DouglasKim+Associates,LLC

To: Dave Rand, AGD

From: Douglas Kim, AICP

CC:

Date: June 3, 2020

Re: 4100 Sunset Boulevard Vibration Analysis

This memo provides information regarding groundborne vibration from construction activities for the proposed project at 4100 Sunset Boulevard.

Our analysis made three conservative assumptions that help predict potential vibration impacts on nearby buildings (expressed as peak particle velocity, or PPV):

1. Use of Federal Transit Administration (FTA) vibration thresholds for building damage that are more conservative than Caltrans guidance on potential thresholds for vibration damage to buildings. For example, FTA find non-engineered timber and masonry buildings can be damaged at 0.2 PPV, where Caltrans finds the threshold is 0.3 for older residential structures.
2. Assuming use of the most vibratory equipment, such as a vibratory roller, which produces a PPV of 0.210 PPV at 25 feet. To ensure a conservative analysis, the vibratory roller is used to forecast the maximum vibratory impacts on off-site structures. More typical heavy equipment has a lesser profile, such as large bulldozers at 0.089 PPV, where loaded trucks have 0.076 PPV, and jackhammers have 0.035 PPV. Their impact on adjacent structures would be less than what is depicted with a vibratory roller.
3. Assuming continuous operation of construction equipment at the closest point possible to adjacent structures. Most equipment is mobile, operating intermittently at one location before moving on and working some if not all of a construction site.

The following table summarizes the potential vibratory impacts of project construction.

DKA Planning
Phone: (310) 316-2800
Fax: (310) 693-2579
E-Mail: doug@dkaplanning.com

TABLE 1
VIBRATION VELOCITIES AT OFF-SITE SENSITIVE RECEPTORS FROM PROJECT CONSTRUCTION (UNMITIGATED)

Sensitive Receptor	Distance to Project Site (feet)	Estimated PPV (inches/ second)	Threshold of Significance (inches/ second)	Significant Impact?
Residences on Sunset Boulevard near Manzanita Street intersection	100	0.026	0.3	No
Residences on Gateway Avenue between Myra Avenue and Santa Monica Boulevard	5	2.348	0.3	Yes
Impacts at all receptors assume use of a vibratory roller at the project site.				

Potentially significant impacts to residences on Gateway Avenue directly to the northwest of the project site could be mitigated by utilizing equipment with lower vibratory profiles. Measures V-1 and V-2 would reduce potential impacts to adjacent residences below the 0.3 inches/second threshold, as shown in the next table.

V-1 For construction activities at the project site, prohibit use of a vibratory roller or equipment with a similar vibratory profile (e.g., hydromill, clam shovel drop, pile drivers) within 15 feet of the northwest property line.

V-2 Any construction activity directly along the northwest property line of the project site shall only use small bulldozers, rubber tired equipment (in lieu of tracked vehicles), or equivalent equipment with a similar vibratory profile of 0.026 inches per second or less at 25 feet.

TABLE 2
VIBRATION VELOCITIES AT OFF-SITE SENSITIVE RECEPTORS FROM PROJECT CONSTRUCTION (WITH PROPOSED MITIGATION)

Sensitive Receptor	Distance to Project Site (feet)	Estimated PPV (inches/ second)	Threshold of Significance (inches/ second)	Significant Impact?
Residences on Sunset Boulevard near Manzanita Street intersection	100	0.026*	0.3	No
Residences on Gateway Avenue between Myra Avenue and Santa Monica Boulevard	5	0.291**	0.3	No
* Assumes use of a vibratory roller rated at 0.21 inches per second at 25 feet. ** Assumes use of equipment rated at 0.026 inches per second at 25 feet.				

Construction Vibration Impact Analysis

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Construction Vibration: UNMITIGATED

DouglasKim+Associates,LLC

Receptor: Residences on Sunset Bl near Manazanita Street intersection
Equipment: Vibratory Roller

Source PPV (in/sec)	0.21
Reference Distance (ft)	25
Ground Factor (N)	1.5
Distance (ft)	100
Unmitigated Vibration Level (in/sec)	**0.026**

Receptor: Residences on Gateway Ave between Myra Ave and Santa Monica Bl
Equipment: Vibratory Roller

Source PPV (in/sec)	0.21
Reference Distance (ft)	25
Ground Factor (N)	1.5
Distance (ft)	5
Unmitigated Vibration Level (in/sec)	**2.348**

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Construction Vibration: UNMITIGATED

DouglasKim+Associates,LLC

Receptor: Residences on Sunset Bl near Manazanita Street intersection
Equipment: Small Dozer-Type Equipment

Source PPV (in/sec)	0.003
Reference Distance (ft)	25
Ground Factor (N)	1.5
Distance (ft)	100
Unmitigated Vibration Level (in/sec)	**0.000**

Receptor: Residences on Gateway Ave between Myra Ave and Santa Monica Bl
Equipment: Small Dozer-Type Equipment

Source PPV (in/sec)	0.003
Reference Distance (ft)	25
Ground Factor (N)	1.5
Distance (ft)	5
Unmitigated Vibration Level (in/sec)	**0.034**

Sources

California Department of Transportation (Caltrans), *Transportation and Construction Vibration Guidance Manual* , September 2013.
Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment* , May 2006

Construction Vibration: MITIGATED

DouglasKim+Associates,LLC

Receptor: Residences on Sunset Bl near Manazanita Street intersection
Equipment: Vibratory Roller

Source PPV (in/sec)	0.21
Reference Distance (ft)	25
Ground Factor (N)	1.5
Distance (ft)	100
Unmitigated Vibration Level (in/sec)	**0.026**

Receptor: Residences on Gateway Ave between Myra Ave and Santa Monica Bl
Equipment: Equipment rated at 0.026 inches per second at 25 feet

Source PPV (in/sec)	0.026
Reference Distance (ft)	25
Ground Factor (N)	1.5
Distance (ft)	5
Unmitigated Vibration Level (in/sec)	**0.291**

Construction Vibration: MITIGATED

DouglasKim+Associates,LLC

Receptor: Residences on Sunset Bl near Manazanita Street intersection
Equipment: Small Dozer-Type Equipment

Source PPV (in/sec)	0.003
Reference Distance (ft)	25
Ground Factor (N)	1.5
Distance (ft)	100
Unmitigated Vibration Level (in/sec)	**0.000**

Receptor: Residences on Gateway Ave between Myra Ave and Santa Monica Bl
Equipment: Small Dozer-Type Equipment

Source PPV (in/sec)	0.003
Reference Distance (ft)	25
Ground Factor (N)	1.5
Distance (ft)	5
Unmitigated Vibration Level (in/sec)	**0.034**

Sources

California Department of Transportation (Caltrans), *Transportation and Construction Vibration Guidance Manual* , September 2013.
Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment* , May 2006