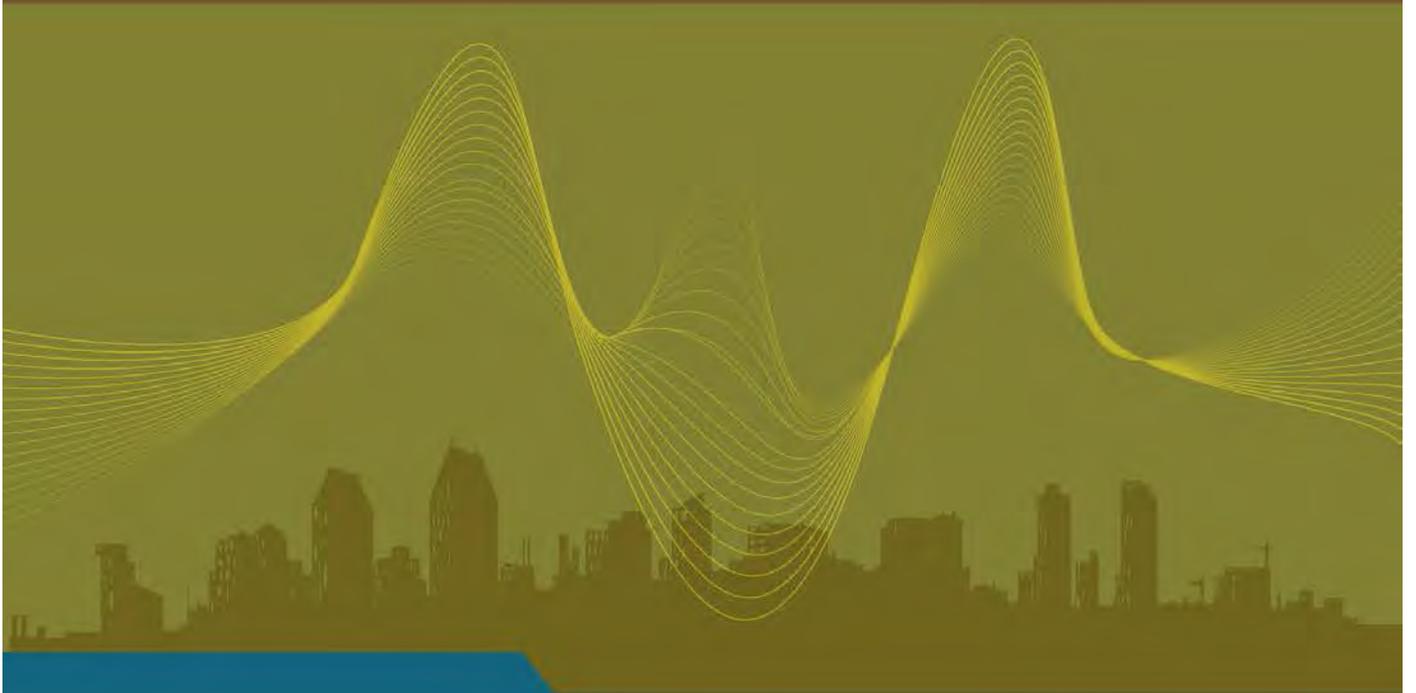


**Appendix E:
Noise Data**

Report #2014-029
February 21, 2014



Exterior Noise Analysis

1620 Whittier Avenue
City of Costa Mesa, California

Prepared for:

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1.0 Definitions

- Noise is undesired sound.
- Sound is an oscillation in pressure, stress, particle displacement, particle velocity, etc., in a medium with internal forces.
- Decibel (dB) is a unit of level when the base of the logarithm is the tenth root of ten, and the quantities concerned are proportional to power.
- Level in acoustics is the logarithm of the ratio of a quantity to a reference quantity of the same kind.
- Time-Weighted refers to the fact that noise occurring during certain time periods is given more significance because it occurs at times when people are more sensitive to noise.
- “A-Weighting” is a frequency correction that correlates overall sound pressure levels with the frequency response of the human ear.
- Leq is the equivalent sound pressure level or “energy” average noise level during a specific time period. It can be measured for any time period, but is typically measured for fifteen minutes, 1 hour, or twenty-four hours.
- Community Noise Equivalent Level (CNEL) is a 24-hour, time-weighted, average noise level based on the “A-weighted” decibel. In the calculation process, noise occurring in the evening time period (7 p.m. to 10 p.m.) is penalized by adding 5 dB, while noise occurring in the nighttime period (10 p.m. to 7 a.m.) is penalized by adding 10 dB. These time periods and decibel increases were selected to reflect a person's increased sensitivity to noise during late-night and early morning hours.
- L(N), or L%, is a statistical method of describing noise which accounts for the variance in noise levels throughout a given measurement period. L(N), where N equals a percentage, is a way of expressing the noise level exceeded for a percentage of time in a given measurement period. For example, since 15 minutes is 25% of 60 minutes, L(25) is the noise level that is exceeded for 15 minutes of a 60 minute measurement period.

2.0 Introduction

The purpose of this report is to determine compliance of 1620 Whittier Avenue with the City of Costa Mesa's exterior noise standards for single and multi-family residential land use. Refer to Figure 1 for the location of the project. Refer to Figure 2 for the conceptual site plan showing home lot numbers. Refer to Figure 3 for the residential area of the project with home lot numbers. Refer to Figure 4 for the live/work area of the project with homes lot numbers.

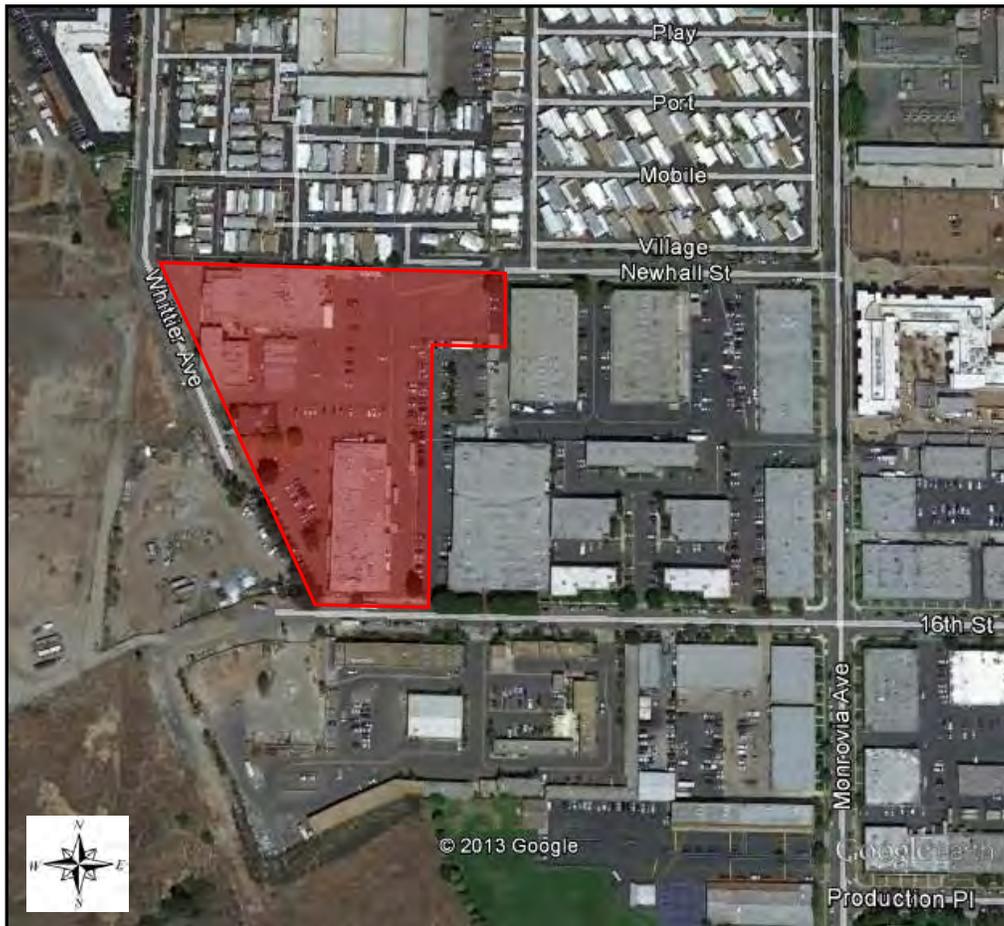


Figure 1 - Location of the Project



Figure 2 – Conceptual Site Plan with Home Lot Numbers



Figure 3 – Residential Area with Home Lot Numbers



Figure 4 – Live/Work Area with Home Lot Numbers

3.0 Noise Exposure Standards

3.1 City of Costa Mesa, California

3.1.1 Noise Element of the General Plan (Transportation Noise Sources)

The City of Costa Mesa’s Noise Element of their General Plan (Adopted January 2002) specifies an exterior noise standard of 65 dB CNEL and an interior noise standard of 45 dB CNEL with closed windows for single and multi- family residential land use. The exterior noise standard for single residential land use is limited to private yards and the exterior noise standard for multi-family residential land use is limited to private patios or balconies which are served by a means of exist from inside the dwelling, balconies 6 feet deep or less are exempt.. The interior environment excludes bathrooms, closets and corridors.

3.1.2 Noise Ordinance of the Municipal Code (Stationary or Non Transportation Noise Sources)

The City of Costa Mesa has established exterior and interior noise standards within Title 13- Chapter XIII (Planning, Zoning and Development – Noise Control). The ordinance is designed to control unnecessary, excessive and annoying sounds generated on one piece of property from impacting an adjacent property and to protect residential areas from noise sources other than transportation sources. The residential exterior and interior noise standards are contained in Table 1 below.

Table 1 – City of Costa Mesa’s Exterior and Interior Noise Standards

Time Period	Exterior Noise Standards (dBA)					Interior Noise Standards (dBA)		
	L50	L25	L8	L2	LMax	L8	L2	LMax
Daytime (7 a.m. to 11 p.m.)	55	60	65	70	75	55	60	65
Nighttime (11 p.m. to 7 a.m.)	50	55	60	65	70	45	50	55

In the event that the alleged offensive noise consists entirely of impact noise, simple tone noise, speech, music, or any combination thereof, each of the noise levels shall be reduced by 5 dBA.

It also states corrections for time characteristics. No person shall create noise or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by such person, with causes the noise level measured on any other residential property to exceed:

- 1) The exterior noise standard for a cumulative period of more than 30 minutes in any hour (L50);
- 2) The exterior noise standard plus 5 dBA for a cumulative period of more than 15 in any hour (L25);
- 3) The exterior noise standard plus 10 dBA for a cumulative period of more than 5 minutes in any hour (L8);
- 4) The exterior noise standard plus 15 dBA for a cumulative period of more than 1 minute in any hour (L2); or
- 5) The exterior noise standard plus 20 dBA for any time period (LMax).
- 6) The interior noise standard for a cumulative period of more than 5 minutes in any hour (L8);
- 7) The interior noise standard plus 5 dBA for a cumulative period of more than 1 minute in any hour (L2); or
- 8) The interior noise standard plus 10 dBA for any time period (LMax).

If the measured ambient level exceeds any of noise limit categories 1-4 and 6-7 above, the cumulative period applicable to said category shall be increased to reflect said ambient noise level. In the event measured ambient level exceeds noise limit categories 5 and 8 above, the maximum allowable noise level under said category shall be increased to reflect the maximum ambient noise level.

The noise ordinance exempts several categories of noise sources, including construction activities which take place between the hours of 7 a.m. and 7 p.m. Monday through Friday and 9 a.m. to 6 p.m. on Saturday. Construction activities are prohibited for all hours on Sundays and federal holidays.

3.2 State of California

Within the 2013 California Building Code (CBC) (California Code of Regulations, Title 24, Part 2, Volume 1, Chapter 12 – Interior Environment, Section 1207 – Sound Transmission), it is stated that residential structures located in noise critical areas shall be designed to prevent the intrusion of exterior noises beyond prescribed levels and should be consistent with the local land-use standards. Interior noise levels attributable to exterior sources shall not exceed 45 dB CNEL in any habitable room and should be consistent with the noise element of the local general plan.

Worst-case noise levels, either existing or future, shall be used as the basis for determining compliance. Future noise levels shall be predicted for a period of at least 10 years from the time of the building permit application.

Residential structures to be located where the CNEL exceeds 60 dB shall require an acoustical analysis showing that the proposed design will limit the exterior noise to the prescribed allowable interior noise level.

4.0 Noise Measurement Survey

A noise measurement survey was conducted on Friday February 7, 2014 from the hours of 8 a.m. to 5 p.m. and on Tuesday, February 11, 2014 from the hours of 8 a.m. to 5 p.m. The goal of the noise measurement survey was to determine the existing ambient noise environment. Noise measurements recorded one second A-weighted noise values at four locations around the projects property line. Refer to Figure 5 for the noise measurement locations.

The sound level meters used to measure the noise levels were 01dB-Metravib SOLO sound level meters. The microphones used were 01dB-Metravib 1/2" condenser microphones. The equipment used meets the American National Standards Institute (ANSI) S1.4 specification for a Type 1 precision sound level meter. The sound level meters were calibrated before and after the test with a Brüel & Kjær Type 4231 sound level calibrator with calibration traceable to the National Institute of Standards and Technology (NIST).

Noise measurement Location 1 was selected for its close proximity to the commercial building on the eastern portion of the project site. The sound level meter at this location was placed at a distance of 10 feet from the nearest property line. The commercial property sits approximately 4 feet higher and there is an existing 6-foot high chain link fence around the property at this location. There are currently six tenants of the commercial building: Bell, Premier Home Staging, Source Motors, CTM Wood Works, Sun Seeker and Crossfit Balboa. To our knowledge, most of these tenants operate Monday-Friday from 8 a.m. to 5 p.m. and sometimes on the weekend between these daytime hours. However, Crossfit Balboa does operate during daytime and nighttime hours: Monday-Friday from 6 a.m. to 8:30 p.m., Saturday from 8:30 a.m. to 10:30 p.m. and Sunday from 11 a.m. to 1 p.m.

Noise measurement Location 2 was selected for its proximity to RVCA on the eastern portion on the project site. The sound level meter at this site was placed 5 feet from the nearest property line. There is an existing 6-foot high chain link fence around the property at this location. RVCA is a clothing manufacturer and warehouse that operates Monday-Friday from 8 a.m. to 5 p.m.

Noise measurement Location 3 was selected for its close proximity to the City of Newport Beach Utility Yard on the southern portion of the project site adjacent to 16th Street. The sound level meter at this location was placed at a distance of 10 feet from the nearest property line. City of Newport Beach Utility Yard is largely shielded from the project site from its own building. City of Newport Beach Utility Yard operates Monday-Friday from 7:30 a.m. to 5:30 p.m.

Noise measurement Location 4 was selected for its close proximity to the commercial property to the west of the project. The sound level meter at this location was placed 5 feet from the nearest property line. There is an existing 6-foot chain link fence around the property at this location.



Figure 5 – Noise Measurement Locations

4.1 Noise Measurement Results

4.1.1 Location 1

The noise measurement survey results for noise measurement Location 1 are presented in Table 2. The table lists the resulting L50, L25, L8, L2, LMax and Leq noise values in terms of dBA for each hour of the measurements. The City of Costa Mesa’s daytime and nighttime exterior noise standards are listed on the bottom row of the table for comparison and values that exceed these standards are shown in red within the table. The nighttime exterior noise standards are shown in this table because one of the tenants of the adjacent commercial building to east of this location, Crossfit Balboa, operates during nighttime hours.

The noise at this location was dominated by noise emanating from the tenants of the commercial building to the east. The values in the table do not exceed the daytime exterior noise standards, but do exceed the nighttime exterior noise standards. Therefore, additional exterior mitigation will be required.

Table 2 – Location 1 Noise Measurement Results (dBA)

Date	Start Time	End Time	L50	L25	L8	L2	Lmax	Leq
2/7/2014	8:00 AM	9:00 AM	44.6	46.4	52.1	61.5	74.8	53.5
2/7/2014	9:00 AM	10:00 AM	49.0	52.8	57.5	64.3	73.6	54.8
2/7/2014	10:00 AM	11:00 AM	47.6	49.5	52.5	61.1	71.8	51.6
2/7/2014	11:00 AM	12:00 PM	47.5	49.3	52.8	57.1	73.8	50.2
2/7/2014	12:00 PM	1:00 PM	49.7	52.0	55.1	60.5	73.0	52.8
2/7/2014	1:00 PM	2:00 PM	46.2	48.6	52.1	62.2	72.9	57.0
2/7/2014	2:00 PM	3:00 PM	45.3	48.5	53.0	58.5	70.1	49.9
2/7/2014	3:00 PM	4:00 PM	48.0	51.8	58.7	65.2	72.1	54.7
2/7/2014	4:00 PM	5:00 PM	54.8	46.2	48.5	55.3	67.2	50.9
2/11/2014	8:00 AM	9:00 AM	43.4	45.2	48.4	53.9	68.3	46.3
2/11/2014	9:00 AM	10:00 AM	46.3	51.1	60.8	66.5	74.7	60.7
2/11/2014	10:00 AM	11:00 AM	49.6	53.5	58.7	64.1	72.9	54.7
2/11/2014	11:00 AM	12:00 PM	46.8	48.4	51.5	58.3	67.8	49.6
2/11/2014	12:00 PM	1:00 PM	47.6	50.3	54.8	59.1	65.1	51.7
2/11/2014	1:00 PM	2:00 PM	46.9	50.3	53.7	59.7	74.2	51.4
2/11/2014	2:00 PM	3:00 PM	50.6	54.0	57.5	65.0	69.2	58.3
2/7/2014	3:00 PM	4:00 PM	52.2	55.2	56.8	60.6	71.8	54.7
2/11/2014	4:00 PM	5:00 PM	52.2	54.1	57.2	62.8	72.1	54.9
Daytime Exterior Noise Standards:			55.0	60.0	65.0	70.0	75.0	-
Nighttime Exterior Noise Standards:			50.0	55.0	60.0	65.0	70.0	-

4.1.2 Location 2

The noise measurement survey results for noise measurement Location 2 are presented in Table 3. The table lists the resulting L50, L25, L8, L2, LMax and Leq noise values in terms of dBA for each hour of the measurements. The City of Costa Mesa’s daytime exterior noise standards are listed on the bottom row of the table for comparison and values that exceed these standards are shown in red within the table. The nighttime exterior noise standards are not shown in this table because RVCA, which is east of this location, only operates during daytime hours.

The noise at this location was dominated by noise emanating from Ametek Aerospace & Defense, which is currently located and operating on the project site, but will be demolished once this project is built. The main noise sources from Ametek Aerospace & Defense were from pumps that have an air filtration system and they ran for the entire duration of the noise measurement survey. There were also truck and vehicle deliveries to Ametek Aerospace & Defense that contributed to the higher noise values.

The values in the table do exceed the daytime exterior noise standards, but since the noise at this location was dominated by noise emanating from Ametek Aerospace & Defense, which will no longer exist once this project is built, additional exterior mitigation measures should not be required.

Table 3 – Location 2 Noise Measurement Results (dBA)

Date	Start Time	End Time	L50	L25	L8	L2	Lmax	Leq
2/7/2014	8:00 AM	9:00 AM	55.1	56.4	60.2	68.4	83.0	58.9
2/7/2014	9:00 AM	10:00 AM	54.7	55.5	57.0	60.0	76.3	55.6
2/7/2014	10:00 AM	11:00 AM	54.6	55.8	61.1	70.0	79.8	59.8
2/7/2014	11:00 AM	12:00 PM	54.3	55.5	59.1	64.8	76.9	57.2
2/7/2014	12:00 PM	1:00 PM	59.6	63.3	64.7	70.7	81.9	62.7
2/7/2014	1:00 PM	2:00 PM	55.7	56.7	59.5	67.5	83.9	59.5
2/7/2014	2:00 PM	3:00 PM	55.7	56.5	58.0	61.2	73.3	56.5
2/7/2014	3:00 PM	4:00 PM	56.5	57.9	61.7	68.1	81.3	60.1
2/7/2014	4:00 PM	5:00 PM	53.8	55.5	58.4	62.6	73.5	55.9
2/11/2014	8:00 AM	9:00 AM	56.5	57.3	59.4	59.1	94.7	63.4
2/11/2014	9:00 AM	10:00 AM	58.8	62.1	58.6	58.8	88.3	66.5
2/11/2014	10:00 AM	11:00 AM	56.4	63.8	59.4	57.7	81.0	61.1
2/11/2014	11:00 AM	12:00 PM	68.6	57.7	59.1	56.7	91.1	65.7
2/11/2014	12:00 PM	1:00 PM	55.1	59.2	58.1	57.1	84.1	59.3
2/11/2014	1:00 PM	2:00 PM	56.4	61.1	58.8	56.6	85.1	60.6
2/11/2014	2:00 PM	3:00 PM	57.4	58.6	64.7	67.2	84.1	62.4
2/11/2014	3:00 PM	4:00 PM	58.0	57.6	57.4	58.0	84.2	61.5
2/11/2014	4:00 PM	5:00 PM	58.3	64.4	62.6	68.4	85.5	63.9
Daytime Exterior Noise Standards:			55.0	60.0	65.0	70.0	75.0	-

4.1.3 Location 3

The noise measurement survey results for noise measurement Location 3 are presented in Table 4. The table lists the resulting L50, L25, L8, L2, LMax and Leq noise values in terms of dBA for each hour of the measurements. The City of Costa Mesa’s daytime exterior noise standards are listed on the bottom row of the table for comparison and values that exceed these standards are shown in red within the table. The nighttime exterior noise standards are not shown in this table because RVCA, which is east of this location and City of Newport Beach Utility Yard, which is south of this location, only operate during daytime hours.

The noise at this location was dominated by noise emanating from Ametek Aerospace & Defense, which is currently located and operating on the project site, but will be demolished once this project is built. The main noise sources from Ametek Aerospace & Defense were from pumps that have an air filtration system and they ran for the entire duration of the noise measurement survey. Trucks and vehicles traveling on 16th Street also contributed to the higher noise values.

The values in the table do exceed the daytime exterior noise standards, but since the noise at this location was dominated by noise emanating from Ametek Aerospace & Defense, which will no longer exist once this project is built, additional exterior mitigation measures should not be required.

Table 4 – Location 3 Noise Measurement Results (dBA)

Date	Start Time	End Time	L50	L25	L8	L2	Lmax	Leq
2/7/2014	8:00 AM	9:00 AM	53.8	55.2	60.6	67.0	74.7	58.4
2/7/2014	9:00 AM	10:00 AM	56.4	57.4	59.0	64.8	80.1	78.3
2/7/2014	10:00 AM	11:00 AM	56.1	58.0	59.8	67.9	80.6	59.9
2/7/2014	11:00 AM	12:00 PM	55.8	57.7	60.3	68.2	80.7	59.8
2/7/2014	12:00 PM	1:00 PM	56.7	59.1	66.1	78.5	95.8	68.4
2/7/2014	1:00 PM	2:00 PM	55.9	57.7	59.3	65.1	75.4	57.8
2/7/2014	2:00 PM	3:00 PM	56.0	57.6	60.1	68.3	79.3	59.3
2/7/2014	3:00 PM	4:00 PM	56.2	58.1	60.9	66.0	76.0	58.5
2/7/2014	4:00 PM	5:00 PM	55.1	57.7	62.1	71.3	89.1	62.5
2/11/2014	8:00 AM	9:00 AM	52.5	53.4	56.6	64.2	82.4	57.3
2/11/2014	9:00 AM	10:00 AM	52.8	53.7	58.2	76.2	87.7	64.7
2/11/2014	10:00 AM	11:00 AM	53.0	55.6	63.5	68.6	77.2	59.4
2/11/2014	11:00 AM	12:00 PM	52.9	54.7	60.5	67.8	74.7	57.9
2/11/2014	12:00 PM	1:00 PM	52.9	55.0	58.5	67.8	85.0	58.3
2/11/2014	1:00 PM	2:00 PM	55.3	57.2	59.0	65.2	77.0	58.0
2/11/2014	2:00 PM	3:00 PM	55.1	57.4	61.1	68.5	84.7	59.7
2/11/2014	3:00 PM	4:00 PM	55.9	57.8	60.0	65.3	71.8	57.8
2/11/2014	4:00 PM	5:00 PM	54.4	56.9	60.8	66.9	77.1	58.2
Daytime Exterior Noise Standards:			55.0	60.0	65.0	70.0	75.0	-

4.1.4 Location 4

The noise measurement survey results for noise measurement Location 4 are presented in Table 5. The table lists the resulting L50, L25, L8, L2, LMax and Leq noise values in terms of dBA for each hour of the measurements. The City of Costa Mesa’s daytime exterior noise standards are listed on the bottom row of the table for comparison and values that exceed these standards are shown in red within the table.

The noise at this location was dominated by noise emanating from Ametek Aerospace & Defense, which is currently located and operating on the project site, but will be demolished once this project is built. The values in the table that do exceed the daytime exterior noise standards were from landscaping/gardening services for Ametek Aerospace & Defense on Friday, February 7th from 12 p.m. to 1 p.m. Noise from the adjacent commercial property to the west was not audible and therefore should have a less than significant impact to the project site.

Since the noise at this location was dominated by noise emanating from Ametek Aerospace & Defense, which will no longer exist once this project is built, additional exterior mitigation measures should not be required.

Table 5 – Location 4 Noise Measurement Results (dBA)

Date	Start Time	End Time	L50	L25	L8	L2	Lmax	Leq
2/7/2014	8:00 AM	9:00 AM	48.7	50.5	56.5	64.9	75.8	74.8
2/7/2014	9:00 AM	10:00 AM	54.1	56.5	59.2	62.0	72.7	71.9
2/7/2014	10:00 AM	11:00 AM	49.1	50.2	53.3	58.2	71.4	71.3
2/7/2014	11:00 AM	12:00 PM	51.1	53.3	54.3	57.5	72.2	69.8
2/7/2014	12:00 PM	1:00 PM	57.0	61.7	65.9	77.3	90.5	89.9
2/7/2014	1:00 PM	2:00 PM	50.0	50.7	53.3	58.4	74.8	71.1
2/7/2014	2:00 PM	3:00 PM	50.1	51.8	54.0	65.8	74.8	74.3
2/7/2014	3:00 PM	4:00 PM	50.6	51.6	53.9	63.1	70.2	69.6
2/7/2014	4:00 PM	5:00 PM	50.6	52.1	55.0	61.1	74.2	68.5
2/11/2014	8:00 AM	9:00 AM	49.3	50.1	51.9	56.3	73.2	50.7
2/11/2014	9:00 AM	10:00 AM	54.5	55.3	59.5	65.2	69.2	56.6
2/11/2014	10:00 AM	11:00 AM	53.7	54.6	56.4	61.0	70.7	54.5
2/11/2014	11:00 AM	12:00 PM	49.5	50.7	54.4	55.7	68.5	51.0
2/11/2014	12:00 PM	1:00 PM	49.2	52.2	55.3	58.8	69.5	52.0
2/11/2014	1:00 PM	2:00 PM	50.7	54.3	55.7	57.5	69.2	52.8
2/11/2014	2:00 PM	3:00 PM	49.7	50.7	52.6	57.6	69.2	51.1
2/11/2014	3:00 PM	4:00 PM	51.6	53.1	55.0	57.5	62.7	52.6
2/11/2014	4:00 PM	5:00 PM	53.3	54.3	55.8	59.4	70.0	54.4
Daytime Exterior Noise Standards:			55.0	60.0	65.0	70.0	75.0	-

4.2 Required Exterior Mitigation Measures

4.2.1 Backyards of Home Lots 14-16

To reduce the noise emanating from the commercial building to the east of measurement Location 1 to levels that comply the City of Costa Mesa's nighttime exterior noise standards at the backyards of Lots 14-16, it was calculated that a 6-foot perimeter wall would be required along the property line between the commercial building and the project site. The 6-foot perimeter wall should reduce the levels in Table 2 above to within the City of Costa Mesa's nighttime exterior noise standards. There is already an 8-foot perimeter wall planned around the project in this location that will satisfy this requirement. Refer to Figure 7 for the location of the planned 8-foot perimeter wall around the project.

The perimeter wall is required to have a surface density of at least 3.5 pounds per square foot, and have no openings or gaps. It may be constructed of wood studs with stucco exterior, 3/8-inch plate glass, 5/8-inch Plexiglas, any masonry material, or a combination of these materials.

4.2.2 2nd Floor Balcony of Home Lot 15

Based upon the preliminary architectural plans, the 2nd floor balcony of Lot 15, which is greater than 6 feet in depth, will have line of sight to the commercial building to the east. It was calculated that the exterior noise level at the 2nd floor balcony of Lot 15 will comply with the nighttime exterior noise standards due to distance reduction. Additional interior mitigation measures will not be required.

4.3. Interior Noise Standards

The project must comply with the City of Costa Mesa's daytime and nighttime interior noise standards for Lots 14-16. To comply with the daytime and nighttime interior noise standards, the homes of Lots 14-16 must provide sufficient exterior to interior noise attenuation to reduce the interior noise exposure to acceptable levels.

The worst-case measured exterior noise levels within Table 2 were 60.8 dBA L8, 66.5 dBA L2 and 74.8 dBA LMax. The City of Costa Mesa's daytime interior noise standards are 55 dBA L8, 60 dBA L2 and 65 dBA LMax. Therefore the rooms within the 1st-3rd floors of the homes of Lots 14-16 must provide 5.8, 6.5 and 9.8, respectively of exterior to interior noise reduction in order to meet the daytime interior noise standards. The City of Costa Mesa's nighttime interior noise standards are 45 dBA L8, 50 dBA L2 and 55 dBA LMax. Therefore the rooms within the 1st-3rd floors of the homes of Lots 14-16 must provide 15.8, 16.5 and 19.8, respectively of exterior to interior noise reduction in order to meet the daytime interior noise standards. Our experience has shown that new standard construction in southern California will typically provide 25-30 dB of noise reduction.

Based upon the preliminary architectural plans, meeting the City of Costa Mesa's daytime and nighttime interior noise standards is achievable with standard construction. We estimate that the homes will not require additional interior mitigation measures. However, an interior noise analysis is recommended when architectural plans become available to ensure that the project complies with the City of Costa Mesa's interior noise standard.

5.0 Roadway Methodology

The roadway noise exposure in this report was computed using an acoustical planning and modeling program called SoundPLAN (Version 7.2). SoundPLAN was created by Braunstein & Berndt GmbH and incorporates the Federal Highway Administration (FHWA) Traffic Noise Model (TNM) (Version 2.5) noise emission and noise prediction methodology. Table 6¹ lists the arterial vehicle mix percentages for day, evening, and night time periods. The vehicles are divided into automobiles, medium trucks and heavy trucks.

Table 6 – Arterial Roadway Vehicle Mix Percentages

	Day	Evening	Night
Automobiles	75.51%	12.57%	9.34%
Medium Trucks	1.56%	0.09%	0.19%
Heavy Trucks	0.64%	0.02%	0.08%

6.0 Roadway Exterior Noise Exposure

The proposed project will be subject to noise from traffic on the three arterial roadways closest to the site: 16th Street, Whittier Avenue and Newhall Street.

The latest existing (2004) ADT volume for 16th Street was obtained from the City of Costa Mesa’s Traffic Engineering department. The future (2024) ADT volume for 16th Street was estimated using the existing (2004) ADT volume with a 1% annual growth rate.

The latest existing (2002) ADT volume for Whittier Avenue was obtained from the City of Costa Mesa’s Traffic Engineering Department. The future (2024) ADT volume for Whittier Avenue was estimated using the existing (2002) ADT volume with a 1% annual growth rate.

The latest existing (2014) ADT volume for Newhall Street was obtained from the City of Costa Mesa’s Traffic Engineering Department. The future (2024) ADT volume for Newhall Street was estimated using the existing (2014) ADT volume with a 1% annual growth rate.

The speed limits for 16th Street, Whittier Avenue and Newhall Street were obtained from a site visit. The existing and future traffic volumes and speed utilized in calculating the traffic noise exposure are presented in Table 7.

¹ County of Orange Environmental Management Agency, *Sound Attenuation Guidelines*, File C54-115, September 4, 1984.

Table 7 – Existing and Future Traffic Volumes and Speeds

Roadway	Type	Traffic Volumes				Speed (mph)
		Existing Year	ADT	Future Year	ADT	
16th Street	Arterial	2004	4,000	2024	4,881	35
Whittier Avenue	Arterial	2002	3,943	2024	4,908	35
Newhall Street	Arterial	2014	2,000	2024	2,209	25

6.1 Residential Area of the Project

The worst-case exterior noise levels at the backyards and 2nd-3rd floors of the homes were calculated and are presented in Table 8. Figure 6 shows the results as lines, or contours of equal noise exposure. The figure shows the 40-75 dB CNEL roadway noise exposure contours at ground level. The worst-case exterior noise levels within Table 8 and Figure 6 take into account the planned 8-foot and 6-foot perimeter walls around the project. Refer to Figure 7 for the location of the planned 8-foot and 6-foot perimeter walls around the project.

The worst case exterior noise levels at the backyards were calculated to be as high as 53.6 dB CNEL. Since this level does not exceed the City of Costa Mesa’s exterior noise standard of 65 dB CNEL, additional exterior mitigation measures will not be required. The worst case exterior noise levels at the 2nd-3rd floors of the homes were calculated to be as high as 54.5 and 54.7 dB CNEL, respectively. Since these levels do not exceed the City of Costa Mesa’s exterior noise standard of 65 dB CNEL, additional exterior mitigation measures will not be required.

6.2 Live/Work Area of the Project

The worst-case exterior noise levels at the 1st-3rd floors of the homes were calculated and are presented in Table 9. Figure 6 shows the results as lines, or contours of equal noise exposure. The figure shows the 40-75 dB CNEL roadway noise exposure contours at ground level. The worst-case exterior noise levels within Table 9 and Figure 6 take into account the planned 8-foot and 6-foot perimeter walls around the project. Refer to Figure 7 for the location of the planned 8-foot and 6-foot perimeter walls around the project.

The worst case exterior noise levels at the 1st-3rd floors of the homes were calculated to be as high as 62.3, 62.0 and 61.4 dB CNEL, respectively. Since these levels not exceed the City of Costa Mesa’s exterior noise standard of 65 dB CNEL, additional exterior mitigation measures will not be required.

Table 8 – Worst-Case Exterior Noise Levels for the Residential Area of the Project (dB CNEL)

Lot	Backyards/ 1st Floor	2nd Floor	3rd Floor
1	53.6	54.5	54.7
2	52.3	47.8	48.2
3	51.6	47.4	47.7
4	50.3	46.2	46.6
5	46.8	47.9	48.5
6	49.9	47.6	48.1
7	49.2	47.2	47.9
8	49.0	46.6	47.6
9	48.4	46.4	47.5
10	48.1	46.3	47.6
11	47.7	46.1	46.9
12	47.6	46.7	47.6
13	47.7	47.7	48.1
14	50.5	50.6	50.3
15	49.9	51.0	50.6
16	50.7	50.2	49.9
17	48.5	47.9	47.9
18	48.0	48.2	48.2
19	49.5	49.0	48.6
20	48.6	45.7	47.1
21	48.4	48.3	48.1
22	48.1	47.9	48.0
23	46.4	45.7	47.0
24	46.0	46.1	47.3
25	46.9	46.5	47.6
26	46.4	46.5	48.0
27	47.0	46.7	48.3
28	46.2	46.6	47.9
29	45.9	47.0	48.1
30	46.5	46.8	48.8
31	47.4	47.4	48.9
32	47.2	45.9	46.6
33	46.1	46.1	46.8
34	45.2	44.5	45.0
35	43.0	43.8	44.7
36	46.0	44.7	46.0
37	46.7	46.2	47.5
38	46.3	45.5	46.6
39	46.5	45.0	45.9
40	46.6	46.4	47.4
41	46.1	46.6	47.5
42	46.8	48.2	48.5
43	47.4	49.3	49.4
44	47.1	46.3	46.4
45	47.6	47.3	47.7
46	48.8	47.9	48.2
47	49.6	48.4	48.5
48	51.4	49.8	49.8
49	52.0	50.8	51.0

Table 9 – Worst-Case Exterior Noise Levels for the Live/Work Area of the Project (dB CNEL)

Lot	1st Floor	2nd Floor	3rd Floor
1	62.3	62.0	61.4
2	62.2	61.9	61.3
3	62.3	61.9	61.4
4	62.2	61.8	61.3
5	56.1	56.3	55.6
6	53.8	54.0	53.3
7	52.0	51.8	51.9
8	50.4	50.3	50.6
9	48.6	48.5	48.7
10	48.2	48.5	48.8
11	47.6	47.8	48.0
12	47.0	47.6	47.8
13	46.3	47.1	47.2
14	46.1	46.6	46.8
15	45.5	46.2	46.3
16	44.4	45.5	45.5
17	44.5	45.5	46.8
18	45.4	46.4	47.5
19	46.0	46.9	48.0
20	46.5	47.7	48.6
21	47.3	48.9	49.4
22	48.5	50.2	50.1
23	44.8	45.9	46.9
24	46.9	47.3	48.4
25	47.7	48.4	49.7
26	47.2	48.1	49.1
27	48.2	48.3	48.7
28	50.9	50.3	50.0
29	49.2	52.4	52.3
30	48.4	50.6	51.0
31	48.5	49.9	50.4
32	49.5	50.2	51.1
33	48.1	48.6	49.3
34	48.5	49.3	49.9
35	48.8	49.3	50.4
36	49.7	50.9	51.4
37	53.2	53.9	54.5
38	53.2	54.0	54.1
39	53.7	54.4	54.3
40	53.7	54.7	54.5

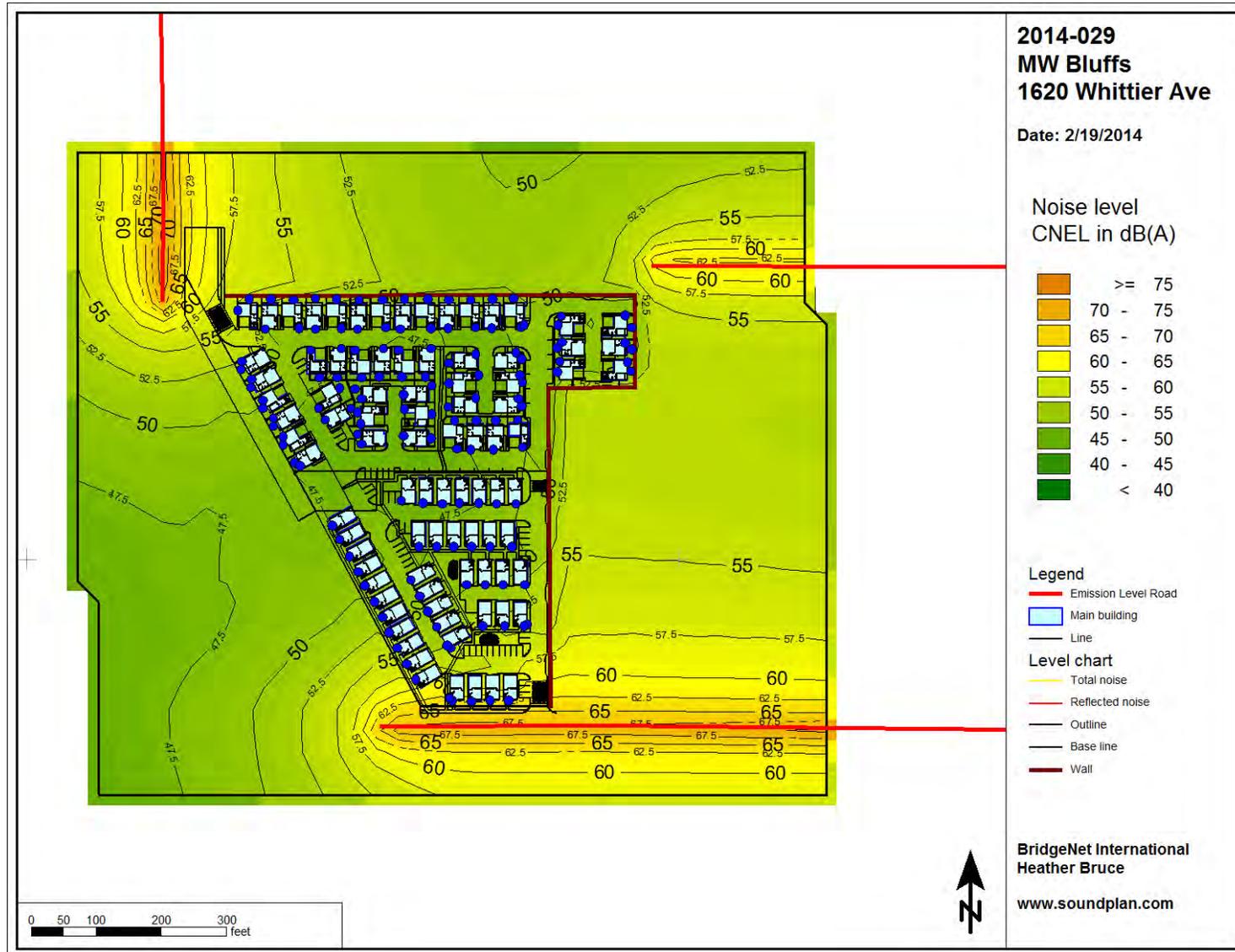


Figure 6 – Roadway Noise Exposure Contours at Ground Level (dB CNEL)

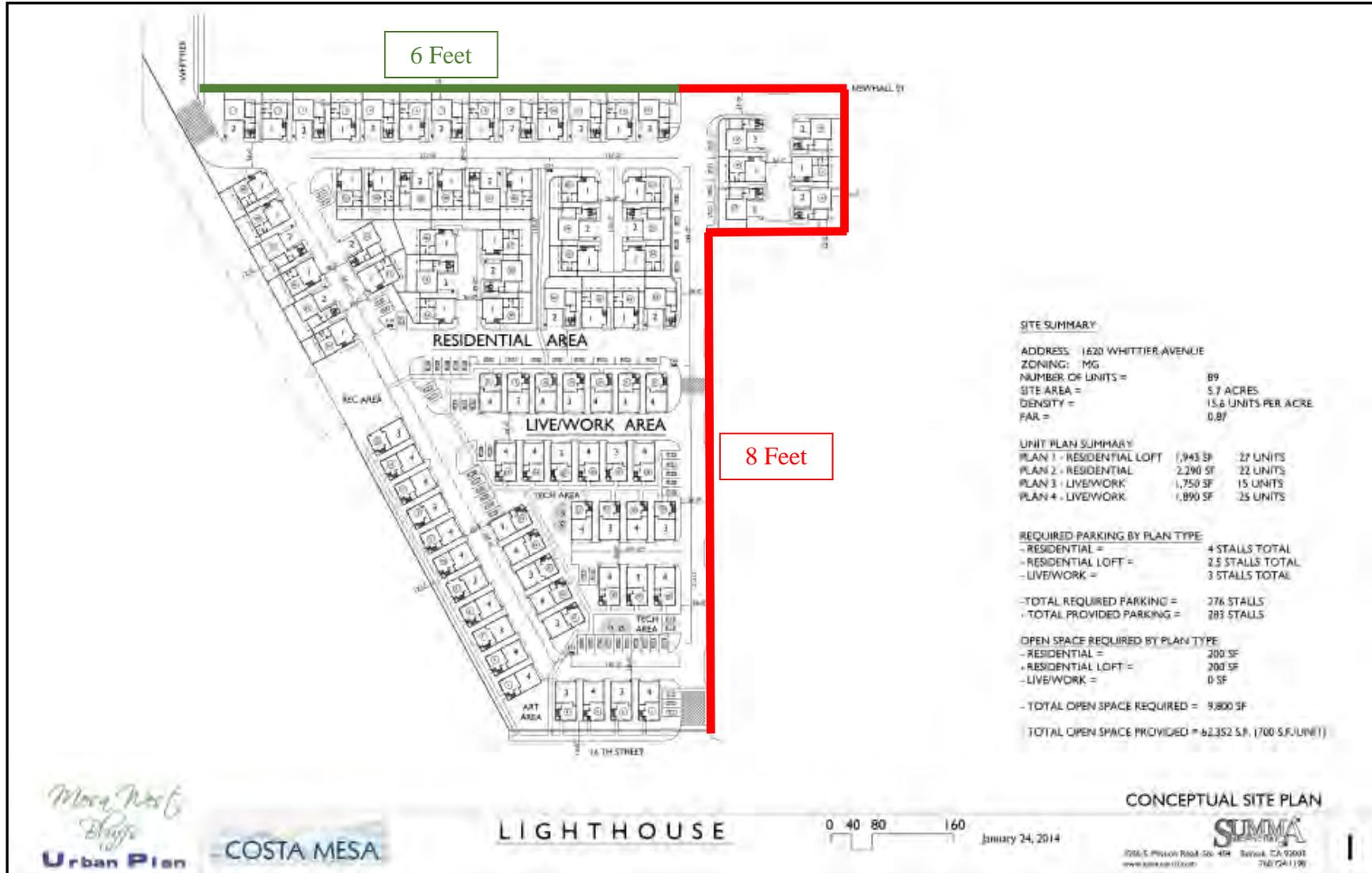


Figure 7 – Location of the Planned 8-Foot and 6-foot Perimeter Walls

7.0 Roadway Interior Noise Exposure

The project must comply with the City of Costa Mesa's interior noise standard of 45 dB CNEL for single and multi-family residential land use. To comply with the interior noise standard the homes must provide sufficient exterior to interior noise attenuation to reduce the interior noise exposure to acceptable levels.

The worst-case exterior noise levels at the 1st-3rd floors of the homes of the residential area of the project were calculated to be as high 53.6, 54.5 and 54.7 dB CNEL, respectively. This means the rooms within the 1st-3rd floors of the homes must provide at least 8.6, 9.5 and 9.7 dB, respectively of exterior to interior noise reduction in order to meet the interior noise standard.

The worst-case exterior noise levels at the 1st-3rd floors of the homes of the live/work area of the project were calculated to be as high 62.3, 62.0 and 61.4 dB CNEL, respectively. This means the rooms within the 1st-3rd floors of the homes must provide at least 17.3, 17.0 and 16.4 dB, respectively of exterior to interior noise reduction in order to meet the interior noise standard.

Our experience has shown that new standard construction in southern California will typically provide 25-30 dB of noise reduction. Based upon the preliminary architectural plans, meeting the City of Costa Mesa's interior noise standard of 45 dB CNEL for single and multi-family residential land use is achievable with standard construction. We estimate that the homes will not require additional interior mitigation measures. However, an interior noise analysis is recommended when architectural plans become available to ensure that the project complies with the City of Costa Mesa's interior noise standard.

8.0 References

County of Orange Environmental Management Agency, *Sound Attenuation Guidelines*, File C54-115, September 4, 1984.

Summa Architecture, Civil Engineering Site Plan for *1620 Whittier Avenue*, City of Costa Mesa, California, October 26, 2013.