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**Subject: Updated Noise Analysis for a Proposed Child Care Center in San Diego, California**

Dear Ms. Jackson:

Yorke Engineering, LLC (Yorke) is pleased to provide this updated Noise Analysis Report letter. This Noise Analysis includes background on noise analyses in general, applicable regulations and policies for the project location, as well as a screening-level noise level modeling assessment for the proposed Project. This evaluation is in support of the environmental assessment for the Conditional Use Permit (CUP) for the operation of the proposed Project at the request of the City of San Diego (the City). The Noise Analysis was conducted to determine if any impacts would occur due to project implementation. This report evaluates the project's consistency with the following criteria:

- City of San Diego General Plan Noise Element – Land Use Compatibility Guidelines;
- City of San Diego Municipal Code §59.5.0401 – Sound Level Limits;
- San Diego County Code §36.404 – Sound Level Limits;
- City of San Diego Land Development Manual – Traffic Noise Thresholds; and
- City of San Diego Mid-City Communities Plan.

If the proposed Project is incompatible with exterior noise levels at outdoor amenities or interior areas, measures must be included as project design features to ensure consistency with the General Plan Noise Element (i.e., setbacks, use of double-paned glass, noise walls/berms, and other noise attenuation techniques). Noise modeling was performed to determine existing and future noise environments at the project site. Although light construction activities (i.e., prefabricated modular building installations) will generate some noise impacts, these potential impacts are qualitatively discussed.

## PROJECT DESCRIPTION

Prava Construction Services, Inc. (Prava) is constructing a child care center (i.e., a Head Start preschool facility) for the Neighborhood House Association (NHA) at 4110 41st Street, San Diego, California. The buildings will be of prefabricated modular design, trucked to the project site, and

installed on prepared foundations/support. No heavy construction activities (e.g., substantial earthmoving) are needed for the proposed Project.

NHA has applied to the City for a CUP for the proposed Project child care center. The project site is currently zoned as RM-1-3 within the Mid-City – City Heights Community Plan area. Additionally, the project site is within the Central Urbanized Planned District Boundary. The application to the City includes a request for the site to remain zoned as RM-1-3 under a CUP for a child care center. The proposed Project facility would have 32 children and 10 employees, and the hours of operation would be from 7:00 a.m. to 6:00 p.m. Figure 1 shows the spatial relationship of the project site to Interstate 15 (I-15), the principal noise source of concern within the vicinity of the proposed Project.

**Figure 1: Source Receptor Relationship**


## NOISE BACKGROUND

### Noise Descriptors

Noise is typically described as any unwanted or objectionable sound. Sound is technically described in terms of the loudness (amplitude) and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Because the human ear is not equally sensitive to sound at all frequencies, a special frequencydependent rating scale, the A-weighted decibel scale (dBA), has been devised to relate noise to human sensitivity. Table 1 lists common sources of sound and their intensities in dBA.

**Table 1: Typical Sound Level Characteristics**

| Pressure (P) $N/m^2$ | Level dB | Sound Level Characteristic |
|---|---|---|
| 2000 | 160 | Rocket Launch |
| 600 | 150 | Military Jet Plane Takeoff |
| 200 | 140 | Threshold of Pain |
| 60 | 130 | Commercial Jet Plane Takeoff |
| 20 | 120 | Industrial Chipper or Punch Press |
| 6 | 110 | Loud Automobile Horn |
| 2 | 100 | Passing Diesel Truck – Curb Line |
| 0.6 | 90 | Factory – Heavy Manufacturing |
| 0.2 | 80 | Factory – Light Manufacturing |
| 0.06 | 70 | Open Floor Office – Cubicles |
| 0.02 | 60 | Conversational Speech |
| 0.006 | 50 | Private Office – Walled |
| 0.002 | 40 | Residence in Daytime |
| 0.0006 | 30 | Bedroom at Night |
| 0.0002 | 20 | Recording or Broadcasting Studio |
| 0.00006 | 10 | Threshold of Good Hearing – Adult |
| 0.00002 | 0 | Threshold of Excellent Hearing – Child |

Sources: Broch 1971; Plog 1988

Notes

dBA = 20 Log ($P/P_O$)

Reference Level $P_O$ = 0.00002 $N/m^2$ = 0.0002 µbar

$N/m^2$ = Newtons per square meter (the Newton is the unit of force derived in the metric system) is equal to the amount of net force required to accelerate one kilogram of mass at a rate of one meter per second squared (1 kg • 1 $m/s^2$ ) in the direction of the applied force.

In most situations, a 3-dBA change in sound pressure is considered a "just-detectable" difference. A 5-dBA change (either louder or quieter) is readily noticeable, and a 10-dBA change is a doubling (if louder) or halving (if quieter) of the subjective loudness. Sound from a small localized source (a "point" source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates (drops off) at a rate of 6 dBA for each doubling of the distance.

The duration of noise and the time period at which it occurs are important factors in determining the impact of noise on sensitive receptors. A single number called the equivalent continuous noise level ($L_{eq}$) may be used to describe sound that is changing in level. It is also used to describe the acoustic range of the noise source being measured, which is accomplished through the maximum $L_{eq}$ ($L_{max}$) and minimum $L_{eq}$ ($L_{min}$) indicators.

In determining the daily measure of community noise, it is important to account for the difference in human response to daytime and nighttime noise. Noise is more disturbing at night than during the day and noise indices have been developed to account for the varying duration of noise events over time, as well as community response to them. The Community Noise Equivalent Level (CNEL) adds a 5-dB penalty to the "nighttime" hourly noise levels (HNLs) (i.e., 7:00 p.m. to 10:00

p.m.) and the Day-Night Average Level ($L_{dn}$) adds a 10-dB penalty to the evening HNLs (Caltrans 2013, FTA 2006).

### Vibration Descriptors

Vibration is a unique form of noise because its energy is carried through structures and the earth, whereas noise is carried through the air. Thus, vibration is generally felt rather than heard. Typically, ground borne vibration generated by manmade activities attenuates rapidly as the distance from the source of the vibration increases. Actual human and structural response to different vibration levels is influenced by a combination of factors, including soil type, distance between the source and receptor, duration, and the number of perceived events.

While not a direct health hazard, the energy transmitted through the ground as vibration may result in structural damage, which may be costly to repair and dangerous in the event of structural failure. To assess the potential for structural damage associated with vibration, the vibratory ground motion in the vicinity of the affected structure is measured in terms of point peak velocity/peak particle velocity (PPV) in the vertical and horizontal directions (vector sum). A freight train passing at 100 feet may cause PPVs of 0.1 inch per second, while a strong earthquake may produce PPVs in the range of 10 inches per second. Minor cosmetic damage to buildings may begin in the range of 0.5 inch per second (Caltrans 2013, FTA 2006).

## NOISE STANDARDS AND REGULATIONS

### California

The State of California does not implement statewide standards for environmental noise but requires each city and county to include a noise element in its general plan [California Government Code Section 65302(f)]. In addition, Title 4 of the California Code of Regulations (CCR) has guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. In general, the guidelines require that community noise standards:

- Protect residents from the harmful and annoying effects of exposure to excessive noise;
- Prevent incompatible land uses from encroaching upon existing or programmed land uses likely to create significant noise impacts; and
- Encourage the application of state-of-the-art land use planning methodologies in the area of managing and minimizing potential noise conflicts.

### City of San Diego General Plan - Noise Element

Tables 2 show the City's General Plan compatible, conditionally compatible, and incompatible noise levels and Table 3 shows the City's General Plan requirements for an acoustical study. As shown in Table 4, the City has an exterior noise level standard of 45 dBA CNEL for residential and institutional land uses. These standards are designed to protect noise-sensitive land uses from high noise levels and to be used as guidelines in the planning for future land uses. Noise-sensitive land uses include, but are not necessarily limited to, single or multiple residential, hospitals, nursing facilities, intermediate care facilities, K-12 schools, libraries, museums, child care facilities, vocational/trade schools, and colleges and universities (City 2015a, 2007).

**Table 2: City of San Diego General Plan – Land Use Category**

| Land Use Category | Exterior Noise Exposure (dBA CNEL) | | | | |
|---|---|---|---|---|---|
| | 60 | 65 | 70 | 75 | |
| *Parks and Recreational* | | | | | |
| Parks, Active and Passive Recreation | | | | | |
| Outdoor Spectator Sports, Golf Courses; Water Recreational Facilities; Indoor Recreation Facilities | | | | | |
| *Agricultural* | | | | | |
| Crop Raising & Farming; Community Gardens, Aquaculture, Dairies; Horticulture Nurseries & Greenhouses; Animal Raising, Maintain & Keeping; Commercial Stables | | | | | |
| *Residential* | | | | | |
| Single Dwelling Units; Mobile Homes | | 45 | | | |
| Multiple Dwelling Units **For uses affected by aircraft noise, refer to Policies NE-D.2. & NE-D.3.* | | 45 | 45* | | |
| *Institutional* | | | | | |
| Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12Educational Facilities; Libraries; Museums; Child Care Facilities | | 45 | | | |
| Other Educational Facilities including Vocational/Trade Schools and Colleges and Universities | | 45 | 45 | | |
| Cemeteries | | | | | |
| *Retail Sales* | | | | | |
| Building Supplies/Equipment; Food, Beverages & Groceries; Pets & Pet Supplies; Sundries Pharmaceutical, & Convenience Sales; Wearing Apparel & Accessories | | | 50 | 50 | |

## Table 3: City of San Diego General Plan – Land Use Category Cont.

| Land Use Category | Exterior Noise Exposure (dBA CNEL) | | | | |
|---|---|---|---|---|---|
| | 60 | 65 | 70 | 75 | |
| *Commercial Services* | | | | | |
| Building Services; Business Support; Eating & Drinking; Financial Institutions; Maintenance & Repair; Personal Services; Assembly & Entertainment (includes public and religious assembly); Radio & Television Studios; Golf Course Support | | | 50 | 50 | |
| Visitor Accommodations | | 45 | 45 | 45 | |
| *Offices* | | | | | |
| Business & Professional; Government; Medical, Dental & Health Practitioner; Regional & Corporate Headquarters | | | 50 | 50 | |
| *Vehicle and Vehicular Equipment Sales and Services Use* | | | | | |
| Commercial or Personal Vehicle Repair & Maintenance; Commercial or Personal Vehicle Sales & Rentals; Vehicle Equipment & Supplies Sales & Rentals; Vehicle Parking | | | | | |
| *Wholesale, Distribution, Storage Use Category* | | | | | |
| Equipment & Materials Storage Yards; Moving & Storage Facilities; Warehouse; Wholesale Distribution | | | | | |
| *Industrial* | | | | | |
| Heavy Manufacturing; Light Manufacturing; Marine Industry; Trucking & Transportation Terminals; Mining & Extractive Industries | | | | | |
| Research & Development | | | | 50 | |

| | | | |
|---|---|---|---|
| | **Compatible** | **Indoor Uses** | Standard construction methods should attenuate exterior noise to an acceptable indoor noise level. Refer to Section I. |
| | | **Outdoor Uses** | Activities associated with the land use may be carried out. |
| **45, 50** | **Conditionally Compatible** | **Indoor Uses** | Building structure must attenuate exterior noise to the indoor noise level indicated by the number (45 or 50) for occupied areas. Refer to Section I. |
| | | **Outdoor Uses** | Feasible noise mitigation techniques should be analyzed and incorporated t make the outdoor activities acceptable. Refer to Section I. |
| | **Incompatible** | **Indoor Uses** | New construction should not be undertaken. |
| | | **Outdoor Uses** | Severe noise interference makes outdoor activities unacceptable. |

## Table 4: City of San Diego General Plan – Acoustical Study Requirements

| An acoustical study should include, but is not limited to the following analysis: |
|---|
| Provide noise level measurements to describe existing local conditions and the predominant noise sources. |
| Measure existing single event noise levels (SENEL, SEL, or Time Above) within airport influence areas. |
| Estimate existing and projected noise levels (CNEL) and compare them to levels on Table NE-3. For parks, may consider motor vehicle traffic noise measurements during the one-hour period where the worst-case traffic noise levels are expected to occur from dawn to dusk at a park. |
| Recommend appropriate mitigation measures to achieve acceptable noise levels on Table NE-3. |
| Estimate noise exposure levels with recommended mitigation measures. |
| Describe a post-project assessment to evaluate the effectiveness of the proposed mitigation measures. |

**Table 5: City of San Diego General Plan – Land Use Noise Compatibility Guidelines**

| Land Use Category – Residential/Institutional | Exterior Noise Exposure (dBA CNEL) |
|---|---|
| Single Dwelling Units; Mobile Homes | 45 |
| Multiple Dwelling Units | 45 |
| Hospitals; Nursing Facilities; Intermediate Care Facilities; Kindergarten through Grade 12 Educational Facilities; Libraries; Museums; Child Care Facilities | 45 |
| Other Educational Facilities including Vocational/Trade Schools and Colleges and Universities | 45 |

Source: City 2015a, 2007

### Other City and County Sound Level Limits

In addition to planning guidelines, local jurisdictions have noise ordinances in their municipal codes to regulate stationary sources of noise and related policies and guidelines to limit the effect of noise on sensitive land uses. Table 6 summarizes the applicable San Diego City and County sound level limits and thresholds contained in codes, policies, and guidelines by land use and time of day (City 2010, 2011, County 2009).

**Table 6: Other City and County Sound Level Limits**

| Residential/Institutional | Time of Day | 1-Hour Average Sound Level (dBA) |
|---|---|---|
| **Construction** | | |
| City of San Diego Municipal Code §59.5.0404 (a) | 7 a.m. to 7 p.m. | N/A |
| City of San Diego Municipal Code §59.5.0404 (b) | 7 a.m. to 7 p.m. | 75 |
| **Operation** | | |
| City of San Diego Municipal Code §59.5.0401 | 7 a.m. to 7 p.m. | 50 |
| | 7 p.m. to 10 p.m. | 45 |
| | 10 p.m. to 7 a.m. | 40 |
| San Diego County Code §36.404 | 7 a.m. to 10 p.m. | 50 |
| | 10 p.m. to 7 a.m. | 45 |
| City of San Diego Traffic Noise Thresholds | Interior | 45 |
| | Exterior | 65 |

Sources: City 2010, 2011; County 2009

The most stringent of these limits and thresholds shown in Tables 2 and 3 (i.e., 45 dBA exterior) was used in this analysis because the proposed Project is a child care center and educational facility, which is considered a noise-sensitive receptor. Light construction activities are temporary and therefore considered short-term. In addition, construction work is not expected to be done on weekends, so activities will only occur in five consecutive day periods until project completion.

### Mid-City Communities Plan

The City of San Diego Mid-City Communities Plan and amendments establishes the goal for community noise to maintain adequate sound levels in residential neighborhoods. The plan

recommends projects to mitigate sound pollution conditions created along major transportation corridors and certain businesses and encourages the use of "noise masking" techniques when appropriate. The Plan also describes applying traffic-calming methods to reestablish the purpose and function of neighborhood streets (City 2015b).

## EXISTING NOISE ENVIRONMENT

### *Existing Noise Sources*

The most ubiquitous noise sources in the City are vehicles on interstate freeways, state highways and major local roadways), and aircrafts (airplanes and helicopters flying overhead). Railroads, stationary industrial, commercial sources, and construction also contribute to the local noise environment. Local collector streets are not considered a significant source of noise because traffic volume and speed are generally much lower than for freeways and major roadways (City 2007).

The traffic noise generated on a roadway is dependent on traffic speed, volume, flow, vehicle mix (percentage of trucks), properly function vehicle muffler system, pavement type and condition, the use of barriers, as well as distance to the receptor. In general, the larger the traffic volume is on a roadway, the higher the noise levels are generated on the roadway. This general condition exists until there is so much traffic that flow degrades and speeds decrease, which lowers noise levels. Roadways with large percentages of heavy trucks will generate higher noise levels. A heavy truck traveling 50 miles per hour (mph) generates about 85 dBA from 50 feet (15 meters), whereas a car traveling the same speed generates about 71 dBA. An increase of 10 dBA is usually perceived by the human ear as a "doubling" of sound volume (FHWA 2006).

The roadways that generate the highest noise levels in the City are the interstate freeways and state highways because they have the highest speed limits, the largest traffic volumes, and the most trucks. Highways typically generate 70 to 80 dBA CNEL at a receptor adjacent to the highway. Heavily used commuter roadways, such as arterials and major streets, also generate significant levels of noise, typically 65 to 75 dBA CNEL at an adjacent receptor.

### *Noise Monitoring Results*

Noise monitoring was performed at the location shown in Figure 1, the results of the noise monitoring events are provided in Table 7. Noise monitoring reports are provided as Attachment A.

**Table 7: Results of Noise Monitoring**

| Site | Date (2019) | Start Time | End Time | Noise Source | Receptor | Measured Noise Level (1-hour dBA Leq) |
|---|---|---|---|---|---|---|
| 1 | 12/5 | 9:24 am | 10:28 am | I-15 Traffic/Park | School/Residential | 63.6 |
| 2 | 12/5 | 10:40 am | 11:41 am | School/Traffic Polk Ave | School/Residential | 55.2 |

Source: Yorke Noise Monitoring, 2019.

## NOISE ANALYSIS METHODOLOGY

### *Noise Monitoring*

Existing noise levels in the vicinity of the project site were measured at locations adjacent to noise sources and where project-related noise has the potential to raise the ambient noise level measurement equipment consisted of Quest Sound Pro SE/DL sound level meter. An acoustical calibrator was used to calibrate the sound level meter before and after use. All instrumentation satisfies the Type II (precision) requirements.

### *Construction*

The screening-level noise analysis for Project construction was completed based on methodology developed by the U.S. Department of Transportation Federal Highway Administration (DOT FHWA) and with CalEEMod™ equipment utilization for small infill projects. The DOT FHWA methodology uses actual noise measurement data collected between 1991-2006 as reference levels for a wide variety of construction equipment in common use. This noise analysis included field measurements of ambient noise in the vicinity of the Project site.

### *Operation*

Noise modeling analysis was conducted based on the traffic criteria utilized in the report "Mobile Source Health Risk Assessment Report," dated April 2019. Background traffic noise, mainly from I-15, is consistent with the City of San Diego General Plan (2015a, 2007) and Land Development Manual (2011). For estimating purposes, traffic on I-15 was assumed to consist of a mix of light-duty vehicles (cars, pickups, vans, SUVs) and heavy-duty diesel trucks (18-wheelers).

Consistent with General Plan Table NE-6, *Potential Noise Attenuation Methods*, traffic noise from I-15 is attenuated (mitigated) by two principal mechanisms: 1) the roadway is approximately 25 feet (7.6 meters) below-grade, with walls and landscaped berms that reflect noise generally upward and away from nearby receptors (the freeway landscaping also absorbs some noise); and 2) the proposed Project facility is 360 feet (110 meters) from the northbound traffic lanes, with interceding landscaping and buildings that absorb and further attenuate traffic noise (City 2015a).

The following formula was used to determine the ambient noise level at noise sensitive receptors from the increase in traffic due to the project. The formula used to relate increases in project traffic to increases in ambient noise levels is:

NLF = NLE + 10log10(VF/VE) (Caltrans, 2013).

Where:
NLF = future noise level
NLE = existing noise level
VF = future vehicle traffic, and
VE = existing vehicle traffic

## NOISE ANALYSIS IMPACT

### *Construction*

Construction of the proposed project would result in a temporary increase in the ambient noise level due to operation of construction equipment and worker and material haul trips. The current ambient noise level at the project site is 55.2 dbA, as shown in Table 8. As shown in Table 8 unmitigated construction noise level would exceed the City's noise standard of 75 dBA; however, with the addition of mitigation the ambient noise level during construction would be reduced below the City's noise standard.

**Table 8: Estimated Construction Noise Impacts at Nearest Sensitive Receptor**

| Construction Impacts | Normal Acceptance Criteria | | Significance Threshold (CNEL dBA)[b] | Exceeds Threshold After Mitigation (Yes/No) |
|---|---|---|---|---|
| | Unmitigated Modeled Noise Level ($L_{eq}$ dBA)[a] | Mitigated Modeled Noise Level ($L_{eq}$ dBA)[a] | | |
| Background | 55.5 | 70.0 | 75 | No |
| Site Preparation | 77.4 | 71.6 | 75 | No |
| Grading | 79.9 | 73.8 | 75 | No |
| Building Construction | 78.3 | 72.2 | 75 | No |
| Paving | 80.4 | 73.7 | 75 | No |
| Architectural Coating | 72.6 | 69.4 | 75 | No |

Sources: CalEEMod v2013.2.2, FHWA 2006, Broch 1971, Plog 1988, City 1986

Notes:

[a] Includes existing street traffic and ambient noise sources

[b] Refer to applicable city general plan noise element

### *Operation*

Traffic is the primary noise source in the vicinity of the project site. Table 9 shows a comparison of modeled screening-level estimated daytime exterior noise impacts for peak highway (I-15) traffic at the designated receptor using Federal Highway Administration (FHWA) Roadway Construction Noise Model attenuation algorithms and published reference levels for typical urban vehicular traffic. Also shown is the estimated unmitigated source background noise and mitigated post-project exterior background noise. If the post-project thresholds are not exceeded, then this project should be considered acceptable (FHWA 2006, Broch 1971, Plog 1988).

**Table 9: Estimated Peak Activity Daytime Noise Impacts – Project Sensitive Receptor**

| Operational Impacts | Normal Acceptance Criteria | | |
|---|---|---|---|
| | Modeled Noise Level ($L_{eq}$ dBA)[a] | City Threshold (CNEL dBA)[b] | Exceeds Threshold (Yes/No) |
| Freeway Noise, Exterior Source | 63.6 | — | — |
| Less Distance/Structures Attenuation (400 ft.) | (18) | — | — |
| At Project Exterior Background | 45.6 | 45 | No |
| Less Building (walls, windows, doors) | (19) | — | — |
| Post-Project Interior | 26.6 | 45 | No |

Sources: FHWA 2006, Broch 1971, Plog 1988, City 2015a, 2007, 2011

Notes

[a] Includes existing street/highway traffic and ambient noise sources

[b] Refer to General Plan Noise Element and Municipal Code Noise Ordinance

As shown in Table 9, this modeling study predicts a less than significant impact for traffic noise at the subject receptor in accordance with the City of San Diego guidelines and codes. There would be approximately 285 additional vehicles traveling on local roadways during the AM and PM peak hours. The current traffic volumes on roadways adjacent to the project site is approximately 660 vehicles (conservatively based on only the adjacent elementary school). The project would increase the ambient noise level by 1.56 dBA due to an increase in project traffic, which is not audible. Because the proposed Project is educational, no significant sources of permanent stationary noise are expected to be operated on-site, such as engines or industrial machinery.

## FUTURE NOISE ENVIRONMENT

The ambient noise levels would not increase over the with-project noise levels shown in the operation impact analysis above. Although traffic may increase on I-15 and local roadway in the future, project traffic would not increase; therefore, the project would not increase the future ambient noise level beyond the ambient noise level analyzed under operation above.

## MITIGATION

As shown in Tables 8 noise levels during construction would exceed the City's noise threshold; therefore, the following mitigation would be required:

- Throughout the construction process the construction site will provide a ½ inch thick plywood eight feet high wall with no gaps or an eight feet high sound absorbing curtain with no gaps surrounding the construction site. As shown in Table 8 with the implementation of this mitigation construction noise would be less than significant.

As shown in Table 9 the ambient noise level during operation of the project would not exceed the City's noise thresholds; therefore, no operational mitigation measures are required.

## CLOSING

Thank you very much for the opportunity to be of assistance to Prava Construction Services, Inc. Should you have any questions, please contact me at (949) 293-7867 (direct) or Greg Wolffe at (909) 861-2729.

Sincerely,

Erin Quinn | San Juan Capistrano Office
Senior Engineer
Yorke Engineering, LLC
equinn@YorkeEngr.com

cc: Greg Wolffe, Yorke Engineering, LLC

## REFERENCES

Broch, Jens. 1971. Acoustic Noise Measurements. Bruel & Kjaer.

California Department of Transportation (Caltrans). 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. Website (http://website.dot.ca.gov/env/noise/docs/tens-sep2013.pdf) accessed December 3, 2019.

California Department of Transportation (Caltrans). 2013. Transportation and Construction Vibration Guidance Manual. Website (http://www.dot.ca.gov/hq/env/noise/pub/TCVGM_Sep13_FINAL.pdf) accessed July 19, 2019.

California Energy Commission (CEC). 2017. Building Energy Efficiency Program. Website (http://www.energy.ca.gov/title24/) accessed July 19, 2019.

City of San Diego (City). 2015a. General Plan Noise Element. Website (https://www.sandiego.gov/sites/default/files/ne_2015.pdf) accessed July 19, 2019.

City of San Diego, City Planning & Community Investment (City). 2015b. Mid-City Communities Plan Amendments. Website (https://www.sandiego.gov/sites/default/files/midcity.pdf) accessed July 19, 2019.

City of San Diego, Development Services Department (City). 2011. Land Development Manual CEQA Significance Determination Thresholds. Website (https://www.sandiego.gov/sites/default/files/legacy/development-services/pdf/news/sdtceqa.pdf) accessed July 19, 2019.

City of San Diego, Municipal Code (City). 2010. Website (https://www.sandiego.gov/city-clerk/officialdocs/municipal-code) accessed July 19, 2019.

City of San Diego (City). 2007. Draft General Plan Final Environmental Impact Report, Noise Section. Website (https://www.sandiego.gov/sites/default/files/legacy/planning/genplan/pdf/peir/noise.pdf) accessed July 19, 2019.

County of San Diego Land Use and Environment Group, Department of Planning and Land Use, Public Works (County). 2009. Guidelines For Determining Significance – Noise. Website (https://www.sandiegocounty.gov/dplu/docs/Noise-Guidelines.pdf) accessed July 19, 2019.

Plog, Barbara, Ed. 1988. Fundamentals of Industrial Hygiene – 3rd Edition, National Safety Council.

Soundproof Windows, Inc. (SWI). 2018. Website (https://www.soundproofwindows.com/stc-ratings/) accessed July 19, 2019.

U.S. Department of Transportation – Federal Highway Administration (FHWA). 2006. Roadway Construction Noise Model User's Guide. Website (https://www.fhwa.dot.gov/Environment/noise/construction_noise/rcnm/) accessed July 19, 2019.

U.S. Department of Transportation – Federal Transit Authority (FTA). 2006. Transit Noise and Vibration Impact Assessment. Website (https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Noise_and_Vibration_Manual.pdf) accessed July 19, 2019.

Viracon. 2018. Acoustic Performance Data Tables. Website (http://www.viracon.com/pdf/ViraconAcousticPerfDataTables.pdf) accessed July 19, 2019.

# Attachment A – Noise Monitoring Reports