



EDWARD L. PACK ASSOCIATES. INC.

1975 HAMILTON AVENUE
SUITE 26
SAN JOSE, CA 95125

Acoustical Consultants

TEL: 408-371-1195
FAX: 408-371-1196
www.packassociates.com

October 10, 2014
Project No. 46-075A

Mr. Scott Kriens
1440 DevCo
P.O. Box 3141
Saratoga, CA 95070

Subject: Preliminary Noise Results, Parking Structure, 1440 Foundation,
Scotts Valley

Dear Scott:

This letter will provide you with some preliminary results of the noise analysis for the proposed parking structure at the 1440 Foundation facility. The City of Scotts Valley General Plan Noise Element uses a noise limit of the existing noise exposure + 5 decibels, as directed by Policy NP-442. The noise exposure is a 24-hour time-weighted average noise level and is quantified using the Day-Night Level (DNL) descriptor.

The existing noise exposures at the Bunter back patio at 700 Tabor Drive were measured to be 55 dB DNL on Friday and 53 dB DNL on Sunday. Therefore, Sunday would present the most restrictive limit of 58 dB DNL for the existing + project scenario. In order not to exceed 58 dB DNL overall, the project's noise exposure is limited to 56 dB DNL. Note that $58 \text{ dB} - 53 \text{ dB} = 56 \text{ dB}$. Sunday also is predicted to generate the highest parking structure operational noise levels. For the purposes of brevity, this letter will address Sunday activity for now.

The table on the following page provides the breakdown of project traffic using the garage on a Sunday. The table shows the number of cars entering the garage (assuming 1/3 of the volume on each floor), driving along the westerly drive aisle, filling the first floor, the second third entering and filling the second floor and the final third entering and filling the roof deck. Sound reflection from vehicles inside the garage was added as was sound reflection off the hillsides. Sound shielding from the structure walls provided a small amount of reduction. The distance to the receptor is the distance from the source to the nearest residence rear yard/patio. The $L_{eq(h)}$ is the hourly average for the various operations. The L_{eq} 's were then combined for the purposes of calculating the DNL.

SUNDAY WORST-CASE												
			reference			building	Receptor	dBA @		Leq(h)	Parking/	Total
		# of cars	dBA	Dist	reflection	reduction	Dist	Recept.	Duration, sec	Driving	Exiting	Leq(h)
Driving in/out	reference	1	60	15	9	6	135	44	7			
1st floor	in	122	81	15	9	6	135	65	7	38	41	43
2nd floor	in	243	84	15	9	6	135	68	7	41	41	44
3rd floor	in	365	86	15	9	6	135	70	7	43		43
3rd floor on deck	in	122	81	15	6		135	68	7	41	46	47
1st floor	out	130	81	15	9	6	135	65	7	38	29	39
2nd floor	out	260	84	15	9	6	135	68	7	41	49	50
3rd floor	out	390	86	15	9	6	135	70	7	43		43
3rd on deck	out	130	81	15	9	6	135	65	7	38	51	51
Parking	reference	1	64	15	9	6	160	46	10	21		
	1st	61	82	15	9	6	125	66	10	41		
	2nd	61	82	15	9	6	125	66	10	41		
	3rd	61	83	15	6		125	71	10	45		
	3rd	61	83	15	6		200	67	10	41		
exiting	reference	1	70	15	9	6	160	52	15	29		
	1st	65	88	15	9	6	125	73	15	49		
	2nd	65	88	15	9	6	125	73	15	49		
	3rd	65	83	15	6		125	71	15	47		
	3rd	65	83	15	6		200	67	15	43		

The total $L_{eq(h)}$ values were inserted into the DNL Calculation spreadsheet shown below. The DNL for predicted Sunday parking structure noise due to vehicles was calculated to be 42 dB. Although the parking structure will be operational between 8:00 AM and 9:00 PM, the traffic volumes were grouped into two 3-hour periods, one for inbound and one for outbound. This was done purely for sake of simplifying and expediting the calculations. All daytime (7:00 AM – 10:00 PM) noise is treated the same so it doesn't matter what time the cars go in and out.

DNL CALCULATIONS			
CLIENT:	1440 FOUNDATION		
FILE:	46-075		
PROJECT:	PARKING STRUCTURE		
DATE:	10/9/2014		
SOURCE:	PROJECT-GENERATED NOISE		
LOCATION 1	Res. PL		
TIME		$10^{Leq/10}$	
7:00 AM		1.0	
8:00 AM		1.0	
9:00 AM		1.0	
10:00 AM		1.0	
11:00 AM		1.0	
12:00 PM	42.6	18322.9	
1:00 PM	43.9	24366.8	
2:00 PM	48.7	74393.8	
3:00 PM	38.6	7224.2	
4:00 PM	49.6	90802.2	
5:00 PM	51.8	151449.9	
6:00 PM		1.0	
7:00 PM		1.0	
8:00 PM		1.0	
9:00 PM		1.0	SUM= 366568.8
10:00 PM		1.0	Ld= 55.6
11:00 PM		1.0	
12:00 AM		1.0	
1:00 AM		1.0	
2:00 AM		1.0	
3:00 AM		1.0	
4:00 AM		1.0	
5:00 AM		1.0	
6:00 AM		1.0	SUM= 9.0
			Ld= 9.5
	Daytime Level=	55.6	
	Nighttime Level=	19.5	
	DNL=	42	
	24-Hour Leq=	41.8	

The parking activity includes noise from people entering the parking space, parking the vehicle, opening the door(s) and getting out, sometimes talking, closing the door(s) and locking the vehicle (including lock chirps). This operation typical takes approximately 10 seconds to perform from the time the vehicle turns into the parking space.

The exiting operation includes people approaching the vehicle, sometimes talking, unlocking the door (includes lock chirps), opening the door(s), getting in, closing the door(s) and backing out. This operation typically takes 15 seconds to perform.

These are average values from many analyses of parking lot/structure noise conditions.

Items left to be included in the final analysis are the cars approaching the garage and leaving the garage along the entrance driveway, people talking or socializing in or on the structure, and the effect of intermittent or spurious noises, such as a car alarm. Note that, however, after a few decades of analyzing vehicular noise, we have never heard a vehicle's alarm suddenly go off in a parking lot or parking structure during a study. The possibility of this occurrence would be extremely rare as some external stimulus usually is needed to trigger the alarm, such as a heavy truck passby shaking the car, someone striking the vehicle or a burglary.

As the calculated noise exposure due to the project thus far is well below the limit of the noise standards, it is highly unlikely that the remaining noise levels to be analyzed would raise the project-generated noise exposure to near the imposed limit. For instance, in terms of the vehicular noise analysis presented herein, the traffic volumes would need to increase tenfold to raise the noise exposure to 52 dB DNL. Therefore, the project results in acceptable noise exposures at this time.

Sincerely,

EDWARD L. PACK ASSOC., INC.

A handwritten signature in blue ink, reading "Jeffrey K. Pack", is written over a horizontal line.

Jeffrey K. Pack
President