
Architectural Coating	Area	Leq-1hour			73.7	112.0	6744.0	0.0	0.0	3	362.76	-62.2	-4.6	-0.4	0.0		0.0	0.0	47.8	0.0	0.0	0.0	47.8
Receiver Site 5 Fl G Leq-1hour dB(A) Leq-1hour 50.7 dB(A)																							
Architectural Coating	Area	Leq-1hour			73.7	112.0	6744.0	0.0	0.0	3	149.68	-54.5	-4.4	-5.4	0.0		0.0	0.0	50.7	0.0	0.0	0.0	50.7
Receiver Site 5 Fl F2 Leq-1hour dB(A) Leq-1hour 55.7 dB(A)																							
Architectural Coating	Area	Leq-1hour			73.7	112.0	6744.0	0.0	0.0	3	149.80	-54.5	-4.0	-0.8	0.0		0.0	0.0	55.7	0.0	0.0	0.0	55.7
Receiver Site 6 Fl G Leq-1hour dB(A) Leq-1hour 48.4 dB(A)																							
Architectural Coating	Area	Leq-1hour			73.7	112.0	6744.0	0.0	0.0	3	326.49	-61.3	-4.6	-0.7	0.0		0.0	0.0	48.4	0.0	0.0	0.0	48.4
Receiver Site 6 Fl F2 Leq-1hour dB(A) Leq-1hour 48.7 dB(A)																							
Architectural Coating	Area	Leq-1hour			73.7	112.0	6744.0	0.0	0.0	3	326.53	-61.3	-4.4	-0.5	0.0		0.0	0.0	48.7	0.0	0.0	0.0	48.7

ATTACHMENT 3.0

Construction Vibration Worksheets

Meridian Consultants LLC

KPAC Coil Avenue Expansion
Construction Vibration Model
(Site 1)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	85	0.014	0.004	71
Jackhammer		1	0.035	85	0.006	0.001	63
Large bulldozer		1	0.089	85	0.014	0.004	71
Loaded trucks		1	0.076	85	0.012	0.003	70
Pile Drive (impact)		1	0.644	85	0.103	0.026	88
Vibratory Roller		1	0.210	85	0.033	0.008	78
Small bulldozer		1	0.003	85	0.000	0.000	42

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment**

Meridian Consultants LLC

KPAC Coil Avenue Expansion
Construction Vibration Model
(Site 2)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	160	0.005	0.001	63
Jackhammer		1	0.035	160	0.002	0.001	55
Large bulldozer		1	0.089	160	0.005	0.001	63
Loaded trucks		1	0.076	160	0.005	0.001	61
Pile Drive (impact)		1	0.644	160	0.040	0.010	80
Vibratory Roller		1	0.210	160	0.013	0.003	70
Small bulldozer		1	0.003	160	0.000	0.000	33

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment**

Meridian Consultants LLC

KPAC Coil Avenue Expansion
Construction Vibration Model
(Site 3)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	540	0.001	0.000	47
Jackhammer		1	0.035	540	0.000	0.000	39
Large bulldozer		1	0.089	540	0.001	0.000	47
Loaded trucks		1	0.076	540	0.001	0.000	46
Pile Drive (impact)		1	0.644	540	0.006	0.002	64
Vibratory Roller		1	0.210	540	0.002	0.001	54
Small bulldozer		1	0.003	540	0.000	0.000	17

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment**

Meridian Consultants LLC

KPAC Coil Avenue Expansion
Construction Vibration Model
(Site 4)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	950	0.000	0.000	40
Jackhammer		1	0.035	950	0.000	0.000	31
Large bulldozer		1	0.089	950	0.000	0.000	40
Loaded trucks		1	0.076	950	0.000	0.000	38
Pile Drive (impact)		1	0.644	950	0.003	0.001	57
Vibratory Roller		1	0.210	950	0.001	0.000	47
Small bulldozer		1	0.003	950	0.000	0.000	10

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment**

Meridian Consultants LLC

KPAC Coil Avenue Expansion
Construction Vibration Model
(Site 5)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	450	0.001	0.000	49
Jackhammer		1	0.035	450	0.000	0.000	41
Large bulldozer		1	0.089	450	0.001	0.000	49
Loaded trucks		1	0.076	450	0.001	0.000	48
Pile Drive (impact)		1	0.644	450	0.008	0.002	66
Vibratory Roller		1	0.210	450	0.003	0.001	57
Small bulldozer		1	0.003	450	0.000	0.000	20

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment**

Meridian Consultants LLC

KPAC Coil Avenue Expansion
Construction Vibration Model
(Site 6)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	840	0.000	0.000	41
Jackhammer		1	0.035	840	0.000	0.000	33
Large bulldozer		1	0.089	840	0.000	0.000	41
Loaded trucks		1	0.076	840	0.000	0.000	40
Pile Drive (impact)		1	0.644	840	0.003	0.001	58
Vibratory Roller		1	0.210	840	0.001	0.000	49
Small bulldozer		1	0.003	840	0.000	0.000	12

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment**