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RE: Dos Lagos Area 6 Manufacturing Development Property Line Noise Levels

The purpose of this letter is to identify noise levels which may be created from the operation of the proposed Dos Lagos Planning Area Six (6) manufacturing development for all adjacent and nearest residential property lines. The proposed Project consists of developing two manufacturing buildings totaling 62,737 SF on a 3.6 acre site. The Project site is located on the east side of Temescal Canyon Road, between Cajalco Road and Breezy Meadow Lane, in the City of Corona, California. Project access will be provided via one right-in/right-out only driveway along Temescal Canyon Road. The project site plan with the location of the noise sources is shown in Figure 1 on the following page.

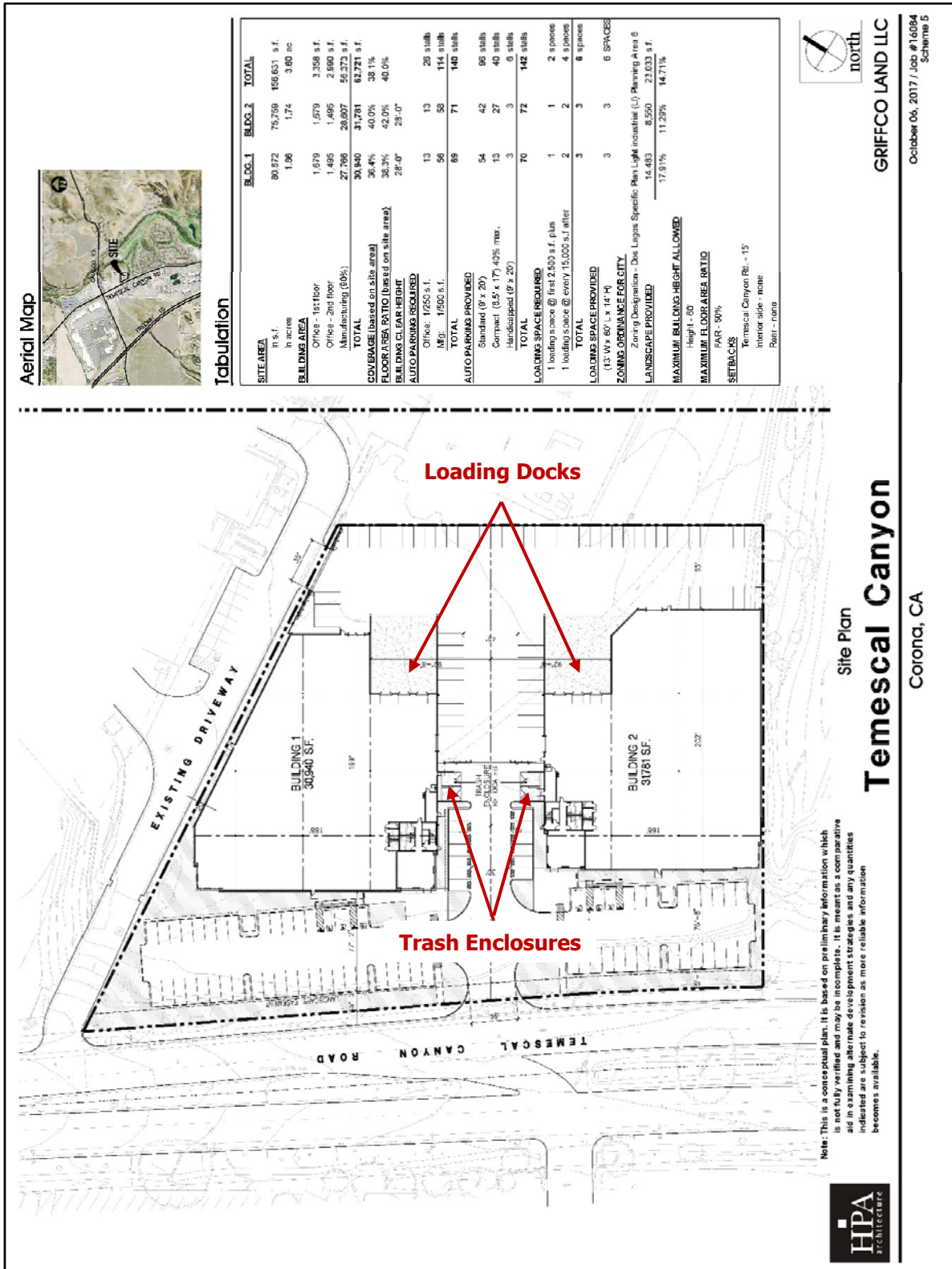
APPLICABLE STANDARDS

City Municipal Code Section 17.84.040 set sound level limits at property lines. Unless a variance has been applied for and granted pursuant to this chapter, it is unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level, at any point on or beyond the boundaries of the property on which the sound is produced, exceeds the applicable limits set forth below in Table 1. Residential land uses exist to the south and therefore, the Project must meet a 55 dBA Leq daytime standard and a property line standard of 50 dBA Leq nighttime standard the residential property line.

Table 1: City Noise Limits

Receiving Land Use Category	Time of Day	Applicable Limit One-Hour Average Sound Level (in decibels)
Residential	7:00 a.m. to 10:00 p.m.	55
	10:00 p.m. to 7:00 a.m.	50

Figure 1: Proposed Project Site Plan



PROPERTY LINE NOISE LEVEL PREDICTIONS

According to the information provided by the Project Proponent, anticipated on-site operational noise sources for this proposed project of primary concern are the delivery truck "reverse signals" and trash pickup. Sound from a small localized source (a "point" source) radiates uniformly outward as it travels away from the source. Their sound levels attenuate or drop off at a rate of 6 dBA for each doubling of distance. Two sources having equal noise levels add logarithmically not linearly. Cumulatively, 50 dBA plus 50 dBA is equal to 53 dBA not 100 dBA.

Using a point-source noise prediction model, calculations of the expected operational noise impacts were completed. The essential model input data for these performance equations include the source levels of each type of equipment, relative source to receiver horizontal and vertical separations, the amount of time the equipment is operating in a given day (also referred to as the duty-cycle) and any transmission loss from topography or barriers. Noise levels drop 3 decibels each time the duration of the source is reduced in half. Therefore, an hourly noise level over a 15 minute period would be reduced 6 decibels at the same distance.

Delivery Trucks

In order to evaluate the truck delivery noise levels, the analysis utilized reference noise level measurements taken at a Lowe's Improvement Center in Murrieta, CA. The measurements included truck drive-by noise, truck loading/unloading and truck engine noise. The noise levels for truck drive-by noise and truck engine noise were measured at 66.3 dBA Leq at a distance of 25-feet. The noise levels from the "reverse signals" or back-up beepers were found to be 87 dBA at a distance of 4 feet and occurred for less than 2 minutes. The fixed operations associated with the delivery trucks will occur at the loading docks. Since there are 6 bays on the project site, a total of 6 trucks at a time may be operating on the site. This is very unlikely to occur but would be considered a worst case scenario for this project.

Trash Pick-up

In order to evaluate the trash pick-up service noise levels, the analysis utilized reference noise level measurements taken at a Target Shopping Center in Temecula, CA. The measurements included truck noise and the loading/trash pick-up noise. The noise levels for the trash pick-up were found to be 90 dBA at a distance of 5 feet and occurred for less than 5 minutes. The project related cumulative hourly noise levels from each source are provided in Table 1.

Table 1: Project Related Operational Noise Sources

Quantity	Equipment Description	Frequency	Related Sound Level Distance (ft)	Noise Level (dBA)	Cumulative Noise Level per Hour (dBA Leq)
6	Delivery Trucks "reverse signal"	2 minutes for each truck	4	87.0	87.8
1	Trash Pickup	Total of 5 minutes	5	90.3	79.5

The noise levels for each source along with the calculated hourly noise levels based upon individual operating times are shown below in Table 2 for the nearest residential property line. The delivery trucks would occur at least 140 feet from the nearest property line to the south and the trash pick-up would occur at least 180 feet from the same property line to the south. It should be noted: the delivery trucks are partially shielded by the proposed building(s) and the trash enclosures are located between the buildings and are fully shielded.

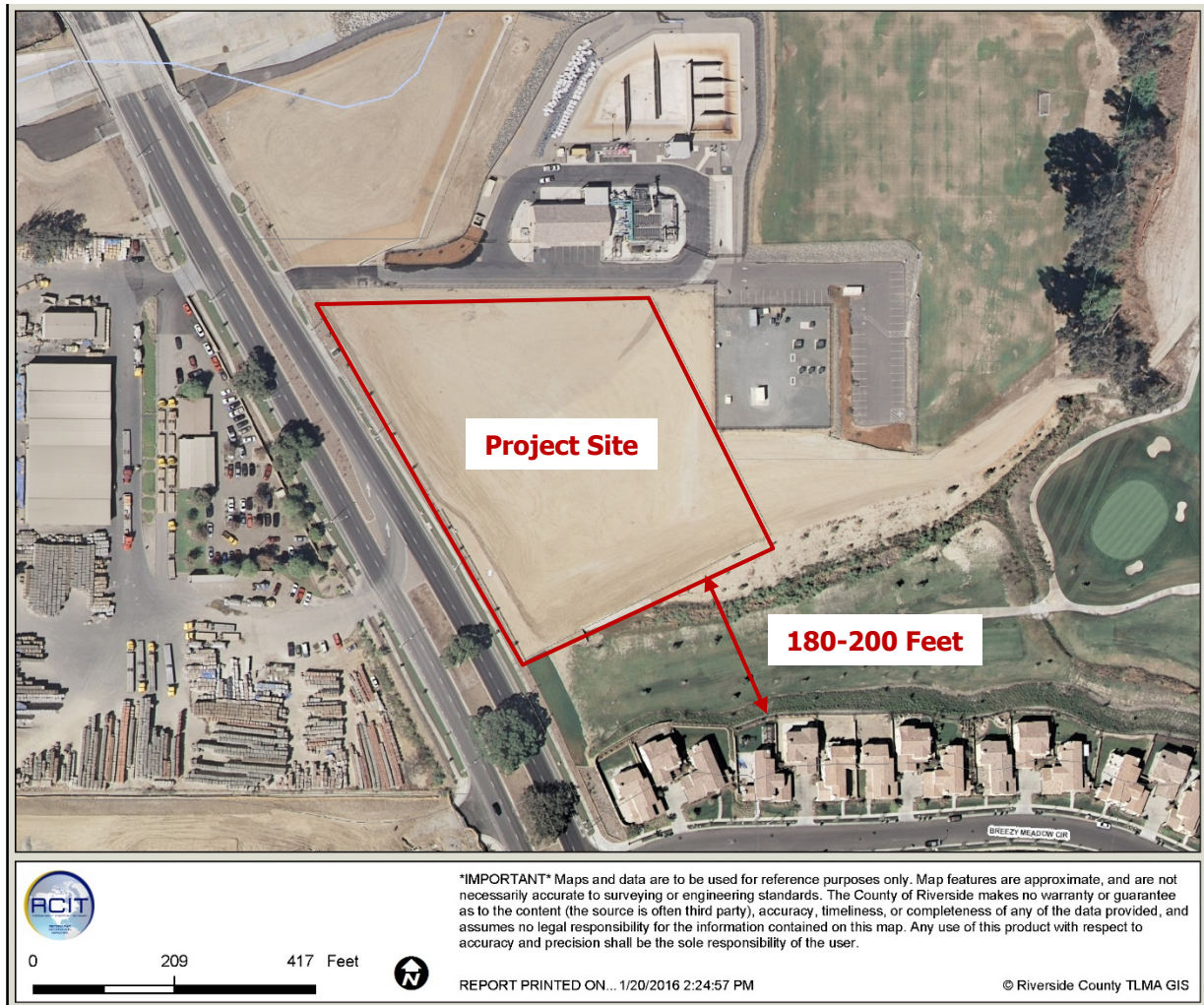
To determine the noise level reductions from the buildings, the Fresnel Barrier Reduction Calculations based on distance, source height, receiver elevation and the top of building was modeled. The noise level reductions due to the buildings was found to be 20 decibels due to the locations of the noise sources and the height of the buildings. To be conservative, based on the truck movements, only a 10 decibel reduction was accounted for in the reductions as shown in Table 2.

The combined noise levels at the adjacent property lines based upon distance separation, limited duty-cycles and shielding for the proposed buildings were projected to be below the City's Noise Ordinance standards. Additionally, the residential units to the south are separated from the site by a drainage basin and green belt, as can be seen in Figure 2 on the following page. The additional distance separation would further reduce the noise levels at least 6 decibels and the project site would comply with the City's hourly threshold of 50 dBA Leq at the existing residential units. Therefore, no impacts are anticipated and no mitigation is required for the continued operations.

Table 2: Operational Noise Levels (Southern Property Line)

Source	Cumulative Noise Level per Hour (dBA Leq)	Distance to Property Line (Feet)	Noise Reduction for Distance	Noise Reduction for Buildings	Resultant Noise Level at Property Line (dBA Leq)
Delivery Trucks	87.8	140	-30.9	-10.0	46.9
Trash Pickup	79.5	180	-31.1	-10.0	38.1
Cumulative Noise Level @ Property Line (dBA)					47.4

Figure 2: Project Site Configuration



CONCLUSIONS

Based upon the noise levels, the proposed project complies with the property line standards at the property lines. Therefore, no impacts are anticipated and no mitigation is required. If you should have any questions regarding these findings, please contact me at (760) 473-1253.

Sincerely, Jeremy Loudon

Principal of Ldn Consulting